Tivoli software

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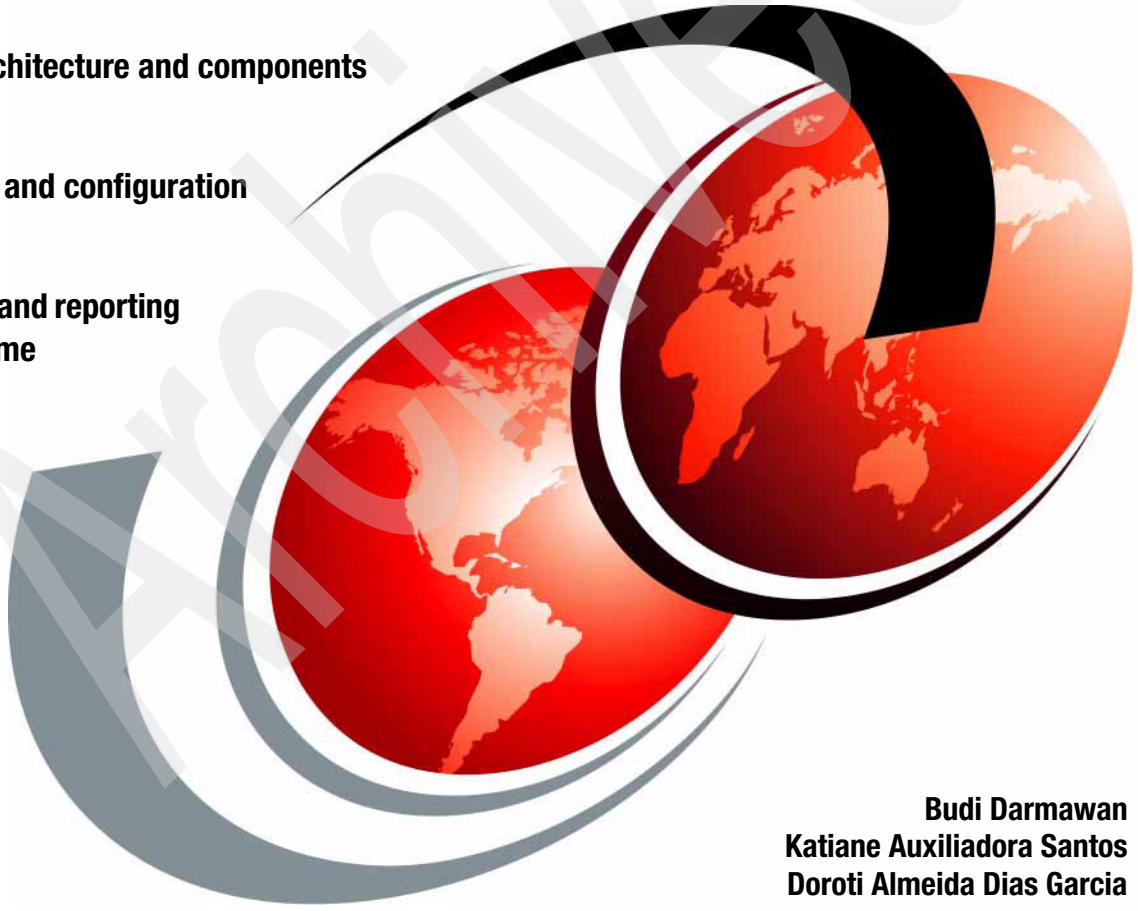
Certification Guide Series: IBM Tivoli Composite Application Manager for Response Time V6.2 Implementation

- Detailed architecture and components discussion
- Installation and configuration processing
- Monitoring and reporting response time



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International Technical Support Organization

Certification Guide Series: IBM Tivoli Composite Application Manager for Response Time V6.2 Implementation

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

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Preface

This book is a study guide for IBM® Tivoli® Composite Application Manager for Response Time V6.2 certification. It is aimed for the IT professional who wants to be an IBM Certified Professional for this product.

IBM Tivoli Composite Application Manager for Response Time V6.2 certification is offered through the IBM Professional Certification program. It is designed to validate the skills required of technical professionals who work with the implementation and deployment of ITCAM for Response Time V6.2.

This book provides the necessary information for understanding the subject matter. It includes sample questions. The sample questions help in evaluating personal progress. It familiarizes the readers with the types of questions that might be encountered in the exam.

This guide does not replace practical experience. It is not designed to be a stand-alone guide for the subject. Instead, this guide should be combined with educational activities and experiences for preparation for the exam.

For your convenience, the chapters are based on the certification objectives of the ITCAM for Response Time V6.2 implementation certification test. Those requirements are planning, prerequisites, installation, configuration, administration, and problem determination. Studying each chapter helps you prepare for each objective of the exam.

The team that wrote this book

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

Figure 1 Doroti Almeida Dias Garcia, Budi Darmawan, Katiane Auxiliadora Santos

Budi Darmawan is a Project Leader at the International Technical Support Organization, Austin Center. He writes extensively and teaches IBM classes worldwide on all areas of Tivoli systems management products. Before joining the ITSO, Budi worked in IBM Indonesia as Technical Lead and Solution Architect. His current interests include Java™ programming, systems availability, and business service management.

Katiane Auxiliadora Santos is a Tivoli IT Specialist for IBM Tivoli Customer Support in Brazil. She has four years of experience in the Tivoli support field. She holds a degree in Computer Science from UNIFEI - Centro Universitario da FEI. Her skills include IBM Tivoli Framework, IBM Tivoli Distributing Monitoring V3.7, IBM Tivoli Monitoring V5.1.x and family, IBM Tivoli Monitoring V6.x and family, ITCAM for Response Time Tracking V6.1, and ITCAM for WebSphere® V6.1.

Doroti Almeida Dias Garcia is an IT Specialist working for Tivoli Customer Support in Brazil. She has eight years of experience with Tivoli products,

focusing on IBM Tivoli Workload Scheduler, IBM Tivoli Identity Manager, IBM Tivoli Directory Server, IBM Tivoli Monitoring, and IBM Tivoli Composite Application Manager. She graduated in Mathematics and Science from UniFAI - Centro Universitario Assuncao and post-graduated in MBA- E-Management IT from Fundacao Getulio Vargas. Her area of expertise also includes the AIX® operating system.

Thanks to the following people for their contributions to this project:

Terry Copeland, Aamir Penkar
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1

Certification overview

This chapter provides an overview of the skills requirements needed to obtain an IBM Advanced Technical Expert certification. This chapter provides a comprehensive review of topics that are essential for obtaining the certification:

1.1 IBM Professional Certification Program

Having the right skills for the job is critical in the growing global marketplace. IBM Professional Certification is designed to validate skill and proficiency in the latest IBM solutions and product technology. It can help provide that competitive edge. The IBM Professional Certification Program Web site is available at:

http://www.ibm.com/certify/index.shtml

The Professional Certification Program from IBM offers a business solution for skilled technical professionals seeking to demonstrate their expertise to the world.

The program is designed to validate your skills and demonstrate your proficiency in the latest IBM technologies and solutions. In addition, professional certification might help you excel at your job by giving you and your employer confidence that your skills have been tested. You might be able to deliver higher levels of service and technical expertise than non-certified employees and move on a faster career track.

The certification requirements are difficult, but it is not overwhelming. It is a rigorous process that differentiates you from everyone else. The mission of IBM Professional Certification is to:

- Provide a reliable, valid, and fair method of assessing skills and knowledge
- Provide IBM with a method of building and validating the skills of individuals and organizations
- Develop a loyal community of highly skilled certified professionals who recommend, sell, service, support, and use IBM products and solutions

The Professional Certification Program from IBM has developed certification role names to guide you in your professional development. The certification role names include IBM Certified Specialist, IBM Certified Solutions/Systems Expert, and IBM Certified Advanced Technical Expert. These role names are for technical professionals who sell, service, and support IBM solutions. For technical professionals in application development, the certification roles include IBM Certified Developer Associate and IBM Certified Developer. An IBM Certified Instructor certifies the professional instructor.

The Professional Certification Program from IBM provides you with a structured program leading to an internationally recognized qualification. The program is designed for flexibility by allowing you to select your role, prepare for and take tests at your own pace, and, in some cases, select from a choice of elective tests best suited to your abilities and needs. Some roles also offer a shortcut by giving credit for a certification obtained in other industry certification programs.

You can be a network administrator, systems integrator, network integrator, solution architect, solution developer, value-added reseller, technical coordinator, sales representative, or educational trainer. Regardless of your role, you can start charting your course through the Professional Certification Program from IBM today.

1.1.1 Benefits of certification

Certification is a tool to help objectively measure the performance of a professional on a given job at a defined skill level. Therefore, it is beneficial for individuals who want to validate their own skills and performance levels, their employees, or both. For optimum benefit, the certification tests must reflect the critical tasks required for a job, the skill levels of each task, and the frequency by which a task needs to be performed. IBM prides itself in designing comprehensive, documented processes that ensure that IBM certification tests remain relevant to the work environment of potential certification candidates.

In addition to assessing job skills and performance levels, professional certification can also provide such benefits as:

- For employees:
  - Promotes recognition as an IBM certified professional
  - Helps to create advantages in interviews
  - Assists in salary increases, corporate advancement, or both
  - Increases self-esteem
  - Provides continuing professional benefits
- For employers:
  - Measures the effectiveness of training
  - Reduces course redundancy and unnecessary expenses
  - Provides objective benchmarks for validating skills
  - Makes long-range planning easier
  - Helps to manage professional development
  - Aids as a hiring tool
  - Contributes to competitive advantage
  - Increases productivity
  - Increases morale and loyalty
- For IBM Business Partners and consultants:
  - Provides independent validation of technical skills
  - Creates competitive advantage and business opportunities
  - Enhances prestige of the team
  - Contributes to IBM requirements for various IBM Business Partner programs

Specific benefits can vary by country (region) and role. In general, after you become certified, you should receive the following benefits:

- Industry recognition

  Certification might accelerate your career potential by validating your professional competency and increasing your ability to provide solid, capable technical support.

- Program credentials

  As a certified professional, you receive through e-mail your certificate of completion and the certification mark associated with your role for use in advertisements and business literature. You can also request a hardcopy certificate, which includes a wallet-size certificate.

  The Professional Certification Program from IBM acknowledges the individual as a technical professional. The certification mark is for the exclusive use of the certified individual.

- Ongoing technical vitality

  IBM Certified professionals are included in mailings from the Professional Certification Program from IBM.

1.1.2 Tivoli Software Professional Certification

The IBM Tivoli Professional Certification program offers certification testing that sets the standard for qualified product consultants, administrators, architects, and partners.

The program also offers an internationally recognized qualification for technical professionals seeking to apply their expertise in today's complex business environment. The program is designed for those who implement, buy, sell, service, and support IBM Tivoli solutions and want to deliver higher levels of service and technical expertise.

Benefits of being Tivoli certified

Tivoli certification provides the following benefits:

- For the individual:
  - IBM Certified certificate and use of logos on business cards
  - Recognition of your technical skills by your peers and management
  - Enhanced career opportunities
  - Focus for your professional development
- For the IBM Business Partner:
  - Confidence in the skills of your employees

  - Enhanced partnership benefits from the IBM Business Partner program
  - Can bill your employees out at higher rates
  - Strengthens your proposals to customers
  - Demonstrates the depth of technical skills available to prospective customers

- For the customer:
  - Confidence in the services professionals handling your implementation
  - Ease of hiring competent employees to manage your Tivoli environment
  - Enhanced return on investment (ROI) through more thorough integration with Tivoli and third-party products
  - Ease of selecting a Tivoli Business Partner that meets your specific needs

Certification checklist

The certification process is:

1. Select the certification that you want to pursue.
2. Determine which test or tests are required by reading the certification role description.
3. Prepare for the test, using the following resources provided:
   - Test objectives
   - Recommended educational resources
   - Sample assessment test
   - Other reference materials
   - Opportunities for experience
4. Register to take a test by contacting one of our worldwide testing vendors:
   - Thomson Prometric
   - Pearson Virtual University Enterprises (VUE)
5. Take the test. Be sure to keep the Examination Score Report provided upon test completion as your record of taking the test.
6. Repeat steps three through five until all required tests are successfully completed for the desired certification role. If additional requirements are needed (such as another vendor certification or exam), follow the instructions on the certification description page to submit these requirements to IBM.
7. After you complete your certification requirements, you will be sent an e-mail asking you to accept the terms of the IBM Certification Agreement before receiving the certificate.

8. Upon acceptance of the terms of the IBM Certification Agreement, an e-mail will be sent containing the following electronic deliverables:
   - A Certification Certificate in PDF format, which can be printed in either color or black and white
   - A set of graphic files of the IBM Professional Certification mark associated with the certification achieved
   - Guidelines for the use of the IBM Professional Certification mark
9. To avoid unnecessary delay in receiving your certificate, ensure that we have your current e-mail on file by keeping your profile up to date. If you do not have an e-mail address on file, your certificate will be sent through postal mail.

After you receive a certificate by e-mail, you can also contact IBM at mailto:certify@us.ibm.com to request that a hardcopy certificate be sent by postal mail.

1.2 ITCAM for Response Time V6.2 implementation

This section explains certification requirements and objectives:

1.2.1 Certification requirements

The following are the certification requirements:

- Job role description and target audience

  An IBM Certified Deployment Professional - IBM Tivoli Composite Application Manager for Response Time V6.2 is a technical professional responsible for enabling the monitoring of applications, including the planning, installing, configuring, troubleshooting, demonstrating usage, and documenting of solutions for ITCAM for Response Time V6.2.

  To attain the IBM Certified Deployment Professional - ITCAM for Response Time V6.2 certification, candidates must pass test #920.

- Key areas of competency

  This person is expected to perform the following tasks independently:

  - Assess customer's architecture and solution design documentation
  - Analyze the deployment environment
  - Assist in project plan development

- Perform basic installations of prerequisite software - IBM Tivoli Monitoring (ITM) V6.1 server, ITM V6.1 Portal server, and IBM DB2®
- Describe the IBM Tivoli Composite Application Manager for Response Time V6.2 features and components
- Install and configure the IBM Tivoli Composite Application Manager for Response Time (ITCAM for Response Time) V6.2 Tivoli Enterprise™ Management Agents (TEMA), Web Response Time (WRT), Robotic Response Time (RRT), Client Response Time (CRT), End User Response Time (EURT) Dashboard
- Troubleshoot ITCAM for Response Time V6.2
- Create Rational® Performance Tester, Rational Robot, and custom scripts for deployment of robotic monitoring of an application
- Enable monitoring of real user transactions on client workstations

This individual will be expected to perform these tasks with limited assistance from peers, product documentation and support resources.

- Required prerequisites:
  - Strong working knowledge of IBM Tivoli Composite Application Manager for Response Time V6.2 infrastructure components
  - Working knowledge of operating systems
  - General knowledge of server hardware
  - Working knowledge of TCP/IP networking principles
  - Working knowledge of system administration of UNIX®, Windows® or Linux® operating systems
  - Working knowledge of relational databases
  - Working knowledge of ITM v6.1 installation, configuration, and administration
  - General knowledge of application monitoring
  - Demonstrate basic knowledge of Application Response Measurement (ARM) concepts
- Recommended prerequisite knowledge
  - Working with environment variables: local variables, exported variables, HOME, PATH
  - General knowledge of basic editors such as VI, emacs, Notepad

1.2.2 Certification details

In order to be certified, you must perform test 920 - IBM Tivoli Composite Application Manager for Response Time V6.2 Implementation:

- Approximate number of questions: 60
- Duration in minutes: 105
- Format: Multiple choice
- Required passing score: 70% passing score, or 42 correct answers

1.2.3 Certification objectives

This section explains the objectives of the test as well as the required knowledge that you need to pass the test questions. Each objective is discussed in more detail in the subsequent chapters of this book.

Planning

This section of the test has these requirements:

- Given customer input and IBM Tivoli Composite Application Manager for Response Time (ITCAM for Response Time) architecture, identify the monitoring environment so that a deployment plan is created. With emphasis on these tasks:
  - Identify the applications, transactions, and servers to be monitored
  - Identify the network topology
  - Identify firewall configuration information
- Given the installation guide and design requirements, identify the Tivoli Enterprise Monitoring Server (TEMS) and Tivoli Enterprise Portal Server (TEPS) environment so that a TEMS and TEPS deployment plan is created. With emphasis on these tasks:
  - Identify hardware and software requirements
  - Identify required ports
  - Gather database information - users and home for embedded
  - Select file system location
  - Create a capacity plan
  - Take necessary firewall action
  - Identify the installation method of ITM, DB2, and TEMA
  - Identify if embedded installation of ITM and DB2 will be performed, or an existing installation will be used
  - Identify location of Tivoli Enterprise Monitoring Servers (TEMS) and Tivoli Enterprise Portal Servers (TEPS)
  - Gather requirements for TEPS workspace customization
- Given the installation guide and design requirements, identify the Tivoli Enterprise Monitoring Agent (TEMA) environment so that the TEMA deployment plan is created. With emphasis on these tasks:
  - Identify hardware and software requirements
  - Identify the Web transaction details
  - Identify the data retention period
  - Identify required ports
  - Identify network constraints for firewalls
  - Determine silent or interactive installation
  - Determine installation location
  - Determine if any monitoring tools are already installed

- Identify disk capacity requirements

Installation

This section of the test has these requirements:

- Given a requirement to do a silent installation, identify the necessary configuration information so that ITCAM for Response Time V6.2 can be installed successfully. With emphasis on these tasks:
  - Identify response file
  - Identify the command for silent installation
- Given the customer's deployment plan, install the ITCAM for Response Time V6.2 application support files on TEMS and TEPS, so that the appropriate workspaces and situations will display correctly. With emphasis on these tasks:
  - Identify the proper operating system platform installation files
  - Identify the correct TEMA application support files
  - Identify the IBM Tivoli Monitoring (ITM) v6.1 TEMS and TEPS servers
  - Install the application support files
- Given that the ITM v6.1 components are started (TEMS, TEPS, and Warehouse Proxy) and the TEMA deployment plan, install the End User Response Time (EURT) TEMA, so that the Tivoli Enterprise Portal (TEP) reports can be generated. With emphasis on these tasks:
  - Identify the proper installation server
  - Gather the correct database information
  - Gather the TEMS connection information
  - Install the End User Response Time TEMA
- Given that the ITM v6.1 components are started (TEMS, TEPS, and Warehouse Proxy) and the TEMA deployment plan, install the Web Response Time TEMA, so that the Tivoli Enterprise Portal (TEP) reports can be generated. With emphasis on these tasks:
  - Identify the proper installation server
  - Gather the correct Web server configuration information
  - Gather the TEMS connection information
  - Install the network monitor driver on the Windows OS
  - Install the Web Response Time TEMA
- Given that the ITM v6.1 components are started (TEMS, TEPS, and Warehouse Proxy) and the TEMA deployment plan, install the Client Response Time TEMA, so that the Tivoli Enterprise Portal (TEP) reports can be generated. With emphasis on these tasks:
  - Identify the proper installation server
  - Gather the TEMS connection information

  - Install the Client Response Time TEMA

- Given that the ITM v6.1 components are started (TEMS, TEPS, and Warehouse Proxy) and the TEMA deployment plan, install the Robotic Response Time TEMA, so that the Tivoli Enterprise Portal (TEP) reports can be generated. With emphasis on these tasks:
  - Identify the proper installation playback workstation
  - Gather the TEMS connection information
  - Install the Robotic Response Time TEMA
  - Install and configure the Rational Robot if needed
- Given the customer's environment, run an installation verification test post installation, so that it is determined whether the various components of ITCAM for Response Time V6.2 are operational. With emphasis on these tasks:
  - Confirm that the TEMAs are connected
  - Confirm that appropriate workspaces and data are available
  - Identify the critical components to be tested for product functionality

Configuration

This section of the test has these requirements:

- Given the need to measure the response time, configure the Robotic Response Time (RRT) TEMA, so that metrics can be obtained. With emphasis on these tasks:
  - Create, test, and upload a Rational Performance Tester (RPT) script
  - Describe how Application Response Measurement (ARM) applies to Robotic Playback script
  - Create, test, and upload a Command Line Interface (CLI) script
  - Create, test, and upload a Rational Robot GUI / VU script
  - Reconfigure the Robotic Monitor
  - Manage Robotic Playback schedules
  - Limit where a playback script will run
- Given the need to measure the response time of the Web server application, configure the Web Response Time (WRT) TEMA, so that transaction data can be obtained. With emphasis on these tasks:
  - Define a target application in the Situation Editor
  - Configure the Web Response Monitors
  - Create and modify the Web Response Time Situation thresholds
  - Reconfigure the TEMA to monitor new Web servers

- Given the need to measure the response time of user desktop applications, configure the Client Response Time (CRT) TEMA, so that transaction data can be obtained. With emphasis on these tasks:
  - Determine the type of application to be monitored, for example:
    - Lotus® Notes® versions 6 and 7
    - Microsoft® Outlook® 2000 and 2003
    - SAP® GUI 6.x
    - IBM PCOMM 5.X (TN3270 protocol only)
    - Hummingbird (TN3270 protocol only)
    - Exceed 11 (TN3270 protocol only)
    - Attachmate Extra 8 TN3270 emulators
  - Create and deploy behavior (.dat) files for custom applications
  - Create and modify the Client Response Time Situation thresholds
  - Reconfigure how data is collected and analyzed at the TEMA
  - Describe how Application Response Measurement (ARM) applies to monitoring ARM instrumented applications

Administration

This section of the test has these requirements:

- Given the TEMA is operational and generating data, customize historical data collection, so that the appropriate historical data is displayed in the workspaces. With emphasis on these tasks:
  - Determine the appropriate attribute group to modify
  - Determine and modify the collection location and interval
  - Determine and modify the Warehouse interval
  - Determine how often data should be summarized and pruned
- Given an installed ITM v6.1 environment integrated with Tivoli Enterprise Console® (TEC), map and configure ITCAM for Response Time V6.2 situations to TEC, so that situation data can be viewed from the TEC console. With emphasis on these tasks:
  - Load the appropriate BAROC file for the TEMA into the current RuleBase
  - Map situation severities to TEC severities
  - Restart the TEC server
- Given an installed TEMA, perform the necessary tasks so that the TEMA is uninstalled from Windows, UNIX, or Linux platforms. With emphasis on these tasks:
  - Uninstall TEMA from a Windows platform
  - Uninstall TEMA from a UNIX (or Linux) platform

- Given a configured ITCAM for RT V6.2 environment, analyze workspace data so that the performance and availability of the applications can be determined. With emphasis on these tasks:
  - Analyze data within the Robotic Response Time (RRT) TEMA workspaces
  - Analyze data within the Web Response Time (WRT) TEMA workspaces
  - Analyze data within the Client Response Time (CRT) TEMA workspaces
  - Analyze data within the End User Response Time (EURT) TEMA workspaces

Problem determination

This section of the test has these requirements:

- Given a failed ITCAM for Response Time V6.2 TEMA installation, troubleshoot the installation so that the TEMA is installed correctly. With emphasis on these tasks:
  - Determine if the installation has failed
  - Locate and analyze the common installation log files
  - Locate and analyze platform specific trace information
  - Locate and analyze the TEMA installation log files
- Given an installed ITCAM for Response Time V6.2 TEMA and no data in the workspaces, troubleshoot the non-functional TEMA so that data can be displayed. With emphasis on these tasks:
  - Identify if the appropriate TEMA application support is installed on the TEMS and TEPS
  - Increase message and trace log level
  - Locate and analyze the appropriate TEMA log files
  - Determine that the appropriate TEMA has started
  - Identify and correct JAVA dump errors
- Given Robotic Playback issues, investigate the problem so that Playback occurs. With emphasis on these tasks:
  - Verify the status of the Robotic Playback script
  - Test the Robotic Playback script
  - Verify that the appropriate Robotic Playback script has been loaded into the dashboard and agent depot directories
  - Locate and analyze the trace Robotic Playback log files

For the most updated objectives of the IBM Tivoli Composite Application Manager for Response Time V6.2 Deployment Certification Test, refer to:

http://www-03.ibm.com/certify/certs/24011301.shtml

1.3 Recommended study resources

Courses and publications are offered to help you prepare for the certification tests. The courses are recommended, but not required, before taking a certification test. If you want to purchase Web-based training courses or are unable to locate a Web-based course or classroom course at the time and location you desire, contact one of our delivery management teams at:

- Americas: mailto:tivamedu@us.ibm.com
- EMEA: mailto:tived@uk.ibm.com
- AP: mailto:tivtrainingap@au1.ibm.com

Note: Course offerings are continuously being added and updated. If you do not see the courses listed in your geography, contact the delivery management team.

1.3.1 Courses

Course names and course numbers vary depending on the education delivery arm used in each geography. Refer to the Tivoli software education Web site to find the appropriate course and education delivery vendor for each geography.

As of the writing this book, the following IBM Tivoli Composite Application Manager for Response Time V6.2 courses are offered:

- Course Code: TM651, IBM Tivoli Composite Application Manager for Response Time V6.2 Implementation and Administration Workshop
- Course Code: TV350, IBM Tivoli Monitoring 6.1 for Implementers

General training information is also available at IBM IT Training at:

http://ibm.com/training

1.3.2 Publications

Before taking test 920, IBM Tivoli Composite Application Manager for Response Time V6.2 Implementation, it is recommended that you review these manuals:

- ITCAM for Response Time V6.2 product manuals

  You might want to refer to the following guides:

  – *IBM Tivoli Composite Application Manager for Client Response Time User's Guide, Version 6.2*, SC23-6332

- *IBM Tivoli Composite Application Manager for End User Response Time Dashboard User's Guide, Version 6.2,* SC23-6335
- *IBM Tivoli Composite Application Manager for Robotic Response Time User's Guide, Version 6.2,* SC23-6334
- *IBM Tivoli Composite Application Manager for Web Response Time User's Guide, Version 6.2,* SC23-6333
- *IBM Tivoli Composite Application Manager for Response Time Problem Determination Guide, Version 6.2*, GI11-8061

- ITCAM for Response Time V6.2 IBM Redbooks publications

  IBM Tivoli Composite Application Manager for Response Time books include:

  - *Deployment Guide Series: ITCAM for Response Time V6.2,* SG24-7484
  - *IBM Tivoli Composite Application Manager Family*, SG24-7151

- IBM Tivoli Monitoring V6.1 IBM Redbooks publications:

  - *Deployment Guide Series: IBM Tivoli Monitoring, Version 6.1*, SC24-1787
  - *Getting Started with IBM Tivoli Monitoring 6.1 on Distributed Environments*, SG24-7143
  - *IBM Tivoli Monitoring Deep Dive and Optimization for Large Scale Environments*, SG24-7443

For the online publications of IBM Tivoli Composite Application Manager for Response Time V6.2, refer to:

`http://publib.boulder.ibm.com/infocenter/tivihelp/v3r1/index.jsp?topic=/com.ibm.itcamwas_rt.doc_6.6/welcome.htm`

2

Concepts and architecture

This chapter provides an overview of ITCAM for Response Time V6.2 concepts. It summarizes ITCAM for Response Time components, requirements, and planning information.

In this chapter, the following topics are discussed:

2.1 ITCAM for Response Time environment

ITCAM for Response Time V6.2 is an application monitoring tool that is designed to comprehensively monitor, alert, and report on the availability and response time of business applications. It is based on IBM Tivoli Monitoring V6.1 architecture. ITCAM for Response Time provides information technology (IT) operations with both real-time and robotic monitoring of user response time experience. It helps quickly identify Service Level Agreement (SLA) breaches and proactively prevents future violations. The discussion includes:

2.1.1 ITCAM for Response Time overview

ITCAM for Response Time provides the ability to collect response time and availability information by:

- Instrumentation of user applications, such as:
  - Web traffic
  - 3270 interface
  - Lotus Notes
  - Microsoft Access™
  - other graphical applications
- Robotic simulation to check availability and response time of a scripted transaction. The transaction can be:
  - Windows based
  - Web based
  - Citrix
  - SAP
  - Mercury LoadRunner

ITCAM for Response Time collects response time information using the IBM Tivoli Monitoring infrastructure. This allows monitoring to be performed together with the resource monitoring and provides cross reference and correlation of events.

These are the major features of ITCAM for Response Time:

- Helps monitor real user response time. It can identify sporadic problems that would otherwise get lost in the averages and show what users are experiencing.

- Records and plays back synthetic transactions. This provides both availability and response time monitoring, which can be useful for testing different locations and service providers and helps proactively find problems.
- Helps automate business practices. It creates comprehensive automated policies and situations to proactively help manage the user experience and provides expert advice to help users understand how to best resolve specific response time issues.
- Delivers end-to-end integration using a common user interface. The integration of data and events with other IBM Tivoli Monitoring based solutions from IBM Tivoli Compsite Application Manager, IBM Tivoli Monitoring, and IBM Tivoli OMEGAMON® helps provide comprehensive management of business applications. It allows management of the entire enterprise with a single user interface, therefore eliminating the need to learn multiple tools with different user interfaces and resulting in faster return on investment.

ITCAM for Response Time provides the following benefits:

- Shorter problem identification to resolution times
- Reduced support cost in determining the cause of downtime and slow down
- Increased revenue and customer satisfaction by maintaining SLAs
- Reduced need for costly and hard to find subject matter experts to solve problems
- Role based user interface to provide the right level of information to the right user for quick problem identification and problem resolution

2.1.2 ITCAM for Response Time components

ITCAM for Response Time V6.2 is an evolved from ITCAM for Response Time Tracking V6.1. It inherited some of the major components and functions of that product.

ITCAM for Response Time is an IBM Tivoli Monitoring 6.1 application. The IBM Tivoli Monitoring architecture is explained in *Deployment Guide Series: IBM Tivoli Monitoring 6.1*, SG24-7188. The operator accesses ITCAM for Response Time using Tivoli Enterprise Portal, either the browser or desktop version.

Figure 2-1 shows the ITCAM for Response Time V6.2 component relationships and logical architecture.

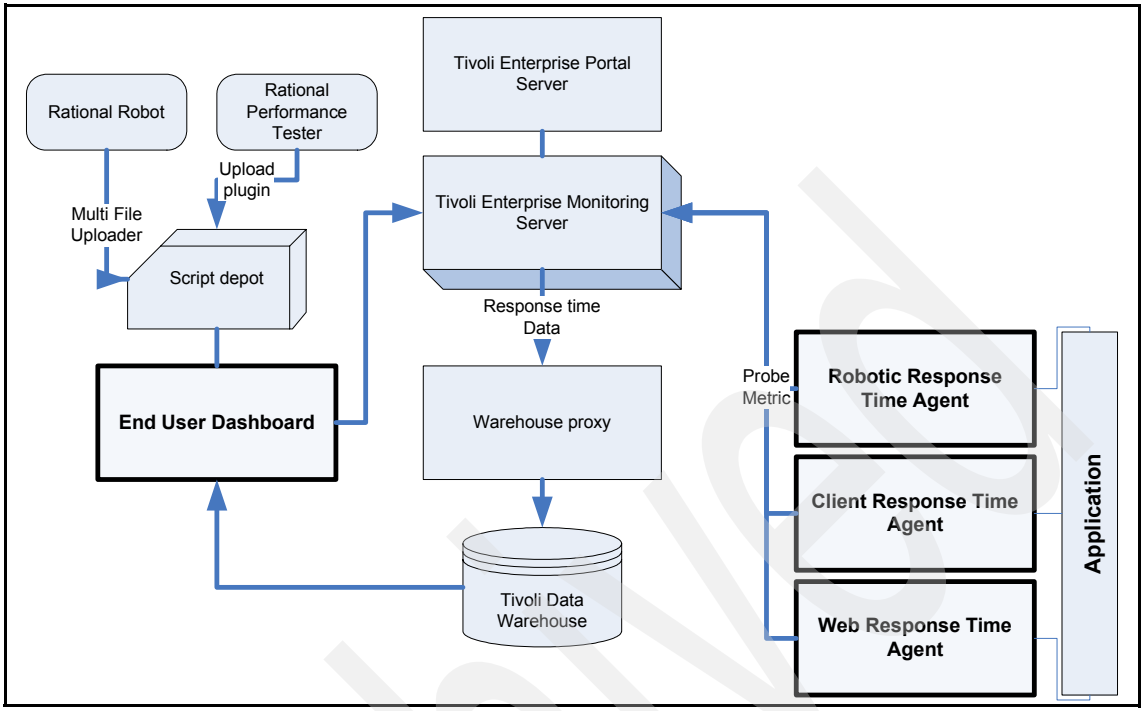

Figure 2-1 ITCAM for Response Time architecture

The bolded boxes represent the ITCAM for Response Time agents:

- Web Response Time Agent
- Client Response Time Agent
  - Client Application Tracker
  - Generic Application Response Measurement (ARM)
- Robotic Response Time Agent
  - Command Line Interface
  - Rational Performance Tester
  - Rational Robot
  - Mercury LoadRunner
  - Generic Application Response Measurement (ARM)
- End User Response Time Dashboard agent

The Robotic, Client, and Web Response Time agents connect to the application and retrieve response time information. Response time data is then stored in the Tivoli Data Warehouse. The End User Response Time Dashboard provides a

comprehensive response time interface for all applications and agents on a specified IBM Tivoli Monitoring instance.

The End User Response Time Dashboard also acts as a robotic file depot. It stores the robotic scripts for Rational Robot, Rational Performance Tester, or Mercury LoadRunner. These scripts are run by the Robotic Response Time agent for execution.

Response time information is collected from the Tivoli Enterprise Monitoring Agents whenever one of the following happens:

- An online request is issued by Tivoli Enterprise Portal (manual refresh or autoupdate interval expires)
- A situation interval expires and the situation requests the data
- The historical collection interval expires and the current data is written out to the historical file

We discuss the four components of ITCAM for Response Time in 2.3, “Monitoring Agent prerequirement” on page 30.

2.1.3 Monitoring agent functions

Table 2-1 illustrates some examples of how you choose the monitoring agent to use.

Table 2-1 Monitoring agents functionality

Monitoring agent	You want to do
ITCAM for Web Response Time	Monitor real user transactions on an HTTP server. You get the following measurements: ► The time for the Web server to process and respond to the HTTP request ► The rendering time for displaying a Web page on a browser ► The time it takes to complete the entire page request (round-trip time). It includes the previous two times and network and data transfer time.
ITCAM for Client Response Time	► Monitor real user response times for Lotus Notes, Microsoft Outlook, or applications running in a Citrix or Terminal Services environment. ► Understand real user client experience. ► Monitor custom Windows applications. ► Monitor custom ARM enabled applications. ► Monitor real user 3270 transactions.

Monitoring agent	You want to do
ITCAM for Robotic Response Time	► Run an existing Mercury LoadRunner script ► Run robotic monitoring for Web applications, Siebel®, SAP, Citrix ► Run a custom application, script, or command. For example: – Testing server availability with FTP, telnet, or ping – Querying a database with a custom SQL command – Running a custom shell script
ITCAM for End User Response Time Dashboard	► View a consolidated enterprise view of all application performance and availability ► Create custom roles to limit access to application data

2.1.4 Firewall configuration, communication protocol, and ports

ITCAM for Response Time V6.2 is an IBM Tivoli Monitoring V6.1 based solution, so it follows an IBM Tivoli Monitoring V6.1 structure.

Basic implementation

IBM Tivoli Monitoring has four choices for communication with the monitoring server, those are IP.UDP, IP.PIPE, IP.SPIPE, or SNA. You can specify up to three communication methods. This enables you to set up backup communication methods. If the method you have identified as Protocol 1 fails, Protocol 2 is used.

IBM Tivoli Monitoring supports most common firewall configurations, including those that use address translation. An exception is that it does not support application proxy firewall. To enable this support, IBM Tivoli Monitoring has to use the IP.PIPE socket address family, a TCP-based protocol that opens a single port on the firewall for communication by IBM Tivoli Monitoring components. Furthermore, using the IP.PIPE enables the Ephemeral Pipe Support (EPS) that allows a connection to cross a network address translation firewall.

The IP or UDP protocol is insufficient for firewall configurations. The connectionless UDP protocol requires opening up multiple ports across firewalls to allow multiple connections from each individual IBM Tivoli Monitoring V6.1 component. Table 2-2 lists the port usage for the IBM Tivoli Monitoring components.

Table 2-2 Default port usage for IBM Tivoli Monitoring V6.1

IBM Tivoli Monitoring V6.1 component	Listening port
Tivoli Enterprise Monitoring Server (IP.PIPE)	1918/TCP
Tivoli Enterprise Monitoring Server (IP.SPIPE)	3660/TCP
Tivoli Enterprise Monitoring Server (IP)	1918/UDP

IBM Tivoli Monitoring V6.1 component	Listening port
Tivoli Enterprise Portal Server	1920/TCP 15001/TCP
Tivoli Enterprise Console	5529/TCP
Tivoli Warehouse Proxy Agent	6014/TCP

Use Table 2-2 on page 20 to set which port to open. If the firewall is not using network address translation (NAT), the port opening rule should be sufficient to have the components connect through the firewall.

Using IP.PIPE allows a few *well known* ports to be open through the firewall. IBM Tivoli Monitoring V6.1 automatically reserves a well known port (default 1918) for Tivoli Enterprise Monitoring Server communication. It does not matter in which order components start on a system that has several IBM Tivoli Monitoring V6.1 components installed; the default well-known port is only used by Tivoli Enterprise Monitoring Server.

Note: Port 1918 is the default well-known port. Any well-known port can be configured, as long as the entire environment matches this port number.

For all other components except for the Tivoli Enterprise Monitoring Server, the following calculation is used internally by IBM Tivoli Monitoring V6.1 to reserve the listening ports.

reserved port = well-known port + (N*4096)

Where:

N= startup sequence

For example:

- The Universal Agent starts first: port 6014 (1918 + 1*4096).
- The remote Tivoli Enterprise Monitoring Server starts second: port 1918 (always reserved for Tivoli Enterprise Monitoring Server).
- The Windows OS Agent starts third: port 10110 (1918 + 2*4096).
- The Warehousing Proxy starts fourth: port 14206 (1918 + 3*4096).

