



TimePictra Release 3.6.1

Administrator's Guide
Revision B – March 2006
Part Number 097-48301-36

Symmetricom, Inc.
2300 Orchard Parkway
San Jose, CA 95131-1017
U.S.A.

<http://www.symmetricom.com>

Copyright © 2004–2006 Symmetricom, Inc.
All rights reserved. Printed in U.S.A.

All product names, service marks, trademarks, and registered trademarks
used in this document are the property of their respective owners.

Contents

How to Use This Guide

Purpose of This Guide	14
Who Should Read This Guide	14
Structure of This Guide	15
Conventions Used in This Guide	15
Warnings, Cautions, Recommendations, and Notes	16
Related Documents and Information	17
Where to Find Answers to Product and Document Questions	18
What's New In This Guide	18

Chapter 1 Introduction and General Information

In This Guide	20
Naming Conventions	20
Software Description	21
TimePictra Features	21
Features and Enhancements – Version 3.6.1	26
Options	27
System Overview	28
Event Handling	29
Transaction Handling	31
Web Subsystem	32
Heartbeat, Configuration Alignment, and Alarm Synchronization Processes	35
System Requirements	38
Prerequisites	39
TimePictra Web Client System Requirements (Windows NT/98/2000/XP Clients)	39
Supported Network Element Firmware	40
TimePictra On-Line Help	41
Responsibilities of the System Administrator	41
Prerequisite Knowledge	42
Related Documentation	42
The Administration Utility	42

Chapter 2 Starting and Stopping TimePictra

Start a Software Session.	46
Power-Up the TimePictra Workstation/Server	46
Verify the Oracle Database is Running	46
Start the TimePictra-related Software Processes	48
Start the Oracle 9i Application Server, if necessary	49
Stop a Software Session.	51
Error Message Troubleshooting Guide	52

Chapter 3 Routine System Administration

Install the TimePictra License File	54
Ordering a License or License Upgrade	54
The License File	55
Installing the License File	56
Check the Health of the System (osmfssystem)	57
Automatic Script Execution	57
Manual Script Execution	58
Check Status of TimePictra Processes (osmfstatus)	59
Archive Performance History Data and Events	63
Monitor and Maintain System Files	66
Cleaning Up Error and Trace Files	66
Cleaning Up Temporary Files	66
Truncating the alert_MV10.log and listener.log Files	67
Truncating TimePictra Log Files	67
Enable or Disable the Config_Align Daemon	68

Chapter 4 System Backup and Recovery

System Backup	72
Backup Categories	72
Backup Requirements	73
Backup Procedures	74
HP-UX Core System Backup	74
System Backup	76
TimePictra Database Backup	78

System Recovery	80
Complete System Recovery	80
Using SAM for Recovery.	82
Restoring the TimePictra Database from Tape or Filesystem	83
Example “otdbrecover.ks -recover” Output.	85

Chapter 5 Installation

Overview	88
Initial Installation	88
Install HP-UX 11i Minimal Technical Operating Environment.	88
Install the June 2005 11i Quality Pack	91
UNIX Kernel Configuration	91
Install the Java SDK	94
Install Oracle 9i Database Version 9.2.0.1.0.	94
Install Release 2 Patch Set 6 Version 9.2.0.7 for HP-UX PA-RISC (64-bit).	97
Install Oracle 9i Application Server.	97
Install Network Node Manager	99
Install TimePictra	100
TimePictra Database Creation	101
Configure Web Services	101
Install Oracle 9iAS/6iserver Patch 16	103
Create a Unix User on the TimePictra Server.	104
Install the TimePictra License File	105
Verify the Installation.	105
Upgrading TimePictra	107
Cleaning the JAR Cache.	110
Additional details on Upgrading TimePictra in a Resiliency Scenario.	111
Additional Details on Patching TimePictra in a Resiliency Scenario.	112
Removing TimePictra	113
Uninstalling TimePictra	113