Implementation with address translation

Address translation is an enhanced security feature of some firewall configurations. With this feature, components that must be reached across the firewall have two unique, but corresponding addresses: the external address

(valid for components outside the firewall) and the internal address (valid for components inside the firewall). In IBM Tivoli Monitoring, the component that typically must be reached for connection is the monitoring server; however, the Warehouse Proxy, which runs on Windows as a server-type application, must also be accessible to clients and also requires an external and internal address. A component on either side of the firewall only knows about the address that is valid for its side (partition).

To accommodate sites with address translation, IBM Tivoli Monitoring uses a partition-naming strategy. This strategy requires two steps:

- The creation of a text file, called a partition file, as part of the configuration of a hub or remote monitoring server (or Warehouse Proxy). The partition file contains an entry that defines that component's address in the other partition.
- The specification of a partition name (any alphanumeric string up to 32 characters) as part of the configuration of any agent, a hub or remote monitoring server, or Warehouse Proxy. A partition name must be specified for each component regardless of which side of the firewall it resides in.

See also *Installation and Setup Guide: IBM Tivoli Monitoring 6.1*, SG32-9407 for more information on the IBM Tivoli Monitoring firewall.

2.2 Monitoring agent structures

This section describes the concept and architecture of ITCAM for Response Time monitoring agents. The discussion consists of:

- 2.2.1, "Web Response Time agent" on page 22
- 2.2.2, "Client Response Time agent" on page 24
- 2.2.3, "Robotic Response Time agent" on page 27
- 2.2.4, "End User Response Time Dashboard agent" on page 28

2.2.1 Web Response Time agent

The Web Response Time agent collects user response time for HTTP and HTTPS Web transactions:

- For HTTP traffic, the agent can listen to the local TCP/IP stack and measure the response time of the transaction.
- For HTTPS traffic, as the product needs to access the unencrypted HTTP datastream, the agent runs on the Web server machine and makes use of the Web server exits to get access to the datastream.

Appliance mode allows the agent to collect HTTP traffic from other machines in the same network segment by enabling collection of network packets in promiscuous mode. If the Analyzer cannot run on a particular machine (for example, because of security concerns or because the operating system is not supported by Web Response Monitor), it can run on a separate machine, called the appliance machine. The parameter must be set to KFC_OWN_NETWORK_DATA_ONLY=N in file kfcmenv (Windows: MA_Home\app\wrm\Analyzer\kfcmenv and UNIX: MA_Home/app/wrm/kfcmenv).

The agent is made up of three components, displayed in Figure 2-2.

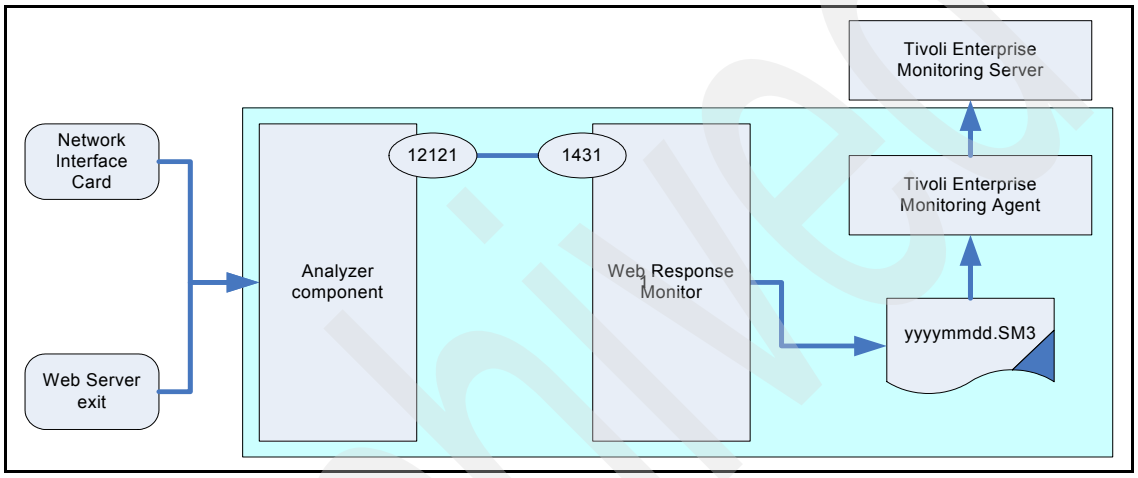

Figure 2-2 Web Response Time Agent structure

The components are:

- Analyzer component

  The Analyzer operates as a TCP/IP network component logically at the NIC card physical layer. This component observes the network packets and applies a patented response time technique to collect the end to end response time of outgoing and incoming sockets. This collects response time all the way down to the requesting source without requiring a software agent at the source.

  In Windows platform, the Analyzer runs as a service called Candle® Media Analyzer. In UNIX or Linux, it runs a separate process.

- Web Response Monitor component

  The Web Response Monitor component collects the socket information from the Analyzer component and correlates all the subcomponents of the Web transaction. When the complete transaction information has been collected

the record is written out to a file (YYYYMMDD.sm3 where YYYY is the year, MM is the month, and DD is the day). The YYYMMDD.sm3 file can be found under the IBM Tivoli Monitoring directory. In Windows it is under the TMAITM6\wrm\log directory.

The Analyzer communicates to the Web Response Monitor using port 12121 and 1431.

The Web Response Monitor runs as a service under Windows known as Candle Web Response Monitor - Collection.

- Tivoli Enterprise Monitoring Agent

  Tivoli Enterprise Monitoring Agent reads the SM3 file and aggregates the data over a user defined interval (five minutes by default). It then calculates the information for displays on the workspaces.

  Tivoli Enterprise Monitoring Agent also starts and stops the Analyzer and Web Response Monitor components, so that they are started when Tivoli Enterprise Monitoring Agent is started and the Tivoli Enterprise Monitoring Agent stops them when it is stopped.

  Note: When the duration between a stop request and start request is too close (such as using the restart process), the analyzer or Web Response Monitor processes might not be stopped properly.

  The Tivoli Enterprise Monitoring Agent performs all the usual IBM Tivoli Monitoring 6.1 agent activities:

  – Responds to requests for data
  – Logs data to binary history files if historical recording is turned on
  – Runs situations when their interval expires
  – Heartbeats the Tivoli Enterprise Monitoring Server to make sure it is still available
  – Responds to Tivoli Enterprise Monitoring Server heartbeats

  The Tivoli Enterprise Monitoring Agent runs as a service under Windows called ITCAM for Web Response Time agent and as kt5agent process in UNIX and Linux.

2.2.2 Client Response Time agent

The Client Response Time agent is installed on a Windows desktop to monitor desktop applications that run on that machine. This machine is typically a user machine on which someone is working with the monitored application.

It analyzes a combination of Windows messages and TCP/IP network traffic to compute the user response time for transactions created by monitored GUI applications.

The logical architecture of the Client Response Time agent is shown in Figure 2-3.

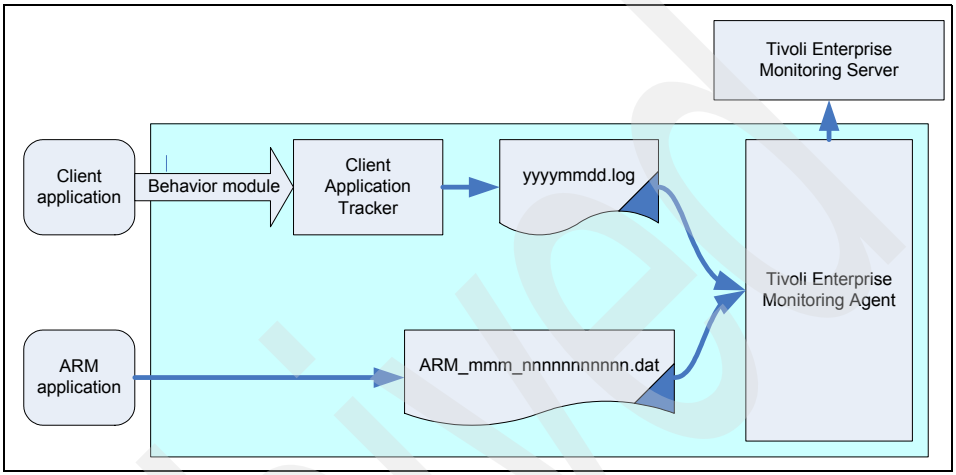

Figure 2-3 Client Response Time agent

The Client Response Time Agent consists of:

- Client Application Tracker

  The Client Application Tracker monitors applications as defined by behavior modules. The behavior modules come as part of the product, or they can be developed by a user using the ETEWatch® Customizer component that is available on the IBM Tivoli Open Process Automation Library at: `http://catalog.lotus.com/wps/portal/topal`

  The product comes with support for:

  - Lotus Notes, versions 6 and 7
  - Microsoft Outlook 2000 and 2003
  - SAP GUI 6.x
  - IBM PCOMM 5.X (TN3270 protocol only)
  - Hummingbird (TN3270 protocol only)
  - Exceed 11 (TN3270 protocol only)
  - Attachmate Extra 8 TN3270 emulators

  The supported applications require no special configuration after installation, by default the above applications can be monitored after installing the ITCAM for Client Response Time agent.

The agent measures and collects application transaction Response Time on Windows clients from the user perspective (you can install the agent on the user's machine). For example, you can use ITCAM for Client Response Time to monitor Lotus Notes response time.

It Reports overall transaction response time as:

```
Response Time = Network time + Server Time + Client Time.
```

Behavior modules reside in the <itm>\TMAITM6\cat\Mgmt\Collector\TC directory on Windows and have a .dat file suffix.

The Client Application Tracker component reads the behavior files at startup and monitors the applications defined in those behavior files. It makes use of Windows messages and TCP/IP datastream to decipher the start and stop times of transactions caused by the users interacting with the monitored applications. When a transaction record is completed it is written out to a daily log file called YYYYMMDD.log (where YYYY is the year, MM the month and DD the day) which is aggregated in a similar way to the how the Web Response time agent aggregates its sm3 file. This file resides in <itm>\TMAITM6\cat\Mgmt\Log. In Windows, the Client Application Tracker runs as a service called IBM Client Application Tracker.

- The Tivoli Enterprise Monitoring Agent

  Tivoli Enterprise Monitoring Agent aggregates the data over a user defined interval (five minutes by default) and calculates the information necessary to populate the IBM Tivoli Monitoring tables that are reported in Tivoli Enterprise Portal workspaces.

  Tivoli Enterprise Monitoring Agent performs all the usual IBM Tivoli Monitoring 6.1 agent activities:

  - Responds to requests for data
  - Logs data to binary history files if historical recording is turned on
  - Runs situations when their interval expires
  - Sends heartbeats to indicate its availability
  - Responds to Tivoli Enterprise Monitoring Server heartbeats

  In Windows, Tivoli Enterprise Monitoring Agent runs as ITCAM for Client Response Time agent service and as the process kt4agent under Linux and UNIX.

  Tivoli Enterprise Monitoring Agent can also collect Application Response Measurement (ARM) Version 2 and ARM Version 4 records that are produced by any ARM instrumented application. The ARM_mmmm_nnnnnnnnnn.dat file (where mmmm is the pid of the program creating the ARM records and nnnnnnnnnn is the timestamp), is created in the <itm>\TMATITM6\cat\Mgmt\Collector\TC directory in Windows.

2.2.3 Robotic Response Time agent

The Robotic Response Time agent is installed on Windows, Linux or UNIX to accept response and availability information from the supported robotic runtime environment. The robotic runtime environments currently supported are:

- Rational Performance Tester
- Rational Robot
- Command Line Interface (CLI)
- Mercury LoadRunner

The logical architecture of the agent is displayed in Figure 2-4.

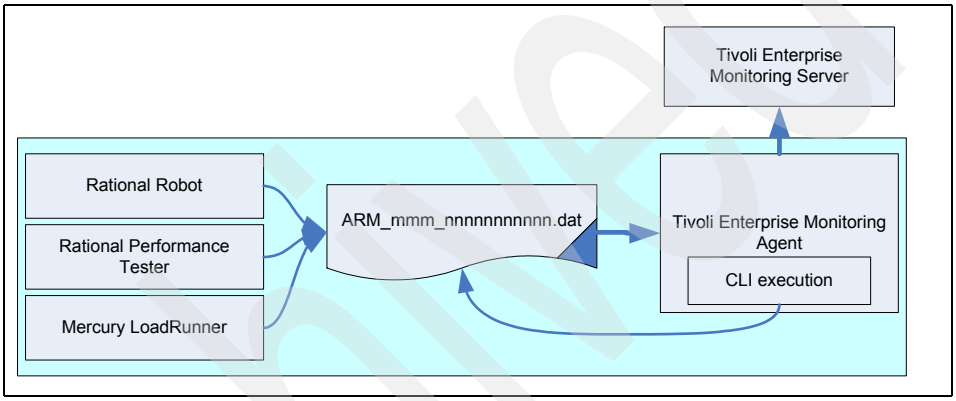

Figure 2-4 Robotic Response Time Agent

The agent collects response and availability information in the form of ARM V2 and ARM V4 records and logs these to the file. The full name of the file is ARM_nnnn_mmmmm.dat where mmmm is the pid of the program creating the ARM records and nnnnnnnnnn is the timestamp. The robots execute at the interval defined at install time (the default is every 15 minutes). This can be changed subsequently.

When you are planning for the deployment, the script content and complexity and the system that the script is accessing during playback, will affect the time that is needed to complete a single iteration of a robotic script.

The agent runs as the service ITCAM for Robot Response Time under Windows and as the process kt6agent under UNIX and Linux.

2.2.4 End User Response Time Dashboard agent

The End User Response Time Dashboard agent consolidates the historical data from the other ITCAM for Response Time agents:

- Client Response Time
- Robotic Response Time
- Web Response Time

As a consolidator, there is only one End User Response Time Dashboard Agent in each IBM Tivoli Monitoring environment. The End User Response Time Dashboard Agent also acts as the file depot for the robotic scripts.

The ITCAM for End User Response Time Dashboard agent integrates up to 8 hours of historical data from the Tivoli Data Warehouse (TDW). In Windows, the agent runs as a service called ITCAM for End User Response Time and as a process in Linux and UNIX called kt3agent.

The product provides automated ways of distributing scripts to the agents, manual methods are also documented. There are two deployments required:

- “Deploying the script to the repository” on page 29
- “Deploying the script from the repository to the agent” on page 29

Figure 2-5 shows the high level view of the architecture.

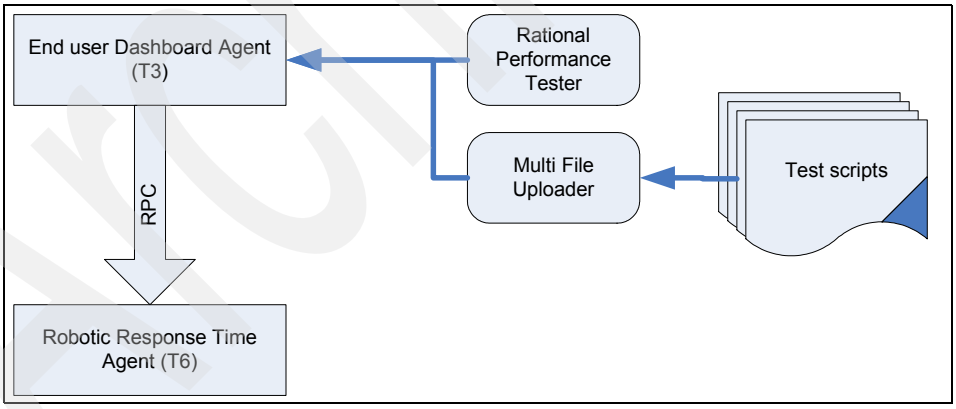

Figure 2-5 Script deployment

Important: There should be no firewalls between the ITCAM for End User Response Time Dashboard and Rational Performance Tester (RPT) workbench.

Deploying the script to the repository

Deploying the script to the repository can be achieved in two ways:

- Automated deployment to the repository

  The repository is a directory that is part of the ITCAM for Response Time dashboard agent. It is typically found at <itm>/kt1depot/T3/<type> where <itm> is the location of the IBM Tivoli Monitoring install directory and <type> is dependent on the type of script such as RPT, CLI, ROBOT_GUI, and ROBOT_VU.

  Rational Performance Tester can send packaged scripts directly to the dashboard agent. The Rational Performance Tester workbench contains an export destination for ITCAM for Response Time. This uses the SOAP mechanism to send the scripts to the repository. It uses port 1976 by default.

  Automated sending of CLI, Load Runner or Rational Robot scripts to the repository uses the Multiple File Uploader (MFU) facility. It can be accessed from Tivoli Enterprise Portal navigator or using remote Java WebStart facility. The MFU also uses SOAP calls from port 1976 by default.

  For Rational Robot, the Multi File Uploader discovers scripts stored under: <itm>\tmaitm6\app\genwin\project\<projectname>\TestData\TestDataStore\DefaultTestScriptDatastore\TMS_Scripts.

- Manual deployment to the repository

  The scripts (as zip files) can be manually placed directly in the repository directory <itm>/kt1depot/T3/type where <itm> is the location of the IBM Tivoli Monitoring install directory and type is dependent on the type of script such as ROBOT_GUI, ROBOT_VU, RPT and CLI.

Deploying the script from the repository to the agent

The scripts can be deployed in two ways between the Respository and the Agent.

- Automatically deploying the script

  At user defined intervals (15 minutes by default) the End User Response Time dashboard agent pulls the new scripts from the repository to the executing agent. They are copied to a directory called <itm>/kt1depot/t6/<type> where type is the type of script, such as CLI, RPT, Robot_GUI and Robot_VU.

- Manual deployment from the repository to the agent

  Scripts can be manually distributed by copying the scripts from the repository at <itm>/kt1depot/T3/<type>, to the machine running the robotic agent under <itm>/kt1depot/t6/<type>.

Both the manual and automated deployment to the agent make use of a RPC capability between the repository and the ITCAM for Robotic Response Time

Agent. This capability exists in Tivoli Enterprise Monitoring Server, and it is installed automatically in Windows and needs to be manually installed on other platforms.

2.3 Monitoring Agent prerequirement

This section describes the hardware and software requirements for ITCAM for Response Time's Tivoli Enterprise Monitoring Agent (TEMA). The topics are:

- 2.3.1, "Hardware requirements" on page 30
- 2.3.2, "Operating systems" on page 31
- 2.3.3, "Other software requirements" on page 32
- 2.3.4, "Scalability" on page 33

2.3.1 Hardware requirements

For ITCAM for Response Time, the agents have these additional requirements for memory and disk space. These additional requirements are in addition to any existing capacity needs.

Table 2-3 Requirements - minimum and recommended memory and disk requirements

Resource	Minimum machine memory	Recommended machine memory	Minimum additional disk space[a]	Recommended additional disk space
Web response time	512 MB	1GB	512 MB	2 GB
Client response time	100 MB	256 MB	256 MB	512 MB
Robotic response time	512 MB	1GB	512 MB	1GB
End User Response Time Dashboard	512 MB	1GB	512 MB	512 MB

a. The disk space requirement for the Robotic, Client and Web response time agents would vary widely depending on the transaction load, monitoring level and tracing level for the agent.

For the most up to date prerequisites, refer to:

http://publib.boulder.ibm.com/tividd/td/ITCAMRT/prereq62/en_US/HTML/memory.html

2.3.2 Operating systems

Table 2-4 lists the supported operating systems at the publication of this book. The most recent list of supported operating systems matrix is provided in:

http://publib.boulder.ibm.com/tividd/td/ITCAMRT/prereq62/en_US/HTML/operatingsysystem.html

Table 2-4 Supported operating systems

Operating system	Web Response Time Monitor	Client Response Time		Robotic Response Time				End User Dashboard Agent
		Client Application Tracker	Generic ARM	CLI Playback	Rational Performance Tester	Rational Robot	Mercury LoadRunner	
AIX 5L™ V5.3	Yes		Yes	Yes				Yes
Solaris™ 9 with patch 111711-16	Yes		Yes	Yes				Yes
Solaris 10	Yes		Yes	Yes				Yes
HPUX 11i V2 (PA-RISC)	Yes		Yes	Yes				Yes
Windows XP Pro SP2	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Windows 2000 Pro	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Windows 2000 Server	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Windows 2003 Server	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Windows 2003 Server 64-bit	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes
RHEL 4.0	Yes		Yes	Yes	Yes			Yes
RHEL 4.0 64-bit	Yes		Yes					Yes
RFAS 4.1	Yes		Yes	Yes				
RFAS 5.1	Yes		Yes	Yes				
SLES 9.x	Yes		Yes	Yes	Yes			Yes
SLES 10.x	Yes		Yes	Yes	Yes			Yes
SLES 9.x 64-bit	Yes		Yes					Yes

Operating system	Web Response Time Monitor	Client Response Time		Robotic Response Time				End User Dashboard Agent
		Client Application Tracker	Generic ARM	CLI Playback	Rational Performance Tester	Rational Robot	Mercury LoadRunner	
SLES 10.x 64-bit	Yes		Yes					Yes

2.3.3 Other software requirements

The software requirements depending on the agent type are needed to perform the functions of ITCAM for Response Time V6.2.

Java Virtual Machine (JVM)

The Java Virtual Machine is required for these agents:

- ITCAM for End User Response Time Dashboard:
  - JDK™ version os SUN JDK 1.4.2 for Solaris
  - IBM JDK 1.5 for all other platforms
- ITCAM for Robotic Response Time:
  - JDK version os SUN JDK 1.4.2 for Solaris
  - IBM JDK 1.4.2 for all other platforms
  - Rational Performance Tester uses JDK 1.5

ITCAM for Client Response Time and Web Response Time do not require Java Virtual Machine.

Generic software requirements

These software levels are needed for all agents:

- IBM Tivoli Monitoring V6.1 with Fixpack 5
- Tivoli Enterprise Console V3.7.1, V3.8, and V3.9
- Tivoli Data Warehouse V2.1
- Tivoli Configuration Manager version 41142 or later for installing agents using SPD files.

Client Response Time agent software requirements

These software levels are needed for the Client Response Time agent:

- ARM V2.0 or V4.0

- Lotus Notes V6.x or V7.x
- Microsoft Outlook 2000 and 2003
- SAP GUI 6.x
- IBM Personal Communication 5.x
- Hummingbird Exceed 11
- Attachmate Extra 8

Robotic Response Time agent software requirements

These software levels are needed for the Robotic Response Time agent:

- Rational Performance Tester V7
- Rational Robot SR6 2003.06.15.xxx
- Mercury LoadRunner V8.0 and V8.1
- Citrix hosted applications
- SAP
- Siebel V7.7 and V7.8

Web Response Time agent software requirements

These software levels are needed for the Web Response Time agent:

- IBM HTTP Server 6.0.x, 2.0.47+, 1.3*
  - For both HTTP or HTTPS protocols
  - Running on AIX, Solaris, HPUX, Windows, Linux on Intel® servers
- IIS 6.0
  - For both HTTP or HTTPS protocols
  - Running on Windows servers
- iPlanet Web Server 6.0, Sun™ Java™ System Web Server 6.1
  - For HTTP protocol running on AIX, Solaris, HPUX, Windows, Linux on Intel servers
  - For HTTPS protocol running on Solaris
- Other Web Servers, including Apache 2.0.47+, 2.2.0
  - For HTTP protocol only
  - Running on AIX, Solaris, HPUX, Windows, Linux on Intel servers

2.3.4 Scalability

The maximum scalability considerations for ITCAM for Response Time V6.2 are:

- Client Response Time is supported up to 5000 agents for a single hub IBM Tivoli Monitoring Tivoli Enterprise Monitoring Server

- Robotic Response Time capacity for scripts running every 5 minutes are:
  - Rational Robot GUI: 10 scripts
  - Command Line playback: 25 scripts
  - Mercury Load Runner: 25 scripts
  - Rational Robot VU: 25 scripts
  - Rational Performance Tester: 25 scripts
- Web Response Time sizing for capturing traffic:
  - HTTP supports 1.8 million requests per hour
  - HTTPS supports 400,000 requests per hour

2.4 Installation considerations

The installation considerations for ITCAM for Response Time are:

- 2.4.1, “Other considerations for ITCAM for Response Time agents” on page 34
- 2.4.2, “Application support files” on page 35
- 2.4.3, “ITCAM for Response Time agents setup” on page 35

2.4.1 Other considerations for ITCAM for Response Time agents

Before you begin installing and configuring the product, you need to gather some information:

- See your IBM Tivoli Monitoring administrator and collect the Tivoli Enterprise Portal Server hostname, Tivoli Enterprise Monitoring Server hostname or IP Address, Tivoli Enterprise Monitoring Server hostname and the protocol settings for the Tivoli Enterprise Monitoring Server where you are going to connect. Get the Tivoli Data Warehouse configurations.
- You need the communications protocol settings that the agent uses to communicate with the monitoring server. You have four choices: IP.UDP, IP.PIPE, IP.SPIPE, or SNA.
- You can install only one ITCAM for End User Response Time Dashboard Tivoli Enterprise Monitoring Agent in your environment. The ITCAM for End User Response Time Dashboard is also the robotic script file depot. There should be only one file depot in the enterprise.
- If you have a previously installed ITCAM for Response Time Tracking, version 6.1, you must uninstall it and verify some dll’s (Windows) or libraries (UNIX or Linux) were deleted before installing ITCAM for Robotic Response Time or ITCAM for Client Response Time.

Special consideration for installation on Windows platform:

- Install ITCAM for Response Time monitoring agents as Administrator on Windows platforms.
- Before installing the ITCAM for Web Response Time agent on Windows platforms, you must install the Windows Network Monitor.
- If you are installing ITCAM for Robotic Response Time, first install Rational Robot software. This is a prerequisite.
- Configure the agent to use Tivoli Data Warehouse before you install the Warehouse Proxy agent or Summarization and Pruning agent.

2.4.2 Application support files

Before ITCAM for Response Time components are installed, you must install the application support files. The application support files must be installed on Tivoli Enterprise Monitoring Server (both hub and remote monitoring servers), Tivoli Enterprise Portal desktop client and Tivoli Enterprise Portal Server machines.

Depending on the configuration of the IBM Tivoli Monitoring environment, you might need to install application support files to one or more machines. During this installation, the Tivoli Enterprise Monitoring Server and Tivoli Enterprise Portal Server must be restarted. This must be scheduled for minimal interruption for the operation.

The detailed procedure of this installation is provided in 3.2, “Installing application support files” on page 59.

2.4.3 ITCAM for Response Time agents setup

The agents for ITCAM for Response Time must then be installed on the appropriate machines. Some of these agents must be installed on the user’s machines. These deployments must be done with minimal interruption to their work. Depending on the environment, here are some ideas on performing the installation:

- Installation with an existing software distribution mechanism such as IBM Tivoli Configuration Manager
- Remote deployment of agent using the operating system agent that is already installed
- Silent installation using a login script for Windows machines
- Or if there is no other option, you can also run the GUI installation wizard on the user machine.

IBM Tivoli Monitoring provides the ability to deploy resource monitoring across your environment from a central location, the monitoring server. You can use the remote deployment feature to deploy and configure monitoring agents, to deploy maintenance and upgrades to agents, and to start and stop agents. To remote deploy or remote configure an agent from the Tivoli Enterprise Portal, the agent depot on the Tivoli Enterprise Monitoring Server must be populated with agent images for the platform to which you are deploying it.

You can install an agent using different methods, in this book we cover the following methods:

- Locally on the same server running Tivoli Enterprise Portal Server, Tivoli Enterprise Monitoring Server, Tivoli Enterprise Portal Desktop Client, Warehouse Proxy, Warehouse Summarization and Pruning agent, and the Warehouse Database as described in 3.4, “Installing End User Response Time Dashboard” on page 68
- Locally when there is an IBM Tivoli Monitoring OS agent installed as described in 3.7, “Installing ITCAM for Robotic Response Time” on page 78
- Locally when there is no IBM Tivoli Monitoring OS agent installed as described in 3.5, “Installing ITCAM for Web Response Time” on page 71
- Installing through the Tivoli Enterprise Portal Server when there is an IBM Tivoli Monitoring OS agent up and running as described in 3.6, “Installing ITCAM for Client Response Time” on page 75

2.5 IBM Tivoli Monitoring V6.1 components

IBM Tivoli Monitoring is the base software for ITCAM for Response Time monitoring agents. IBM Tivoli Monitoring provides a way to monitor the availability and performance of enterprise systems from one or several designated workstations. It also provides useful historical data for tracking trends and troubleshooting system problems.

You can use IBM Tivoli Monitoring to do the following tasks:

- Monitor for exception conditions on the systems that you are managing by using predefined situations or custom situations
- Establish performance thresholds
- Investigate the causes leading to an exception condition
- Gather comprehensive data about system conditions
- Use policies to perform actions, schedule work, and automate manual tasks

An IBM Tivoli Monitoring V6.1 installation consists of several components collectively labeled the Tivoli Monitoring Services framework. This framework

consists of several core components. There are optional components that can be installed to extend the monitoring framework features:

See also *Deployment Guide Series: IBM Tivoli Monitoring 6.1*, SG24-7188 for more information about the IBM Tivoli Monitoring components.

2.5.1 Tivoli Enterprise Monitoring Server

Tivoli Enterprise Monitoring Server is the first component installed when building the IBM Tivoli Monitoring Services foundation. All other core components directly interface with this one single core component. Tivoli Enterprise Monitoring Server acts as a collection and control point for alerts received from agents and collects their performance and availability data.

Tivoli Enterprise Monitoring Server is responsible for tracking the heartbeat request interval for all the Tivoli Enterprise Monitoring Agents connected to it. The monitoring server stores, initiates, and tracks all situations and policies. It is the central repository for storing all active conditions and short-term data about every Tivoli Enterprise Monitoring Agent. The responsibility of Tivoli Enterprise Monitoring Server includes initiating and tracking all generated actions that invoke a script or program on the Tivoli Enterprise Monitoring Agent.

The Tivoli Enterprise Monitoring Server storage repository is a proprietary database format (referred to as the *Enterprise Information Base*, EIB) grouped as a collection of files located on the Tivoli Enterprise Monitoring Server.

These files start with the file name prefix qa1 and are in:

- <installation_dir/tables/<tems_name>
- <installation_dir>: IBM Tivoli Monitoring V6.1 home directory
- <tems_name>: Tivoli Enterprise Monitoring Server name

Note: <tems_name> is the monitoring server name, not necessarily the Tivoli Enterprise Monitoring Server host name.

The primary Tivoli Enterprise Monitoring Server is configured as a hub (*LOCAL). All IBM Tivoli Monitoring V6.1 installations require at least one Tivoli

Enterprise Monitoring Server configured as a hub. Additional remote (*REMOTE) Tivoli Enterprise Monitoring Servers can be installed afterward to introduce a scalable hierarchy into the architecture.

If security validation is configured, a separate procedure is necessary to manage the OS-level user IDs at the hub Tivoli Enterprise Monitoring Server. User access is managed within IBM Tivoli Monitoring V6.1 through the Tivoli Enterprise Portal GUI only. A matching user ID must be defined at the hub Tivoli Enterprise Monitoring Server (including the Hot Standby) using the standard user management process for that hub Tivoli Enterprise Monitoring Server operating system.

The Hot Standby works:

- When there is a failure on the acting primary hub Tivoli Enterprise Monitoring Server
- When the switch is initiated by a user on a Tivoli Enterprise Monitoring Server

There is no automatic switch when the primary comes back up.

2.5.2 Tivoli Enterprise Portal Server

Tivoli Enterprise Portal Server (referred to as the portal server) is a repository for all graphical presentations of monitoring data. The portal server is responsible for the management of user IDs and user access controls for the monitoring workspaces, situations, and policies. Tivoli Enterprise Portal Server provides the core presentation layer that allows for retrieval, manipulation, analysis, and preformatting of data. It manages this access through user workspace consoles. The portal server keeps a persistent connection to the hub Tivoli Enterprise Monitoring Server, and can be considered a logical gateway between the hub Tivoli Enterprise Monitoring Server and the Tivoli Enterprise Portal client. Any disconnection between the two components immediately disables access to the monitoring data used by the Tivoli Enterprise Portal client.

An RDBMS must be installed on the same physical system prior to the Tivoli Enterprise Portal Server installation. This prerequisite is necessary because the portal server installation will create the mandatory Tivoli Enterprise Portal Server database, along with the supporting tables. Additionally, an Open Database Connectivity (ODBC) data source name is configured to connect directly to the Tivoli Data Warehouse RDBMS. This OBDC connection is used whenever a pull of historical data from the Tivoli Data Warehouse is requested.

Note: Even though technically valid, implementing a remote RDBMS for the Tivoli Enterprise Portal Server is not recommended. Tivoli Enterprise Portal Server is closely coupled to the RDBMS and the complexity of a remote RDBMS is difficult to maintain.

When the Tivoli Enterprise Portal Server, a propriety integrated Web server is installed for use with the Tivoli Enterprise Portal client in browser mode. Depending on the network topology and possible security implications, this might play a role in constructing the solution. Instead, an external Web server installed on the same system as the portal server can be used. Refer to Chapter 9 of *IBM Tivoli Monitoring Installation and Setup Guide, Version 6.1.0*, GC32-9407, for additional details.

2.5.3 Tivoli Enterprise Portal

The Tivoli Enterprise Portal client is a Java-based user interface that connects to the Tivoli Enterprise Portal Server to view all monitoring data collections. It is the user interaction component of the presentation layer. Tivoli Enterprise Portal consolidates all these views into a single window, enabling complete visibility to any non-functioning component. The client offers two modes of operation: a Java desktop client and an HTTP browser.

Assuming a default installation, for the browser mode Tivoli Enterprise Portal client, use this URL:

```
http://<hostname>:1920///cnp/kdh/lib/cnp.html
```

Where <hostname> is the host name of the Tivoli Enterprise Portal Server.

2.5.4 Tivoli Enterprise Monitoring Agent

The agents are installed on the system or subsystem requiring data collection and monitoring. The agents are responsible for data gathering and distribution of attributes to the monitoring servers, including initiating the heartbeat status

The agents test attribute values against a threshold and report these results back to the monitoring servers. An alert icon is displayed in Tivoli Enterprise Portal when a threshold is exceeded or a value is matched. These tests are called situations.

2.5.5 Warehouse Proxy Agent

The Warehouse Proxy Agent is a unique agent that performs only one task. The Warehouse Proxy Agent collects and consolidates all the historical data collections from the individual agents to store in the Tivoli Data Warehouse. If using Tivoli Data Warehouse, one Warehouse Proxy Agent is required for each IBM Tivoli Monitoring V6.1 installation. It uses Open Database Connectivity (ODBC) to write the historical data to a supported relational database.

2.5.6 Warehouse Summarization and Pruning Agent

The Summarization and Pruning Agent is a unique agent that performs the aggregation and pruning functions for the historical raw data on Tivoli Data Warehouse. It has advanced configuration options, enabling exceptional customization of the historical data storage.

A Summarization and Pruning Agent is recommended to manage the historical data in Tivoli Data Warehouse. Due to the tremendous amounts of data processing necessary, we recommend that you always install the Summarization and Pruning Agent on the same physical system as the Tivoli Data Warehouse repository.

2.5.7 Tivoli Data Warehouse

IBM Tivoli Data Warehouse is the database storage that contains all the historical data collection. A Warehouse Proxy must be installed to leverage the Tivoli Data Warehouse function within the environment. In large-scale deployments, Tivoli Data Warehouse can be shared between monitoring installations.

2.5.8 Optional IBM Tivoli Monitoring V6.1 components

Some optional IBM Tivoli Monitoring V6.1 components:

- Monitoring Agent for IBM Tivoli Monitoring 5.x Endpoint: The integration agent enables the collection and visualization of IBM Tivoli Monitoring V5.x resource models in Tivoli Enterprise Portal. The visualization is the direct replacement for the Web Health Console. Additionally, the agent provides a rollup function into the Tivoli Data Warehouse.
- Tivoli Enterprise Console event synchronization: The event synchronization component sends updates to situation events back to the monitoring server that are forwarded to the event server. Actions performed at the Tivoli Enterprise Console for IBM Tivoli Monitoring V6.1 situations are reflected in Tivoli Enterprise Portal Server.

2.6 IBM Tivoli Monitoring V6.1 environment

We discuss the following items:

- 2.6.1, “Requirements” on page 41
- 2.6.2, “Scalability” on page 45
- 2.6.3, “Environment preparation” on page 47
- 2.6.4, “IBM Tivoli Monitoring V6.1 installation” on page 49

2.6.1 Requirements

This section discusses the requirements for IBM Tivoli Monitoring V6.1 installation.

Hardware requirements

The hardware requirements (see Table 2-5) for ITCAM for Response Time relate to the requirements of IBM Tivoli Monitoring V6.1. For the IBM Tivoli Monitoring servers, such as Tivoli Enterprise Monitoring Server or Tivoli Enterprise Portal Server, the recommended processor speeds are at least 1 GHz for RISC architectures and 2 GHz for Intel architectures. A single processor is suitable when the components are installed on separate computers.

Table 2-5 IBM Tivoli Monitoring memory and disk requirements

Component	Memory requirement[a]	Disk space requirement
Hub monitoring server	70 MB - 100 MB	650 MB
Remote monitoring server	100 MB - 300 MB	250 MB
Portal server	100 MB - 300 MB	800 MB
Portal client	150 MB - 300 MB	150 MB
Tivoli data warehouse	2 GB - 8 GB	must be calculated[b]
Warehouse proxy agent	50 MB - 100 MB	150 MB
Summarization and pruning agent	150 MB - 300 MB	150 MB

a. Memory requirement is ranged based on the processing needs. The low end is for around 100-200 monitoring agents, while the high end is for around 500-1000 monitoring agents.

b. The size of data of Tivoli Data Warehouse depending on the size of data for each attribute group. For each attribute group, you need the number of detailed records per day, the data size per record, and the aggregation policy. See: http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.itm.doc/itm_install65.htm#estimate

The hardware requirements for IBM Tivoli Monitoring servers is discussed in detail in:

http://publib.boulder.ibm.com/infocenter/tivihelp/v15r1/topic/com.ibm.itm.doc/itm_install61.htm#hardware

Supported operating systems

This section shows all operating systems supported for IBM Tivoli Monitoring V6.1 (see Table 2-6). ITCAM for Response Time V6.2 does not support all IBM Tivoli Monitoring V6.1 operating systems. For this information, see Table 2-4 on page 31.