Chapter 6 TimePictra Resiliency Option

Introduction and General Information	116
Description of the TimePictra Resiliency Option.	116
Features of TimePictra Resiliency Option.	116
Resiliency Server Administration	116
Responsibilities of the System Administrator	118

- Installing the Resiliency Option on Primary and Secondary Masters 118
 - Prerequisites for Installing the Resiliency Option 119
 - Installing the Resiliency Option on the Primary Master 119
 - Installing the Resiliency Option on the Secondary Master 120
 - Setting the time on the Primary and Secondary Masters 121
 - Configuring Remote Shell Parameters of the Primary
and Secondary Masters 121
- Enabling Resiliency on the Primary and Secondary Masters 123
 - Prerequisites 123
 - Enabling and Starting Resiliency on the Primary
and Secondary Masters 124
- Checking the Status of Resiliency. 125
 - Resiliency Status Information 125
 - Checking Resiliency Status 125
- Operating Scenarios and Troubleshooting 126
 - Scenario 1 126
 - Scenario 2 127
 - Scenario 3 132
 - Scenario 4 134
 - Scenario 5 136
- Removing the Resiliency Option 138
- TimePictra Database Tables 140
- Known Issues 142

Chapter 7 TimePictra SNMP Agent Option

- Introduction and General Information 144
 - Description of the SNMP Agent Option 144
 - FAQ Regarding the MIB 148
 - System Requirements 150
 - Prerequisite Knowledge 151
 - Responsibilities of the System Administrator 151
- Installing the TimePictra SNMP Agent Option 151
 - Prerequisites for Installing the SNMP Agent 152
 - Installing the SNMP Agent 152
- Configuring the TimePictra SNMP Agent 153
- More Details on Setting Up SNMPD.cnf Files 155
 - Configuration Files 155
 - Configuring /opt/osmf/SNMP/conf/snmpd.cnf 156
 - TimePictra SNMP Traps to Multiple Destinations 163

Starting and Stopping the TimePictra SNMP Agent	163
Starting the SNMP Agent	163
Stopping the SNMP Agent	164
Removing the TimePictra SNMP Agent Option	164
Troubleshooting	166
Enabling Tracing	166
Troubleshooting Hints	167
Special Features and Limitations of the SNMP Agent	169
Special Features	169
Limitations of the SNMP Agent	170
Traps and Fields	170

Chapter 8 Commissioning an NE

Configuring NEs to Communicate with TimePictra	174
Configuring a Terminal Server to Communicate with TimePictra	174
Configuring a TimeHub to Communicate with TimePictra	175
Configuring a 55400A to Communicate with TimePictra	176
Configuring a TimeSource 3X00 to Communicate with TimePictra	178
Configuring a MIS-23 to Communicate with TimePictra	178
Configuring DCDs to Communicate with TimePictra	178
Configuring a PRR10 to Communicate with TimePictra	179
Configuring TSG-3000 firmware versions D/E to Communicate with TimePictra	179
Configuring a TimeProvider 1000/1100 to Communicate with TimePictra	180
Configuring a SSU-2000 to Communicate with TimePictra	181

Chapter 9 Performance Utility Option

Description of the Performance Utility Option	184
Phase Data Auto-upload	184
Performance Data Plotting	185
Retrieve (Manual) Performance Data	186
Performance Utility - Retrieve dialog box	186
Retrieving Performance Data	192
Schedule (Automatic Upload) Jobs for Performance Data	194
Performance Utility - Schedule dialog box	194
Scheduling Data Retrieval Jobs	202
Performance Utility Administration and Troubleshooting	204
The PM Utility	204

Performance Utility Administration	205
Checking the Status of the Retriever Job	205
Starting and Stopping the Data Retriever Database Job	206
Fixing a Broken Runtime Instance of the Retriever Job	206
Index	209

Figures

1-1	TimePictra Software Block Diagram	29
1-2	Block Diagram	33
3-1	Example TimePictra License File	55
3-2	Example “osmfstatus” Output with No Options	60
3-3	“Example “osmfstatus” Output in Verbose Mode	61
7-1	The Information Model and TimePictra	145
7-2	TimePictra Event Model.	146
7-3	TimePictra SNMP MIB Structure (1 of 2).	147
7-4	TimePictra SNMP MIB Structure (2 of 2).	148
8-1	NIMC Assembly Switch Locations.	176
9-1	Sample TimeMonitor Display.	185
9-2	Performance Utility – Retrieve dialog box (DCD series)	186
9-3	Performance Utility – Retrieve dialog box (NetSync 55400/55409).	187
9-4	Performance Utility – Retrieve dialog box (SSU-2000)	188
9-5	Performance Utility – Retrieve dialog box (TimeHub 5500).	189
9-6	Performance Utility – Retrieve dialog box (TimeSource series)	190
9-7	Performance Utility – Retrieve dialog box (TSG-3800)	191
9-8	Performance Utility – Schedule dialog box (DCD series)	195
9-9	Performance Utility – Schedule dialog box (NetSync 55400/55409).	196
9-10	Performance Utility – Schedule dialog box (SSU-2000)	197
9-11	Performance Utility – Schedule dialog box (TimeHub 5500).	198
9-12	Performance Utility – Schedule dialog box (TimeSource series).	199
9-13	Performance Utility – Schedule dialog box (TSG-3800)	200

Tables

1-1	Object Naming Conventions	20
1-2	Supported NE Firmware Versions	40
1-3	“osmfadmin” Menus	43
3-1	TimePictra Process Status Fields	60
3-2	SE Process Status Fields	61
3-3	Network Element Status Fields	62
5-1	Logical Volumes	90
5-2	Kernel Parameters	92
7-1	Events and Traps	146
7-2	Troubleshooting Hints	167
7-3	Traps and Fields	170
9-1	Performance Utility – Retrieve Dialog Box Description	191
9-2	Performance Utility – Schedule Dialog Box Description	200
9-3	PM Utility Menu	204

How to Use This Guide

This preface describes the format, layout, and purpose of this guide.

In This Preface

- [Purpose of This Guide](#)
- [Who Should Read This Guide](#)
- [Structure of This Guide](#)
- [Conventions Used in This Guide](#)
- [Warnings, Cautions, Recommendations, and Notes](#)
- [Related Documents and Information](#)
- [Where to Find Answers to Product and Document Questions](#)
- [What's New In This Guide](#)

Purpose of This Guide

The *TimePictra 3.6.1 Administrator's Guide* describes how to administer and maintain the TimePictra software platform. This guide explains how to install TimePictra Release 3.6.1 or perform a system upgrade. System startup/shutdown procedures, backup/recovery procedures, and routine administration and maintenance procedures are also included. The last chapter explains how to commission various NEs for basic communication with the TimePictra software.

Who Should Read This Guide

[Chapter 1, Introduction and General Information](#), is written for non-technical audiences who need general information about the product's features, as well as a more technical description of the software. [Chapter 2, Starting and Stopping TimePictra](#) through [Chapter 5, Installation](#) describes how to administer and maintain the TimePictra software platform. [Chapter 6, TimePictra Resiliency Option](#) and [Chapter 7, TimePictra SNMP Agent Option](#) explain system administration tasks related to the TimePictra options. [Chapter 8, Commissioning an NE](#) describes how to set up various NEs to establish basic communications with TimePictra.

This *Administrator's Guide* is designed for the following categories of users:

- **System Administrators** – [Chapter 1](#) through [Chapter 7](#) provide detailed information and procedures to ensure proper installation or upgrades, turn-on, and maintenance of the TimePictra platform.
- **NE Installation Engineers** – [Chapter 8](#) explains how to commission various NEs to establish basic communications with TimePictra.

While [Chapter 1](#) contains some introductory information that is written for non-technical audiences, other sections of [Chapter 1](#) as well as the other chapters in the manual contain detailed information and instructions that are intended to be performed by *qualified personnel only*.