Table 2-6 Supported operating systems

Operating system	Monitoring server	Portal server	Portal client[a]	Monitoring agent[b]	Warehouse Proxy	Summarization and Pruning Agent
AIX 5L V5.1 (32/64 bit)				Yes		Yes
AIX 5L V5.2 (32/64 bit)	Yes			Yes		Yes
AIX 5L V5.3 (32/64 bit)	Yes			Yes		Yes
Solaris Operating Environment V8 (32/64 bit)				Yes		Yes
Solaris Operating Environment V9 and V10 (32/64 bit)	Yes			Yes		Yes
HP-UX 11i (32/64 bit) with patch PHSS_30970				Yes		
Windows 2000 Professional				Yes		Yes
Windows 2000 Server	Yes	Yes	Yes	Yes	Yes	Yes
Windows 2000 Advanced Server	Yes	Yes	Yes	Yes	Yes	Yes
Windows XP			Yes	Yes	Yes	Yes
Windows 2003 Server SE (32 bit) with Service Pack 1[c]	Yes	Yes	Yes	Yes	Yes	Yes

Operating system	Monitoring server	Portal server	Portal client[a]	Monitoring agent[b]	Warehouse Proxy	Summarization and Pruning Agent
Windows 2003 Server EE (32 bit) with Service Pack 1c	Yes	Yes	Yes	Yes	Yes	Yes
Red Hat Enterprise Linux 2.1 Intel				Yes		Yes
Red Hat Enterprise and Desktop Linux 4 Intel	Yes	Yes	Yes	Yes		Yes
Red Hat Enterprise and Advanced Linux 3 for z/Series				Yes		Yes
Red Hat Enterprise Linux 4 for z/Series 31 bit	Yes			Yes		Yes
SUSE Linux Enterprise Server 8 Intel				Yes		Yes
SUSE Linux Enterprise Server 8 for z/Series 31 bit	Yes			Yes		Yes
SUSE Linux Enterprise Server 8 for z/Series 64 bit				Yes		Yes
SUSE Linux Enterprise Server 9 Intel	Yes	Yes	Yes	Yes		Yes
SUSE Linux Enterprise Server 9 for z/Series 31 bit	Yes	Yes		Yes		Yes
SUSE Linux Enterprise Server 9 for z/Series 64 bit				Yes		Yes
OS/400® V5.2				Yes		
OS/400 V5.3				Yes		
z/OS® V1.4[d]	Yes			Yes		
z/OS V1.5	Yes			Yes		
z/OS V1.6	Yes			Yes		
z/OS V1.7	Yes			Yes		

a. The Tivoli Enterprise Portal desktop client is supported on marked platforms. However, the Tivoli Enterprise Portal browser client can only be accessed from Microsoft Windows computers running Internet Explorer® 6 or 7.

b. The Monitoring agent column indicates the platforms on which an agent is supported. It does not indicate that any agent runs on any platform. For example, to monitor a Linux computer, you must use a Linux monitoring agent, not a Windows monitoring agent.

c. For Windows 2003 Server, if you do not plan to deploy Service Pack 1 in your environment at this time, you must download and install Microsoft Installer 3.1 (KB893803), which is available from the Microsoft Download Web site:
http://www.microsoft.com/downloads.

d. For information about installing the Tivoli Enterprise Monitoring Server on z/OS, see the Program Directory that comes with that product. For information about configuring the monitoring server on z/OS, see *Configuring IBM Tivoli Enterprise Monitoring Server on z/OS*, SC32-9463.

Note: If Tivoli Enterprise Monitoring Server is running on Linux, it will only support DB2 Universal Database as the historical warehouse.

Required software for IBM Tivoli Monitoring V6.1

The required software for IBM Tivoli Monitoring V6.1 components is shown in Table 2-7.

Table 2-7 Required software for IBM Tivoli Monitoring

Products	Supported versions	Management Server	Portal Server	Portal Desktop Client	Portal Browser Client	Warehouse agent[a]
IBM Runtime Environment for Java	JRE™ V1.4.2 or later	Yes	Yes	Yes	Yes	Yes
Linux: A Korn shell interpreter	pdksh-5.2.14	Yes	Yes	Yes		
AIX 5L: xlC Runtime Environment		Yes				
Microsoft Internet Explorer	V6.0 with all critical Microsoft updates applied	Yes			Yes	
Database[b]: ► DB2 UDB V8[c] ► Microsoft SQL Server™ 2000[d] ► Oracle V9.2 or V10.1 (for warehousing only, not for Tivoli Enterprise Portal Server)	DB2 UDB V8 FixPack 10		Yes			Yes
IBM Tivoli Enterprise Console	Version 3.9 Fix Pack 03					
For TCP/IP communication: ► Windows 2000 Professional or Server with Service Pack 3 or later ► Winsock V1.1 or later ► Microsoft TCP/IP protocol stack		Yes	Yes	Yes	Yes	Yes

Products	Supported versions	Management Server	Portal Server	Portal Desktop Client	Portal Browser Client	Warehouse agent[a]
For SNA communication: ► Windows 2000 Professional or Server with Service Pack 3 or later ► Microsoft SNA Server V3.0 or later ► IBM Communications Server V5.0 or V5.2	► Microsoft SNA Server V4.0 with Service Pack 1 ► IBM Communications Server V5.0 requires fixes JR10466 and JR103368	Yes				

a. " WAREHOUS" is the default database name for the database used by Tivoli Data Warehouse.
b. The only supported database for a Linux portal server is DB2. Each database requires a driver: JDBC™-DB2 for DB2, MS SQL JDBC for MS SQL, and Oracle® JDBC for Oracle.
c. If you are installing Tivoli Enterprise Portal on a Linux computer, an OS user is required to support the configuration of DB2. If such a user does not exist, the installation program attempts to create. If the installation program does not have the required authority, the installation fails.
d. IBM Tivoli supports MS SQL Server 2000 only if the data is limited to code points inside the Basic Multilingual Plane (range U+0000 to U+FFFF). This restriction does not apply to IBM DB2.

The software requirements for IBM Tivoli Monitoring components are discussed in detail in IBM Tivoli Monitoring V6.1 documentation.

2.6.2 Scalability

A distributed networking infrastructure inherits scalable characteristics by design. After all, a distributed system is built to expand and shrink through the increase and decrease in hardware capacity. Scalability is not the same as performance tuning. Performance tuning deals with increasing the output from the current capacity without adding additional resources.

You must make this decision carefully, because different sources have their own reasons for providing sizing metrics.

For IBM Tivoli Monitoring V6.1, analysis of all these sources, including an in-depth knowledge of the monitoring environment, will assist in scaling the installation properly. Understanding the limitations of IBM Tivoli Monitoring V6.1 and strategically working through them will facilitate obtainable goals.

From a scalability standpoint, Tivoli Enterprise Monitoring Server plays the key role. As the architect of an IBM Tivoli Monitoring V6.1 implementation, the following factors need to be considered:

- Number of physical hosts and platform types included
- Number and type of applications and operating systems per host
- Geographical topology of the environment, particularly in relation to where the managed systems will reside
- Estimated number of events generated or thresholds that will be deployed, or both
- The degree of automation that is required or planned, both reflex and workflow
- Estimated number of Tivoli Enterprise Portal users and the expected type of usage (heavy reporting, frequent real time updates, and so on)
- Network topology and firewall considerations

The information generated from these points can then be combined with the scalability guidelines that have been established for the initial release of IBM Tivoli Monitoring V6.1 (see Table 2-8).

Table 2-8 Extensive metrics

IBM Tivoli Monitoring V6.1 component	Verified metric
Remote Tivoli Enterprise Monitoring Server	15 (Windows and UNIX)
Managed systems	5,000
Managed systems per remote Tivoli Enterprise Monitoring Server	500
Heartbeating agents per Tivoli Enterprise Monitoring Server	500
Simultaneous agent startup/logins to a Tivoli Enterprise Monitoring Server	1,000
Agents storing historical data at remote Tivoli Enterprise Monitoring Server	250
Consoles per Tivoli Enterprise Portal Server	50
Total situations	1,500 (30/agent)

Important: These metrics measure the apex for the IBM Tivoli Monitoring V6.1 components with respect to load quantity. All these metrics represent one installation instance.

These metric values do not represent actual hard limits in IBM Tivoli Monitoring V6.1. These numbers are derived from what was actually tested, not necessarily a product limitation.

2.6.3 Environment preparation

The initial environment preparation includes:

- Installing and preparing the new server machines with the appropriate operating system and network connectivity. This applies to the machines that would run Tivoli Enterprise Monitoring Server, Tivoli Data Warehouse and other servers.
- Identify client or agent machines on which Tivoli Enterprise Monitoring Agent would be installed. This includes tabulating their IP addresses, hostname, port numbers, owner, access to the machine and other relevant information.
- Collect installation media and required software for the installation.

Other items before the installation are:

Naming your monitoring server

You must first decide how to name your monitoring servers. In general, use names that are short but meaningful within your environment. Use the following guidelines:

- Each name must be unique. One name cannot match another monitoring server name for its entire length. (For example, .ibm. and .ibmremote. are unique and permitted.)
- Each name must begin with an alpha character. No blanks or special characters (.$#@) can be used.
- Each name must be between 2 and 32 characters in length.
- Monitoring server naming is case-sensitive on all platforms.

Windows installation consideration - User authority

To install IBM Tivoli Monitoring on a Windows computer, you must have administrator privileges on that computer. You must also run the IBM Tivoli Monitoring components as a user with administrator privileges.

Linux or UNIX installation considerations

There are several items to consider for Linux and UNIX installations:

- Import the images

  Import the IBM Tivoli Monitoring V6.1 images to the server where you will perform the installation.

- Host name for TCP/IP network services

  Configure the TCP/IP network services, such as NIS, DNS, and the /etc/hosts file, to return the fully qualified host name (for example, hostname.ibm.com). Define the fully qualified host name after the dotted decimal host address value and before the short host name in the /etc/hosts file.

- Use of fully qualified path names

  Because of the wide variety of UNIX operating systems and possible user environments, use fully qualified path names when entering a directory during the installation process (no pattern-matching characters). IBM scripts use the Korn shell; when a new process or shell is invoked, use of symbolic links, environmental variables, or aliases can potentially cause unexpected results.

- File descriptor (maxfiles) limit

  The monitoring server requires a minimum of 256 file descriptors (maxfiles) for the operating system.

Furthermore, in a UNIX and Linux environment, it is recommended to create a special IBM Tivoli account for Tivoli Monitoring instead of using the root user. For best performance, follow these guidelines:

- You can use any valid name. If you do not install IBM Tivoli Monitoring V6.1 as root, you must use the following procedure to create the user and correctly set the permission. Let us create a user called *itmuser* in the *itmusers* group:

  a. Create the itmusers group:

     For Linux, Solaris, and HP-UX computers, run the command **`groupadd itmusers`**. For an AIX 5L computer, run the command **`mkgroup itmusers`**.

  b. Create the itmuser user belonging to itmusers group; itmusers is the primary group. Create the itmuser account with the command **`useradd -g itmusers -s /usr/bin/ksh itmuser`**.

  c. For installing a portal server on Linux, connect the user to DB2 administrator group (typically db2grp1) to give the user access to DB2. Use the command **`gpasswd -a itmuser db2grp1`**.

- After properly creating the user, use the following procedure to set the permissions:
  a. Set the CANDLEHOME directory. Set it in the itmuser user profile. Use the command **`export CANDLEHOME=/opt/IBM/ITM`**.
  b. Change to the directory returned by the previous step, issue **`cd $CANDLEHOME`**.
  c. Run the following commands:

```
chgrp itmusers .
chgrp -R itmusers .
chmod o-rwx .
chmod -R o-rwx .
```

Once the environment preparation is done, IBM Tivoli Monitoring V6.1 can be installed. This includes installing DB2 Universal Database™ V8.1 for Tivoli Enterprise Portal Server and maybe Tivoli Data Warehouse.

2.6.4 IBM Tivoli Monitoring V6.1 installation

For the detailed installation steps for IBM Tivoli Monitoring V6.1, see *IBM Tivoli Monitoring Installation and Setup Guide, Version 6.1.0*, GC32-9407, and *IBM Deployment Guide Series: IBM Tivoli Monitoring 6.1*, SG24-7188.

We discuss the deployment of a small IBM Tivoli Monitoring environment on a single computer. Installation on one computer might be useful for a test environment, a demonstration environment, or for monitoring a small environment.

IBM DB2 Universal Database or Microsoft SQL Server must be already installed on a Portal Server machine.

Required order of IBM Tivoli Monitoring installation

If any of the following products will be installed on the same computer as monitoring agents, they must be installed before the agent is installed:

- Hub Tivoli Enterprise Monitoring Server
- Remote monitoring server (if necessary)
- Tivoli Enterprise Monitoring Agent framework
- Tivoli Enterprise Portal Server
- Tivoli Enterprise Portal desktop client

In addition, these products must be installed on at least one computer before the agent can be properly configured. If an IBM Tivoli Monitoring environment already exists, you can use the same structure.

Note: The installation procedures in this book provide information for installing a single component (such as the monitoring server) on one computer. But you can also install multiple components (such as the monitoring server and the portal server) on the same computer simultaneously. You just need to select the components during the installation process.

Tivoli Enterprise Monitoring Server installation

This section provides some details about the hub monitoring server and remote monitoring server installation. Here, we describe the main tasks performed during the installation.

On Windows

In Microsoft Windows, the tasks include:

1. To launch the installation wizard, run **`setup.exe`** in the \WINDOWS directory in IBM Tivoli Monitoring V6.1 media. The default installation directory is C:\IBM\ITM.
2. The installation program asks about the encryption key. Type 32 characters for the encryption key or use the default key.

   Notes:

   - This encryption key is used to established a secure connection (using SSL protocol) between the hub Tivoli Enterprise Monitoring Server and the other components of the Tivoli Monitoring V6.1 environment as the remote Tivoli Enterprise Monitoring Server connected to the hub. Do not use any of the following characters in your key: = ’ |
   - Ensure that you document the value you use for the key. Use this key during the installation of any components that communicate with this monitoring server.

3. In addition, you need to select the components that you want to install. Select Tivoli Enterprise Monitoring Server.

Note: If you want to use the Summarization and Pruning Agent to work with data in Data Warehouse, expand Tivoli Enterprise Monitoring Agent and select Windows Summarization and Pruning Agent. See *IBM Tivoli Monitoring Administrator's Guide, Version 6.1.0*, SC32-9408, for information about configuring and using this agent.

4. If you want to do remote deployment of agent software, select those agents that you want to deploy. This step creates and populates the deployment depot, from which you can deploy agents at a later time.

Notes:

- By default, the depot is located in the <itm_installdir>/CMS/depot directory on Windows and the <itm_installdir>/tables/<ms_name>/depot directory on Linux and UNIX.
- If you want to use a different directory, change the DEPOTHOME value in the kbb.env file.

You can also populate the agent depot using the **tacmd addBundles** command.

5. After the components are installed, a configuration window (the Setup Type window) opens, where you select what you want to configure. Perform the following main tasks in this window:
   - Select the type of monitoring server that you are configuring: Hub or Remote. For this procedure, select Hub. Verify that the name of this monitoring server is correct in the TEMS field. The default name is hub_hostname.
   - Identify the communications protocol for the monitoring server. You have four choices: IP.UDP, IP.PIPE, IP.SPIPE, or SNA. You can specify three methods for communication; this enables you to set up backup communication methods.

Note: IP.PIPE protocol uses TCP, thus a permanent connection is established between the Tivoli Enterprise Monitoring Server and the remote servers. This might have an impact on the server performance, because of the number of remote procedure calls (RPCs) that it needs to handle. If using UDP will not cause security breaches in your environment, we recommend that you set up the first protocol as IP.UDP; otherwise, use IP.PIPE. Note that if you have a firewall between your Tivoli Enterprise Monitoring Server and your agents, you cannot use IP.UDP.

– Select whether or not you want Tivoli Monitoring V6.1 to forward events to IBM Tivoli Enterprise Console using the Tivoli Enterprise Console Event Integration Facility.

– Specify the monitoring server location and what data to add to application support.

– Specify the default communication between any IBM Tivoli Monitoring component and the hub monitoring server.

On UNIX or Linux

In Linux or UNIX, the tasks include:

1. To launch the installation wizard, run `./install.sh` in the directory where the installation files were extracted. The default installation directory is /opt/IBM/ITM.
2. The Linux or UNIX installation does not have a GUI (as does the Windows installation), instead you are prompted with text menus.
3. As in Windows installation, you need to enter the encryption key. Use the same instructions as in Windows installation.
4. Select the operating system and components to be installed.

   The naming convention for Linux or UNIX is the same HUB_hostname.

Notes:

- When the Tivoli Enterprise Monitoring Server installation service finishes, the installation program will not ask whether you want to configure or not. In order to configure, you need to run the **`./itmcmd config -S -t tems_name`** command from /opt/IBM/ITM/bin.
- In addition, you need to add application support for the monitoring server by running the **`./itmcmd support -t tems_name pc pc pc`** (pc product code) command. Application support includes the workspaces and situations for agents.

The steps to install the remote monitoring servers are similar to the hub monitoring server installation. You need to select the monitoring server type as Remote Server. The default name is REMOTE_hostname.

Tivoli Enterprise Portal Server installation

This section resumes the steps necessary to install Tivoli Enterprise Portal Server (TEPS).You can install Tivoli Enterprise Portal Server on either a Windows computer or Linux computer. Note the following considerations about the installation.

Install Database

The Tivoli Enterprise Portal Server requires a database product to manage monitoring data. For an evaluation installation, for example, we will use the DB2 Universal Database product.

1. Log on to the system with a user account that has the appropriate installation privileges.
2. Access the software from the downloaded DB2 installation files or CDs.
3. Launch the DB2 setup installation executable (`setup.exe`) to start the DB2 Setup wizard.
4. Click *Install Product* in the IBM DB2 Setup Launchpad.

   You can view installation prerequisites and release notes from this window.
5. Proceed through the DB2 Setup wizard installation panels and make your selections.
   - Installation help is available to guide you through the remaining steps: Click *Help* or press F1.
   - Click **Cancel** at any time to end the installation.
   - If asked which database to use in subsequent steps, choose DB2.

Tivoli Enterprise Portal Server for Windows

On Windows, the tasks include:

1. To launch the installation wizard, run `setup.exe` in the \WINDOWS directory in IBM Tivoli Monitoring V6.1 media. The default installation directory is C:\IBM\ITM.
2. You need to enter an encryption key to use. Use the same key that was used during the installation of the monitoring server to which this portal server will connect.
3. Select Tivoli Enterprise Portal Server from the list of components to install.
4. If you are installing the portal server on a computer that already has a monitoring server installed, you need to populate the depot.

After the installation completes, the installation program prompts you to configure the portal server and the connection to the monitoring server. In order to perform this configuration, you need to know the following information:

- The host name where you are installing the portal server
- The portal server's connection details to the data source

Tivoli Enterprise Portal Server for UNIX or Linux

On Linux or UNIX, the tasks include:

1. To launch the installation wizard, run **`./install.sh`** in the directory where the installation files were extracted. The default installation directory is /opt/IBM/ITM. The installation runs in text mode.
2. You need to enter an encryption key to use. Use the same key that was used during the installation of the monitoring server to which this portal server will connect.
3. Select the operating system and components to be installed.

Note: After installation, you need to configure Tivoli Enterprise Portal Server. Change the directory to /opt/IBM/ITM/bin and run:

```
./itmcmd config -A cq
```

2.7 ITCAM for Response Time workspaces

Working areas of the Tivoli Enterprise Portal window contain multiple views of the data. It displays information in chart and table format. Every managed system in your monitoring environment has one or more predefined workspaces. Start monitoring activity and system status immediately with the predefined workspaces.You also can tailor workspaces for specific conditions, display critical threshold values in red, filter incoming data, and change the hierarchical order in which agents are displayed. Also, you can create custom workspaces to present only the information you want to monitor.

2.7.1 ITCAM for Response Time workspaces

The workspaces for ITCAM for Response Time in the physical tree are organized based on agents. Each agent type provides a different set of workspaces which are collected under it. The End User Dashboard agent is a unique agent that only collects data from the historical data warehouse, instead of the live system. The dashboard provides an overall view of the cross enterprise response time.

The hierarchy tree of the workspace for ITCAM for Response Time agents are shown in Figure 2-6 on page 55.

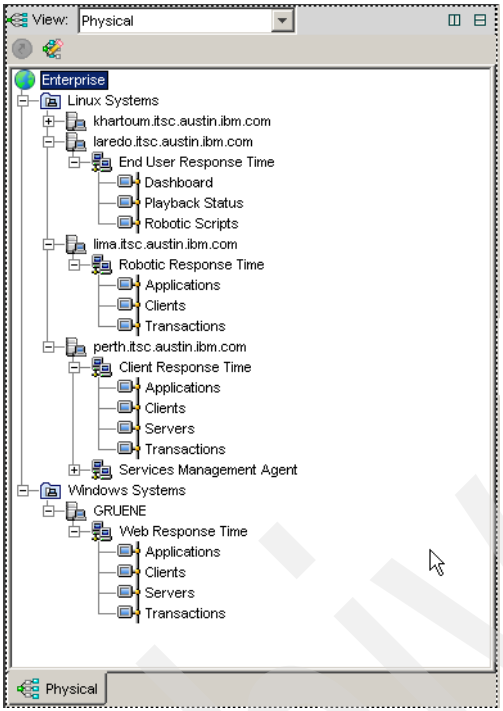

Figure 2-6 Workspace structure

As shown in Figure 2-6, the workspace for ITCAM for Response Time is divided into:

- By application: An application is defined as a larger entity that encompasses multiple transactions.
- By transaction: individual element of an application
- By client: the user machine or IP addresses that access the application
- By server: the request processing server, such as 3270 host, application server machine and so on. The robotic response time does not have a server aggregation because the transaction can be directed to any server within the robotic script.

The dashboard contains the overall summary or aggregate of all ITCAM for Response Time agents' statuses. The playback status and robotic scripts workspaces are related to the robotic script depot. The application, clients and servers workspaces show the historical status of the available response time measurement broken down by application or client or server.

Furthermore, the End User Dashboard workspace aggregates information from all other ITCAM for Response Time agents.

For more details about ITCAM for Response Time agents workspace, see Chapter 5, “Administration” on page 131.

2.7.2 TEPS workspace customization

A workspace can have one view or as many as you can practically fit into the space. So, you can customize a workspace. The changes you can make to a workspace include the following:

- Split a view horizontally or vertically into two separate views.
- Change the dimensions of the views by dragging the borders between them.
- Maximize the view and, if you like, save the workspace while the view is still maximized.
- Change a view to a different type, such as from a pie chart to a bar chart.
- Edit the workspace properties, such as to make it the default workspace.
- Edit the properties of the individual views to control their styles, and in table and chart views, to determine what data to display.
- Build a link to another workspace so that you can jump from one to the other workspace quickly.
- Save a copy of the current workspace (with **File** → **Save As**) and edit the copy.

For more information about TEPS workspace customization, see *IBM Tivoli Monitoring User's Guide, Version 6.1.0*, GC32-9409.

3

Installation

This chapter contains information about the installation of ITCAM for Response Time 6.2 agents and components.

In this chapter, the following topics are discussed:

3.1 ITCAM for Response Time installation overview

This chapter contains information about the installation of ITCAM for Response Time monitoring agents.

For this certification guide, we installed Tivoli Enterprise Monitoring Server, Tivoli Enterprise Portal Server, Tivoli Enterprise Portal Desktop Client, Warehouse Proxy, Warehouse Summarization and Pruning Agent, and the Warehouse Database on the same server. This type of installation is recommended only for proof of concepts or small-size environments. For more information about IBM Tivoli Monitoring design considerations see *IBM Tivoli Monitoring Installation and Setup Guide,* GC32-9407 or *Deployment Guide Series: IBM Tivoli Monitoring 6.1,* SG24-7188. It is a step-by-step deployment guide for IBM Tivoli Monitoring 6.1 which covers small to large environments and discusses best practices for a deployment plan.

For each ITCAM for Response Time monitoring agent you are going to install, you must first install application support files on Tivoli Enterprise Monitoring Server, Tivoli Enterprise Portal Server and Tivoli Enterprise Portal Desktop Client. You just need to install the application support files once for each type of ITCAM for Response Time agent you are going to install.

For the installation of ITCAM for Response Time V6.2 agents, you can verify these tasks:

- Obtain the installation software. You can do this either by downloading from Passport Advantage® or using a product CD.
- Verify the software and hardware requirements for the agent you want to install, discussed in:
  - 2.3.1, “Hardware requirements” on page 30
  - 2.3.2, “Operating systems” on page 31
  - 2.3.3, “Other software requirements” on page 32
- Collect the necessary information you will be asked during installation and configuration, see 2.4.1, “Other considerations for ITCAM for Response Time agents” on page 34.
- Install application support for the agents as discussed in 2.4.2, “Application support files” on page 35 and 3.2, “Installing application support files” on page 59.
- Install the Tivoli Enterprise Monitoring Agents, discussed in:
  - 3.3, “Installing agents using silent installation” on page 65
  - 3.4, “Installing End User Response Time Dashboard” on page 68
  - 3.5, “Installing ITCAM for Web Response Time” on page 71

  - 3.6, “Installing ITCAM for Client Response Time” on page 75
  - 3.7, “Installing ITCAM for Robotic Response Time” on page 78
  - 3.8, “Post installation” on page 85
- Configure the monitoring agents, see 3.8.3, “Configuring ITCAM for Response Time agents” on page 86

Note: If there is any component already installed from the same installation media (such as if you are installing the application support separately from the agent or you have already installed an agent on the computer), you will see a dialog titled Modify, repair or remove the program; click **Modify** and continue with the installation. Do *not* uncheck any components already installed because it removes the component you unchecked.

For the agent installation, you must collect information regarding the IBM Tivoli Monitoring installation, including:

- Tivoli Enterprise Portal Server hostname
- Tivoli Enterprise Monitoring Server hostname and IP Address
- Tivoli Enterprise Monitoring Server protocol settings
- Tivoli Data Warehouse configurations

Some additional considerations for installing ITCAM for Response Time 6.2 monitoring agents:

- On a Windows computer, you must have administrator privileges on that computer.
- If you have GSKit version newer than 7.0.3.18, the installation fails. Uninstall the GSKit and try installing the agent again.

3.2 Installing application support files

Before you can view data collected by monitoring agents, you must install and enable application support for the agents. Application support files provide agent-specific information for workspaces, helps, situations, templates, and other data. The discussion includes:

- 3.2.1, “Installing Application Support for Windows” on page 60
- 3.2.2, “Installing Application Support for Linux or UNIX” on page 61

3.2.1 Installing Application Support for Windows

All monitoring agents require that application support files be configured on all instances of the following infrastructure components:

- Tivoli Enterprise Monitoring Server (both hub and remote monitoring servers)
- Tivoli Enterprise Portal Server
- Tivoli Enterprise Portal Desktop Client

If there are several components to be installed in a single machine, it is recommended to install them together. If the installation does not seem to proceed correctly, you might check <ITM_HOME>\CNPS\Logs\seedk*pp*.log file (where *pp* is the two-character code for each monitoring agent) for diagnostic messages that help you determine the cause of the problem.

Use the following procedure to install application support files:

Note: Stop the Tivoli Monitoring services before installing or modifying a component, or the wizard automatically stops the services when it installs.

1. Open Manage Tivoli Enterprise Monitoring Services.
2. Stop the appropriate components that you are modifying, such as Tivoli Enterprise Monitoring Server, Tivoli Enterprise Portal Server, or Tivoli Enterprise Portal desktop client; right-click and select **Stop**.
3. Run **`setup.exe`** in the \WINDOWS directory on the agent installation media.
4. Click **Next** on the Welcome window.
5. Click **Accept** on the software license agreement.
6. If you see a message telling you the installed version is newer than the agent installation, click **OK** to ignore this message.
7. Select the appropriate component, such as Tivoli Enterprise Monitoring Server, Tivoli Enterprise Portal Server or Tivoli Enterprise Portal desktop client, and click **Next**.
8. IBM Tivoli Monitoring provides the ability to deploy resource monitoring across your environment from a central location, the monitoring server. You can use the remote deployment feature to deploy and configure monitoring agents. To add the agent to the deployment depot, select the agent and click **Next**.
9. Review the installation summary details. Click **Next** to start the installation.
10. After installation is complete, a configuration window is displayed. By default, all the components you just installed are selected for configuration. Just check

on the components that you currently modified. Click **Next** on the configuration window. The following step indicates that all steps are selected.

11. Specify the default values for communication with the Tivoli Enterprise Monitoring Server, and click **OK**.
12. Identify the default communications protocols for agents to use to connect to the Tivoli Enterprise Monitoring Server, and click **OK**.
13. Specify the location of the monitoring server, and click **OK**. Your choices are `This computer` or `On a different computer`.
14. Click **OK**.
15. Select the data to add to the Tivoli Enterprise Monitoring Server and click **OK**. By default, all available application support is selected.
16. Click **Next** on the application support message.
17. Specify the default values for the agent to use when it communicates with the TIvoli Enterprise Monitoring Server, and click **OK**. You might get additional connection settings to connect to Tivoli Enterprise Monitoring Server for any additional components you configure.
    a. If the agent must cross a firewall to access the Tivoli Enterprise Monitoring Server, select **Connection must pass through firewall**.
    b. Identify the type of protocol that the agent uses to communicate with the Tivoli Enterprise Monitoring Server. You have four choices: IP.UDP, IP.PIPE, IP.SPIPE, or SNA.
18. Type the host name for the portal server and click **Next**.
19. The wizard will then rebuild the portal server presentation.
20. Click **Finish**.
21. Open Manage Tivoli Enterprise Monitoring Services and start the components that you modified.

Installation of application support files is completed.

3.2.2 Installing Application Support for Linux or UNIX

On Linux or UNIX systems, all monitoring agents require that application support files be configured on all instances of the following infrastructure components:

- Tivoli Enterprise Monitoring Server (both hub and remote monitoring servers)
- Tivoli Enterprise Portal Server
- Tivoli Enterprise Portal Desktop Client

Use the following procedure to install Application Support files for Linux or UNIX systems:

1. Stop the Tivoli Enterprise Monitoring Server by running the following command:

   ./itmcmd server stop <tems_name>

   where <tems_name> is the name of Tivoli Enterprise Monitoring Server.

2. Stop the Tivoli Enterprise Portal Server by running the following command:

   ./itmcmd agent stop cq

3. Stop the Tivoli Enterprise Portal Desktop Client by running the following command:

   ./itmcmd agent stop cj

4. Run **./install.sh** in the directory where the installation files were extracted.
5. Linux or UNIX installations do not have a graphical wizard, so you must answer interactive installation prompts. Type **1** to install a product to the local host and start the installation and press Enter.
6. Type the number that corresponds to the language in which you want to display the software license agreement and press Enter.
7. Press Enter to display the agreement.
8. Type **1** to accept the agreement and press Enter.
9. Type a 32 character encryption key and press Enter. This key should be the same as the key that was used during the installation of the Tivoli Enterprise Monitoring Server to which this monitoring agent connects.

   Note: This step applies only to those agents that you install from IBM Tivoli Monitoring installation image. Agents installed from the agent installation image do not need to provide the encryption key.

   A numbered list of available operating systems is displayed.

10. For installing Tivoli Enterprise Monitoring Server support:
    a. Type the number that corresponds to `Tivoli Enterprise Monitoring Server support` and press Enter.
    b. Type **y** to confirm and press Enter. A list of the components to install is displayed.
    c. Type the number that corresponds to all of the above and press Enter.
    d. Type **y** to start the installation.

11. For installing Tivoli Enterprise Portal Server support:
    a. Type the number that corresponds to `Tivoli Enterprise Portal Server support` and press Enter.
    b. Type **y** to confirm and press Enter. A list of the components to install is displayed.
    c. Type the number that corresponds to all of the above and press Enter.
    d. Type **y** to start the installation.
12. For installing the Tivoli Enterprise Portal desktop client support:
    a. Type the number that corresponds to `Tivoli Enterprise Portal Desktop Client support` and press Enter.
    b. Type **y** to confirm and press Enter. A list of the components to install is displayed.
    c. Type the number that corresponds to all of the above and press Enter.
    d. Type **y** to start the installation.
13. After all of the components are installed, you are asked whether you want to install components for a different operating system. Type **n** and press Enter.

    Installation is complete.
14. For configuring Tivoli Enterprise Monitoring Server:
    a. Start the Tivoli Enterprise Monitoring Server by running the command: **./itmcmd server start <tems_name>**. Where <tems_name> is the name of the Tivoli Enterprise Monitoring Server.
    b. Activate the application support files on the Tivoli Enterprise Monitoring Server by running the command **./itmcmd support -t <tems_name> <pc>** where <pc> is the product code for the agent:
        - ITCAM for End User Response Time Dashboard is t3
        - ITCAM for Client Response Time is t4
        - ITCAM for Web Response Time is t5
        - ITCAM for Robotic Response Time is t6
    c. Stop the Tivoli Enterprise Monitoring Server by running the command **./itmcmd server stop <tems_name>**
    d. Start the Tivoli Enterprise Monitoring Server by running the command **./itmcmd server start <tems_name>**
15. For configuring Tivoli Enterprise Portal Server
    a. Configure Tivoli Enterprise Portal Server with the new agent information by running the command **./itmcmd config -A cq**. Complete the configuration as prompted.
    b. Start Tivoli Enterprise Portal Server by running the command **./itmcmd agent start cq**.

16. For configuring Tivoli Enterprise Portal desktop client:

    a. Configure Tivoli Enterprise Portal Desktop Client with the new agent information by running the command **./itmcmd config -A cj**. Complete the configuration as prompted.

    b. Start Tivoli Enterprise Portal Desktop Client by running the command **./itmcmd agent start cj**.

To view the product codes for the application support you have just installed, run **./cinfo -i** command. See Example 3-1.

Example 3-1 cinfo -i output

```
[root@peoria bin]# ./cinfo -i

*********** Tue Oct 30 11:41:57 CDT 2007 ******************
User      : root Group: root bin daemon sys adm disk wheel db2grp1
Host name : peoria.itsc.austin.ibm.com   Installer Lvl:06.10.05.02
CandleHome: /opt/IBM/ITM
************************************************************
...Product inventory
...
...
t3      ITCAM for End User Response Time Dashboard Agent
         tms     Version: 06.20.00.00
         tpd     Version: 06.20.00.00
         tps     Version: 06.20.00.00
         tpw     Version: 06.20.00.00

t4      ITCAM for Client Response Time Agent
         tms     Version: 06.20.00.00
         tpd     Version: 06.20.00.00
         tps     Version: 06.20.00.00
         tpw     Version: 06.20.00.00

t5      ITCAM for Web Response Time Agent
         tms     Version: 06.20.00.00
         tpd     Version: 06.20.00.00
         tps     Version: 06.20.00.00
         tpw     Version: 06.20.00.00

t6      ITCAM for Robotic Response Time Agent
         tms     Version: 06.20.00.00
         tpd     Version: 06.20.00.00
         tps     Version: 06.20.00.00
```

3.3 Installing agents using silent installation

This section provides information about installing ITCAM for Response Time agents using the silent installation method. This method of installation is useful for advanced users who prefer to input installation information once through a response file instead of repeatedly through an installation wizard. You might run through the installation wizard one time to determine the values that you need to set for your monitoring needs and then use silent installation to install the rest of your environment.

The silent installation relies on the following response files which are provided on the ITCAM for Response Time agent installation CD. The samples are listed in Table 3-1.

Table 3-1 Information file for silent installation

Monitoring agent	Windows Information file	UNIX or Linux Information file
ITCAM for End User Response Time Dashboard	T3V620_Silent.txt	T3V620_Silent_Unix.txt
ITCAM for Client Response Time	T4V620_Silent.txt	T4V620_Silent_Unix.txt
ITCAM for Web Response Time	T5V620_Silent.txt	T5V620_Silent_Unix.txt
ITCAM for Robotic Response Time	T6V620_Silent.txt	T6V620_Silent_Unix.txt

3.3.1 Silent installation on Windows

Use the following steps to edit the response file as appropriate for your environment:

1. Locate the response file on the installation CD. Copy this file to a temporary directory on your system.
2. Open your copy of the response file in a text editor.
3. Change the parameters as appropriate for your environment. The sample response file contains descriptions of all the parameters, including directions on how to use them. Complete all of the steps listed in the file. Each line of the file must be either a comment (containing a semicolon in column one) or a directive that starts in column one.

4. The default protocol is TCP/IP with IP.PIPE. If you want to use UDP, you have to explicitly specify IP.UDP.
5. Do not modify any other files that come with the installation (for example, the SETUP.ISS file).
6. Save the file and close the editor.
7. Run the silent installation using one of the following methods:
   a. “Running the silent installation from the command line” on page 66
   b. “Using Microsoft System Management Server” on page 66

Running the silent installation from the command line

Use the following steps to run the installation from the command line:

1. Open a Command Window.
2. Change the path to the directory containing the installation where setup.exe and setup.ins reside.
3. Run **setup**; note that you *must* specify the parameters in the same order listed here:

   ```
   setup /z"/sfC:\temp\SILENT.TXT" /s /f2"C:\temp\silent_setup.log"
   ```

   where

   /z"/sf<file>" specifies the name of the installation driver you customized for your site. This is a required parameter. This file must exist.

   /s specifies that this is a silent install. This causes nothing to be displayed during installation.

   /f2 specifies the name of the InstallShield log file. If you do not specify this parameter, the default is to create Setup.log in the same location as the setup.iss file. In either case, the Setup program must be able to create and write to this file.