Structure of This Guide

This guide contains the following sections and appendixes:

Chapter, Title	Description
Chapter 1, Introduction and General Information	Provides an overview of the product, describes the major hardware and software features and options, provides a technical description of the software, and other general information regarding the software.
Chapter 2, Starting and Stopping TimePictra	Contains procedures for starting and stopping the software on the TimePictra platform.
Chapter 3, Routine System Administration	Describes some routine system administration tasks, such as performing system status and health checks, and archiving system data.
Chapter 4, System Backup and Recovery	Explains how to perform different levels of system backup, and recovery options in case of a system crash or other disaster.
Chapter 5, Installation	Explains how to perform a clean installation of the system software, how to perform a system upgrade, and how to uninstall the software.
Chapter 6, TimePictra Resiliency Option	Provides information necessary to install, manage, and maintain the TimePictra Software Resiliency Option.
Chapter 7, TimePictra SNMP Agent Option	Provides information necessary to install, manage, and maintain the TimePictra SNMP Agent option.
Chapter 8, Commissioning an NE	Explains how to commission various NEs to establish basic communications with the TimePictra software.
Index	Provides references to individual topics within this guide.

Conventions Used in This Guide

This guide uses the following conventions:

- **Acronyms and Abbreviations** – Terms are spelled out the first time they appear in text. Thereafter, only the acronym or abbreviation is used.
- **Revision Control** – The title page lists the printing date and versions of the product this guide describes.
- **Typographical Conventions** – This guide uses the typographical conventions described in the table below.

When text appears this way...	... it means:
<i>TimePictra 3.6.1 Administrator's Guide</i>	The title of a document.
SSU CRITICAL	An operating mode, alarm state, status, or chassis label.
Select File , Open...	Click the Open option on the File menu.
Press Enter Press ;	A named keyboard key. The key name is shown as it appears on the keyboard. An explanation of the key's acronym or function immediately follows the first reference to the key, if required.
Username :	Text in a source file or a system prompt or other text that appears on a screen.
PING swinstall	A command you enter at a system prompt or text you enter in response to a program prompt. You must enter commands for case-sensitive operating systems exactly as shown.
<i>A fault analysis operation</i>	A word or term being emphasized.
Symmetricom does not recommend...	A word or term given special emphasis.

Warnings, Cautions, Recommendations, and Notes

Warnings, Cautions, Recommendations, and Notes attract attention to essential or critical information in this guide. The types of information included in each are explained in the following examples.



Warning: To avoid serious personal injury or death, *do not* disregard warnings. All warnings use this symbol. Warnings are installation, operation, or maintenance procedures, practices, or statements, that if not strictly observed, may result in serious personal injury or even death.



Caution: To avoid personal injury, *do not* disregard cautions. All cautions use this symbol. Cautions are installation, operation, or maintenance procedures, practices, conditions, or statements, that if not strictly observed, may result in damage to, or destruction of, the equipment. Cautions are also used to indicate a long-term health hazard.



ESD Caution: To avoid personal injury and electrostatic discharge (ESD) damage to equipment, *do not* disregard ESD cautions. All ESD cautions use this symbol. ESD cautions are installation, operation, or maintenance procedures, practices, conditions, or statements that if not strictly observed, may result in possible personal injury, electrostatic discharge damage to, or destruction of, static-sensitive components of the equipment.



Electrical Shock Caution: To avoid electrical shock and possible personal injury, do not disregard electrical shock cautions. All electrical shock cautions use this symbol. Electrical shock cautions are practices, procedures, or statements, that if not strictly observed, may result in possible personal injury, electrical shock damage to, or destruction of components of the equipment.



Recommendation: All recommendations use this symbol. Recommendations indicate manufacturer-tested methods or known functionality. Recommendations contain installation, operation, or maintenance procedures, practices, conditions, or statements, that provide important information for optimum performance results.



Note: All notes use this symbol. Notes contain installation, operation, or maintenance procedures, practices, conditions, or statements, that alert you to important information, which may make your task easier or increase your understanding.

Related Documents and Information

Other helpful documents and software tools are listed below. See your Symmetricom representative or sales office for a complete list of available documentation.

- TimePictra Performance Analyzer Option User's Guide
- TimePictra Performance Analyzer Option Enabling Procedure



Note: Symmetricom offers training courses designed to enhance your knowledge of TimePictra. Contact your local representative or sales office for a complete list of courses and outlines.

Where to Find Answers to Product and Document Questions

For additional information about the products described in this guide, please contact your Symmetricom representative or your local sales office. You can also contact us on the web at www.symmetricom.com.

What's New In This Guide

The following new features and enhancements are included in version 3.6.1 of the TimePictra software:

- Support is added for the following TimeProvider 3.0 functions:
 - Embedded NTP server
 - Integrated TPIU/IMC card
 - RS 422
 - CAS/CCS framing (both inputs and outputs)
 - SSM bit output programmability
- Support is added for provisioning the following SSU-2000 modules:
 - Japanese Composite Clock Input Module
 - Japanese Composite Clock Output Module
 - Japanese Sinewave Input Module
 - Japanese Sinewave Output Module
- Support is added for TimeSource 1.06.09, 1.06.10 and 1.06.11
- Corrected issues in TimeSource status panel LED
- Changed expansion shelves naming in SSU-2000
- Corrected issue caused when trying to display DCD 5.05.02 expansion shelves
- Added navigation arrows in DCD NE status
- Corrected issue for SSU-2000 NE Status auto-refresh functionality
- Enhancement: Separated SSU-2000 GPS options from other input cards in Configuration form
- Corrected issue caused when managing five full SSU-2000 shelves
- In TimeProvider configuration form, show date and time are blank but the setting feature is still available

Chapter 1 Introduction and General Information

This chapter describes the software and provides an overview of the system configuration and system requirements.

In This Chapter

- [In This Guide](#)
- [Naming Conventions](#)
- [Software Description](#)
- [Features and Enhancements – Version 3.6](#)
- [System Overview](#)
- [System Requirements](#)
- [Supported Network Element Firmware](#)
- [TimePictra On-Line Help](#)
- [Responsibilities of the System Administrator](#)
- [Prerequisite Knowledge](#)
- [Related Documentation](#)
- [The Administration Utility](#)

In This Guide

The *TimePictra Administrator's Guide* provides information necessary to manage and maintain the TimePictra hardware and software. It makes the assumption you have experience with the HP-UX operating system, Oracle database administration, Oracle 9, and Oracle 9 Application Server.

This guide includes the following topics:

- Features supported in the current version of the software as well as a modular description of the software
- System requirements
- Basic system administration tasks, such as starting and stopping the software, and routine system administration
- Installing and upgrading the software license
- System backup and recovery
- Installation of the software and software upgrades

Naming Conventions

This guide uses several names to refer to the same objects. The usage of multiple terms for the same object helps define the relationship between objects in different situations. To establish naming conventions, the objects and their corresponding names are listed in [Table 1-1](#).

Table 1-1. Object Naming Conventions

Object	Names Used for the Object
TimePictra software	TimePictra application, TimePictra, software
HP-UX workstation	TimePictra workstation, TimePictra system, host system, element manager
Timing Signal Generator	TSG, SSU, NSU, BITS, NE, network element, network object
Primary Reference Source	PRS, PRC, GPS, NE, network element, network object
HP-UX 11: Minimal Technical Operating Environment	HP-UX, 11, MTOE, Unix

Software Description

TimePictra provides an easy-to-use graphical user interface (GUI) for the management of NEs that make up a synchronization network. NEs are managed via a network connection between the host system and each NE. Once this connection is established, the software can be used to monitor alarms, modify the topology of the synchronization network, manage the configuration of the individual NEs in the network, and perform other network management functions on them.

TimePictra Features

The following sections explain the feature set of TimePictra. The first section explains the features included in the pre 3.1 release of TimePictra, and subsequent sections explain the additional features and enhancements in each subsequent release of the TimePictra software.