Using Microsoft System Management Server

Use the following steps to run the installation using Microsoft System Management Server:

1. Copy all the installation files to a LAN-based disk that SMS mounts on the desired computers (copy all files in the directory with setup.exe and setup.ins.).
2. Replace the original SILENT.TXT file on the LAN disk with your modified version.

3. Edit the PDF file located with **setup.exe** and change the Setup invocation as follows:

```
Setup /z"/sfC:\temp\SILENT.TXT" /s /f2"C:\temp\silent_setup.log"
```

3.3.2 Silent installation on Linux and UNIX

On Linux and UNIX, the silent installation method is divided into two phases, silent installation of the code and a silent configuration of the agent.

Silent configuration requires a response file, <pc>_silent_config.txt. This file is automatically updated with the parameters you supply whenever you install or configure the product.

Silent installation

To start a silent installation, run **install.sh** provided in the directory where you extracted the installation files:

```
./install.sh -q -h <install_dir> -p <response_file>
```

where

<install_dir> specifies the installation location for the monitoring agent. The default installation location is /opt/IBM/ITM.

<response_file> identifies the response file that you edited to specify installation parameters, the *pc*V620_Silent_Unix.txt file. Specify the full path to this file.

Silent configuration

To start a silent configuration, run the **CandleConfig** command in the <install_dir>/bin directory with the following configuration option:

```
./CandleConfig -A -p <response_file> <pc>
```

where

<response_file> identifies the response file that you edited to specify configuration parameters, usually *pc*_silent_config.txt. You can only find this file after the agent is installed. It is located in the directory <install_dir>/config. Specify the full path to this file.

<pc> is the product code for the agent.

3.4 Installing End User Response Time Dashboard

For the detailed installation steps, see *ITCAM for Response Time* 6.2 *End User Response Time Dashboard User's Guide*, and *Deployment Guide Series: ITCAM for Response Time* 6.2, SG24-7484. The discussion includes:

- 3.4.1, "Preinstallation steps" on page 68
- 3.4.2, "Installing on Windows" on page 68
- 3.4.3, "Installing End User Response Time Dashboard for Linux or UNIX" on page 70

3.4.1 Preinstallation steps

In this topic, we describe some details to be aware of before starting the installation:

- End User Response Time Dashboard agent and Tivoli Data Warehouse

  The ITCAM for Response Time 6.2 End User Response Time Dashboard agent works with data from the Tivoli Data Warehouse. Therefore it is recommended to be installed close to the Tivoli Data Warehouse, but on a separate system, in the same subnet. It could be on the same machine as the Warehouse Proxy or Summarization and Pruning agents as they all accesses the warehouse..

- Robotic script file depot

  Install *only* one ITCAM for Response Time 6.2 End User Response Time Dashboard agent in the IBM Tivoli Monitoring environment. This agent is also the robotic script file depot.

3.4.2 Installing on Windows

Use the following steps to install ITCAM for End User Response Time Dashboard agent for Windows:

1. If you have not already done so, obtain the installation software by downloading it or inserting the product CD.
2. Launch the installation wizard by double-clicking **setup.exe** in the \WINDOWS subdirectory for the installation files. The software displays the Welcome window
3. Click **Next** to display the Prerequisites window.
4. Verify that you meet the prerequisites and click **Next** to display the Install Prerequisites window.

5. ITCAM for Response Time 6.2 agents require IBM Global Security Toolkit (GSKit) 7.0.3.18 and IBM Java 1.4.2. Follow the instructions in the Install Prerequisites window and select the appropriate boxes.
6. Click **Next** to display the Software License Agreement window.
7. Click **Accept** to display the Choose Destination Location window.
8. Choose the directory where you want to install the product. The default directory is C:\IBM\ITM. Click **Next** to display the User Data Encryption Key window.
9. Type a 32 character encryption key and click **Next**. This key must conform to the key you specified in the Tivoli Enterprise Monitoring Server.
10. Click **OK** to confirm the encryption key. The software displays the Select Features window.

Note: The Select Features window varies. If the Tivoli Enterprise Monitoring Server, Tivoli Enterprise Portal Server, or Tivoli Enterprise Portal is installed on the same computer, there are additional check boxes to install support for them.

11. Expand **Tivoli Enterprise Monitoring Agents**.
12. Select ITCAM for End User Response Time Dashboard agent and click **Next**.
13. If you are installing the agent on a computer that has a Tivoli Enterprise Monitoring Server installed, the next step is to populate the depot. If you do not have a monitoring server on this computer, this step is skipped. The software displays the Select Program Folder window. Select a program folder and click **Next**. The default program folder name is IBM Tivoli Monitoring.
14. The software displays the installation summary details that identify what you are installing and where you chose to install.
15. Click **Next** to start the installation. The software displays the status as it installs.

    After the components are installed and the configuration environment is initialized, the software displays the Setup Type window for configuration.
16. Select what you want to configure and click **Next** to begin configuring the default values.

Installation is complete. See additional procedures in 3.8, “Post installation” on page 85.

3.4.3 Installing End User Response Time Dashboard for Linux or UNIX

Use the following steps to install ITCAM for End User Response Time Dashboard agent for Linux or UNIX:

1. In the directory where you extracted the installation files, run the following command:

   ./install.sh

2. When prompted for the IBM Tivoli Monitoring home directory, press Enter to accept the default (/opt/IBM/ITM) or type the full path to a different directory.
3. If the installation directory does not already exist, you are asked if you want to create it. Type **y** to create this directory and press Enter.
4. Start the installation by answering to the prompt to `Install products to the local host`. Type **1** to start the installation and press Enter.
5. Type the number that corresponds to the language in which you want to display the software license agreement and press Enter.
6. Press Enter to display the agreement.
7. Type **1** to accept the agreement and press Enter.
8. Type a 32 character encryption key and press Enter.This key should be the same as the key that was used during the installation of the Tivoli Enterprise Monitoring Server to which this monitoring agent connects. A numbered list of available operating systems is displayed.
9. Type the number for the operating system that you are installing on. The default value is your current operating system. Press Enter.
10. Type **y** to confirm the operating system and press Enter. A numbered list of available components is displayed.
11. Type the number that corresponds to the ITCAM for Response Time 6.2 End User Response Time Dashboard and press Enter.
12. Type **y** to confirm the installation. The installation begins.
13. After all of the components are installed, you are asked whether you want to install components for a different operating system. Type **n** and press Enter.

Installation is complete. See additional procedures in 3.8, “Post installation” on page 85.

3.5 Installing ITCAM for Web Response Time

For the detailed installation steps, see *ITCAM for Web Response Time User's Guide* and the *Deployment Guide Series: ITCAM for Response Time* 6.2. The discussion includes:

3.5.1 Preinstallation steps

In this topic, we describe some details to be aware of before starting the installation:

- Web Server

  You should install ITCAM for Web Response Time agent on each Web Server or install in appliance mode using promiscuous mode to monitor the entire network traffic. If you have an OS Agent installed and you have the ITCAM for Web Response Time agent loaded into IBM Tivoli Monitoring Depot, you may install through the Tivoli Enterprise Portal Server which will not ask you about Tivoli Enterprise Monitoring Configuration.

- Windows Network Monitor

  Before installing the ITCAM for Web Response Time agent on a Windows platform, you must install the Windows Network Monitor.

3.5.2 Installing Windows Network Monitor

Use the following steps to install Windows Network Monitor:

1. Do one of these steps:
   - For Windows 2000: Click **Start** → **Control Panel** → **Network and Dial-up Connections** → **Local Area Connection**
   - For Windows 2003 and Windows XP: Click **Start** → **Control Panel** → **Network Connections** → **Local Area Connection**
2. Right-click **Local Area Connection**.
3. In the menu, click **Properties**. See Figure 3-1 on page 72.

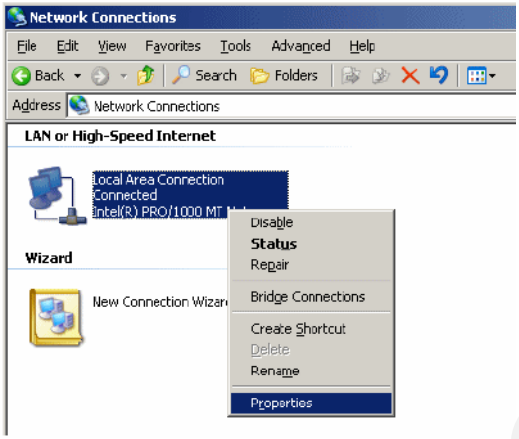

Figure 3-1 Network Connections properties

You can verify if Windows Network Monitor has been installed or not on the monitored system by Network Connection Properties.

4. In the Local Area Connection Properties window, click **Install** if there is no **Network Monitor Driver** available.
5. Select **Protocol** from the Select Network Component window and click **Add**.
6. Select **Network Monitor Driver** from the Select Network Protocol window and click **OK**.
7. After the Network Monitor Driver is displayed in the Local Area Connections Properties window, click **Close**.

3.5.3 Installing ITCAM for Web Response Time for Windows

Use the following steps to install ITCAM for Web Response Time agent for Windows:

1. If you have not already done so, obtain the installation software by downloading it or inserting the product CD.
2. Launch the installation wizard by double-clicking **setup.exe** in the *\WINDOWS* subdirectory for the installation files. The software displays the Welcome window
3. Click **Next** to display the Prerequisites window.
4. Verify that you meet the prerequisites and click **Next** to display the Install Prerequisites window.

5. ITCAM for Response Time 6.2 agents require IBM Global Security Toolkit (GSKit) 7.0.3.18 and IBM Java 1.4.2. Follow the instructions in the Install Prerequisites window and select the appropriate boxes.

   Click **Next** to display the Software License Agreement window.

6. Click **Accept** to display the Choose Destination Location window.
7. Choose the directory where you want to install the product. The default directory is C:\IBM\ITM. Click **Next** to display the User Data Encryption Key window.
8. Type a 32 character encryption key and click **Next**. This should be the same key you use on the monitoring server.
9. Click **OK** to confirm the encryption key. The software displays the Select Features window.

Note: The Select Features window varies. If the Tivoli Enterprise Monitoring Server, Tivoli Enterprise Portal Server, or Tivoli Enterprise Portal is installed on the same computer, there are additional check boxes to install support for them.

10. Expand **Tivoli Enterprise Monitoring Agents**.
11. Select ITCAM for Web Response Time Agent and click **Next**.
12. If you are installing the agent on a computer that has a Tivoli Enterprise Monitoring Server installed, the next step is to populate the depot. If you do not have a monitoring server on this computer, this step is skipped. The software displays the Select Program Folder window. Select a program folder and click **Next**. The default program folder name is IBM Tivoli Monitoring.
13. The software displays the installation summary details that identify what you are installing and where you chose to install.
14. Click **Next** to start the installation. The software displays the status as it installs.

    After the components are installed and the configuration environment is initialized, the software displays the Setup Type window for configuration.

15. Select what you want to configure and click **Next** to begin configuring the default values.

Installation is complete. See additional procedures in 3.8, “Post installation” on page 85.

3.5.4 Installing ITCAM for Web Response Time for Linux or UNIX

Use the following steps to install ITCAM for Web Response Time agent for Linux or UNIX:

1. In the directory where you extracted the installation files, run **`./install.sh`**.
2. When prompted for the IBM Tivoli Monitoring home directory, press Enter to accept the default (/opt/IBM/ITM) or type the full path to a different directory.
3. If the installation directory does not already exist, you are asked if you want to create it. Type **y** to create this directory and press Enter.
4. Answer the prompt to `Install products to the local host`. Type **1** to start the installation and press Enter.
5. Type the number that corresponds to the language in which you want to display the software license agreement and press Enter.
6. Press Enter to display the agreement.
7. Type **1** to accept the agreement and press Enter.
8. Type a 32 character encryption key and press Enter.This key should be the same as the key that was used during the installation of the Tivoli Enterprise Monitoring Server to which this monitoring agent connects. A numbered list of available operating systems is displayed.
9. Type the number for the operating system that you are installing on. The default value is your current operating system. Press Enter.
10. Type **y** to confirm the operating system and press Enter. A numbered list of available components is displayed.
11. Type the number that corresponds to ITCAM for Web Response Time and press Enter.
12. Type **y** to confirm the installation. The installation begins.
13. After all of the components are installed, you are asked whether you want to install components for a different operating system. Type **n** and press Enter.

Installation is complete. See additional procedures in 3.8, “Post installation” on page 85.

3.6 Installing ITCAM for Client Response Time

For the detailed installation steps, see *ITCAM for Client Response Time User's Guide* and the *Deployment Guide Series: ITCAM for Response Time* 6.2. The discussion includes:

- 3.6.1, "Preinstallation steps" on page 75
- 3.6.2, "Installing ITCAM for Client Response Time for Windows" on page 75
- 3.6.3, "Installing ITCAM for Client Response Time for Linux or UNIX" on page 77

3.6.1 Preinstallation steps

If you have a previously installed ITCAM for Response Time Tracking 6.1, you must uninstall it from your environment and verify that the following libraries were deleted before installing ITCAM for Robotic Response Time:

- C:\windows\system32\libarm4.dll
- C:\windows\system32\libarm32.dll
- C:\windows\system32\armjni4.dll
- C:\windows\system32\armjni.dll
- C:\windows\system32\armcli.dll
- C:\windows\system32\libarm4net.dll

or in a Linux or UNIX environment, this library has to be removed from the PATH environment:

- libarm

3.6.2 Installing ITCAM for Client Response Time for Windows

Use the following steps to install ITCAM for Client Response Time agent for Windows:

1. If you have not already done so, obtain the installation software by downloading it or inserting the product CD.
2. Launch the installation wizard by double-clicking **setup.exe** in the \WINDOWS subdirectory for the installation files. The software displays the Welcome window
3. Click **Next** to display the Prerequisites window.
4. Verify that you meet the prerequisites and click **Next** to display the Install Prerequisites window.

5. ITCAM for Response Time 6.2 agents require IBM Global Security Toolkit (GSKit) 7.0.3.18 and IBM Java 1.4.2. Follow the instructions in the Install Prerequisites window and select the appropriate boxes.

   Click **Next** to display the Software License Agreement window.

6. Click **Accept** to display the Choose Destination Location window.
7. Choose the directory where you want to install the product. The default directory is C:\IBM\ITM. Click **Next** to display the User Data Encryption Key window.
8. Type a 32 character encryption key and click **Next**. This must be the same as the encryption key in the monitoring server.
9. Click **OK** to confirm the encryption key. The software displays the Select Features window.

Note: The Select Features window varies. If the Tivoli Enterprise Monitoring Server, Tivoli Enterprise Portal Server, or Tivoli Enterprise Portal is installed on the same computer, there are additional check boxes to install support for them.

10. Expand **Tivoli Enterprise Monitoring Agents**.
11. Select ITCAM for Client Response Time agent and click **Next**.
12. If you are installing the agent on a computer that has a Tivoli Enterprise Monitoring Server installed, the next step is to populate the depot. If you do not have a monitoring server on this computer, this step is skipped. The software displays the Select Program Folder window. Select a program folder and click **Next**. The default program folder name is IBM Tivoli Monitoring.
13. The software displays the installation summary details that identify what you are installing and where you chose to install.
14. Click **Next** to start the installation. The software displays the status as it installs.

    After the components are installed and the configuration environment is initialized, the software displays the Setup Type window for configuration.

15. Select what you want to configure and click **Next** to begin configuring the default values.

Installation is complete. See additional procedures in 3.8, “Post installation” on page 85.

3.6.3 Installing ITCAM for Client Response Time for Linux or UNIX

Use the following steps to install ITCAM for Client Response Time agent for Linux or UNIX:

1. In the directory where you extracted the installation files, run the following command:

   ./install.sh

2. When prompted for the IBM Tivoli Monitoring home directory, press Enter to accept the default (/opt/IBM/ITM) or type the full path to a different directory.
3. If the installation directory does not already exist, you are asked if you want to create it. Type **y** to create this directory and press Enter.
4. Answer the prompt to `Install products to the local host`. Type **1** to start the installation and press Enter.
5. Type the number that corresponds to the language in which you want to display the software license agreement and press Enter.
6. Press Enter to display the agreement.
7. Type **1** to accept the agreement and press Enter.
8. Type a 32 character encryption key and press Enter. This key should be the same as the key that was used during the installation of the Tivoli Enterprise Monitoring Server to which this monitoring agent connects. A numbered list of available operating systems is displayed.
9. Type the number for the operating system that you are installing on. The default value is your current operating system. Press Enter.
10. Type **y** to confirm the operating system and press Enter. A numbered list of available components is displayed.
11. Type the number that corresponds to ITCAM for Client Response Time and press Enter.
12. Type **y** to confirm the installation. The installation begins.
13. After all of the components are installed, you are asked whether you want to install components for a different operating system. Type **n** and press Enter.

Installation is complete. See additional procedures in 3.8, “Post installation” on page 85.

3.7 Installing ITCAM for Robotic Response Time

For the detailed installation steps, see *ITCAM for Robotic Response Time User's Guide* and the *Deployment Guide Series: ITCAM for Response Time* 6.2.

This section discusses:

3.7.1 Preinstallation steps

In this topic, we describe some details to be aware of before starting the installation.

Rational Robot

If you want to use Rational Robot for playback with ITCAM for Robotic Response Time, you must install Rational Robot before you install the agent. The ITCAM for Robotic Response Time uses Rational Robot to record and playback the user experience on Windows based applications and Web based applications.

You should install Rational Robot if you are monitoring Windows GUI applications or are using Robot VU HTTP legacy support. You can install Rational Robot on any computer with the following characteristics:

- The computer runs one of the supported Windows versions.
- The computer can connect to the Web resources needed for the robotic transaction.
- The computer is accessible to the management server for the uploading of completed recordings.

If you plan to run Rational Robot on a Citrix server, contact IBM Software Support and request a floating Rational Robot License key before starting the installation. You must have access to a bulk-file transfer program, such as FTP, and a file extraction program, such as WinZip or PKZIP for installing and running Rational Robot.

Rational Performance Tester

Rational Performance Tester Workbench is needed to record and upload Rational performance Tester robotic scripts. Rational Performance Tester scripts can be used to monitor Web applications, SAP, Siebel, or Citrix applications.

Rational Performance Tester creates tests of Web pages without manual coding of the verification points required in Rational Robot VU. No programming knowledge is necessary to create, comprehend, modify, and execute a performance test. A Rational Performance Tester test provides a graphical illustration of the Web pages visited during execution. Code editing is unnecessary to create a multi-user test. For more advanced testers, information about items such as underlying page elements and server responses is also available.

Previous ITCAM for Response Time Tracking 6.1

If you have a previously installed ITCAM for Response Time Tracking 6.1, you must uninstall it from your environment and verify that the following libraries were removed before installing ITCAM for Robotic Response Time.

- c:\windows\system32\libarm4.dll
- c:\windows\system32\libarm32.dll
- c:\windows\system32\armjni4.dll
- c:\windows\system32\armjni.dll
- c:\windows\system32\armcli.dll
- c:\windows\system32\libarm4net.dll

In a Linux or UNIX environment, the following libraries must not be in the PATH environment variable:

- libarm4.*
- libarmjni4.*
- libarmjni.*
- libarm32.*
- libarmcli.*

3.7.2 Installing Rational Robot

Use the following steps to install Rational Robot:

1. Insert the CD containing Rational Robot.
2. Run the **`setup.exe`** command to start the installation wizard.
3. On the Welcome to the Setup Wizard window, click **Next** to display the Product Selection window.
4. Select **Rational Robot** and click **Next**.

5. Select your deployment method and click **Next**.
6. Click **Next**.
7. Close any open applications and then click **Next**.
8. Click **View** to read the license agreement.
9. Click **I accept**, and then click **Next**.
10. Click **Next** to accept the location.
11. Select the programs you want to install and click **Next**.
12. Click **Install**.
13. Select **Import a Rational License File** and click **Next**.
14. Select the **ibm_robot.upd** file.
15. Click **Import**.
16. Click **Import** again.
17. Click **OK**.
18. Close the window.
19. Restart the computer.
20. Run 3.7.3, “Setting DCOM configuration” on page 80.

3.7.3 Setting DCOM configuration

You must also set DCOM configuration security permissions for the Administrator.

DCOM is a network extension of the component object model (COM) technology that enables interprocess communication across the network on Windows. The distributed component object model (DCOM) enables communication across the network on Windows. The default access and launch permissions of DCOM do not give the Rational Robot Player account permission to launch Microsoft Internet Explorer. You can add the Rational Robot Player account to DCOM’s launch and access permissions by using the DCOMCNFG.EXE utility:

1. Restart the managed system after installing Rational Robot.
2. Set DCOM Config Default Security permissions for the user on the management agent on which Rational Robot is installed. Run the **DCOMCNFG.EXE** file.
3. Click the **Default Security** tab.
4. Click **Edit Default** in the Default Access Permissions group.
5. Click **Add**.

6. Select the **computer name** from the List Names From list.
7. Click **Show Users** and do one of these steps:
   - Select an existing user
     - Select the Agent robotic user from the list of names
   - Create a new user; if the management agent user is not in the list:
     - Click **Add** to display the Add Users and Groups window.
     - Select the user from the list.
     - Click **Add** and click **OK**.
8. Choose **Allow Access** from the Type of Access menu and click **OK**.
9. Click **Edit Default** in the Default Launch Permissions field.
10. Select the user from the list and choose Allow Launch from the Type of Access menu.
11. Click **OK**.
12. Click **Edit Default** at Default Configuration Permissions.
13. Select the user from the list.
14. Choose **Full Control** from the Type of Access menu
15. Click **OK** twice to finish the procedure.

3.7.4 Installing Rational Performance Tester

You can install the Rational Performance Tester Workbench on any system from which you want to record the tests. You do not need to install it on the same system as ITCAM for Robotic Response Time Agent. The Rational Performance Tester Workbench needs a connection to ITCAM for End User Response Time Dashboard Agent. *Make sure that there are no firewalls between them*.

For the installation we used the following media:

- ITCAM for Response Time V6.2: Rational Performance Test V7.0 Integration Support Windows, English. This one contains the setup_RPT.exe that will call the Rational Performance Installation Media (Part 1, 2 and 3) and perform the installation, including IBM Installation Manager 1.0, IBM Rational Performance Tester 7.0, IBM Rational Performance Tester 7.0 license key and ITCAM for Response Time 6.2 Integration plug-in.
- IBM Rational Performance Tester V7.0 Multiplatform Multilingual Part 1.
- IBM Rational Performance Tester V7.0 Multiplatform Multilingual Part 2.
- IBM Rational Performance Tester V7.0 Multiplatform Multilingual Part 3.

If you are downloading the software to a disk, we recommend that you uncompress all four installation images on the same directory, for example, C:\ITCAMRational, so it will not ask you for the Rational media.

For this demonstration we created one directory for *ITCAM* for Response Time V6.2: Rational Performance Test V7.0 Integration *Support Windows, English* media and another for *IBM Rational Performance Tester V7.0 Multiplatform Multilingual Part 1, 2 and 3* in order to show you how to proceed if they are on separate directories.

Use the following steps to install Rational Performance Tester:

1. Verify the supported platforms for Rational Performance Tester at:

   http://www-306.ibm.com/software/awdtools/tester/performance/sysreq/index.html

2. Go to the RPT/<operating_system> directory of the downloaded installation images.

   <operating_system> is the name of the operating system of the computer on which you want to install Rational Performance Tester. For example for an installation image for the Windows operating system: RPT\w32-ix86\disk1.

3. Run **setup_RPT.exe** to display the Welcome window.

4. Click **Next**. Accept the terms of the license agreement and click **Next**.

5. *(Optional)* If the installation images do not contain the RPTBase directory at the same level as disk1 directory, the RPT images display the Rational Performance Tester 7.0 Image Location window. Otherwise the RPT installation images is discovered automatically and this window will not be displayed. Click **Browse** to locate the directory that contains the RPTBase directory and click **Next**.

6. The software calculates and displays the required disk space needed for the installation and shows the default directories used for installation.

7. Verify you have sufficient disk space.

   – If you do not, click **Cancel** and either install on a different computer or free the required disk space.

   – If you have sufficient disk space, click **Next**.

8. Do one of these steps:

   – Accept the default installation directories by clicking **Next**.

   – Click **Browse** and navigate to a different set of directories and click **Next**.

9. Click **Next** to begin the installation. The various parts of the installation can take several minutes each.

10. Click **Finish**.

3.7.5 Installing ITCAM for Robotic Response Time for Windows

Use the following steps to install ITCAM for Robotic Response Time agent for Windows:

1. If you have not already done so, obtain the installation software by downloading it or inserting the product CD.
2. Launch the installation wizard by double-clicking **setup.exe** in the \WINDOWS subdirectory for the installation files. The software displays the Welcome window.
3. Click **Next** to display the Prerequisites window.
4. Verify that you meet the prerequisites and click **Next** to display the Install Prerequisites window.
5. ITCAM for Response Time 6.2 agents require IBM Global Security Toolkit (GSKit) 7.0.3.18 and IBM Java 1.4.2. Follow the instructions in the Install Prerequisites window and select the appropriate boxes.

   Click **Next** to display the Software License Agreement window.
6. Click **Accept** to display the Choose Destination Location window.
7. Choose the directory where you want to install the product. The default directory is C:\IBM\ITM. Click **Next** to display the User Data Encryption Key window.
8. Type a 32 character encryption key and click **Next**. You must use the same encryption key as the monitoring server. Click **OK** to confirm the encryption key. The software displays the Select Features window.

Note: The Select Features window varies. If the Tivoli Enterprise Monitoring Server, Tivoli Enterprise Portal Server, or Tivoli Enterprise Portal is installed on the same computer, there are additional check boxes to install support for them.

9. Expand **Tivoli Enterprise Monitoring Agents**.
10. Select ITCAM for Robotic Response Time agent and click **Next**.
11. If you are installing the agent on a computer that has a Tivoli Enterprise Monitoring Server installed, the next step is to populate the depot. If you do not have a monitoring server on this computer, this step is skipped. The software displays the Select Program Folder window. Select a program folder and click **Next**. The default program folder name is IBM Tivoli Monitoring.

12. The software displays the installation summary details that identify what you are installing and where you chose to install.
13. Click **Next** to start the installation. The software displays the status as it installs.

    After the components are installed and the configuration environment is initialized, the software displays the Setup Type window for configuration.
14. Select what you want to configure and click **Next** to begin configuring the default values.

Installation is complete. See additional procedures in 3.8, “Post installation” on page 85.

3.7.6 Installing ITCAM for Robotic Response Time for Linux or UNIX

Use the following steps to install ITCAM for Robotic Response Time agent for Linux or UNIX.

1. In the directory where you extracted the installation files, run the following command:

   ./install.sh
2. When prompted for the IBM Tivoli Monitoring home directory, press Enter to accept the default (/opt/IBM/ITM) or type the full path to a different directory.
3. If the installation directory does not already exist, you are asked if you want to create it. Type **y** to create this directory and press Enter.
4. Answer the prompt to `Install products to the local host`. Type **1** to start the installation and press Enter.
5. Type the number that corresponds to the language in which you want to display the software license agreement and press Enter.
6. Press Enter to display the agreement.
7. Type **1** to accept the agreement and press Enter.
8. Type a 32 character encryption key and press Enter. This key should be the same as the key that was used during the installation of the Tivoli Enterprise Monitoring Server to which this monitoring agent connects. A numbered list of available operating systems is displayed.
9. Type the number for the operating system that you are installing on. The default value is your current operating system. Press Enter.
10. Type **y** to confirm the operating system and press Enter. A numbered list of available components is displayed.

11. Type the number that corresponds to the ITCAM for Robotic Response Time and press Enter.
12. Type **y** to confirm the installation. The installation begins.
13. After all of the components are installed, you are asked whether you want to install components for a different operating system. Type **n** and press Enter.

Installation is complete. See additional procedures in 3.8, “Post installation” on page 85.

3.8 Post installation

When the installation is complete, there are several actions that you must perform. Those are:

- 3.8.1, “Changing the file permissions for agents” on page 85 (for Linux/UNIX)
- 3.8.2, “Operating ITCAM for Response Time monitoring agents” on page 86
- 3.8.3, “Configuring ITCAM for Response Time agents” on page 86
- 3.8.4, “Configuring the Eclipse Server” on page 87

3.8.1 Changing the file permissions for agents

If you used a non-root user to install a monitoring agent on a UNIX computer, the file permissions are initially set to a low level. Run the following procedure to change these file permissions:

1. Log in to the computer as root, or become the root user by running the **su** command. Create the itmuser user and itmusers group as discussed in “Linux or UNIX installation considerations” on page 48.
2. Run the **bin/SetPerm** command to change the ownership of additional agent files.
3. If you want to run the agent as a particular user, add the user to the itmusers group. Use the **gpasswd** command in Linux or edit the /etc/group file and ensure that the user is in the list of users for the itmusers group.

   For example, if you want to run the agent as user test1, ensure that the following line is in the /etc/group file:

   ```
   itmusers:x:504:test1
   ```
4. Run the **su** command to switch to the user that you want to run the agent as or log in as that user.

3.8.2 Operating ITCAM for Response Time monitoring agents

You can use the GUI in both Windows and UNIX environments to start and stop monitoring agents. You can also use the command line in UNIX. For additional information about the **itmcmd agent** command, see the IBM Tivoli Monitoring product documentation.

You have two options to start and stop ITCAM for Response Time monitoring agents:

- Start and stop *all* agents: Use the command **./itmcmd agent start all** or **./itmcmd agent stop all**
- Start and stop *a specific* agent. Use the command **./itmcmd agent start <pc>** or **./itmcmd agent stop <pc>**

  where <pc> is product code for the agent that you want to start or stop.

  - ITCAM for End User Response Time Dashboard is t3
  - ITCAM for Client Response Time is t4
  - ITCAM for Web Response Time is t5
  - ITCAM for Robotic Response Time is t6

Note: If you install ITCAM for Response Time on SuSE SLES 10 platform, the agent might not restart automatically when the environment reboots. You can start the agent manually with instructions in this section.

You can also run the S99ITMAgents1 script from the /etc directory. The script is in one of the rc.d directories. The location varies for different environments. It is recommended that you run the S99ITMAgents1 script on a reboot only when the system starts any other ITCAM for Response Time agents that might have been running.

3.8.3 Configuring ITCAM for Response Time agents

Use the following steps to configure ITCAM for Response Time agents:

1. Run the following command from <install_dir>/bin:

   ./itmcmd config -A <pc>

   where

   <install_dir> is the installation location for the agent.

   <pc> is product code for the agent that you want to configure.

   - ITCAM for End User Response Time Dashboard is t3
   - ITCAM for Client Response Time is t4
   - ITCAM for Web Response Time is t5

– ITCAM for Robotic Response Time is t6

2. Press Enter.
3. Edit Tivoli Data Warehouse Database Configuration Options, End User Response Time Agent Response Time Configuration Options, and JMX™ SOAP Connector Server Configuration settings.
4. Press Enter when you are asked if the agent connects to a monitoring server.
5. Type the host name for the monitoring server.
6. Type the protocol that you want to use to communicate with the monitoring server.
   – You have four choices: ip, sna, ip.spipe, or ip.pipe.
   – Press Enter to accept the default protocol (IP.PIPE).
7. *(Optional)* To set up a backup protocol, enter that protocol and press Enter. If you do not want to use backup protocol, press Enter without specifying a protocol.
8. Depending on the type of protocol you specified, provide the information you collected in “Information to collect before you begin installation and configuration” on page 12 when prompted.
9. Press Enter to *not* specify the name of the KDC_PARTITION.
10. Press Enter when asked if you want to configure the connection to a secondary monitoring server. The default value is No.
11. Press Enter to accept the default for the Optional Primary Network Name (none).

3.8.4 Configuring the Eclipse Server

The eclipse server provides the help facilities for Tivoli Enterprise Portal.

For Windows

Use the following steps to configure the Eclipse Server for Windows:

1. Start Manage Tivoli Enterprise Monitoring Services by selecting **Start** → **All Programs** → **IBM Tivoli Monitoring** → **Manage Tivoli Monitoring Services**
2. The Eclipse Help Server entry in the Configured column must be **Yes**. If it is not, right-click the entry and select **Configure Using Defaults** from the menu.
3. When prompted for the port number for the Eclipse Help Server, set this value to the same port number specified when installing IBM Tivoli Monitoring and click **OK**.

4. To automatically start the Eclipse help whenever this node is restarted, right-click the **Eclipse Help Server** entry.
5. Select **Change Startup** from the menu. The Eclipse server's startup parameters are displayed.
6. Select **Automatic** in the Startup Type field and click **OK**.

For Linux or UNIX

Use the following steps to configure the Eclipse Server for Linux or UNIX:

Note: If you are using an IBM Tivoli Monitoring version 6.1 with Fix Pack 3 on Linux or UNIX, the Eclipse server cannot start when it is installed. To solve this problem, install ITM Interim Fix 13 to ITM Fix Pack 4 environment.

1. Start Manage Tivoli Enterprise Monitoring Services by executing the command **`./itmcmd manage`**
2. The Eclipse Help Server entry must be **Yes** in the Configured column. If it is not, right-click the entry and select **Configure** from the menu.
3. When prompted for the port number for the Eclipse Help Server, set this value to the same port number specified when installing IBM Tivoli Monitoring.
4. Click **OK**.

4

Configuration

This chapter contains information about the configuration of ITCAM for Response Time 6.2 agents and components.

In this chapter, the following topics are discussed:

4.1 Configuration parameters

This topic describes information about ITCAM for Response Time agent configuration parameters. These parameters can be configured from the configure option from the Manage Tivoli Monitoring services dialog. The dialog is invoked using the command **`./itmcmd manage`** or click on **Start** → **Manage Tivoli Monitoring Services**. From the Manage Tivoli Monitoring Services window, right-click on the appropriate agent and select **Configure**.

The parameter name indicates the name that it is specified for remote deployment or silent installation.

This section covers:

4.1.1 Parameters for End User Response Time Dashboard

Table 4-1 shows the parameters to configure ITCAM for End User Response Time Dashboard.

Table 4-1 End User Response Time Dashboard parameters

Parameter	Parameter name	Value description
Tivoli Data Warehouse parameters		
Database type for Tivoli Data Warehouse	KT3DBTYPE	Select databases of DB2, ORACLE, and MS SQL.
Fully qualified hostname of the Tivoli Data Warehouse Database Machine	KT3DBHOST	The hostname of the computer in which the database is located. For example, WAREHOUSE.
Specify Database Port	KT3DBPORT	The port number of the database.
Database Name or SID Name	KT3DBNAME	The database name or the system identifier.
TDW Schema User Login Name	KT3DBUID	The username for Tivoli Data Warehouse schema.
TDW Schema User Login Password	KT3DBPWD	The password for Tivoli Data Warehouse schema.

Parameter	Parameter name	Value description
Directory of db2jcc.jar and db2jcc_license_cu.jar for DB2 or ojdbc14.jar for Oracle	KT3JDBCPA	The absolute path of the jar files for either DB2 or Oracle.
JMX SOAP Connector Server Configuration tab		
Port	KT3SCPORT	JMX SOAP connector server port. Default value is 1976.
SSL	KT3SCSSL	Whether SSL authentication is required. Your choices are true and false.
SSL Keyfile	KT3SCSSLKEY FILE	SSL certificate keyfile.
SSL Keyfile Password	KT3SCSSLKEY PASS	Password to the SSL keyfile.
SSL Client Authentication	KT3SCSSL CLIENTAUTH	Whether SSL client authentication is required. Your choices are true and false.
Timespan Configuration tab		
Maximum Timespan for End User Response Time Reporting in hours	KT3HRSDISP	The maximum number of hours for reporting.
Interval Timespan for End User Response Time in minutes	KT3SUMMINT	The number of minutes for the interval.

4.1.2 Parameters for ITCAM for Client Response Time

The Client Response Time configuration dialog is shown in Figure 4-1 on page 92.

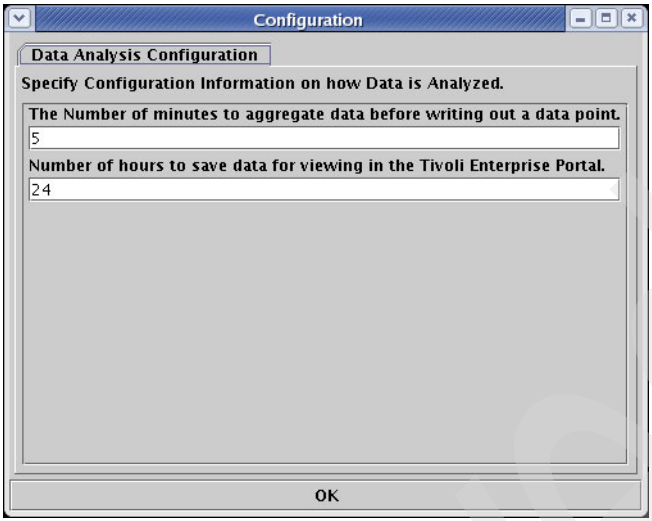

Figure 4-1 Data Analysis Configuration

Table 4-2 lists the parameters to configure ITCAM for Client Response Time.

Table 4-2 ITCAM for Client Response Time parameters

Parameter	Parameter name	Value description
Timespan Configuration tab		
Maximum Timespan for End User Response Time Reporting in hours	KT4HRSDISP	The maximum number of hours for reporting
Interval Timespan for End User Response Time in minutes	KT4SUMMINT	The number of minutes for the interval
Number of minutes to aggregate data before writing out a data point	KT4OVERTIME INTERVAL	The time period during which the data is aggregated
Number of hours to save data for viewing in the Tivoli Enterprise Portal	KT4SUMMARY INTERVAL	The time period during which all data points are saved locally

4.1.3 Parameters for ITCAM for Web Response Time

The ITCAM for Web Response Time configuration dialog is shown in Figure 4-2 on page 93.