Features - Pre-Version 3.1 Release of TimePictra

The following features are included in the pre-version 3.1 release of the TimePictra software:

- Support for the following NE types:
 - TimeHub 5500
 - Net Sync 55400/55409
 - Net Sync 55300 (fault management only)
 - TimeSource 3000/3100/3500/3600
 - DCD
 - TSG-3800
 - PRR10
 - SSU-2000 (fault management only)
- Ability to manage synchronization networks consisting of up to 1500 Network Elements (NEs).
- Ability to communicate with NEs over the network using the TCP/IP and TP4 communications protocols.
- Adherence to TNM standards
- Integration with industry standards: Oracle, HP Openview, HP-UX, Windows.
- Single screen graphical representation of the synchronization network topology using HP Openview Network Node Manager. Color status indicates the severity of alarms originating at nodes within the network.

- Web-based graphical user interface that can be viewed on supported platforms capable of browser based connections to the world-wide-web, with color status indicating the severity of alarms originating at nodes with the network. Web presentation is via a combination of HTML pages and Java applets. The main Web-based screen is referred to as the Launch Pad, and it is from the Launch Pad that other management activities are launched during Web sessions.
- TimePictra status propagation rules to indicate changes in status of network elements at the lower levels of the containment hierarchy. Status propagation is visible in the Openview map as well as the Launch Pad.
- Synchronization trails to allow assignment of input to output connectivity between NEs. Visual representation of sync trails is viewable via a form, and on Openview Maps directly.
- Network Element Status display, which can be used to remotely view the status of selected panel indicators from a specified NE.
- An Alarm Viewer and Event History Log, which provide sorting and filtering capability for effective ordering and displaying of current alarms and other events. Alarm and event details are available along with the ability to acknowledge and discharge current alarms.
- Fault analysis, which provides the functionality to analyze the number and type of alarms and events generated by selected NEs over a given period of time.
- Forced alarm synchronization, in which the user can selectively force the system to compare a list of active alarms from a selected NE to the alarms that are stored in the TimePictra database for that NE. The system then transfers any alarms that are in the TimePictra database but no longer active in the NE from the Alarm Viewer to the Event Log.
- Alarm auto-synchronization daemon that ensures alarms on management system, match the current alarms on the NE.
- Heartbeat task, which provides automatic, periodic checking of connectivity of the host system to all managed NEs.
- Performance Monitoring, which collects and displays performance measurement data for a variety of NE input channel measurements in either line, column, or tabular format. The performance monitor allows the display of some measurements against a selection of performance masks, as well as against previously recorded measurement data. (performance history data)
- Inventory management, which allows for the tracking of all installed hardware down to the component level. Much of the hardware is auto-discovered when the NE is first managed by the system.
- Ability to view and modify the configuration of any NE that is actively being managed by the system.
- Three different levels of user access determine the level and capability each user will be granted. Management domains add additional security while also providing organizational views for the NEs.

- Ability to download firmware code from TimePictra system to the EPROMs on the targeted NE.
- User administration of NE users as well as TimePictra users.
- Pass-through communication via TL1 commands. The pass-through screen includes command history and command prototyping capability.
- Print and report generation of alarms, events, performance data, and activity logs.
- Default templates, which may be used to compare database values against template values. Templates may be added and removed from the database.
- Direct audit of NEs to compare database values against NE values.
- Command bundles, which may be used to batch download commands to specified NEs.
- Auto Action, which allows system interaction with other applications and the end user. This powerful tool may be used to execute any command or utility when triggered by alarms or events received from any NE.
- An Activity log, which shows all activity between TimePictra and each NE.
- A Transaction log, which shows actions taken by each TimePictra user on each NE.
- Administration utilities which provide ease of use for the administration of the TimePictra platform.

Features and Enhancements - Version 3.1

In addition to the features listed above, the following features and enhancements are included in version 3.1 of the TimePictra software:

- **New Launch Pad Look and Feel** - The Launch Pad now has a look and feel which provides better resolution and distinction between NEs and domains. Domains are shown as folders in the left panel of the target list area of the Launch Pad, and NEs in the selected domain are listed in the right panel. An auto-refresh function has been added for automatic, periodic refreshing of containment tree and status information as shown in the target list area.