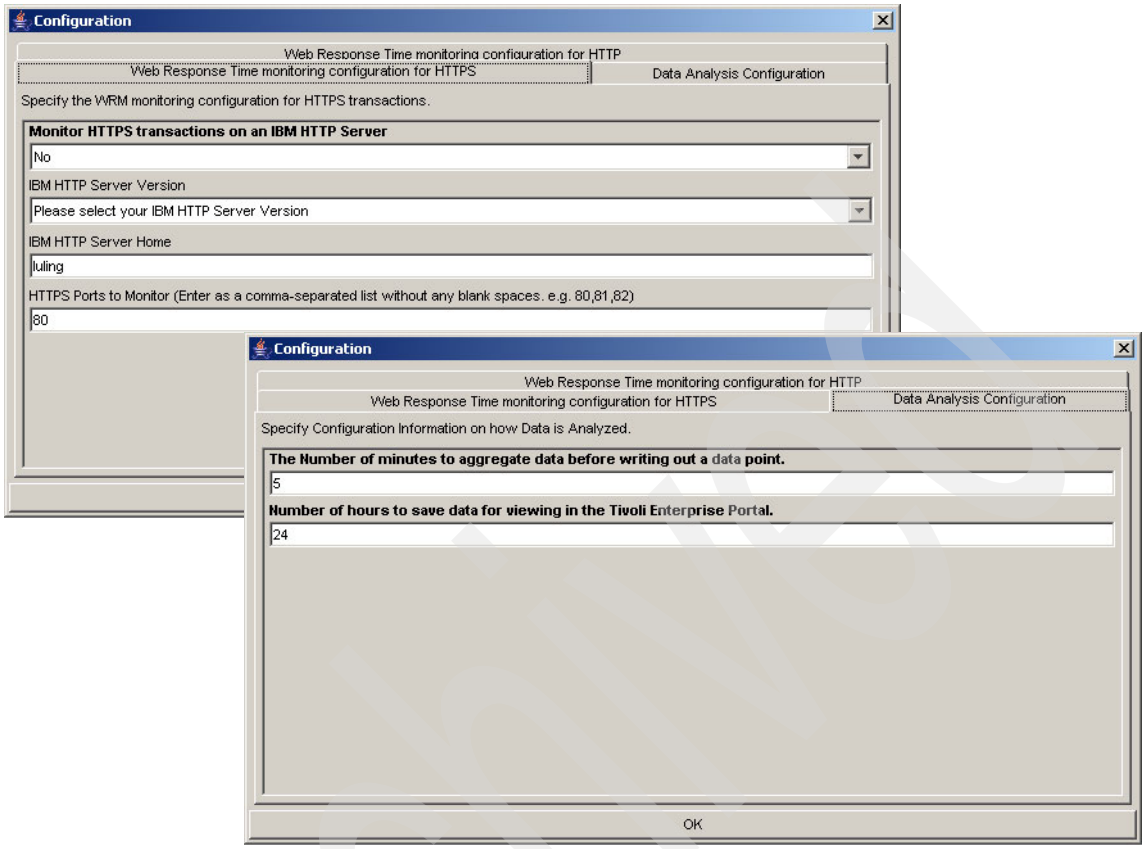

Figure 4-2 Web Response Time configuration dialog

Table 4-3 lists the parameters to configure ITCAM for Web Response Time.

Table 4-3 ITCAM for Web Response Time configuration

Parameter	Parameter name	Value description
Data Analysis Configuration tab		
Number of minutes to aggregate data before writing out a data point	KT5OVERTIME INTERVAL	The time period during which the data is aggregated
Number of hours to save data for viewing in the Tivoli Enterprise Portal	KT5SUMMARY INTERVAL	The time period during which all data points are saved locally
Web Response Time monitoring configuration for HTTP tab		

Monitor HTTP transactions on an IBM HTTP Server, a Microsoft Internet Information Server, or a Sun Java System Web Server	KT5MONITOR HTTP	Whether HTTP transactions should be monitored.
HTTP Ports to Monitor	KT5HTTPPORTS	HTTP ports monitored by ITCAM for Web Response Time. Default value is 80.
Web Response Time monitoring configuration for HTTPS tab		
Monitor HTTPS transactions on an IBM HTTP Server	KT5MONITOR HTTPS	Whether HTTPS transactions should be monitored.
IBM HTTP Server Version	KT5IHSVER	Monitored IBM HTTP Server version. Default value is 6.0.
IBM HTTP Server Home	KT5IHSHOME	Home directory of the monitored IBM HTTP Server.
HTTPS Ports to Monitor	KT5HTTPSPORTS	HTTPS ports monitored by ITCAM for Web Response Time. Default port number is 80.

4.1.4 Parameters for ITCAM for Robotic Response Time

Table 4-4 lists the parameters to configure Robotic Monitoring on ITCAM for Robotic Response Time.

Table 4-4 ITCAM for Robotic Response Time configuration

Parameter	Parameter name	Value description
Data Analysis Configuration tab		
Number of minutes to aggregate data before writing out a data point	KT6OVERTIME INTERVAL	The time period during which the data is aggregated.
Number of hours to save data for viewing in the Tivoli Enterprise Portal	KT6SUMMARY INTERVAL	The time period during which all data points are saved locally.
Robotic Monitoring Configuration tab		
Playback timeout period (seconds)	TIMEOUT	The number of seconds to wait before the playback times out.
Number of retries to attempt	NUMRET	The number of retries to attempt on timeout or availability failure.

Lag time between retries (seconds)	RETLAG	The number of seconds to wait before retries.
Concurrent CLI playbacks	CONCUR	Whether CLI monitor playbacks concurrently.
Abort playback on availability violation	ABRTVIOL	Whether playback should abort when an availability violation occurs.
Script location preference	KT6SCRIPT LOCPREF	Whether to use a remotely uploaded script or a manually distributed local script when the same script exists both remotely and locally.
Script Download Interval	KT6SCRIPT DOWNLOAD INTERVAL	Specifies how often to check for new and updated remote scripts to download.
Maximum number of concurrent robotic playbacks		The maximum number of robotic scripts to playback concurrently.
Rational Robot Gui Configuration tab		
Playback per line timeout period		The number of seconds during which a script line should complete.
Abort Script On Timeout	KT6ABRTON TIMEOUT	Whether robotic process should be aborted when playback times out.
Terminate Robot Process When Not Responding	KT6TERMNTW HENNOTRESP	Whether robotic process should be terminated when it is not responding.
Recovery Command When Robot Not Responding	KT6RECVRY CMDNOTRESP	The recovery command to execute when robot is not responding.
Reboot When Robot Not Responding	KT6REBOO TNOTRESP	Whether the computer should be rebooted when robot is not responding.
Windows Logon User Name	KT6ROBOT USER	Windows logon user name for the computer to automatically re-logon after reboot
Windows Logon Password	KT6ROBOT PASSWORD	Windows logon password for the computer to automatically re-logon after reboot.
Rational Robot VU Configuration tab		
Keep VU Playback Directories	KT6KEEPVU DIR	Whether to keep the VU playback directories.
Maximum Number of Virtual Users	KT6MAX VIRTUALUSR	Maximum allowed number of virtual users. Default is 20.
Robot VU Log Level	KT6RTVUILOG LEVEL	Rtvui log level. Default is error.

Robot VU Log Level	KT6VUENV VARS	Rtvui environment variables.
Robot VU Extra CLI Parameters	KT6VUEXTRA CLIPARAMS	Rtvui extra CLI parameters. Default is -r.
VU Compiler Warning Level	KT6VUCOMP WARNLEVEL	Rtvuc warning level.
VU Compiler External Libraries	KT6VUCOMP EXTLIBS	Rtvuc external libraries. Default is libSWARM32.
VU Compiler Options	KT6VUCOM OPTIONS	Rtvuc compiler options.
Mercury LoadRunner Configuration tab		
LoadRunner Command Home	KT6LRCMD HOME	The home directory of the LoadRunner command.
LoadRunner command	KT6LRCMD	Executable LoadRunner command. Default is bin/mdrv.exe on Windows.
LoadRunner command arguments	KT6LRARG0	Command arguments to execute LoadRunner.

4.2 Working with ITCAM for Robotic Response Time

This section describes the major steps to configure robotic playback scripts:

1. First of all, you have to record a robotic script. ITCAM for Robotic Response Time supports the scripts discussed in:
   - 4.2.1, “Recording Rational Performance Tester script” on page 97
   - 4.2.2, “Recording CLI Command Playback script” on page 98
   - 4.2.3, “Recording Rational Robot GUI script” on page 100
   - 4.2.4, “Recording Mercury LoadRunner script” on page 103
2. Upload the script to ITCAM for End User Response Time Dashboard. The upload is discussed in:
   - 4.2.5, “Uploading scripts using Eclipse Plugin for RPT” on page 104
   - 4.2.6, “Uploading scripts using Multi File Uploader (MFU)” on page 104
   - 4.2.7, “Uploading scripts manually” on page 107
3. Create a situation for playing back the robotic script or let the default RRT_Robotic_Playback situation play it back automatically every 15 minutes. See 4.2.8, “Robotic Response Time situations” on page 107.
4. (Optional) Define applications, transactions, and clients.

4.2.1 Recording Rational Performance Tester script

Rational Performance Tester monitors Web applications, SAP, Citrix, and Siebel using protocol-based record and playback. In this guide, we only consider creating a Rational Performance Tester HTTP script. This is performed using Rational Performance Tester Workbench:

1. From the Rational Performance Tester, create a new test from the recording:
   a. Select **File** → **New** → **Test from Recording**.
   b. Select HTTP recording and click **Next**.
   c. Specify a project.
   d. Type the filename for the test you want to create and click **Finish**.
2. Use Performance Test Generator to access a test site and record HTTP transactions.
3. (Optional) Create a datapool. A datapool provides variable data during test runs. Rational Performance Tester scripts use data from when the test was recorded. By associating a datapool with a test at runtime, you can substitute the variable data in the datapool for the data in the test.
   a. Click **File** → **New** → **Datapool**
   b. Specify a name and location for the datapool file.
   c. Specify the number of variables (columns) that you want and click **Next**.
   d. Specify the number of records (rows) that you want and click **Next**.
   e. Specify the name, type of action, and the location of the datapool variable and click **OK**.
   f. Associate the datapool with a test.
      - Click the **Add datapool** button in the common options tab of a test.
      - Select the datapool you want to use.
   g. Associate a request in the test with a Datapool column.
      - Select a request in the test. The candidates for datapool appear in green in Test Element Details.
      - Right click on the candidate and select **Substitute From** → **Datapool Variable**.
      - Select the Datapool column and click **Use Column**.
4. (Optional) Create verification points.
   a. Open the test for which you want to create custom code.
   b. Right-click on a test element and do one of these steps:
      - Select **Add** → **Custom Code** to append custom code to the bottom of the test element
      - Select **Insert** → **Custom Code** to append custom code above the selected test element
   c. In Test Element Details, you specify a new or an existing class name.
   d. Click **Generate Code** to create skeleton code.
   e. Edit the existing or skeleton code and click **Add**.

Note: You must enable the corresponding verification points in the RPT test before you upload the test script with Multi File Uploader.

Verification Points are a way to:

- Detect problems in an application, such as: Does the Web page contain the expected information? Is this the expected window? Is the current page displaying the expected content?
- Enforce a Service Level Agreement so that you can verify that each page in the transaction sequence to multiple pages is correct.

Web verification points:

- Content searches for a specific string on a page.
- Page Title compares the page title against the recorded title.
- Response Code compares the HTTP code returned against the recorded code.
- Response Size compares the page size returned against the recorded size.
- Custom is Java API available only when custom code is added to a test.

5. (Optional) Customize the script with Custom Code which extends RPT tests:
   - Adding custom logging
   - Providing runtime data values to the test
   - Adding custom verification points
   - Running external programs

   Additionally, you can also provide a custom test using these steps:
   - Use ICustomCode2 and ITestExecutionServices interfaces to create custom code and extend test execution.
   - Interfaces for creating custom code are in the com.ibm.rational.test.lt.kernel.services package.
   - Add any external jars referenced by the Custom code to the Java build path of the project.

4.2.2 Recording CLI Command Playback script

CLI Command Playback runs scripts or executable commands (appropriate for the operating system). Using CLI Command Playback generates events and reports them to the Tivoli Enterprise Portal.

You can use CLI Command Playback to automate running a script or an application several times a day and discover how long it took. You might have an application that is not well-suited for monitoring by one of the other components,

such as running test cases with Rational Functional Tester. Other possible uses of CLI Command Playback include:

- Testing server availability with **`FTP`**, **`telnet`**, or **`ping`**
- Querying a database with a custom SQL command
- Running a custom shell script
- Running other playback technologies, such as Rational Function Tester or **`wget`**.

CLI Command Playback works by running a user-defined command or by wrapping a recording in ARM start and stop calls so that the software can measure the total time the command or recording took. If you want additional timing information for the script such as how long particular calls within the script took, it must be ARM-instrumented by hand to a more detailed level.

For information on how to do this, see the ARM Instrumentation Guide white paper, available from the online publication library.

CLI command playback *supports:*

- Any playback engine, such as Rational Function Tester that has a command line interface.
- A command line interface that starts an application or script.

CLI command playback *does not* support:

- Popup windows in scripts.
- Commands that cannot be run from a service on Windows. You can do this, however, if you run the management agent as a user process (jmxservice –r). (Windows Only)
- Commands that interact with the Windows desktop and emulate user actions. (Windows Only)
- Commands that require user interaction. (All Platforms)
- Asynchronous commands. ARM response times do not accurately reflect the application's response time. (All Platforms)

CLI Command Playback script guidelines

Keep the following guidelines in mind:

- Uploading CLI script files is optional. You can run a command that is already on the computer without uploading any files by specifying the complete path name to the script.
- The Multi File Uploader automatically zips command executables and data files and uploads them to ITCAM for End User Response Time Dashboard.
- If you use Multi File Uploader, the software automatically downloads the files, unzips them into and plays them back from a playback directory, and adds the

directory to the PATH. Both stdout and stderr are automatically captured in the playback event when there is a return code failure and written to the playback directory. The playback directory is <ITM>/tmaitm6/app/GENERIC_PLAYBACK/scripts/<scriptname>_<cli_command_name>_<uniquekey>\

- You can define an application name for the CLI Command Playback script when uploading the script through the Multi File Uploader. The application name is used for associating the data from the CLI playback with a specific application. If an application name is not defined, the CLI playback situation name is used as the application name.

ARM instrumentation and CLI Command Playback

The following are guidelines for instrumenting CLI Command Playback:

- CLI Command Playback uses ARM instrumentation to gather performance and availability data.
- By default, if you specify a command to run without a robotic script, the CLI Command Playback automatically makes the ARM calls by wrapping an ARM start and arm stop around the command execution.
- If a robotic script is ARM-enabled, select the ARM Enabled checkbox when uploading the script. If ARM Enabled is not checked, CLI Playback automatically wraps the command with ARM start and arm stop.
- If the command is already instrumented, do not choose the Auto-instrument option when uploading the script with the Multi File Uploader.

4.2.3 Recording Rational Robot GUI script

Rational Robot GUI collects performance and availability data with a recorded sequence of actions for Microsoft Windows applications, Web applications, and Java-based applications from a user's perspective by using Rational Robot scripts. You can upload test scripts with the Multi File Uploader.

The transaction you specify is defined in a Rational GUI script that you specify when creating a robotic script for playback.

Keep these facts in mind:

- A Rational Robot robotic script can be used by only one robotic monitor at a given time on the same monitoring agent.
- Rational Robot GUI requires the monitored desktop to remain unlocked because it directly interacts with the user desktop. Think of it as a real user moving the mouse and clicking on the screen.

- Rational Robot GUI can record and playback native Windows applications, Java applications, Java applets, and HTTP transactions from a Web browser.
- Rational Robot GUI *does not* support concurrent playback because Robot GUI controls the desktop just like a real user; it must run scripts sequentially.
- Rational Robot GUI *cannot* run with the screen locked. When the Windows desktop is locked, it disables the desktop control.

Note: For more information about Rational Robot best practices, see:

- IBM Rational Robot Home:
  http://www.ibm.com/developerworks/rational/products/robot
- Reusable code for IBM Rational Robot:
  http://www.ibm.com/developerworks/rational/library/1724.html

Sample scripts

There are sample scripts in the Robot image directory:

<pathname>\examples\TestDatastore\DefaultTestScriptDatastore\TMS_Scripts

where <pathname> is the location where robot2003.zip is extracted.

The Multi File Uploader only recognizes the scripts if they are in a Rational Robot project. If you want to use these sample scripts, you must:

1. Create a new blank Robot GUI script in your Rational Robot project.
2. Copy the content of the sample script into the new script.
3. Upload the script with Multi File Uploader.

Guidelines for Rational Robot scripts

ITCAM for Robotic Response Time automatically creates a Rational Robot project called *ITCAMProject* as part of the installation. Use ITCAMProject exclusively for playing back ITCAM for Robotic Response Time Rational Robot scripts. Do not use this project for recording Robot scripts or for any other purpose. Use a separate Robot project for creating and uploading test scripts.

If playback scripts fail with the message: `fail to acquire foreground lock or screen locked`, check the value of ForegroundLockTimeout in the Windows registry. If necessary, change it from 20000 to 0.

While playing back Rational Robot GUI scripts:

- Unlock the desktop.
- Avoid any interaction with the screen.
- Do not open or run other Rational windows.

Keep the following guidelines in mind:

- Do not use non-ASCII characters for project names; this is a limitation in Rational Robot.
- Do not use multi-byte characters in path names.
- Do not install Rational testing products to the root directory of a drive.
- Do not install to a directory path that contains non-ASCII or double-byte characters.

Note: There is a known issue when naming datastores in double-byte foreign characters that have backslash (code 5C) in the second byte. The datastore works correctly when renamed so that the second byte of a double-byte character is not code 5C (backslash).

Recording with Rational Robot

Follow these steps to record with Rational Robot:

1. Run the Java Enabler on the computers that you use for Rational Robot recordings.
   a. Click **Start** → **Programs** → **Rational Software** → **Rational Test** → **Java Enabler**.
   b. Select the Custom option.
   c. Enable all of the JVMs on the target computers.
2. From the Windows desktop, click **Start** → **Programs** → **Rational Software** → **Rational Robot**.
3. Record the Windows or Web application transaction that you want to play back.
4. Optionally, you can add ARM instrumentation to the Robot recording. Otherwise the Multi-File Uploader can do it for you. There are sample templates in the robot zip file.

   Use caution when including ARM calls in the SQA Basic Script and verify the Application Name and Transaction Patterns before uploading the script. Avoid using the same transaction recording with multiple situations; the ARM engine maps the performance and availability metrics to only one situation.

GUI and VU files

For GUI robotic scripts, you must include a *.rec* file and any supporting files, such as verification points files (each type of verification point has its own extension). Multi File Uploader understands all these requirements and uploads all the correct files.

For VU robotic scripts, include a *.s* or *.S* file along with any datapool files. A verification point confirms the state of a running script. The verification point files start with scriptname and are located in the following directory:

Rational_project_directory/TestDatastore/DefaultTestScriptDatastore
/TMS_Scripts/vp

Specifying filenames for GUI and VU scripts

The monitoring software does not support absolute filenames for referenced headers/dlls/scripts. When specifying a script that you want to upload, enter *only* the name of the file.

Place all files in the following default directories so that Multi File Uploader can find and upload them:

- File Type: headers
  - GUI directory location:
    <project>\DefaultTestScriptDatastore\TMS_Scripts\SQABas32
  - VU directory location
    <project>\DefaultTestScriptDatastore\TMS_Scripts\include
- File Type: dll
  - GUI directory location
    <project>\DefaultTestScriptDatastore\TMS_Scripts\dll
  - VU directory location
    <project>\DefaultTestScriptDatastore\TMS_Scripts\externC
- File Type: scripts
  - GUI directory location
    <project>\DefaultTestScriptDatastore\TMS_Scripts\
  - VU directory location
    <project>\DefaultTestScriptDatastore\TMS_Scripts\

4.2.4 Recording Mercury LoadRunner script

Mercury LoadRunner monitors the performance and availability of Mercury LoadRunner scripts. You can use Mercury LoadRunner to record a protocol based test script and export the script as a zip file that can be uploaded with the Multi File Uploader.

Mercury LoadRunner is a test tool that records a set of steps (transactions) and plays them back while recording their availability and performance. Use this component when you have already created Mercury LoadRunner scripts that you want to monitor using the ITCAM for Response Time product.

When you upload a Mercury LoadRunner robotic script, the ARM automatically instruments the script, or you can specify ARM options for a script that is already ARM enabled.

Uploading LoadRunner robotic scripts automatically with Multi File Uploader adds ARM commands that are needed by the monitoring software. A comment is always inserted with the code and starts with the word Tivoli so you can search for what has been added.

4.2.5 Uploading scripts using Eclipse Plugin for RPT

Eclipse Plugin is used to export RPT scripts to the ITCAM for End User Response Time Dashboard.

Use the following procedure:

1. From the Rational Performance Tester, select **File** → **Export.**
2. Expand Other.
3. Highlight ITCAM for Response Time and click **Next**.
4. Fill in the required information regarding ITM in the ITCAM for End User Response Time Dashboard window.
5. Click **Next**.
6. Highlight the project that you want to export and click **Next**.

Note: Status indicates if the test already exists on the server and if the local test is out of sync. The status is blank if the test does not exist on the server.

7. Click **Finish**.

4.2.6 Uploading scripts using Multi File Uploader (MFU)

Multi File Uploader (MFU) discovers and uploads recordings of Rational Robot GUI and VU, CLI (command line interface), and Mercury LoadRunner scripts. It can also automatically ARM-instrument a recording that has not previously been instrumented.

Note: When performing multi file upload using Tivoli Enterprise Portal:

- Stop ITCAM for Robotic Response Time; see 3.8.2, “Operating ITCAM for Response Time monitoring agents” on page 86.
- Use Tivoli Enterprise Portal to upload your script.
- After uploading the scripts, close the Tivoli Enterprise Portal window.
- Restart ITCAM for Robotic Response Time.

Accessing Multi File Uploader

Access the Multi File Uploader in one of the following ways:

- From the Tivoli Enterprise Portal navigator view:
  a. Click “+” beside the operating system for the computer on which ITCAM for End User Response Time Dashboard is located to display a list of monitored nodes.
  b. Click “+” beside the name of the node on which the agent is located.
  c. Click “+” at End User Response Time.
  d. Right-click **Robotic Script** to display a menu.
  e. Select **Workspace** → **Upload Robotic Scripts**.
- From Java WebStart (remotely), use the URL:

  `http://<tepserver>:<port>///cnp/kdh/lib/classes/mfu.jnlp`

  where

  <tepserver> is the fully qualified host name for the Tivoli Enterprise Portal.
  <port> is the port name for the Tivoli Enterprise Portal, typically 1920.

Configuring Multi File Uploader

The first time you access the Multi File Uploader, you must configure the End User Response Time Dashboard.

1. Access Multi File Uploader and select **File** → **Preferences** to display the Preferences window.
2. In the Preferences window, enter:
   – Fully qualified host name for End User Response Time Dashboard Server
   – Port number for End User Response Time Dashboard, the default is 1976
   – Enable or disable Secure Socket Layer (SSL) communication
   – If you enabled SSL, specify the Key Store .jks file and its password.
3. Click **OK**.

Using Multi File Uploader

The following is how to use Multi File Uploader. You can do any of these procedures:

1. Add a Mercury LoadRunner script:
   a. Click "+" and select **Mercury LoadRunner Script** to display the Add Script window.
   b. Type the complete path name to the .zip file at File. You must have exported the zip file from Mercury LoadRunner.
   c. (Optional) Type a brief description at Description to uniquely identify this file when you see it in a list.
   d. If the file is not already ARM-instrumented, click the checkbox beside Auto Instrument.
   e. Type a name at Application Name. This is the name of the application that is associated with the robotic script, and the software displays it in the Application workspace. If the default name is not meaningful, you might want to edit it.
   f. Click **OK**.
2. Add a CLI Playback script:
   a. Click "+" and select **CLI Playback Script** to display the Add Script window.
   b. Type the name that you want to give the .zip file you are creating with this procedure at Name.
   c. Type the complete path name to the file(s) you want to add to the.zip file at File. You can enter multiple files by separating them with semicolons.
   d. (Optional) Type a brief description at Description to uniquely identify this file when you see it in a list.
   e. If the file is already ARM-instrumented, click the checkbox beside ARM Enabled.
   f. Type a name at Application Name. This is the name of the application that is associated with the robotic script, and the software displays it in the Application workspace. If the default name is not meaningful, you might want to edit it.
   g. Click **OK**.
3. Upload a robotic script:
   a. Select a recording from the list of recordings that are available. The software automatically discovers Rational Robot GUI and VU scripts and displays them. The displayed CLI and LoadRunner scripts were added with the previous procedures.
   b. You can edit the Application Name.
   c. Click on the up-arrow.
4. Delete a robotic script:
   a. Select a recording from the list to delete.

b. Click the **X**.

Note: You can delete only CLI Playback and Mercury LoadRunner robotic scripts.

4.2.7 Uploading scripts manually

You also have the option of manually distributing the recording zip files to the <ITM_HOME>/tmaitm6/recording directory.

Copy the zip files from the ITCAM for End User Response Time Dashboard directory <ITM_HOME>/kt1depot/T3 to the robotic agent in the following directories:

Command Line	/tmaitm6/recording/GENERIC_PLAYBACK
LoadRunner	/tmaitm6/recording/LOADRUNNER
Robot GUI	/tmaitm6/recording/ROBOT_GUI
RPT	/tmaitm6/recording/RPT
Robot VU	/tmaitm6/recording/ROBOT_VU

When you configured this monitoring agent, you specified with Script Location Preference whether to use remote or local script when the same script name exists in both locations.

4.2.8 Robotic Response Time situations

ITCAM for Robotic Response Time provides a set of situations designed to monitor critical activity in your systems. These situations can also serve as templates for creating your own customized monitoring situations.

The predefined situations for this product have names which begin with the letters RRT. Predefined situations are activated after they are distributed to the environment that you want to monitor. The situation alerts provided with ITCAM for Robotic Response Time trigger event notification.

There are some Robotic Response Time situation templates that you can create the situation from. Those are:

RRT_CLI_Playback setting includes standard command and sampling interval

RRT_CLI_Playback_Advanced
setting includes command, timeout, retry, abort option, and return code calculation

RRT_Robotic_Playback setting includes robotic script name

RRT_Robotic_Playback_Advanced
setting for RPT script only, includes timeout, abort option, and retry time

These situations are templates for creating new situations. From the situation editor window, select one of the templates, right-click and select **Create Another**. Assign the necessary parameter settings. You can set how often you want the robotic script to play back by modifying the Sampling Interval. The distribution list of the robotic agents determines the agents that would run the script.

4.2.9 Scheduling Robotic Playback

Advanced Robotic playback scheduling (for example, `maintenance windows` or `setting up monitoring only during prime shift hours`) must be done through IBM Tivoli Monitoring work flow or policy. The following procedure provides a high-level overview of how to do this with examples:

Note: When you try to schedule an hour or minute that is less than 10, you must add a 0 (zero) before the number, or it does not work. For example, when you want to schedule 4 hours or minutes, enter it as 04.

1. Create a robotic playback configuration situation and do not select Run at startup. If it is selected, deselect it.
2. Create a scheduling situation to start the robotic playback configuration situation. Make sure to distribute the scheduling situation to the same robotic Tivoli Enterprise Monitoring Agent as the robotic configuration situation.

   Select **Run at Startup** for this scheduling situation.
3. Create a scheduling situation to stop the robotic playback configuration situation. Do not use Run at Startup, which is the default. Distribute the scheduling situation to the same robotic Tivoli Enterprise Monitoring Agents as the robotic configuration situation.

   Select **Run at Startup** for this scheduling situation.
4. Create a workflow to start and stop the robotic playback configuration situation. Make sure you select **Distributed** and choose the robotic agents to which you want to distribute this workflow.

4.2.10 Running a Robotic script

Use the following procedure to run a Robotic script manually:

1. Click beside the operating system for the computer on which ITCAM for Robotic Response Time is located to display a list of monitored nodes.
2. Click beside the name of the node on which the agent is located.
3. Click **Robotic Response Time** to select it.
4. Right-click **Take Action** → **Select**.
5. At Name: <Select Action>, select **Run a robotic script** to display the Edit Argument Values dialog.
6. At Robotic_Script_Type, enter one of the following values:
   - CLI Playback: not supported
   - Rational Robot GUI: ROBOT_GUI
   - Rational Robot VU: ROBOT_VU
   - Rational Performance Tester: RPT
   - Mercury LoadRunner: LOADRUNNER
7. At Robotic_Script Name, enter the name assigned to the robotic script.
8. Click **OK**.
9. Select where you want the script to run at Destination System. (You can select multiple systems by holding down the Ctrl key while clicking.).
10. Click **OK**.

4.3 Working with ITCAM for Web Response Time

The ITCAM for Web Response Time agent is used to collect all HTTP traffic and measure their response time. This section provides information about the following procedures:

- 4.3.1, “Working with ITCAM for Web Response Time situations” on page 109
- 4.3.2, “Monitoring HTTPS transactions” on page 117

4.3.1 Working with ITCAM for Web Response Time situations

ITCAM for Web Response Time provides a set of situations designed to monitor critical activity. You can also use these situations as templates for creating customized monitoring situations.

The predefined situations for ITCAM for Web Response Time begin with the letters WRT and are activated after they are distributed to the Web that you want to monitor. The list of situations for the ITCAM for Web Response Time agent can be retrieved by right-clicking on the ITCAM Web Response Time agent in the navigation tree and selecting **Manage Situations**.

There are two ways to view a default situation:

- Use the command **./tacmd listSit** A sample output is shown in Figure 4-3.

```
root@peoria:/opt/IBM/ITM/bin
[root@peoria bin]# ./tacmd listSit | more
TYPE                                NAME
Client Response Time                CRT_Availability_Threshold
Client Response Time                CRT_Client_Transactions
Client Response Time                CRT_Critical_Agent_Messages
Client Response Time                CRT_Define_Clients
Client Response Time                CRT_Response_Time_Threshold
All Managed Systems                 MS_Offline
All Managed Systems                 NonPrimeShift
All Managed Systems                 PrimeShift
All Managed Systems                 QOMEGAMON_ONLINE
Robotic Response Time               RRT_Availability_Threshold
Robotic Response Time               RRT_CLI_Playback
Robotic Response Time               RRT_CLI_Playback_Advanced
Robotic Response Time               RRT_Critical_Agent_Messages
Robotic Response Time               RRT_Define_Clients
Robotic Response Time               RRT_Playback_Error
Robotic Response Time               RRT_Response_Time_Threshold
Robotic Response Time               RRT_Robotic_Playback
Robotic Response Time               RRT_Robotic_Playback_Advanced
Robotic Response Time               RRT_Robotic_Realms
Robotic Response Time               RRT_Robotic_Transactions
Services Management Agent Environment UADVISOR_KD4_KD42IT
--More--
```

Figure 4-3 WRT situations - CLI

- Use the Tivoli Enterprise Portal interface. The manage situation list window is shown in Figure 4-4.

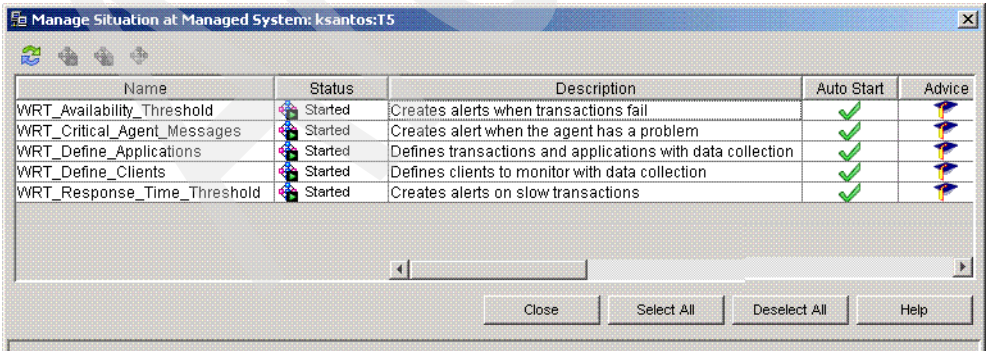

Figure 4-4 WRT situations - GUI

The next sections explain each ITCAM for Web Response Time default situation:

- “WRT_Availability_Threshold” on page 111
- “WRT_Critical_Agent_Messages” on page 111
- “WRT_Define_Applications” on page 112
- “WRT_Response_Time_Threshold” on page 113
- “WRT_Define_Clients” on page 113

WRT_Availability_Threshold

This situation generates a Critical alert when a specified number of transactions fail during a specified time period. Use this situation to monitor the ability of transactions to complete successfully and identify problems in the environment. See Figure 4-5.

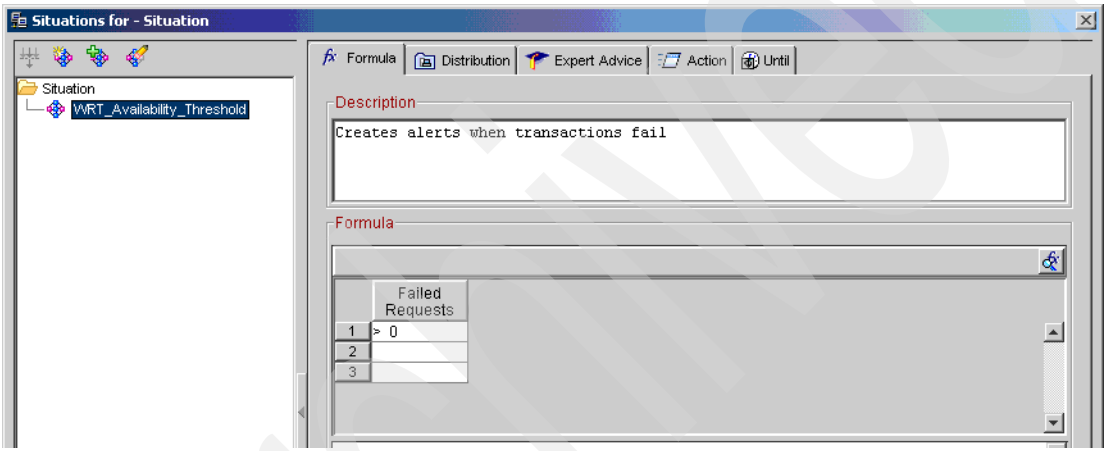

Figure 4-5 WRT_Availability_Threshold

WRT_Critical_Agent_Messages

This situation generates Critical alerts about system operation; for example, a server starting or stopping, failure of the ARM engine on an application server, or authentication problems. See Figure 4-6 on page 112.

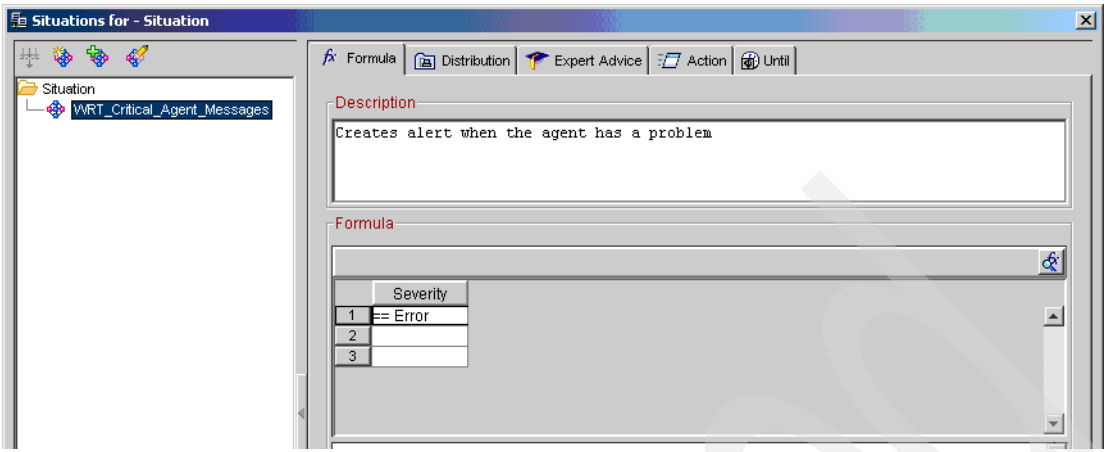

Figure 4-6 WRT_Critical_Agent_Messages

WRT_Define_Applications

This situation makes it possible for the monitoring software to collect information about the applications in your environment. It also tells the monitoring software how to group the transactions it finds. You must use this situation to enable data collection for applications, but you must customize the situation for your environment. It defines:

- Application name, based on a pattern
- Transaction name, based on a pattern; percentage
- Aggregation, instance collection and sampling percentage
- Response time threshold

It generates an Informational alert. See the situation in Figure 4-7 on page 113.

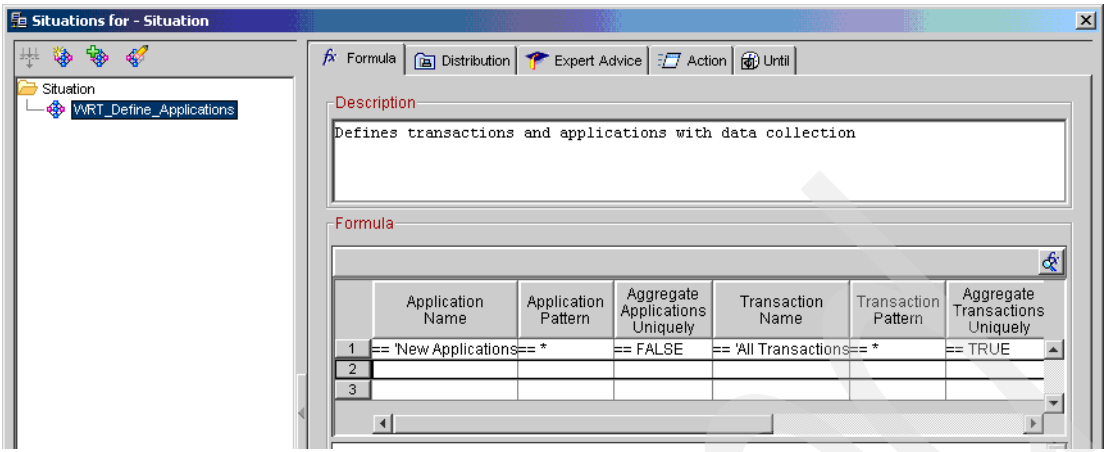

Figure 4-7 WRT_Define_Applications

WRT_Response_Time_Threshold

This situation generates a Critical alert when the average response time of a transaction exceeds a specified number of seconds to complete. Use this situation when you want to identify transactions that perform outside acceptable boundaries. See Figure 4-8.

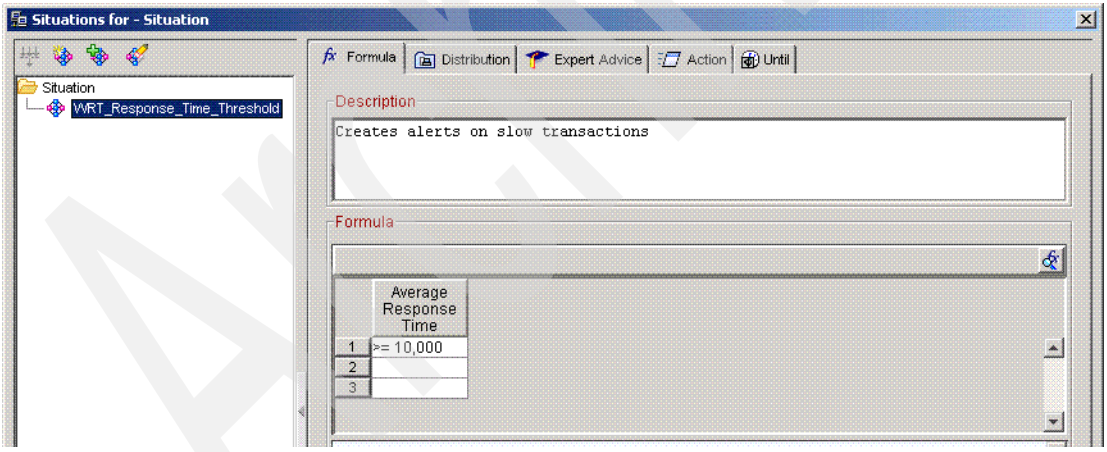

Figure 4-8 WRT_Response_Time_Threshold

WRT_Define_Clients

This situation makes it possible for the monitoring software to collect information about the clients in your environment. It also tells the monitoring software how to group the transactions it finds. You must use this situation to enable data collection for clients, but you might want to customize the situation for your

environment. It generates an Informational alert. It defines a client based on IP address or hostname pattern. See Figure 4-9.

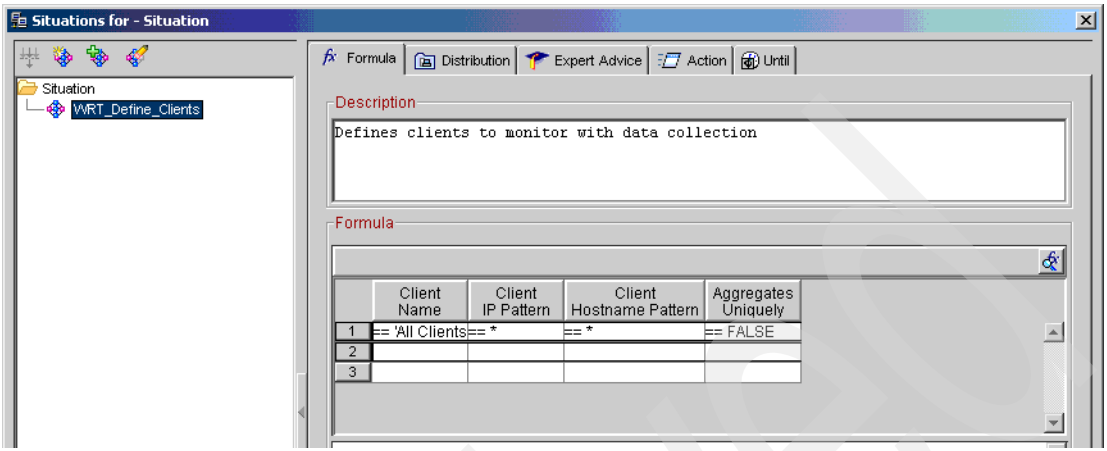

Figure 4-9 WRT_Define_Clients

Creating a situation

Use the following procedure to create new situation. In this example, we are creating a new application situation:

1. Access Tivoli Enterprise Portal Server.
2. Click “+” beside the operating system for the computer on which ITCAM for Web Response Time is located to display a list of monitored nodes, if necessary.
3. Click beside the name of the node on which the agent is located, if necessary.
4. Click **Web Response Time**.
5. Right-click on **Applications** and click **Situations**.

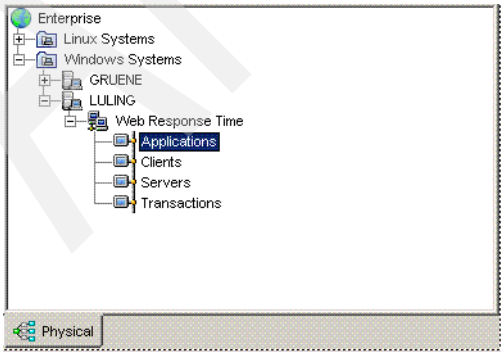

Figure 4-10 Accessing Web Response Time

6. The Situation editor screen displays; click on **Create new Situations**.

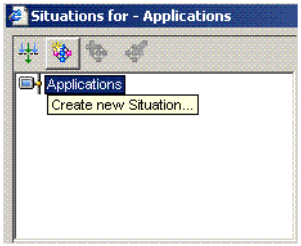

Figure 4-11 Creating new situation

7. The Create Situation screen displays. Enter **Name** and **Description** for Situation and click **OK**.

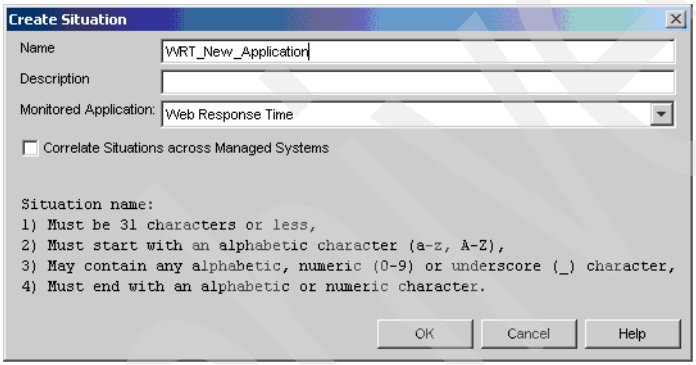

Figure 4-12 WRT_New_Application

8. The Select condition screen displays. Select Attribute Group and Attribute Item as your need and click **OK**.
9. Situations for Applications displays. Select Formula as your need and click **Apply** and **OK**.

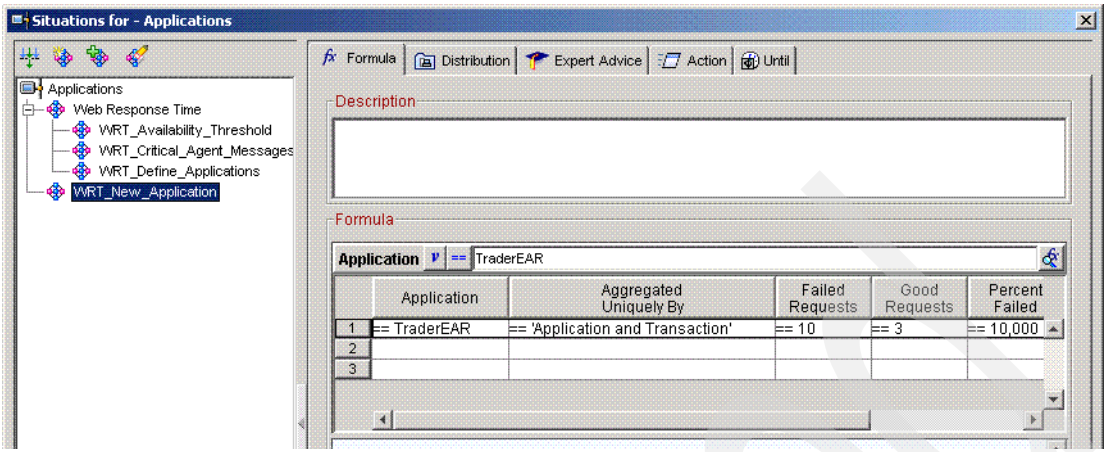

Figure 4-13 WRT_New_Application formula

10. Figure 4-14 shows WRT_New_Application in the list.

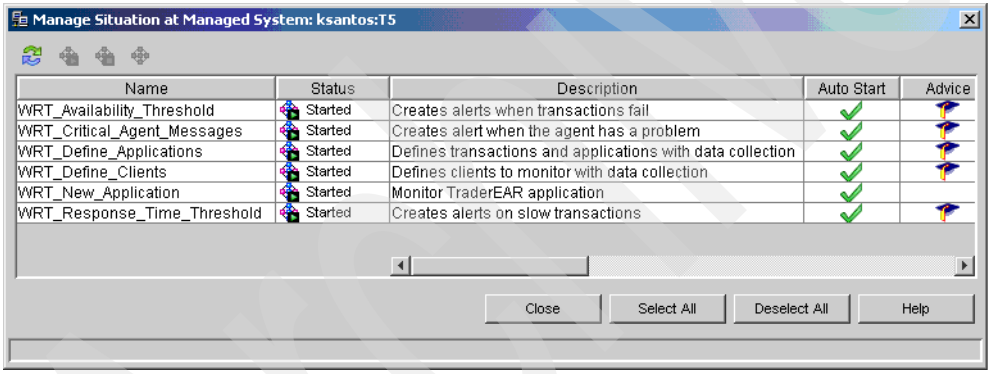

Figure 4-14 WRT_New_Application in the list

Note: It is recommended that you do not change the default situation. If you want to change some thresholds, you have to copy and edit the situation and set the new threshold.

4.3.2 Monitoring HTTPS transactions

The ITCAM for Web Response Time collects user response time for HTTP and HTTPS Web transactions:

- For HTTP traffic, the agent can listen to the local TCP/IP stack and measure the response time of the transaction.
- For HTTPS traffic, as the product needs to access the unencrypted HTTP datastream, the agent runs on the Web server machine and makes use of the Web server exits to get access to the datastream.
- Appliance mode allows the agent to collect HTTP traffic from other machines in the same network segment by enabling collection of network packets in promiscuous mode.

Monitoring HTTPS transactions on iPlanet Web servers

To monitor HTTPS (secure HTTP) transactions on iPlanet Web servers (also known as Sun One and Netscape iPlanet), you must install an HTTPS filter. The filter consists of two shared libraries: libkfcins.so and libkbb.so.

Follow these steps:

1. In the virtual server home directory, find a script named **start**.
2. If the virtual server domain name is hermes.candle.com and the iPlanet root directory is `/iPlanet/server4`, the virtual server home directory is: `/iPlanet/servers/https-hermes.candle.com`.
3. Make a backup copy of the start script.
4. Add the following statements to the script.

   ```
   #* The following variables are added for Candle HTTPS Filter **
   KFC_ENABLE=Y; export KFC_ENABLE
   KBB_RAS1='ERROR>/iPlanet/servers/https-domain_name/logs/kfcins.log';
   export KBB_RAS1
   ```

   where domain_name is the virtual server domain name; for example, hermes.candle.com.
5. If the port to be monitored is a port other than 443:
   a. Add to both the start script and kfcmenv the following lines:

      ```
      KFC_SRI_PIPENAME=DEFAULT; export KFC_SRI_PIPENAME
      KFC_HTTPS_PORT="port1, port2, ... ";export KFC_HTTPS_PORT
      ```

   b. Edit the magnus.conf file.
      i. Add these after the last occurrence of Init fn="load-modules":

```
Init fn="load-modules"
hlib="/iPlanet/servers/bin/https/lib/libkfcins.so"
funcs="KFC_initFilter,KFC_checkRequest,KFC_getRequestVariables
"
Init fn="KFC_initFilter"
```

ii. Add the following statement immediately after the last `PathCheck` statement in the <Object name="default"> section:

```
PathCheck fn="KFC_checkRequest"
```

iii. Add the following statement immediately after the last AddLog statement in the Object name="default" section:

```
AddLog fn="KFC_getRequestVariables"
```

c. Add the following statement to the `kflmenv` file:

```
SM3_LOG_HTTPS=Y; export SM3_LOG_HTTPS
```

This file is located as follows:

- Windows: $CANDLE_HOME\app\wrm\WRM\collector\cfg\kflmenv
- UNIX: %CANDLEHOME/app/wrm/kflmenv

Monitoring HTTPS transactions on IIS Server

To monitor HTTPS on IIS Web Servers, perform the following procedure:

1. Open the Internet Services Manager.
2. Traverse to the Internet Information Server folder and right-click the computer's hostname, click **Properties**.
3. In the Master Properties list, select **WWW Service** and click **Edit** to display the host's Master Properties notebook.
4. Click the **ISAPI Filters** tab and click **Add**.
5. Type `KFC Candle Filter` in the Filter Name field of the Filter Properties window.
6. For the executable name, browse to locate kfcCandleFilter.dll in MA_HOME\app\wrm\CandleFilter\. The Executable field must contain the full path to kfcCandleFilter.dll.
7. Click **OK** to close the Filter Properties window.
8. Click **Apply** and **OK** to close the Master Properties notebook.
9. Click **OK** to close the host's Properties page.
10. Close the console.
11. When prompted, click **Yes** to save the new settings.
12. Restart the Web server and enable the configuration changes.

13. From the Internet Service Manager console, go back to the **ISAPI Filters** tab and move kfcCandleFilter.dll to the top of the list of low-priority filters.

Tip: A green Up arrow to the left of the filter indicates that it has started.

14. Click **Apply** and **OK** to close the Master Properties notebook.
15. Click **OK** to close the host's Properties page.
16. Make sure that `SM3_LOG_HTTPS=Y` is in the kflmenv file.

Note: The start of the path (up to wrm) can be configured during the installation.

17. If you have multiple IP addresses, you can select the IP addresses:
    a. Set the IP address at KFC_FILTER_SERVER_ADDR in the KFCIENV file.
    b. Add one of the following values to HKEY_LOCAL_MACHINE\SOFTWARE\Candle\KBB_ENVPATH:
       - For IIS 5: `inetinfo=<pathname>`
       - For IIS 6: `w3wp=<pathname>`

       where <pathname> is the path to the KFCIENV file.

4.4 Working with ITCAM for Client Response Time

The ITCAM for Client Response Time agent is used to provide real user response time and availability monitoring for the following application servers that support ARM natively: Websphere, DB2 UDB, Siebel Application Server, IBM HTTP Server (IHS), and Apache. It can also monitor any compatible ARM version 2 or version 4 instrumented application. This section provides information about the following procedures:

Note: You cannot run ITCAM for Client Response Time as a service. It is installed in the user startup folder on the server so that it is launched when a remote session starts. If it runs as a service, it does not have access to the user session space where the applications are running and cannot monitor the message queues to record transactions.

4.4.1 Using ETEWatch Customizer to monitor your applications

With the ETEWatch Customizer, you can create behavior files to monitor virtually any application with ITCAM for Client Response Time. The Customizer is a wizard that guides you through the process of creating the behavior files.

The Customizer uses the most common application events to define a transaction. A transaction typically begins with a user action (a mouse click or keystroke). A transaction typically ends when the application is populated with new information or a new window is displayed.

Following the instructions in the ETEWatch documentation, use the Window Locator tool to point to the application you want to monitor. You can find ETEWatch customizer documentation at:

http://publib.boulder.ibm.com/tividd/td/IBMTivoliETEWatchCustomizer1.1.html

You do not need to create a new situation to start monitoring. The default CRT_Client_Transactions situation defined for CRT monitored applications shows aggregated transactions by application.

4.4.2 Monitoring an application running on a Citrix server

You can configure a Citrix ICA client on a workstation to connect to a published application or to a specific Citrix MetaFrame server. Application publishing allows Citrix ICA clients to launch a single application or a desktop session on a remote Citrix server without knowing the name or address of a particular Citrix server. You can create a published application using the Presentation Server Console tool. A published application can be either Standard Desktop or Single Application.

When you connect to published applications configured as desktop sessions, you see a standard Windows NT desktop. To start the Client Application Tracking component automatically, place KeeAgent.exe in the startup folder of the user. The component launches when a user logs on.

To run the Collector in a session that launches only a single application, use the ETELaunch utility. ETELaunch allows monitoring of a published application. When both ETELaunch and the published application to be monitored are specified on the command line, the ETEWatch Collector starts automatically.

The advantage of using ETELaunch.exe is that you can use it to publish an application. This removes a command window on the desktop if you run the application from a batch file. The format of the command line for using ETELaunch is: **`ETELaunch.exe PUB_APP PUB_APP_PARMS`**

Where:

PUB_APP specifies the full path to the actual program you want to monitor.

PUB_APP_PARMS specifies any command line switches used by the PUB_APP program.

For example, to run Internet Explorer:

```
C:\IBM\ITM\TMAITM6\CAT\MGMT\COLLECTOR\\ETELaunch.exe
c:\Program Files\Internet Explorer\IExplore.exe
```

You can find further information about IBM Tivoli ETEWatch for Citrix MetaFrame at:

http://publib.boulder.ibm.com/tividd/td/IBMTivoliETEWatchforCitrixMetaFrame2.0.2.html

4.4.3 Monitoring Terminal Services and 3270 Terminal servers

Running ITCAM for Client Response Time for a Terminal services environment is essentially the same thing as running in a Citrix environment. The only difference is the protocol used to create the session. You can run any application in a remote session.

For a standard desktop, you can start the Client Application Tracker component automatically by placing KeeAgent.exe in the startup folder. The component launches when a user logs on.

To run the Collector in a session that launches only a single application, use the ETELaunch utility. ETELaunch allows monitoring of a published application. When both ETELaunch and the published application to be monitored are specified on the command line, the ETEWatch Collector starts automatically.

The advantage to using ETELaunch.exe is that you can use it to publish an application. This removes a command window on the desktop if you run the

application from a batch file. The format of the command line for using ETELaunch is: **ETELaunch.exe PUB_APP PUB_APP_PARMS**

Where:

PUB_APP specifies the full path to the actual program you want to monitor.

PUB_APP_PARMS specifies any command line switches used by the PUB_APP program.

For example, to run Internet Explorer:

```
C:\IBM\ITM\TMAITM6\CAT\MGMT\COLLECTOR\\ETELaunch.exe
c:\Program Files\Internet Explorer\IExplore.exe
```

4.4.4 Running ARM-instrumented applications on UNIX

ITCAM for Client Response Time provides a shell script that allows the environment to be modified on UNIX operating systems so that applications that are ARM-instrumented can make ARM calls and find the appropriate runtime libraries.

The shell script is named **setup4ARM.sh** and it is located in the <arch>/<pc>/lib directory during installation. To use this script, you must provide a single parameter to the script that is in the path to the script, for example:

```
./setup4ARM.sh ./setup4ARM.sh
```

4.4.5 Monitoring WebSphere with Generic ARM

When using Generic ARM to monitor applications, consider the following basic performance and scale guidelines:

- Be aware of how many transactions and subtransactions your application generates.
- If the workload is very high, turning on collect instance data for a situation can cause significant processing overhead.
- Warehousing subtransaction instance tables generates extremely large amounts of data in medium to high load scenarios.
- Both Rational Performance Tester and Rational Robot VU pass correlators when accessing Web sites. If you use them to generate load on a monitored Websphere application, turn off instance tracing for the RPT or VU situation. If you do not, the correlators that are passed cause Websphere to collect subtransaction instance data. This might overwhelm the Analyzer on that computer and cause undesirable resource usage.

- When monitoring Websphere with Generic ARM, consider using the Hops option in the WebSphere Administration console during normal circumstances to keep resource usage low. If you need more detail for debugging, increase it temporarily whenever you need it. The following scenario can happen when you use Generic ARM to monitor Websphere and/or IHS:

  a. If you have an RPT testcase monitoring a Generic ARM-instrumented WebSphere application and the robotic situation has instance trace turned on, this causes all WebSphere instances to be traced for RPT initiated requests; RPT passes the correlator to WebSphere and uses RPT situations correlator settings for the Websphere transactions instead of the settings for the Websphere agent.

  b. This generates subtransaction instance data that is written to disk on the WebSphere computer, causing extra disk IO and Analyzer Performance overhead.

  c. When this scenario occurs and if you have subtransaction warehousing turned on for ITCAM for Client Response Time, this can overwhelm the Data Warehouse and cause the file system on the Websphere agent to fill up.

In summary if you want to monitor a high load IHS/Websphere box and use the robotic playback agents to drive the transactions, remember that the instance trace settings from the robotic playback agent govern the transactions on the Websphere computer, not the ITCAM for Client Response Time situations.

4.4.6 Working with ITCAM for Client Response Time situations

ITCAM for Client Response Time provides a set of situations designed to monitor critical activity. You can also use these situations as templates for creating customized monitoring situations.

The predefined situations for ITCAM for Client Response Time begin with the letters *CRT* and are activated after they are distributed to the Web that you want to monitor. The list of situations for the ITCAM for Client Response Time agent can be retrieved by right-clicking on the ITCAM Client Response Time agent in the navigation tree and selecting **Manage Situations**.

There are two ways to view the default situation:

- Run the command **`./tacmd listSit`** as shown in Figure 4-15 on page 124.

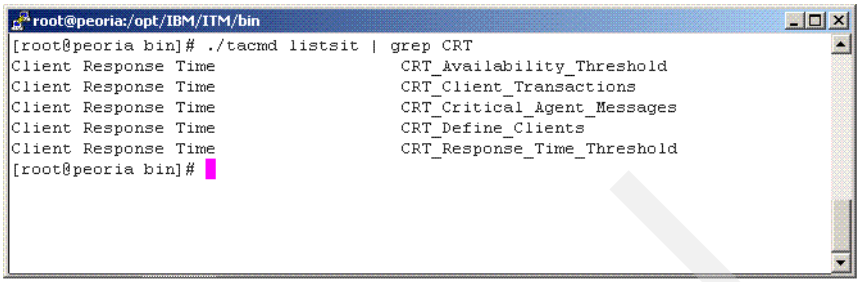

Figure 4-15 CRT situations - CLI

- Use Tivoli Enterprise Portal's manage situation list as shown in Figure 4-16.

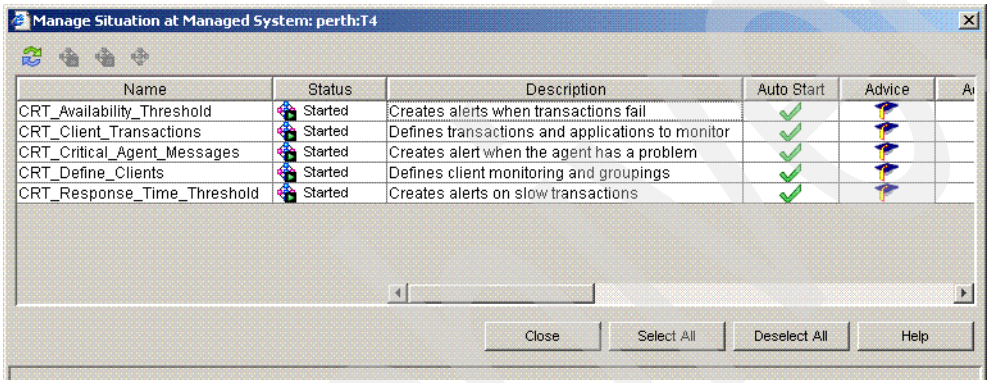

Figure 4-16 CRT situations - GUI

The next sections explain each ITCAM for Client Response Time default situation:

- "CRT_Availability_Threshold" on page 124
- "CRT_Critical_Agent_Messages" on page 125
- "CRT_Define_Clients" on page 125
- "CRT_Client_Transactions" on page 126
- "CRT_Response_Time_Threshold" on page 127

CRT_Availability_Threshold

This situation generates a Critical alert when a specified number of transactions fail during a specified time period. Use this situation to monitor the availability of transactions that successfully complete and identify problems in the environment. See Figure 4-17 on page 125.

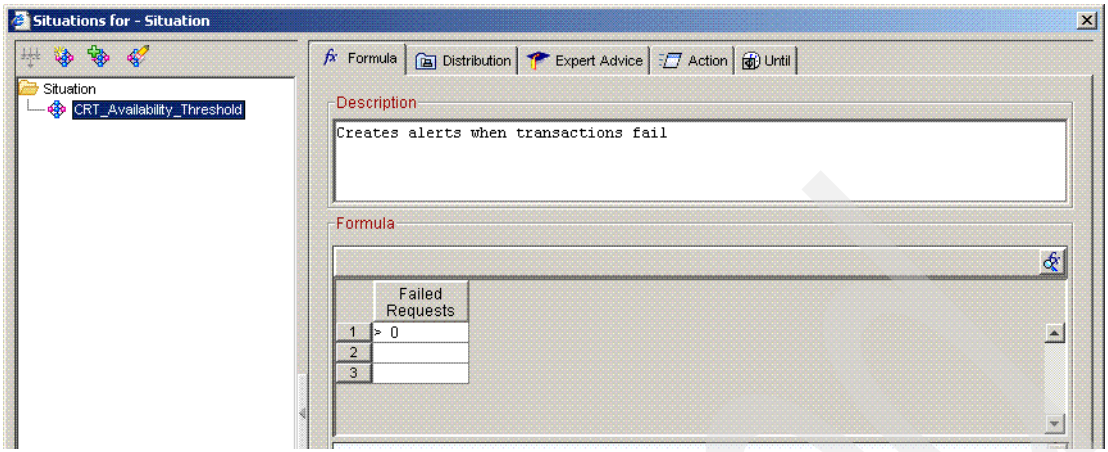

Figure 4-17 CRT_Availability_Threshold

CRT_Critical_Agent_Messages

This situation generates Critical alerts about system operation; for example, the agent starting or stopping, failure to collect data, or configuration problems. See Figure 4-18.

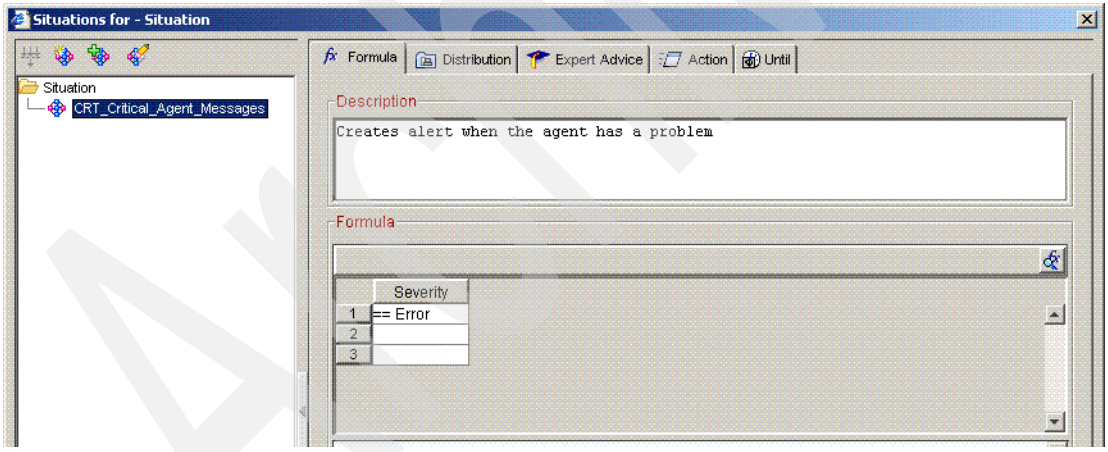

Figure 4-18 CRT_Critical_Agent_Messages

CRT_Define_Clients

This situation is used to configure the Tivoli Enterprise Monitoring Agent, and it never violates. The formula tells the monitoring software what clients to monitor and how to group those clients for reporting and alerting purposes. It also tells the monitoring software how to group the discovered transactions. You must use this situation to enable data collection for clients. You might want to customize

the situation for your environment; for example you might want to define a range of clients based on IP address or hostname.

For example for defining IBM sites, we use (see Figure 4-19):

```
Client Name = "IBM Internals"
Client Hostname = "*.ibm.com"
Aggregate Uniquely = FALSE
```

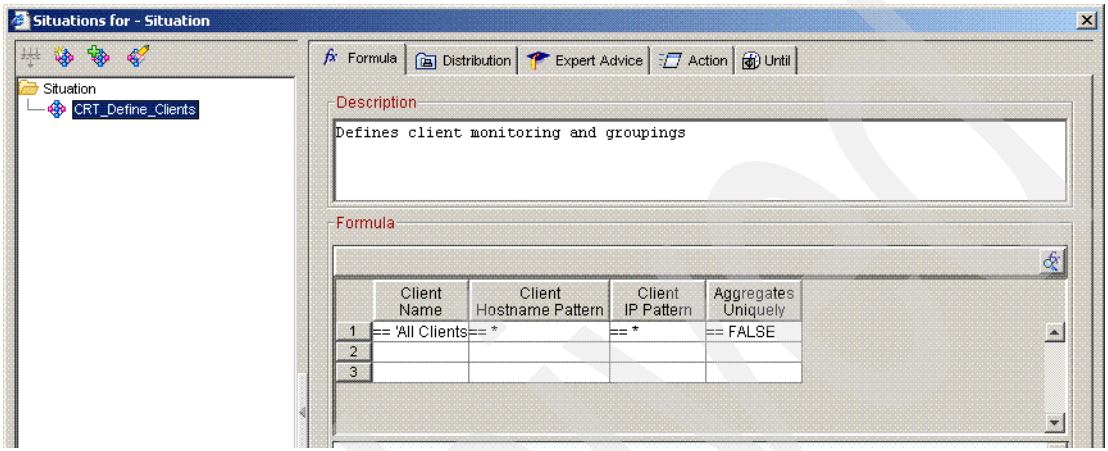

Figure 4-19 CRT_Define_Clients

CRT_Client_Transactions

This situation defines how the monitoring software collects client transactions. By default, all applications and transactions are aggregated uniquely using the application name and transaction name specified in the recording. This can be customized by setting the Aggregate Uniquely attribute to false and defining the Application Name, Application Pattern, Transaction Name, and Transaction Pattern attributes.

For example, to monitor how long it takes to Replicate in Lotus Notes, you can define a situation with the following attributes (see Figure 4-20 on page 127):

```
Application Name = "Lotus Notes"
Application Pattern = "Lotus Notes"
Transaction Name = "Replicate"
Transaction Pattern = "*Replicate*"
Aggregate Applications Uniquely = FALSE
Aggregate Transaction Uniquely = FALSE
```

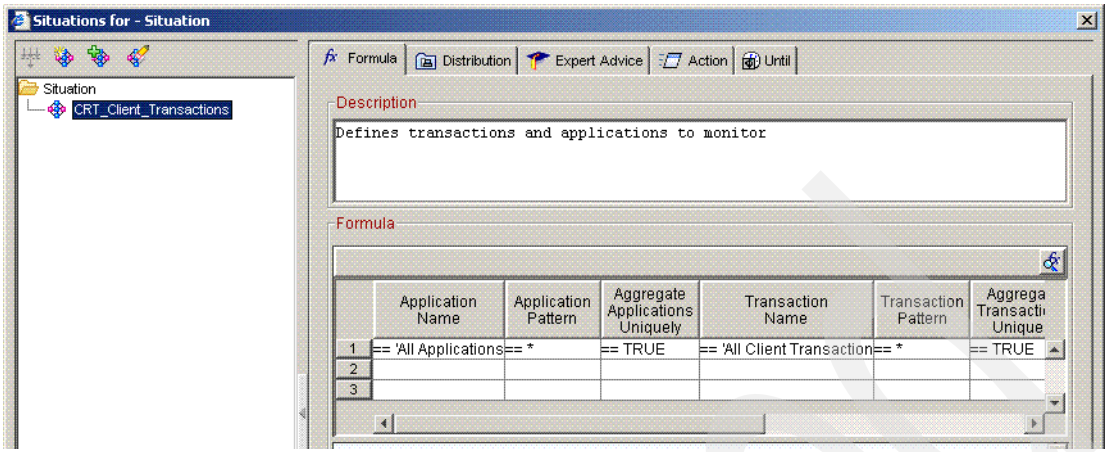

Figure 4-20 CRT_Client_Transactions

CRT_Response_Time_Threshold

This situation generates a Critical alert when the average response time of a transaction exceeds a specified number of seconds to complete. Use this situation when you want to identify transactions that perform outside acceptable boundaries. See Figure 4-21.

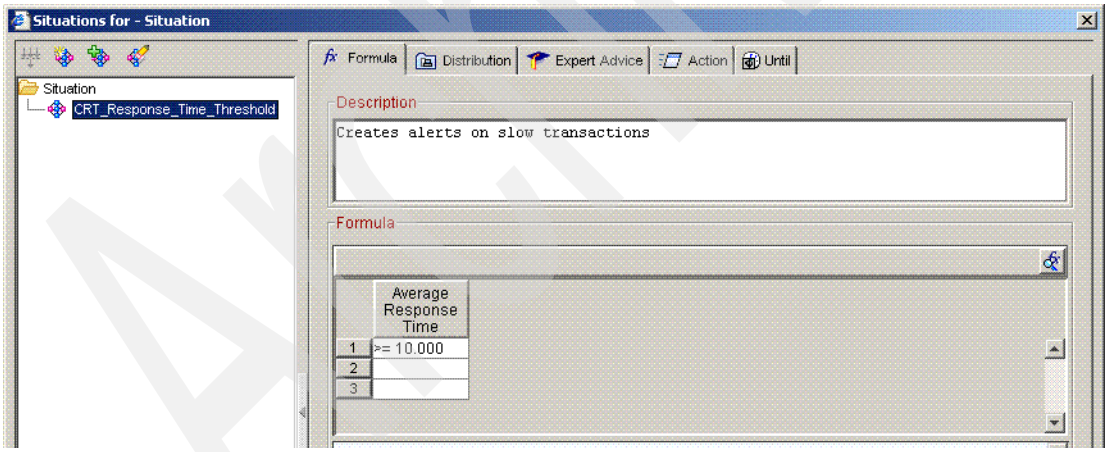

Figure 4-21 CRT_Response_Time_Threshold

Creating a Client Response Time situation

Use the following procedure to create new situation. In this example, we are creating a new application situation:

1. Access Tivoli Enterprise Portal Server.

2. Click “+” beside the operating system for the computer on which ITCAM for Client Response Time is located to display a list of monitored nodes, if necessary.
3. Click beside the name of the node on which the agent is located, if necessary.
4. Click **Client Response Time**.
5. Right-click on **Applications** and click **Situations**.

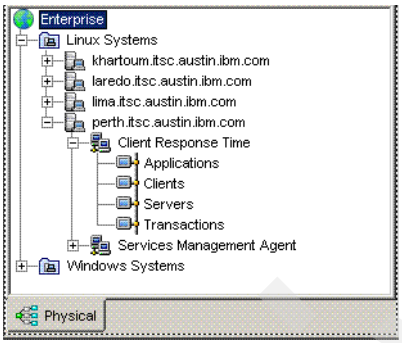

Figure 4-22 Accessing Client Response Time

6. The Situation editor screen displays; click **Create new Situations**.

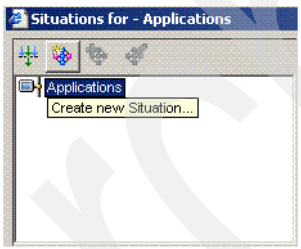

Figure 4-23 Creating new situation

7. The Create Situation screen displays. Enter **Name** and **Description** for Situation and click **OK**.

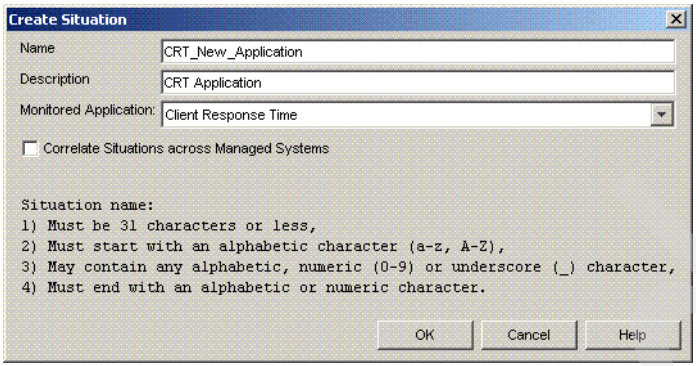

Figure 4-24 CRT_New_Application

8. The Select condition screen displays. Select Attribute Group and Attribute Item as your need and click **OK**.
9. Situations for Applications displays. Select Formula as your need and click **Apply** and **OK**.

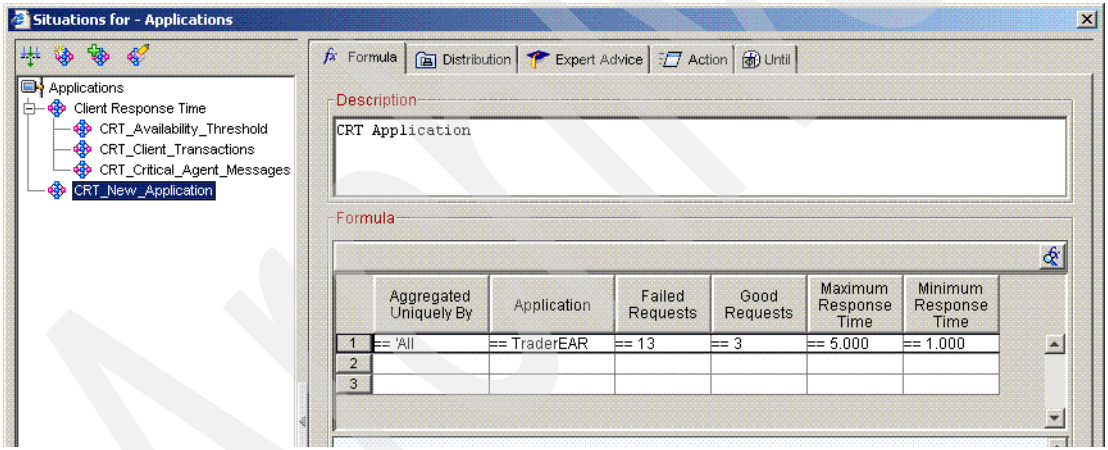

Figure 4-25 CRT_New_Application formula

10. Figure 4-26 on page 130 shows CRT_New_Application in the list.

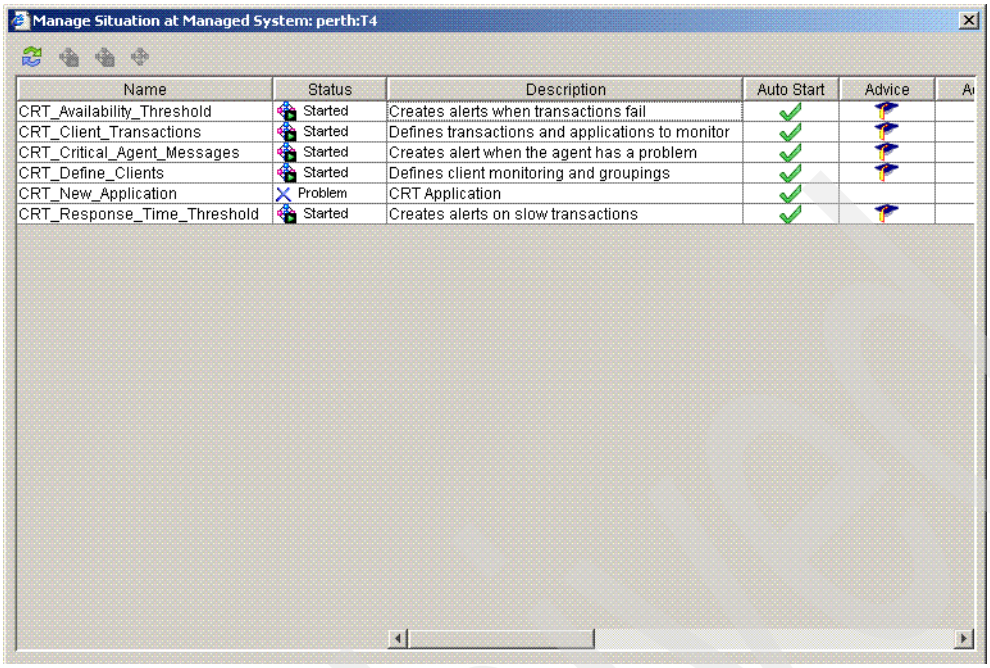

Figure 4-26 CRT_New_Application in the list

Note: It is recommended that you do not change default situation. If you want to change some thresholds, you have to copy and edit the situation and set the new threshold.

5

Administration

This chapter discusses the administration of IBM Tivoli Composite Application Manager for Response Time V6.2. We discuss the following topics:

5.1 Historical data collection

After the Tivoli Enterprise Monitoring Agent is running and generating data for Tivoli Enterprise Monitoring Server, you can configure it to collect historical data. Historical data is written to the Tivoli Data Warehouse by the Warehouse Proxy agent. The data warehouse can be hosted on a DB2, Oracle, or Microsoft SQL Server database. An additional agent, the Warehouse Summarization and Pruning agent is used to maintain the data size and provide a summarized view of the data.

5.1.1 Setting ITMUSER privileges

By default, IBM Tivoli Monitoring creates the WAREHOUS database to set up historical data collection. You specify the user ID to create and initialize the database. If the user ID does not have any authority to access a DB2 database, the Warehouse Proxy log (<hostname>_hd_nnnnnnnnn.log) contains the error in Example 5-1.

Example 5-1 Error example

```
"[IBM][CLI Driver][DB2/NT] SQL0552N "ITMUSER" does not have the
privilege to perform operation "CREATE BUFFERPOOL". SQLSTATE=42502
```

In DB2, you can grant access to the user ID by connecting the user to the DB2 administrator group. The default DB2 administrator group in Windows is DB2ADMNS group; in UNIX or Linux, the group is called by default db2grp*n*, where n is representing the instance sequence.

5.1.2 Setting up historical data collection

This section describes the steps necessary to set up historical data collection:

Note: Some tables can be warehoused, but they should not be summarized (made hourly, daily, weekly). The tables are:

- CRT_Agent_Messages
- WRT_Agent_Messages
- RRT_Agent_Messages
- RRT_Robotic_Playback_Events
- RRT_Robotic_Playback_Status

1. Copy the Oracle or DB2 JDBC JAR files to $KT2_CLASSPATH. The JAR files are:
   - For DB2: db2jcc_license_cu.jar and db2jcc.jar
   - For Oracle: ojdbc14.jar

   The kt2env file tells the location CLASSPATH. The typical path is:
   - $ITMHOME/tmaitm6/kt2env (Windows)
   - $ITMHOME/logs/t2.env (UNIX)
2. Log on the IBM Tivoli Enterprise Portal and click **History Collection Configuration**.
3. Select one of the ITCAM for Web Response Time agents from the Select a product list. Your choices are Client Response Time, Dashboard, Robotic Response Time, or Web Response Time.
4. In the Select Attributes Groups panel, you can select a group to configure for warehousing. The groups are shown in Table 5-1.

Table 5-1 Attribute groups for warehousing

Tivoli Enterprise Monitoring Agent	Attribute Group
ITCAM for Client Response Time	CRT Agent Messages CRT Application Over Time CRT Client Over Time CRT Server Over Time CRT Subtransaction Instance CRT Subtransaction Over Time CRT Transaction Instance CRT Transaction Over Time
ITCAM for Web Response Time	WRT Agent Messages WRT Application Over Time WRT Clients Over Time WRT Server Over Time WRT Transaction Instance WRT Transaction Over Time
ITCAM for Robotic Response Time	RRT Applications Over Time RRT Agent Messages RRT Robotic Playback Status RRT Subtransaction Instance RRT Subtransaction Over Time RRT Transaction Instance RRT Transaction Over Time

5. In the History Collection Configuration panel (Figure 5-1 on page 134), you can configure:

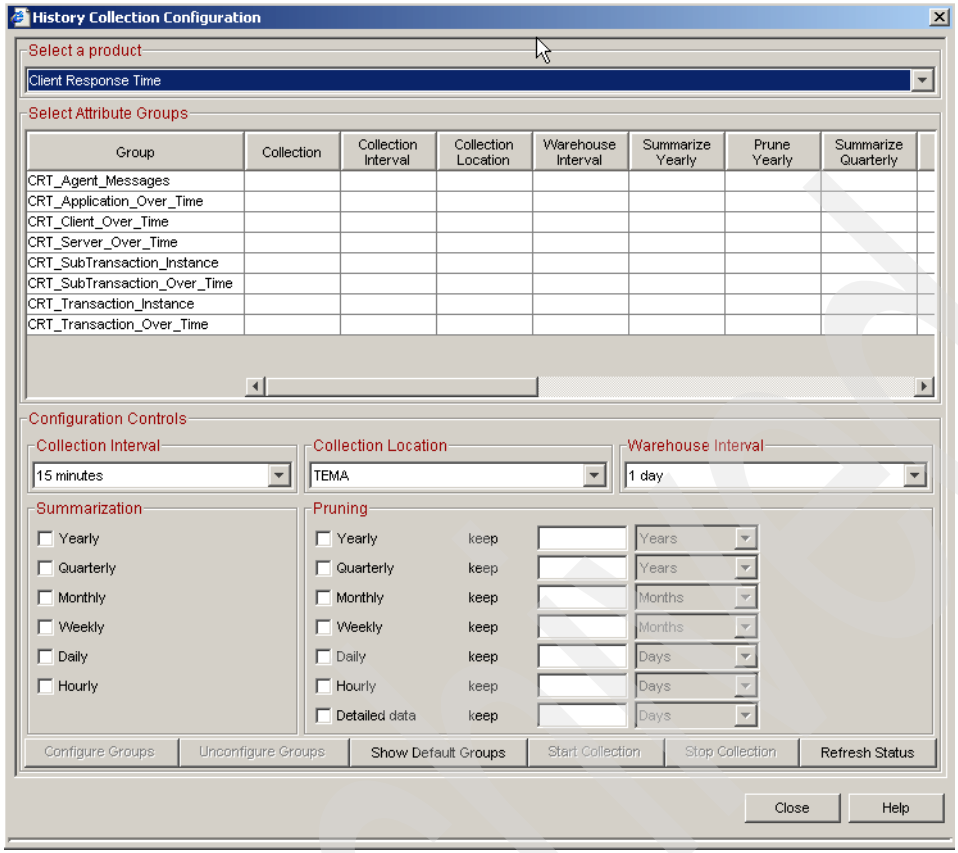

Figure 5-1 History Collection Configuration window

Collection Interval Choose how often you want the data collected (5 minutes, 15 minutes, 30 minutes or 1 hour).

Collection Location Choose where you want the collected data to be stored until it is uploaded into Tivoli Data Warehouse (TEMA or TEMS).

Warehouse Interval Choose how often you want the Warehouse interval (1 hour, 1 day or Off).

Summarization Check how often you want a summary of the data. You can make multiple selections (Yearly, Quarterly, Monthly, Weekly, Daily and Hourly).

Pruning Choose when you want data to be purged. This can be changed later. You can choose pruning interval (Yearly, Quarterly, Monthly, Weekly, Daily, Hourly and Detailed

data) and the number for how many Years, Months, or Days you want to keep the data.

6. Click **Configure Groups**, **Start Collection** and **Refresh Status**.
7. Repeat this process for each agent group you want to configure.

5.1.3 Warehouse database

To verify the Tivoli Data Warehouse works correctly, look at the warehouse database and verify the tables are there and contain data. The location of the warehouse database was specified during its installation, so ask the person who installed it where it is located. You can use the command line tools with the database. For DB2 you can use the **db2** command processor.

1. Connect to the WAREHOUS. The database name is limited to 8 characters.
2. Type one of these commands depending on which ITCAM for Response Time agent you want to check:

Note: Table and column names in Tivoli Data Warehouse are created with mixed case. To access them you must have double quotes and exact capitalization.

```
select count(*) from "WRT_Transaction_Over_Time"
select count(*) from "CRT_Transaction_Over_Time"
select count(*) from "RRT_Transaction_Over_Time"
```

The sample result is shown in Example 5-2. It should have several rows of data.

Example 5-2 Result of select command

```
db2 => select count(*) from "WRT_Transaction_Over_Time"
1
-----------
351
1 record(s) selected.
```

5.2 IBM Tivoli Enterprise Console (TEC) integration

IBM Tivoli Monitoring V6.1 can be configured to send events to IBM Tivoli Enterprise Console. You can also add Tivoli Enterprise Console views to your workspace.

Generic event mapping provides useful event class and attribute information for situations that do not have specific event mapping defined. Each event class corresponds to an attribute group in the monitoring agent.

For more information about mapping attribute groups to event classes, see the Tivoli Enterprise Console product documentation.

Before you configure the Tivoli Enterprise Console, you need to make sure that the Enterprise Console event integration facility is configured to point to the correct Tivoli Enterprise Console server with the correct host and port information. Then do the following procedures:

1. Install the om_tec.baroc and agent specific baroc file in Tivoli Enterprise Console. The baroc files are listed in Table 5-2. These baroc files must be loaded into an Enterprise Console rule base and activated.

Table 5-2 Baroc files

Tivoli Enterprise Monitoring Agent	Baroc file	Event class
ITCAM for End User Response Time Dashboard	kt3.baroc	KT3_Base
ITCAM for Client Response Time	kt4.baroc	KT4_Base
ITCAM for Web Response Time	kt5.baroc	KT5_Base
ITCAM for Robotic Response Time	kt6.baroc	KT6_Base

Note: When you install Tivoli Enterprise Monitoring Server support, the installation places the baroc files in the <ITM_BASE>/cms/teclib directory.

2. Edit the <ITM_install_dir>/CMS/TECLIB/tecserver.txt file to add the situations for which you want to see events. The format is:

   ```
   <SituationName>=*,SEVERITY=CRITICAL | WARNING | UNKNOWN.
   ```

   For example:

   ```
   CRT_Response_Time_Threshold=*,SEVERITY=CRITICAL.
   ```

3. Restart the Tivoli Enterprise Monitoring Server.

Each of the event classes from the situation is a child of an agent specific event as listed in Table 5-2. The base event class can be used for generic rules processing for any event from the Tivoli Enterprise Monitoring Agent.

5.3 Monitoring Agent uninstall

You can use the same procedure to uninstall all ITCAM for Response Time monitoring agents. The agents can be uninstalled individually.

Notes: When you uninstall ITCAM for Robotic Response Time, the uninstall process leaves behind any directories or files that have been added or modified by users. You must manually delete the following directories: \IBM\Rational and \IBM\SDP70Shared.

5.3.1 Uninstalling an agent

You can perform the following steps to uninstall an agent on a Windows and UNIX or Linux platform.

On Windows

Use the following steps to remove an agent from a Windows computer:

1. From the desktop, click **Start** → **Settings** → **Control Panel** (for Windows 2000) or **Start** → **Control Panel** (for Windows 2003).
2. Open the Add or Remove Programs.
3. Select the agent you want to uninstall.
4. Click **Change/Remove**.
5. Select **Remove** and click **Next**.
6. Click **OK** to confirm the uninstall.
7. Click **Finish** to complete the uninstall.

On UNIX or Linux

Use the following steps to remove an agent from a UNIX or Linux computer:

1. From a command prompt, change to the appropriate bin subdirectory of IBM Tivoli Monitoring.
2. Run the `./uninstall.sh` command. A numbered list of product codes, architecture codes, version and release numbers, and product titles is displayed for all installed products.
3. Type the number for the monitoring agent.
4. Repeat this step for each additional installed product you want to uninstall.

5.3.2 Uninstalling the language pack

Follow these steps to remove the language pack on the GUI or silent uninstall in Windows and UNIX or Linux platforms:

1. From the <ITM>_uninstpc directory, run the following command:

   /uninstall.jar

   Where:

   <install_dir> is the directory where the Tivoli Enterprise Portal Server or agent is installed.
   <pc> is the product code for the agent.

2. On Windows, click **Next** to start the uninstall.

5.4 ITCAM for Response Time agent workspaces

For the monitoring agents, the robotic, Web and client response time agents, the workspaces are similar. The summary of all workspaces for each of these are provided in Table 5-3.

Table 5-3 Workspace list

Type	Robotic Response Time	Web Response Time	Client Response Time
Agent	Agent Configuration	Agent Configuration	Agent Configuration
	Agent Status	Agent Status	Agent Status
	Playback Status	-	-
Application	Applications Dashboard	Applications Dashboard	Applications Dashboard
	Application Availability Summary	Application Availability Summary	Application Availability Summary
	Application Trend	Application Trend	Application Trend
	Top 5 Worst Applications	Top 5 Worst Applications Top 5 Worst Clients for an Application Top 5 Worst Servers for an Application Top 5 Worst Transactions for an Application	Top 5 Worst Applications

Client	Clients Dashboard	Clients Dashboard	Clients Dashboard
	-	Client Availability Summary	-
	Client Trend	Client Trend	Client Trend
		Top 5 Worst Clients Top 5 Worst Applications for a Client Top 5 Worst Servers for a Client	
Server	- Robotic response time does not identify the application server.	Servers Dashboard	Servers Dashboard
		Server Availability Summary	Server Availability Summary
		Server Trend	Server Trend
		Top 5 Worst Servers Top 5 Worst Applications for a Server Top 5 Worst Clients for a Server	Top 5 Worst Servers
Transaction	Transactions Dashboard	Transactions Dashboard	Transactions Dashboard
	Transaction Availability Summary	Transaction Availability Summary	Transaction Availability Summary
	Transaction Breakdown	-	Transaction Breakdown
	Transaction Breakdown Trend Transaction Trend	Transaction Trend for Application Transaction Trend	Transaction Breakdown Trend Transaction Trend
	Transaction Instance Exceptions	Transaction Instance Exceptions	Transaction Instance Exception
	Top 5 Worst Transactions	Top 5 Worst Transactions	Top 5 Worst Transactions
	All Subtransactions	-	All Subtransactions
	Subtransaction Trends	-	Subtransaction Trends

As shown in Table 5-3 on page 138, there are several similar workspaces for different branches. They provide similar views inside these workspaces, the difference being the break-down of the measurement data. We discuss the workspaces for these agents here, while the End User Response Time Dashboard workspaces are different and discussed in 5.5, “End User Response Time Dashboard workspaces” on page 147.

Some workspaces can only be accessed from the context menu in the navigation tree as shown in Figure 5-2.

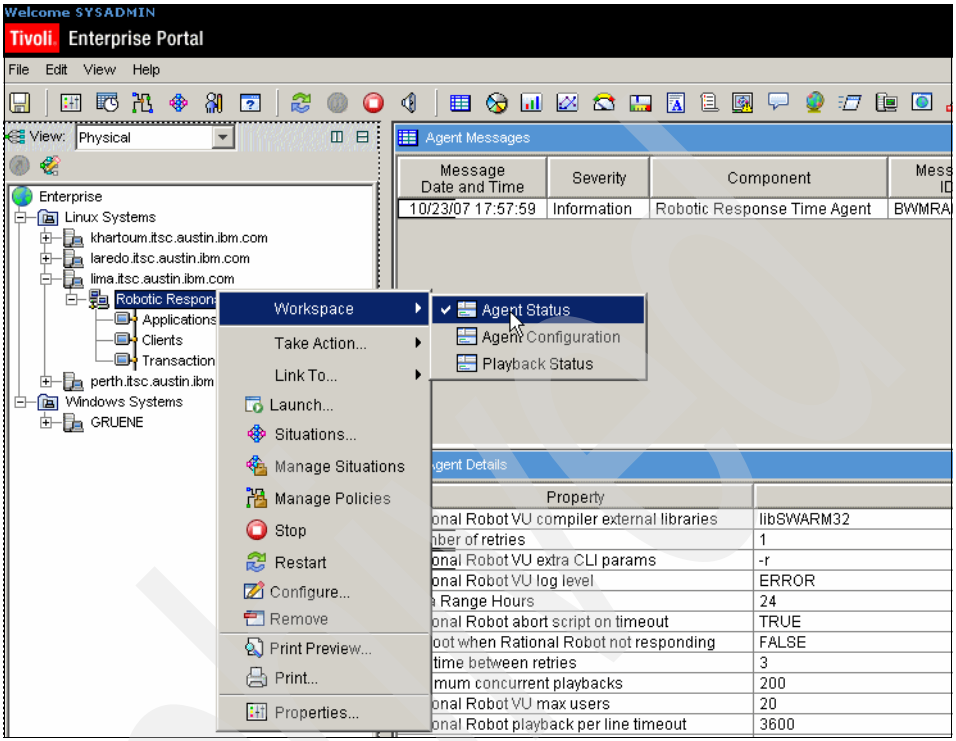

Figure 5-2 Workspace menu

5.4.1 Agent Configuration

The Agent Configuration workspace provides information about the monitoring agent's configuration values and patterns. This is the default workspace for the agent. It has the following views:

Transaction Patterns	Displays the aggregated information about the transaction patterns.
Client Patterns	Displays the aggregated information about the client patterns.
Realms	Displays the realm authentication information for ITCAM for Robotic Response Time.

Use the Agent Configuration workspace to view the configuration information of transaction patterns, client patterns, and realms. This workspace exists for all three agents.

This workspace displays data provided by the following attribute groups:

- RRT Transaction Patterns, RRT Client Patterns and the RRT Realms
- WRT Transaction Patterns and the WRT Client Pattern
- CRT Transaction Patterns and the CRT Client Pattern

5.4.2 Agent Status

You can verify if the ITCAM for Response Time agent is running. The Agent Status workspace has the following views:

Agent Messages	Displays the messages generated by the monitoring agent as it monitors transactions. It also provides details about the messages based on which attributes were specified when the situation was created.
Agent Details	Displays the monitoring agent's configuration based on which attributes were specified when the situation was created.

This workspace displays data provided by the attribute groups:

- RRT Agent Details and RRT Agent Messages
- WRT Agent Details and WRT Agent Messages
- CRT Agent Details and CRT Agent Messages

5.4.3 Playback Status

This workspace displays data provided by RRT Robotic Playback Status. This workspace is exclusively for the Robotic Response Time agents. It has the following three views:

Current Robotic Playback Status	Provides information about each script running on the agent in a table view. Use it to monitor the current status of any robotic scripts running on the server.
Robotic Playback Availability Events	Provides information about the current availability of robotic scripts.
Robotic Playback Errors	Provides information about errors that occurred during the play back of a robotic script. Use the Playback Status view to determine the playback status of the robotic script on the agent and any playback errors that have occurred.

5.4.4 Dashboard workspaces

The Dashboard workspaces are the default views when you click on Application, Client, Server, or Transaction in a Tivoli Enterprise Monitoring Agent. They summarize the availability of all monitored applications, clients, servers, and transactions over a specified period of time so that you have a quick view of what is working and what is not working. You can use this workspace to investigate the overall availability and drill down to view more detailed information about each transaction. The workspace has the following views:

Availability Dashboard View Displays a bar chart showing the availability of each application, client, server, or transaction. The name of the transaction is on the left-hand side of the bar, and the percentage of failure forms the bottom grid. Each bar represents the availability of a selected entity with the percentages of good transactions, slow transactions, and failed transactions. The bar chart sorts the transactions by the percentages of their failed transactions and places the one with the largest failure percentage on the top.

All Displays a summary of availability and response time data for the transactions associated with the application, client, or server. Availability and response time metrics provide overall comparisons among different transactions. By default, summary data indicates data collected for the last 24 hours.

The dashboard collects data from the summary attribute groups:

- RRT Application Summary, RRT Client Summary, RRT Transaction Summary
- WRT Application Summary, WRT Client Summary, WRT Server Summary, WRT Transaction Summary
- CRT Application Summary, CRT Client Summary, CRT Server Summary, CRT Transaction Summary

5.4.5 Availability Summary workspaces

The Availability Summary workspaces displays the last 24 hours of availability and response time data. Use this workspace to discover the performance of an application, client, server, or transaction over time and to discover underlying problems. This has the following views:

Availability	Displays a bar graph showing the percentage of times the transaction failed (red), performed slowly (yellow), or performed as expected (green). When you hover over a bar, the date and percentage of availability is displayed for that bar. The graph also shows the date and time that information was collected.
Top 5 Most Unavailable	Displays a bar graph showing the five most unavailable (most failures) transactions. Unavailability is calculated by percentages so that the largest percentage is on top. If there are less than five transactions, the chart shows all of them.
Summary	Displays a table that shows all the associated data for transactions.

Data is collected from the transaction summary and over time attribute groups:

- RRT Transaction Summary, RRT Application Over Time
- RRT Transaction Summary, RRT Transaction Over Time and RRT Subtransaction Summary
- WRT Transaction Summary, WRT Application Over Time
- WRT Transaction Summary, WRT Server Over Time
- WRT Transaction Summary, WRT Transaction Over Time
- CRT Transaction Summary, CRT Application Over Time
- CRT Transaction Summary and CRT Server Over Time
- CRT Transaction Summary, CRT Transaction Over Time and CRT Subtransaction Summary

5.4.6 Trend workspaces

Trend workspaces displays detailed data about trends for specific applications, clients, servers, subtransactions or transactions over a specified period of time. Use this workspace to examine the response time to see specifically when a problem occurs. You can customize the time period that the Tivoli Enterprise Monitoring Agent collects data to display the performance metrics to pinpoint a specific problem; you can customize this using the Data Interval attribute.

The table views vary depending on the monitoring agent from which you accessed it. The following descriptions include information for all workspaces. The workspace has the following views:

Volume	Displays a bar chart showing the total number of transactions processed during the data interval. The software divides the total number into failed transactions, slow transactions, and good transactions. Each vertical bar represents a monitored transaction with the data collected during the last data interval.
Response Time	Displays a bar chart showing the average number of seconds for the selected application, transaction to respond. Each bar represents the monitored entity during the latest data interval over the past 24 hours. The response time is the sum of average time that transactions spent on client, network, and server.
Details	Displays a table that shows all the associated data for volume and response time.

Trend workspaces collects data from the following attribute groups:

- RRT Transaction Over Time
- RRT Subtransaction Over Time
- WRT Application Over Time
- WRT Client Over Time
- WRT Server Over Time
- WRT Transaction Over Time
- CRT Application Over Time
- CRT Client Over Time
- CRT Server Over Time
- CRT Subtransaction Over Time

5.4.7 Top 5 Worst workspaces

The Top 5 Worst workspaces summarizes the availability and response time of the monitored applications, during the data period on the Tivoli Enterprise Monitoring Agent. Depending on your selection, you can see data for the last 24 hours or the current status (which is the last 5 minutes). Use this workspace to investigate the problems when your Web sites have unavailable and slow applications. You can customize the data interval. The workspace has the following views:

Top 5 Most Unavailable	Displays the five most unavailable (most failures) items. Unavailability is calculated by percentages so that the largest percentage is on top.

Top 5 Slowest	Displays a graph with the five longest data values (by the number of seconds) for applications. The slowest application is on top. The slowest item is the item associated with the transactions that spent the most time on the client, the network, and the server.
Top 5 Most Active	Displays a graph of the five busiest items (based on number of requests). The most active item is the item associated with the most recorded transactions during the data interval. The most active is on top.
All	Displays summary data about each item during the data period on the Tivoli Enterprise Monitoring Agent.

The data is provided by the Summary or Current Status attribute groups:

- RRT Transaction Summary or RRT Transaction Current Status
- RRT Application Summary or RRT Application Current Status
- WRT Client Summary or WRT Client Current Status
- WRT Application Summary or WRT Application Current Status
- WRT Client Application
- WRT Server Application
- WRT Transaction Summary or WRT Transaction Current Status
- WRT Client Server
- WRT Server Current Status or WRT Server Summary
- CRT Application Current Status and CRT Application Summary
- CRT Server Summary and CRT Server Current Status
- CRT Transaction Current Status

5.4.8 Transaction workspaces

Some transaction based workspaces are specific as transactions can have a subtransaction. A subtransaction is a correlated response time that makes up part of the transaction. This is important to identify problem spots. The specific workspaces are:

- “Transaction Breakdown” on page 145
- “Transaction Instance Exceptions” on page 146
- “All Subtransactions” on page 146
- “Transaction Trend for Application” on page 146

Transaction Breakdown

This workspace shows the availability and response times for first level subtransactions (i.e. the steps of the transaction) for monitored applications, clients, and servers. Use this workspace when you have identified a performance

problem in a particular transaction and you want to understand the transaction path so you can diagnose where the problem is occurring.

First Level Subtransaction Availability	Displays a bar graph so you can investigate the percentage of successful transactions over a specified period of time.
First Level Subtransaction Response Time	Displays a bar chart showing the average number of seconds for the selected transaction to respond. Each bar represents the monitored entity during the latest data interval over the past 24 hours. The response time is the sum of average time that transactions spent on client, network, and server.
First Level Subtransaction Summary	Displays a table that shows all the associated data for subtransactions.

The RRT Subtransaction Summary provides the data for this workspace.

Transaction Instance Exceptions

The Transaction Instance Exceptions workspace displays the status of the transactions that have violations. It also displays the number of violations over time. Use this workspace to see the details of a failed transaction, such as status code or other instance metrics. You can also use this to determine how many failures there have been over a period of time. This workspace has the following views:

Number of Failed Transactions Over Time	Shows the number of transaction violations over time.
Transaction Instance Exceptions	Displays status for the transactions that have violations.

The RRT Transaction Instance provides the information for this workspace.

All Subtransactions

Use All Subtransactions to investigate the performance of a monitored transaction (typically URI pattern) and up to five of its subtransactions that have the highest response times over a specified period of time. Use this workspace when you want to see a single view of all your subtransactions to identify the worst problem.

The RRT Subtransaction Summary provides the data for this workspace.

Transaction Trend for Application

The Transaction Trend for Application workspace displays the detailed data about a selected transaction associated with an application over a specified period of

time. You can use this workspace to see the response times and performance of a transaction over time. You can customize the time period that the Tivoli Enterprise Monitoring Agent collects data to display the performance metrics for the transaction to pinpoint a specific problem with an application, you can customize this using the Data Interval attribute. The workspace has four views:

Transaction for an Application Availability	Graph shows the percentage availability performance for the last 24 hours.
Transaction by Application Response Time	Graph shows the average response time for the last 24 hours.
Transaction by Application Requests	Graph shows five minute volume sums for the last 24 hours by default.
Transaction by Application Details	Report displays the aggregated information about the selected transaction by each application. You can use this table to view every attribute this workspace supports.

This workspace displays data provided by the WRT Transaction Over Time attributes.

5.5 End User Response Time Dashboard workspaces

ITCAM for End User Response Time Dashboard has the following workspaces:

- "Agent Status" on page 148
- "Dashboard workspaces" on page 149
- "Robotic workspaces" on page 151
- "Applications" on page 151
- "Clients" on page 152
- "Servers" on page 152

Figure 5-3 on page 148 shows the ITCAM for End User Response Time workspace.

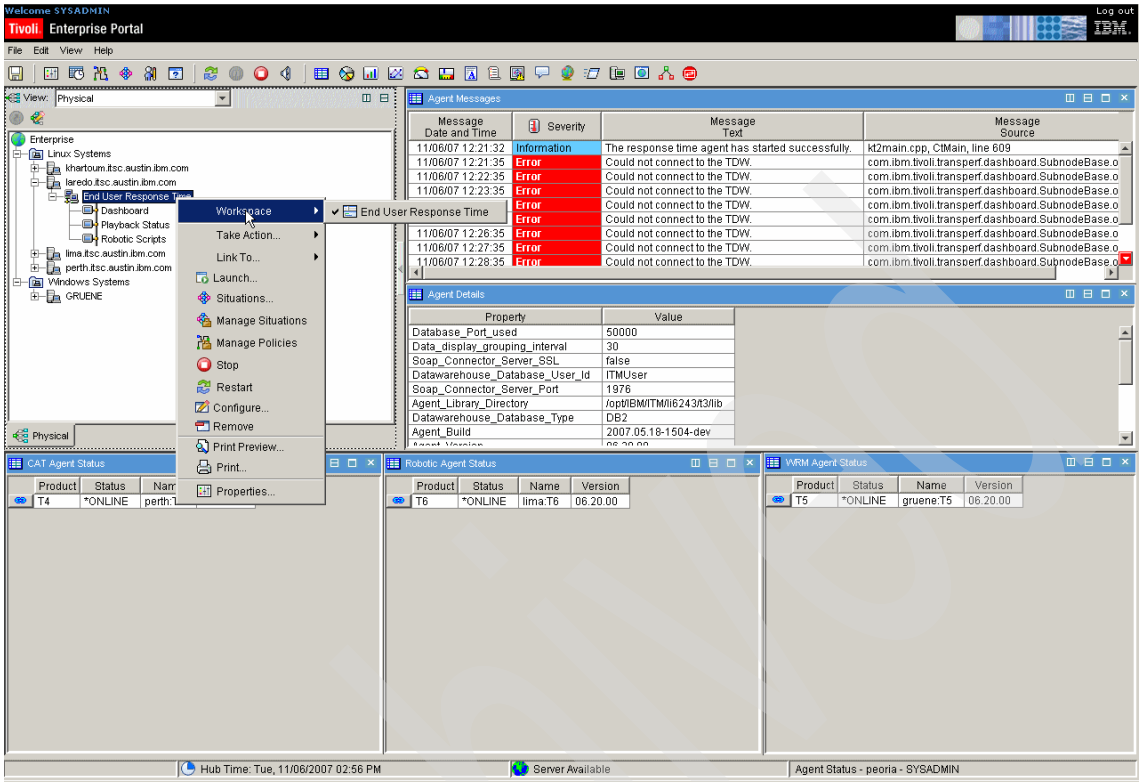

Figure 5-3 Agent Status workspace

5.5.1 Agent Status

The Agent Status workspace has the following sections:

Agent Messages	Displays the messages generated by the monitoring agent as it monitors transactions.
Agent Details	Displays the monitoring agent's configuration based on the configuration parameters used when you set up the agent.
CAT Agent Status	Displays information about ITCAM for Client Response Time, if the agent is installed.
Robotic Agent Status	Displays information about ITCAM for Robotic Response Time, if the agent is installed.
WRM Agent Status	Displays information about ITCAM for Web Response Time, if the agent is installed.

The ERT Agent Messages and DB Agent Details provide the data for this workspace.

5.5.2 Dashboard workspaces

This topic describes the two Dashboard workspaces:

- Dashboard
- Dashboard Table

Dashboard

The Dashboard graphically displays the overall health of the enterprise with the following views:

Applications Health Summary	Displays a pie chart that displays the overall availability of your applications.
Applications Availability Summary	Displays the last 24 hours of availability and response time data. Use this workspace when you have two or more transactions that are similar, and you want to compare them to understand transaction length and volume.
Top 5 Least Available Applications	Displays the five most unavailable (most failures) applications. Unavailability is calculated by percentages so that the largest percentage is on top. If there are less than five monitored applications, the chart shows all of them. The graph is color-coded so that you can instantly identify the worst performing (red) application. The application with the largest percentage of uncompleted transactions is at the top of the chart.
Top 5 Least Available Clients	Displays the five most unavailable (most failures) for clients. Unavailability is calculated by percentages so that the largest percentage is on top. If there are less than five monitored clients, the chart shows all of them.

Figure 5-4 on page 150 shows the default Dashboard view.

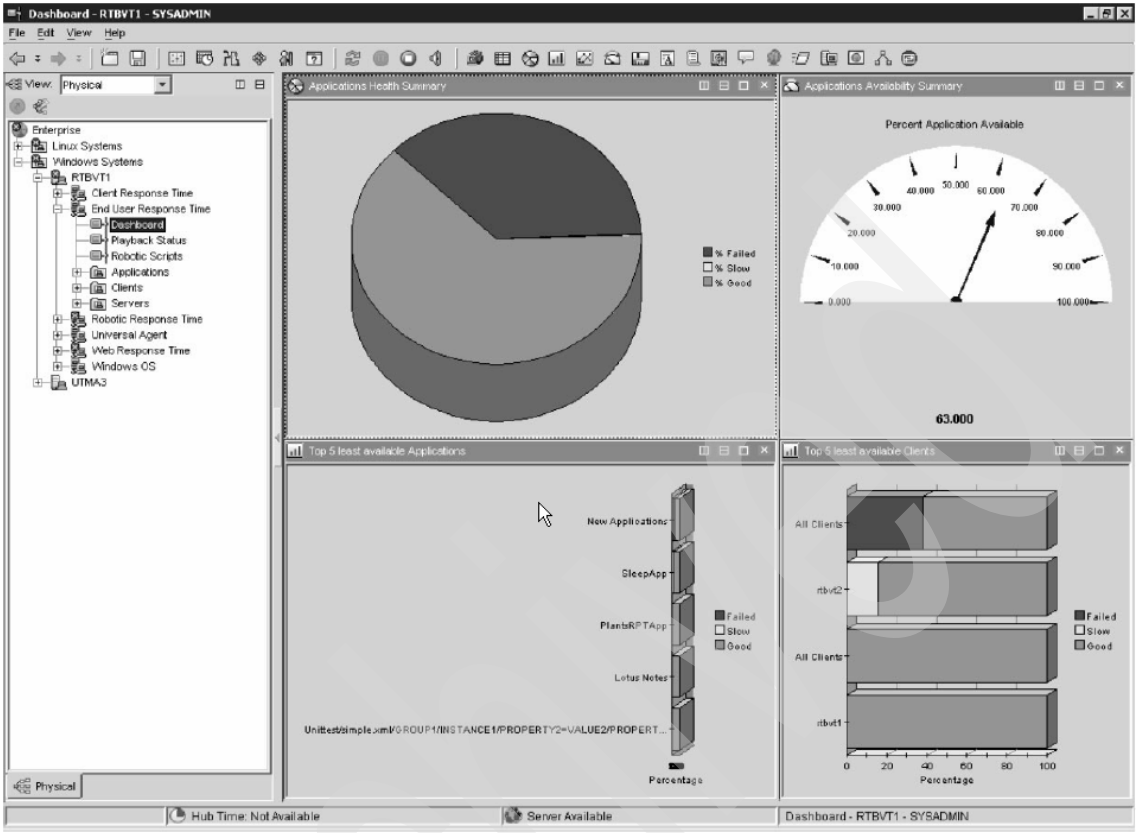

Figure 5-4 ITCAM for End User Response Time Dashboard

The DB Application Summary and DB Client Summary provide the data for this workspace.

Dashboard Table

The Dashboard Table provides the following views:

Applications Availability **Client Availability**	Displays bar graphs showing the percentage of times the transaction failed (red), performed slowly (yellow), or performed as expected (green). When you hover over a bar, it displays the date and percentage of availability for that bar. The graph also shows the date and time that information was collected.
Applications Details **Client Details**	Displays a table that shows all the associated data for transactions.

The DB Application Summary and DB Client Summary provide the data for this workspace.

5.5.3 Robotic workspaces

The robotic workspaces include:

- Playback Status
- Robotic Scripts

Playback Status

Playback Status provides information about each script running on the agent in a table view. Use it to monitor the current status of any robotic scripts running on the server. Robotic scripts run from ITCAM for Robotic Response Time provide the data for this workspace.

Robotic Scripts

Multi File Uploader (MFU) discovers and uploads recordings of Rational Robot GUI and VU, CLI (command line interface), and Mercury LoadRunner scripts. It can also automatically ARM-instrument a recording that has not previously been instrumented.

The DB File Depot provides data to this workspace.

5.5.4 Applications

The Applications workspace provides the following views:

Top 5 Most Unavailable Applications	Displays the five most unavailable (most failures) applications. Unavailability is calculated by percentages so that the largest percentage is on top.
Top 5 Slowest Applications	Displays a graph with the five longest data values (by the number of seconds) for applications. The slowest application is on top. The slowest application is the application associated with the transactions that spent the most time on the client, the network, and the server. If there are less than five monitored applications, the chart shows all of them.
Summary	Displays summary data about each application during the data period on the Tivoli Enterprise Monitoring Agent.

The DB Sub Node Application Over Time and DB Sub Node Application Summary provide data to this workspace.

5.5.5 Clients

The Clients workspace provides the following views:

Top 5 Most Unavailable Clients	Displays the five most unavailable (most failures) for clients. Unavailability is calculated by percentages so that the largest percentage is on top.
Top 5 Slowest Clients	Displays a graph with the five longest data values (by the number of seconds) for clients. The slowest client is the client that initiated the transactions that spent the most time on the client system, the network and the server. The slowest value is on top and the data is collected in seconds.
Client Summary	Displays summary data about each client during the data period on the Tivoli Enterprise Monitoring Agent.

The DB Sub Node Application Client Summary provides data to this workspace.

5.5.6 Servers

The Servers workspace provides the following views:

Top 5 Most Unavailable Servers	Displays the five most unavailable (most failures) for servers. Unavailability is calculated by percentages from the failed transactions out of the total number of transactions. The largest percentage is on top.
Top 5 Slowest Servers	Displays a graph with the five longest data values (by the number of seconds) for servers. The slowest server is the server that processed the transactions that spent the most time on the client system, the network and the server.
Server Summary	Displays summary data about each server during the data period on the Tivoli Enterprise Monitoring Agent.

The DB Sub Node Application Server Summary provides data to this workspace.

6

Troubleshooting

This chapter discusses troubleshooting of IBM Tivoli Composite Application Manager for Response Time V6.2 installation and components.

In this chapter, the following topics are discussed:

6.1 Monitoring Agent installation troubleshooting

ITCAM for Response Time V6.2 is based on IBM Tivoli Monitoring V6.1 architecture. As such, the troubleshooting process is in the framework of IBM Tivoli Monitoring.

A problem on the client side would involve Tivoli Enterprise Portal desktop client or Tivoli Enterprise Portal Web client. The desktop client logs are:

- <ITM_home>\CNP\logs\kcjras1.log
- <ITM_home>\CNP\logs\kcj.log

Tivoli Enterprise Portal Web client stores information in plugin131_0x.trace, a file that is stored in the user home directory. This is typically under C:\Document and Settings\<username>.

The Tivoli Enterprise Portal Server consists of two processes, each of these generate different log files. The files are:

- <ITM_home>\CNP\logs\kfwras1.log
- <ITM_home>\CNP\logs\cmwras1.log

6.1.1 Location of ITCAM for Response Time agents trace and log files

If you have a problem with installation, these are some log files that you may look into:

- Common installation logs:
  <ITM_home>/InstallITM/plugin/executionEvents/logs/YYYYMMDD-HHMMSS/trace_install_plugin.trc
- Platform-specific trace information:
  <ITM_home>/logs/install_plugin_trace.log
- Other agent logs:
  <ITM_home>/tmaitm6/logs/*.log

6.1.2 Starting or stopping ITCAM for Response Time agents

If you have a problem during the installation; or to see the monitoring data in the Tivoli Enterprise Portal Server or to see the error message logs, check the items described in:

- 2.6.1, “Requirements” on page 41
- 2.3.3, “Other software requirements” on page 32
- 2.4.2, “Application support files” on page 35

- 2.4.1, “Other considerations for ITCAM for Response Time agents” on page 34
- 3.8.2, “Operating ITCAM for Response Time monitoring agents” on page 86

For UNIX machines, if you have problems to start the agent verify if the agent file system is mounted and, if all file systems and all files in the machine belong to the same group of the user created to run the agent. If so, there are post installation errors and you can analyze the TEMA installation log files.

For Windows machines, if the problem continues, you can uninstall the agent, reboot the machine to remove any locked or no-use files (you might need to remove manually some entries on the register), remove required directories, and reinstall and restart the agent.

6.1.3 Rational Performance Tester (RPT) workbench installation

The Rational Performance Tester Workbench is needed to record and upload RPT tests. You should install the Rational Performance Tester Workbench if you want to monitor Web applications, SAP, Siebel, or Citrix applications.

You can install the Rational Performance Tester workbench on any system from which you want to record the tests. You do not need to install it on the same system as ITCAM for Robotic Response Time. The RPT workbench needs a direct connection to ITCAM for End User Response Time Dashboard; make sure that there are no firewalls between the RPT workbench system and ITCAM for End User Response Time Dashboard.

Examples of problems to install Rational Performance Tester (RPT) workbench:

- The installation program cannot continue to install RPT7.0 because it has detected that RPT6.1 is installed on this computer.
  - Run the uninstall program to uninstall Rational Performance Tester 6.1 or install RPT7.0 to another computer which does not have RPT6.1 nor RPT7.0 installed.
- IBM Rational Performance Tester 7.0 does not support the specified platform.
  - IBM Rational Performance Tester 7.0 only supports the following platforms: Windows 2000, Windows XP, Windows 2003. Upgrade the operating system to a supported version, reinstall the operating system to a supported version, or use a different computer with a supported platform.

- Management Agent installation is detected. Rational Performance Tester 7.0 and Robotic Management Agent cannot be installed on the same computer.
  - The installation program encountered a file that is used for inventory information on this computer. This file contained text that indicates Management Agent is already installed on this computer. The Prereqs.xml file on the CD-ROM identifies the file names being searched on the different operating systems and the text within them that is used to indicate that Management Agent is already installed. Run the uninstall program to uninstall Management Agent or remove the text from the inventory file to force the installation to proceed.

For information about installation messages see *Problem Determination Guide, IBM Tivoli Composite Application Manager for Response Time*, Version 6.1.2, GI11-8061.

6.2 Monitoring Agent troubleshooting

This section describes the relevant files, tracing activation procedures and process names. The discussion is divided into these topics:

- 6.2.1, “Application support files” on page 156
- 6.2.2, “Troubleshooting End User Response Time Agent” on page 157
- 6.2.3, “Troubleshooting Robotic Response Time Agent” on page 159
- 6.2.4, “Troubleshooting Web Response Time Agent” on page 162
- 6.2.5, “Troubleshooting Client Response Time Agent” on page 164

6.2.1 Application support files

To see the monitoring data in the portal, you must install the monitoring agent and add the application support to the Tivoli Enterprise Portal server, Tivoli Enterprise Monitoring Server, and Tivoli Enterprise Portal.

You can install a monitoring agent either on a computer by itself or on a computer that already has installed the portal server, monitoring server, and/or portal. If you install the monitoring agent on a computer where the portal server, monitoring server, and portal are already installed, the installation asks if you want to install application support, depending on what is installed on the monitoring agent computer; the procedure to do this is essentially the same as the procedure for installing application support.

For more information about application support files, see:

- 2.4.2, “Application support files” on page 35

- 3.2, “Installing application support files” on page 59

6.2.2 Troubleshooting End User Response Time Agent

This topic discusses the location of configuration, trace, and log files; process name and troubleshooting tips for End User Response Time Agent.

Location of configuration, trace, and log files

Table 6-1 lists some important files under the IBM Tivoli Monitoring installation path (C:\IBM\ITM or /opt/IBM/ITM), related to End User Response Time Agent. Note that some log files reside in the Tivoli common directory (C:\Program Files\ibm\tivoli\common or /var/ibm/tivoli/common).

Table 6-1 File locations of End User Response Time Agent

Windows file name	UNIX file name	Description
Configuration files		
tmaitm6\kt3env	config/kt3.ini	T3 agent environment configuration file
tmaitm6\$(HOSTNAME)_t3.cfg	$hostname_t3.cfg	T3 agent configuration setting file – not to be edited manually
tmaitm6\t3-logging.properties	config/t3-logging.properties	T3 agent log level configuration
Log files		
tmaitm6\logs\$hostname$_t3_*.log	$(HOSTNAME)_t3_*.log	T3 agent native diagnostic logs
tmaitm6\logs\Primary_$(HOSTNAME)_t3.LG*	logs\Primary_$(HOSTNAME)_t3.LG*	T3 agent native diagnostic log
<common-dir>\BWM\logs\trace-dashboard.log	<common-dir>/BMW/logs/trace-dashboard.log	T3 agent Java diagnostic log (in Tivoli common directory)

For other problems you might need to activate tracing. The following procedure explains the tracing process:

Note: After gathering the logs, turn off the tracing. Tracing turned on is a significant performance hit.

1. Set the RAS1 tracing option for the agent into:

```
ERROR (UNIT:kt1 ALL) (UNIT:kt2 ALL) (UNIT:kt3 ALL) (UNIT:kra ALL)
```

– This can be performed from Manage Tivoli Enterprise Monitoring Services, right click on the selected agent and select **Advanced** → **Edit Trace Parms** and change the RAS1 filter.

– Edit /opt/IBM/ITM/config/t3.ini file and set the option in KBB_RAS1

2. Change all trace level in t3-logging.properties to DEBUG_MAX using a text editor.

3. Restart the agent.

   You can check the log files for each agent in the Manage Tivoli Enterprise Monitoring Services, right-click on the selected agent and select **Advanced** → **View Trace Log.**

Process names

Table 6-2 lists the process names of End User Response Time Agent for Windows and Unix or Linux environments.

Table 6-2 Process names of End User Response Time Agent

Windows file name	UNIX file name	Description
kt3agent (kt3agent.exe)	kt3agent	End User Response Time Agent process name

Troubleshooting tips

This topic describes some problems that you might experience with the End User Response Time Agent and includes locations of configuration, trace, and log files.

- Agent Messages view in the entry workspace Agent Status has an error message “Could not connect to the TDW” and all the other workspaces are blank.

  To resolve this problem, you can:

  – Check the history configuration panel in the TEPS for Robotic Response Time Agent, Web Response Time Agent, Client Response Time Agent and verify that for all of these TEMAs, history collection for the Transaction Over Time table is turned on and the Warehouse Interval is set.

  – Check the TEMS log to make sure that the following situations have been created and distributed:

    - UADVISOR_T4_T4TXOT
    - UADVISOR_T5_T5TXOT
    - UADVISOR_T6_T6TXOT

- Examine the TEMA Primary_$(HOSTNAME)_t*.LG0 (where * = 4 or 5 or 6) and make sure that UADVISOR_T*_T*TXOT situations have started (where * = 4 or 5 or 6).
- Make sure that binary history files for the Robotic Response Time Agent, Web Response Time Agent, and Client Response Time Agent are being generated.
- Check the kt*.env in Windows or kt*.ini in UNIX files for Robotic Response Time Agent, Web Response Time Agent, and Client Response Time Agent and verify that all of them have the following line in each of the files: KHD_EXPORT_DEBUG=Y
- Check the Warehouse Proxy logs and verify that there are no errors in the logs for the following tables:
  - CRT_Transaction_Over_Time
  - WRT_Transaction_Over_Time
  - RRT_Transaction_Over_Time

- Agent Messages view in the entry workspace has three warning messages and an informative message. “No Historical data exists for Web Response Monitor Agent,” “No Historical data exists for Client Response Time Agent,” “No Historical data exists for Robotic Response Monitor Agent,” and “Connection to TDW was established.” All other workspaces are blank.

  To resolve this problem, perform the following verification tasks:

  - Check the history collection Panels in TEPS.
  - Make sure that UADVISORS have started in TEMS.
  - Make sure that UADVISORS have started at the TEMA.
  - Make sure that the TEMA is collecting binary data.
  - Make sure that Warehouse Proxy logs show no error and tables are created.
  - Make sure all CAT/WRM/ROBOT TEMAs have an entry in their env/ini files to ensure that history tables get created and uploaded at every sampling interval

6.2.3 Troubleshooting Robotic Response Time Agent

This topic discusses the location of configuration, trace, and log files; process names and troubleshooting tips for Robotic Response Time Agent.

Location of configuration, trace, and log files

Table 6-3 on page 160 lists some important files under the IBM Tivoli Monitoring installation path (C:\IBM\ITM or /opt/IBM/ITM), related to Robotic Response Time Agent. Note that some log files reside in the Tivoli common directory (C:\Program Files\ibm\tivoli\common or /var/ibm/tivoli/common).

Table 6-3 File locations of Robotic Response Time Agent

Windows file name	UNIX file name	Description
Configuration files		
\tmaitm6\kt6env	/config/t6.ini	Robotic agent environment configuration
\tmaitm6\${HOSTNAME}_t6.cfg	/config/${HOSTNAME}_t6.cfg	Robotic agent configuration setting file – not to be edited manually
\tmaitm6\t6-logging.properties	/config/t6-logging.properties	Robotic agent log level configuration
\tmaitm6\app\RPT\config\itcamrt-logging.properties	/tmaitm6/app/RPT/config\itcamrt-logging.properties	RPT log level configuration
\tmaitm6\app\RPT\config\managed_jvm.xml	/tmaitm6/app/RPT/config/managed_jvm.xml	RPT managed JVM™ Java configuration
Log files		
\tmaitm6\logs\${HOSTNAME}_t6_*.log	/logs/${HOSTNAME}_t6_*.log	Robotic agent native diagnostic logs
<common_dir>\BWM\logs\trace-robotic.log	<common_dir>/BWM/logs/trace-robotic.log	Robotic agent Java diagnostic logs
<common_dir>\BWM\logs\msg-robotic.log		Robotic agent message logs
<common_dir>\BWM\logs\RPT\{runtime version}\trace-rpt.log	<common_dir>/BWM/logs/RPT/{runtime version}/trace-rpt.log	RPT diagnostic logs
<common_dir>\BWM\logs\{applicationname}\{scriptname}\msg-rptHistory.log	<common_dir>/BWM/logs/{applicationname}/{scriptname}/msg-rptHistory.log	RPT execution history

For other problems you might need to activate tracing. The following procedure explains the tracing process:

Note: After gathering the logs, turn off the tracing. Tracing turned on is a significant performance hit.

1. Set the RAS1 tracing option for the agent into:

```
ERROR (UNIT:kt2 ALL) (UNIT:kt6 ALL) (UNIT:kra ALL)
```

- This can be performed from Manage Tivoli Enterprise Monitoring Services, right-click on the selected agent, select **Advanced** → **Edit Trace Parms** and change the RAS1 filter.
- Edit /opt/IBM/ITM/config/t6.ini file and set the option in KBB_RAS1

2. Change all trace levels in t6-logging.properties to DEBUG_MAX using a text editor, specifically for BWM.trc.playback.common.level.
3. For Rational Performance Tester, tracing is controlled from itcamrt-logging.properties file.
4. Restart the agent.

   You can check the log files for each agent in the Manage Tivoli Enterprise Monitoring Services, right-click on the selected agent and select **Advanced** → **View Trace Log.**

Process names

Table 6-4 lists the process names of Robotic Response Time Agent for Windows and UNIX or Linux environments.

Table 6-4 Process names of Robotic Response Time Agent

Windows file name	UNIX file name	Description
Kt6agent.exe	Kt6agent	Robotic agent process name
Java.exe	java (Linux on Intel only)	RPT Managed JVM
Typeperf.exe		Performance collector used by RPT (Windows only)

Troubleshooting tips

This topic describes some problems that you might experience with the Robotic Response Time Agent and includes locations of configuration, trace, and log files.

- No Robotic data in the workspaces

  To resolve this problem, you can:

  - Verify that the robotic script is playing back.
  - All robotic components use ARM to store the data. Check the ITM_HOME/tmaitm6/arm/log/kt6 for *.dat files. ARM writes out these .dat files when it is collecting data. Make a copy of the *.dat files and view the copy to see what data is collected.
  - Check the Agent Configuration workspace (right-click **Client Response Time** → **Workspaces** → **Agent Configuration**) to make sure the application and transaction patterns are correct. The application and

transaction patterns can be modified in the RRT_Robotic_Transactions situation.

- Enable ARM debug.
- ARM debug is enabled by creating a file called debug_all.txt or debug_[process ID].txt in the ITM_HOME/tmaitm6/arm/log/kt6 directory.
- The ARM debug log is written to c:\program files\ibm\tivoli\common\bwm\logs\trace-armdebug.log on Windows and /var/ibm/tivoli/common/bwm/logs/trace-armdebug.log on UNIX.

6.2.4 Troubleshooting Web Response Time Agent

This topic discusses the location of configuration, trace, and log files; process names and troubleshooting tips for Web Response Time Agent.

Location of configuration, trace, and log files

Table 6-5 lists some important files under the IBM Tivoli Monitoring installation path (C:\IBM\ITM or /opt/IBM/ITM), related to Web Response Time Agent.

Table 6-5 File locations of Web Response Time Agent

Windows file name	UNIX file name	Description
Configuration files		
\tmaitm6\kt5env	/config/t5.ini	Web Response Time Agent configuration file
\tmaitm6\${HOSTNAME}_t5.cfg	/config/${HOSTNAME}_t5.cfg	Agent configuration setting file - not to be edited manually
\tmaitm6\wrm\analyzer\kfcmenv	/tmaitm6/wrm/kfcmenv	Web Response Time Agent Analyzer configuration file
\tmaitm6\wrm\wrm\collector\kflmenv	\tmaitm6\wrm\wrm\collector\kflmenv	Web Response Time Agent Collector configuration file
Log files		
\logs\${HOSTNAME}_t5_*.log	/logs/${HOSTNAME}_t5_*.log	Web Response Time Agent diagnostic logs
\tmaitm6\wrm\analyzer\${HOSTNAME}_kfmserver_*.log	/tmaitm6/wrm/platform/${HOSTNAME}_kfcm120_numberSequence.log	Web Response Time Agent Analyzer logs

Windows file name	UNIX file name	Description
\tmaitm6\wrm\wrm\collector\${HOSTNAME}_kflm_*.log	/tmaitm6/wrm/platform/${HOSTNAME}_kflm_numberSequence.log	Web Response Time Agent Collector diagnostic logs
\tmaitm6\wrm\log*.sm3	/tmaitm6/wrm/log/*.sm3	Web Response Time Agent data files

For other problems you might need to activate tracing. The following procedure explains the tracing process:

Note: After gathering the logs, turn off the tracing. Tracing turned on is a significant performance hit.

1. Set the RAS1 tracing option for the agent into:

   ```
   ERROR (UNIT:kt2 ALL) (UNIT:kt5 ALL) (UNIT:kra ALL)
   ```

   – This can be performed from Manage Tivoli Enterprise Monitoring Services, right-click on the selected agent, select **Advanced** → **Edit Trace Parms** and change the RAS1 filter

   – Edit /opt/IBM/ITM/config/t5.ini file and set the option in KBB_RAS1

2. Restart the agent.

   You can check the log files for each agent in the Manage Tivoli Enterprise Monitoring Services, right-click on the selected agent and select **Advanced** → **View Trace Log.**

Process names

Table 6-6 lists the process names of Web Response Time Agent for Windows and UNIX or Linux environments.

Table 6-6 Process names of Web Response Time Agent

Windows file name	UNIX file name	Description
Kt5agent.exe	kt5agent	Web Response Time Agent process name
Kfcmserver (kfcmserver.exe)	kfcm120	Web Response Time Agent Analyzer name
Kflmcollector (kflm.exe)	kflm	Web Response Time Agent Collector name

Troubleshooting tips

This topic describes some problems that you might experience with the Web Response Time Agent and includes locations of configuration, trace, and log files.

- No WRM data in workspaces - HTTP

  To resolve this problem, you can:

  - Check for the presence of the sm3 file and make sure that it contains the expected transactions.
  - Verify that the HTTP server is being hit from a host external to the Web server so that traffic will go through the network adapter.
  - Verify that SM3_LOG_HTTP=Y is set in kflmenv file.
  - Verify that KFC_HTTP_PORT parameter specifies the correct ports in the kfcmenv file, such as KFC_HTTP_PORT=80,9080.
  - Enable debug ALL in kflmenv and kfcmenv config files. Rerun the transactions and analyze WRM log files.

- No WRM data in workspaces - HTTPS

  To resolve this problem, you can:

  - Verify manual configuration steps for the HTTPS filter are performed correctly.
  - Verify that SM3_LOG_HTTPS=Y is set in kflmenv file.
  - Verify that KFC_HTTPS_PORT parameter specifies the correct ports in the kfcmenv file, such as KFC_HTTPS_PORT=443,9443.
  - Follow the troubleshooting workflow for HTTP.

6.2.5 Troubleshooting Client Response Time Agent

This topic discusses the location of configuration, trace, and log files; process names and troubleshooting tips for Client Response Time Agent.

Location of configuration, trace, and log files

Table 6-7 lists some important files under the IBM Tivoli Monitoring installation path (C:\IBM\ITM or /opt/IBM/ITM), related to Client Response Time Agent.

Table 6-7 File locations of Client Response Time Agent

Windows file name	UNIX file name	Description
Configuration files		
\tmaitm6\kt4env	/config/t4.ini	Client Response Time Agent configuration file

Windows file name	UNIX file name	Description
\tmaitm6\${HOSTNAME}_t4.cfg	/config/${HOSTNAME}_t4.cfg	Agent configuration setting file - not to be edited manually
Log files		
\cat\mgmt\log\keeagent.log		Application log file for keeagent
\cat\mgmt\log\keehook.log		Traces transaction information from monitored application from keehook process
\cat\mgmt\log\${DATE}.log		Client Application Tracker data files

For other problems you might need to activate tracing. The following procedure explains the tracing process:

Note: After gathering the logs, turn off the tracing. Tracing turned on is a significant performance hit.

1. Set the RAS1 tracing option for the agent into:

   `ERROR (UNIT:kt2 ALL) (UNIT:kt4 ALL) (UNIT:kra ALL)`

   – This can be performed from Manage Tivoli Enterprise Monitoring Services, right-click on the selected agent, select **Advanced → Edit Trace Parms** and change the RAS1 filter.

   – Edit /opt/IBM/ITM/config/t4.ini file and set the option in KBB_RAS1

2. Restart the agent.

   You can check the log files for each agent in the Manage Tivoli Enterprise Monitoring Services, right-click on the selected agent and select **Advanced → View Trace Log.**

Process names

Table 6-8 lists the process names of Client Response Time Agent for Windows and UNIX or Linux environments.

Table 6-8 Process names of Client Response Time Agent

Windows file name	UNIX file name	Description
KEEAGENT.EXE	keeagent	Main module for monitoring application transactions

Windows file name	UNIX file name	Description
KEESVC		Service wrapper to run KEEAGENT
KE2MGR	ke2mgr	Client Response Time Agent Collector name

Troubleshooting tips

This topic describes some problems that you might experience with the Client Response Time Agent and includes locations of configuration, trace, and log files.

- No data showing on the TEMS

  To resolve this problem, you can:

  - Make sure that CAT support is installed on TEMS.
  - Make sure that CAT situation is started on TEMS.
  - Check if transactions are generated by CAT agent by finding the dated transaction file YYYYMMDD.log.
    - If yes, check the [hostname]_t4_*.log for errors.
    - If no, provide the contents ITM_HOME\tmaitm6\cat\mgmt\log to support.

6.3 Robotic playback troubleshooting

This section provides debugging information for robotic script playback. The discussion includes:

6.3.1 Robotic playback overview

Follow these major steps for setting up robotic playback scripts:

1. Record a script. ITCAM for Robotic Response Time supports the following types of scripts:
   - Using Rational Performance Tester (RPT)
   - Using Rational Robot GUI
   - Using Mercury LoadRunner
   - Using CLI Command Playback
   - Using sample scripts
2. Upload the script to ITCAM for End User Response Time Dashboard, using one of the following methods:
   - Eclipse Plugin for RPT scripts
   - Multi File Uploader, which automatically ARM instruments the script
   - Manual download

   When uploading scripts:
   - Stop ITCAM for Robotic Response Time before opening the Tivoli Enterprise Portal workspace.
   - After uploading the scripts, close the Tivoli Enterprise Portal window.
   - Restart ITCAM for Robotic Response Time.
3. Create a situation of playing back the robotic script or let the default RRT_Robotic_Playback situation play it back automatically every 15 minutes.
4. (Optional) Define applications, transactions, and clients.
5. Check the status of the playback.

6.3.2 Playback Status

Robotic playback agent workspace provides the following three views:

- Current Robotic Playback Status: provides information about each script running on the agent in a table view. Use it to monitor the current status of any robotic scripts running on the server.
- Robotic Playback Availability Events: provides information about the current availability of robotic scripts.
- Robotic Playback Errors: provides information about errors that occurred during the play back of a robotic script.

  Use the Playback Status view do determine the playback status of the robotic script on the agent and any playback errors that have occurred.

Accessing Playback Status

Following these steps to access playback status:

1. Click “+” beside the operating system for the computer on which ITCAM for Web Response Time is located to display a list of monitored nodes.
2. Click “+” beside the name of the node on which the agent is located.
3. Click Robotic Response Time to select it.
4. Right-click Robotic Response Time to display a menu.
5. Select **Workspace Playback Status**.

6.3.3 Working with Rational Performance Tester (RPT)

Rational Performance Tester (RPT) monitors Web applications, SAP, Citrix, and Siebel using protocol-based record and playback.

You cannot migrate a previously recorded Rational Robot VU script to a RPT script. You must record new scripts with the Rational Performance Tester.

Before creating a Rational Performance Tester (RPT) script, you must install Rational Performance Tester Workbench.

6.3.4 Working with the Rational Robot GUI

Rational Robot GUI collects performance and availability data with a recorded sequence of actions for Microsoft Windows applications, Web applications, and Java-based applications from a user’s perspective by using Rational Robot scripts. You can upload test scripts with the Multi File Uploader.

For information about which applications can be monitored by Rational Robot, see:

http://www-306.ibm.com/software/awdtools/tester/robot/sysreq/index.html

The transaction you specify is defined in a Rational GUI script that you specify when creating a robotic script for playback.

Keep these facts in mind:

- A Rational Robot robotic script can be used by only one robotic monitor at a given time on the same monitoring agent.
- Rational Robot GUI requires the monitored desktop to remain unlocked because it directly interacts with the user desktop. Think of it as a real user moving the mouse and clicking on the display.

Rational Robot GUI can:

- Record and playback native Windows applications, Java applications, Java applets, and HTTP transactions from a Web browser.
- Use Verification Points to verify the content and response from a particular interaction.

Rational Robot GUI does not support:

- Concurrent playback. Because Robot GUI controls the desktop just like a real user, it must run scripts sequentially.
- Running with the screen locked. When the Windows desktop is locked, it disables the desktop control.

For more information on Rational Robot best practices, see:

- IBM Rational Robot Home:

  http://www.ibm.com/developerworks/rational/products/robot

- Reusable code for IBM Rational Robot:

  http://www.ibm.com/developerworks/rational/library/1724.html

6.3.5 Working with the Mercury LoadRunner

Mercury LoadRunner monitors the performance and availability of Mercury LoadRunner scripts. You can use Mercury LoadRunner to record a protocol based test script and export the script as a zip file that can be uploaded with the Multi File Uploader.

Mercury LoadRunner is a test tool that records a set of steps (transactions) and plays them back while recording their availability and performance. Use this component when you have already created Mercury LoadRunner scripts that you want to monitor using the ITCAM for Response Time product.

When you upload a Mercury LoadRunner robotic script, the software automatically ARM instruments the script, or you can specify ARM options for a script that is already ARM enabled.

6.3.6 Working with the CLI Command Playback

CLI Command Playback runs scripts or executable commands (appropriate for the operating system). Using CLI Command Playback generates events and reports them to the Tivoli Enterprise Portal.

You can use CLI Command Playback to automate running a script or an application several times a day and discover how long it took. You might have an application that isn't well-suited for monitoring by one of the other components, such as running test cases with Rational Functional Tester. Other possible uses of CLI Command Playback include:

- Testing server availability with FTP, telnet, or ping
- Querying a database with a custom SQL command
- Running a custom shell script
- Running other playback technologies, such as Rational Function Tester or wget

CLI Command Playback works by running a user-defined command or by wrapping a recording in ARM start and stop calls so that the software can measure the total time the command or recording took. If you want additional timing information for the script such as how long particular calls within the script took, it must be ARM-instrumented by hand to a more detailed level. For information on how to do this, see the *ARM Instrumentation Guide* white paper, available from the online publication library.

CLI Command Playback supports:

- Any playback engine, such as Rational Function Tester that has a command line interface.
- A command line interface that starts an application or script.

CLI Command Playback does not support:

- Popup windows in scripts.
- Commands that cannot be run from a service on Windows. You can do this, however, if you run the management agent as a user process (jmxservice –r). (Windows only)
- Commands that interact with the Windows desktop and emulate user actions. (Windows only)
- Commands that require user interaction. (All platforms)
- Asynchronous commands. ARM response times do not accurately reflect the application's response time. (All platforms)

6.3.7 Working with scripts

By default, when scripts are uploaded to ITCAM for End User Response Time Dashboard, ITCAM for Robotic Response Time automatically downloads the robotic scripts that match the Robotic Script Name defined in the playback

situations. You have the option to manually distribute scripts by doing the following:

- Copy the zip files from the ITCAM for End User Response Time Dashboard directory <itm>/kt1depot/T3 to the robotic agent in the following directories:
  - Command Line: <ITM>/tmaitm6/recording/CLI
  - LoadRunner: <ITM>/tmaitm6/recording/LOADRUNNER
  - Robot GUI: <ITM>/tmaitm6/recording/ROBOT_GUI
  - RPT: <ITM>/tmaitm6/recording/RPT
  - Robot VU: <ITM>/tmaitm6/recording/ROBOT_VU
- Delete the zip files from <itm>/kt1depot/T3 directory.

If there are scripts both in the local <itm>/tmaitm6/recording directory and the ITCAM for End User Response Time Dashboard file depot, the software queries both the local scripts and the ITCAM for End User Response Time Dashboard file depot for all scripts that match the Robotic Script Name pattern and plays back the merged list of local and remote recordings.

6.3.8 Working with the Multi File Uploader

Multi File Uploader (MFU) discovers and uploads recordings of Rational Robot GUI and VU, CLI (command line interface), and Mercury LoadRunner scripts. It can also automatically ARM-instrument a recording that has not previously been instrumented.

For information about how to record the scripts that you want to upload, refer to the *Composite Application Manager for Response Time: Robotic Response Time Agent User's Guide*.

6.3.9 Verifying if the playback is working

Now that we already uploaded the script to the ITCAM for End User Response Time Dashboard, we are going to check if it is being played back.You can verify it by navigating some of the workspaces on TEP.

- To identify what scripts are stored on the End User Response Time Dashboard, you can access the Robotic Scripts workspace.
- From the End User Response Time workspace, you see the status of all the ITCAM for Response Time agents and from that workspace you can link to the agent specific workspaces.
- The Current Robotic Playback Status view, provided in the Robotic Response Time Playback Status workspace, provides information about each script

running on the agent. From this workspace you can monitor the current status of any robotic scripts running on the server.

6.3.10 Troubleshooting tips

This topic describes some problems that you might experience with Robotic playback.

- Uploaded Robotic Scripts Do Not Play Back

  To resolve this problem, you can:

  - Check the Current Robotic Playback Status view in the Robotic Response Time workspace to see if you see the robotic script.
  - Check the Robotic Playback Errors view in the Robotic Response Time workspace for any error.
  - Check the Robotic Response Time situations to make sure:
    - There is a situation defined for the robotic script.
    - The distribution list is correct.
    - The situation is started.
  - Check the Robotic Scripts workspace on the dashboard agent to see which scripts have been uploaded.
  - Check the dashboard agent's depot directory, ITM_HOME/kt1depot/T3, to verify that the recordings are in the T3 depot directory.
  - Check the robotic agent's depot directory, ITM_HOME/kt1depot/T6, to verify that the recordings are downloaded to that directory.
  - Check the trace-robotic.log in the Tivoli common logging directory for any exception. Look for the downloadAndRunScript() method to see which scripts are being returned for playback.

- Robotic script playback shows a Failed state

  To resolve this problem, you can:

  - Check the Current Robotic Playback Status view in the Robotic Response Time workspace to verify that the robotic script playback status is Failed.
  - Check the Robotic Playback Availability Events view in the Robotic Response Time workspace for an event explaining why it failed.
  - Check the Robotic Playback Errors view in the Robotic Response Time workspace for errors.
  - Check the trace-robotic.log in the Tivoli common logging directory for exceptions.

- No Robotic data in the workspaces

  To resolve this problem, you can:

  - Verify that the robotic script is playing back.
  - All robotic components use ARM to store the data. Check the ITM_HOME/tmaitm6/arm/log/kt6 for *.dat files. ARM writes out these .dat files when it is collecting data. Make a copy of the *.dat files and view the copy to see what data is collected.
  - Check the Agent Configuration workspace (right-click **Client Response Time** → **Workspaces** → **Agent Configuration**) to make sure the application and transaction patterns are correct. The application and transaction patterns can be modified in the RRT_Robotic_Transactions situation.
  - Enable ARM debug.
  - ARM debug is enabled by creating a file called debug_all.txt or debug_[process ID].txt in the ITM_HOME/tmaitm6/arm/log/kt6 directory.
  - The ARM debug log is written to: c:\program files\ibm\tivoli\common\bwm\logs\trace-armdebug.log on Windows and /var/ibm/tivoli/common/bwm/logs/trace-armdebug.log on UNIX

Abbreviations and acronyms

AIX	Advanced Interactive executive
API	Application Programming Interface
ARM	Application Response Measurement
CD-ROM	Compact Disc Read Only Memory
CICS®	Customer Information Control Systems
CLI	Command Line Interface
CPU	Central Processing Unit
DNS	Domain Name Service
GB	Gigabyte
GUI	Graphical User Interface
HTTP	Hyper Text Transfer Protocol
HTTPS	HTTP Secure
IBM	International Business Machines Corporation
IIS	Internet Information Server
IP	Internet Protocol
IT	Information Technology
ITCAM	IBM Tivoli Composite Application Manager
ITIL®	IT Infrastructure Library®
ITSO	International Technical Support Organization
JAAS	Java Authentication and Authorization Service
JDBC	Java Database Connectivity
JMX	Java Management extension
JNDI	Java Naming and Directory Interface™
MFU	Multi File Uploader
NIC	Network Interface Card
OS	Operating Systems
PDF	Portable Document Format
RISC	Reduced Instruction Set Computer
RPC	Remote Procedure Call
RPT	Rational Performance Tester
SLA	Service Level Agreement
SOA	Service Oriented Architecture
SOAP	Simple Object Access Protocol
SQL	Structured Query Language
SSL	Secure Socket Layer
TCP/IP	Transmission Control Protocol Internet Protocol
TDW	Tivoli Data Warehouse
TEMA	Tivoli Enterprise Monitoring Agent
TEMS	Tivoli Enterprise Monitoring Server
TEP	Tivoli Enterprise Portal
URL	Universal Resource Locator
WRM	Web Response Monitor

Related publications

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

IBM Redbooks publications

For information about ordering these publications, see “How to get IBM Redbooks publications” on page 178. Note that some of the documents referenced here may be available in softcopy only:

- *IBM Tivoli Composite Application Manager Family Installation, Configuration and Basic Usage,* SG24-7151
- *Deployment Guide Series: IBM Tivoli Monitoring V6.1*, SG24-7188

Other publications

These publications are also relevant as further information sources:

- IBM Tivoli Composite Application Manager for Response Time publications:
  - *IBM Tivoli Composite Application Manager for Client Response Time User's Guide Version 6.2*, SC23-6332
  - *IBM Tivoli Composite Application Manager for Web Response Time User's Guide Version 6.2*, SC23-6333
  - *IBM Tivoli Composite Application Manager for Robotic Response Time User's Guide Version 6.2*, SC23-6334
  - *IBM Tivoli Composite Application Manager for End User Response Time Dashboard User's Guide Version 6.2*, SC23-6335
  - *IBM Tivoli Composite Application Manager for Response Time Problem Determination Guide Version 6.2*, GI11-8061
- IBM Tivoli Monitoring publications:
  - *Exploring IBM Tivoli Monitoring*, SC32-1803
  - *IBM Tivoli Monitoring Administrator's Guide*, SC32-9408
  - *IBM Tivoli Monitoring: Configuring IBM Tivoli Enterprise Monitoring Server on z/OS*, SC32-9463

  - *IBM Tivoli Monitoring Installation and Setup Guide*, GC32-9407
  - *IBM Tivoli Monitoring Problem Determination Guide*, GC32-9458
  - *IBM Tivoli Monitoring User's Guide*, SC32-9409
  - *IBM Tivoli Monitoring: Upgrading from Tivoli Distributed Monitoring*, GC32-9462
  - *IBM Tivoli Universal Agent API and Command Programming Reference Guide*, SC32-9461
  - *IBM Tivoli Monitoring Universal Agent User's Guide*, SC32-9459
  - *Introducing IBM Tivoli Monitoring*, GI11-4071
- *CandleNet ETEWatch User's Guide*, GC32-9178

Online resources

These Web sites are also relevant as further information sources:

- ITCAM for Response Time online documentation:

  `http://publib.boulder.ibm.com/infocenter/tivihelp/v3r1/index.jsp?topic=/com.ibm.itcamwas_rt.doc_6.6/welcome.htm`

- ITCAM for Response Time Web site:

  `http://www-306.ibm.com/software/tivoli/products/composite-application-mgr-response-time/`

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Certification Guide Series: IBM Tivoli Composite Application Manager for Response Time V6.2 Implementation

Detailed architecture and components discussion

Installation and configuration processing

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This book is a study guide for IBM® Tivoli® Composite Application Manager for Response Time V6.2 certification. It is aimed for the IT professional who wants to be an IBM Certified Professional for this product.

IBM Tivoli Composite Application Manager for Response Time V6.2 certification is offered through the IBM Professional Certification program. It is designed to validate the skills required of technical professionals who work with the implementation and deployment of ITCAM for Response Time V6.2.

This book provides the necessary information for understanding the subject matter. It includes sample questions. The sample questions help in evaluating personal progress. It familiarizes the readers with the types of questions that might be encountered in the exam.

This guide does not replace practical experience. It is not designed to be a stand-alone guide for the subject. Instead, this guide should be combined with educational activities and experiences for preparation for the exam.

For your convenience, the chapters are based on the certification objective of the ITCAM for Response Time V6.2 implementation certification test. Those requirements are planning, prerequisites, installation, configuration, administration, and problem determination. Studying each chapter helps you prepare for each objective of the exam.

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