The Launch Pad also has improved navigation and usability features, including a menu bar, shortcut icons, and pop-up labels (tool tips). Refer to the chapter entitled *Starting and Stopping a User Session* in the TimePictra User's Guide for an explanation of the improved Launch Pad.

- **Reporting and Printing of Inventory** - The NE Inventory dialog box now contains a print function, which allows the creation and printing of formatted inventory reports. This report generation feature is similar in functionality to the report feature used in other TimePictra management functions.
- **Standard Edition of Oracle 9i Database** - TimePictra now functions with the standard edition of the Oracle 9i database.
- **Incremental Patches Incorporated** - Patch 001 has been incorporated into TimePictra.

Features and Enhancements - Version 3.2

In addition to the features listed above, the following features and enhancements are included in version 3.2 of the TimePictra software:

- Full management of the SSU-2000 network element.
- Enhancement to the Alarm Viewer filter.
- Performance Analyzer option support. The Performance Analyzer option captures performance data for use with TimeMonitor.
- Incremental Patches Incorporated.

Features and Enhancements - Version 3.3

In addition to the features listed above, the following features and enhancements are included in version 3.3 of the TimePictra software:

- Full management of the TimeProvider network element type.
- Hardware re-alignment of the NetSync 55400, TimeHub, and TimeProvider network element types.
- TP4 protocol support for the NetSync 55400 network element type.
- Fault management of DCD NEs equipped with the MIS-23 card.
- Enhanced heartbeat algorithm.

Features and Enhancements - Version 3.4

In addition to the features listed above, the following features and enhancements are included in version 3.4 of the TimePictra software:

- Modification of the NE Status, View Configuration, and Modify Configuration dialog boxes to provide support for the RS-422 Output Module, E1/2048 Output Module, and LRU Module in the SSU-2000 NE.
- Full TimePictra support for the Net Sync 55300A GPS Telecom PRS NE.
- The following security enhancements:
 - *Password Policy Enforcement*, which enforces a format policy for Web user passwords, and allows the creator of the Web user to set a password expiration time.
 - *Functionality Access Matrix*, which allows the creator of a given user to disable access to select TimePictra features and functions that are normally included in the user's default functionality access.
 - *Software licensing*, which determines the features and capabilities of a given installation of the TimePictra software, and protects against illicit installations of the TimePictra software.
- Added support for the following versions of NE firmware:
 - Net Sync 55300A - 3704D
 - SSU-2000 - H.01

- TSG-3800 - E.16
- TimeHub 5500 - 4328E

Features and Enhancements - Version 3.5

- With an all new "Alarm Mapping" feature, the Network Operations Center (NOC) can now change incoming severities of alarms to the severity they would like to see in their monitoring screens. All other modules within TimePictra would also treat an alarm with the new mapped severity. A high level of granularity is supported while creating the alarm mappings, which means that alarm mappings can be broad or made very specific.
- TimePictra's 'PM Option' until now supported scheduled collection of all performance measurement types, except for raw phase data, because raw phase data could be a large file size. "Raw Phase data scheduled collection" is now a new feature supported for SSU-2000 and TSG-3800. Large amounts of raw phase data can be collected for multiple NEs at the same time.
- Storing "User Preferences" for subsequent login is another new feature in TimePictra. The auto-refresh intervals in the Alarm-Viewer GUI and the main Launch-Pad GUI can now be stored for an individual user. Also the way the initial filter works in "Alarm Viewer" and "Event History Log" can also be stored as a preference.
- "Auto-Set Date on NE, as an option in manage operation" is now supported for SSU-2000, TimeHub, 55400, DCD and TimeSource. If the NE allows it, this feature will let users set the time on the NE to the local TimePictra server time.
- The new "Overall System Report" feature allows you to create a full report on Network Elements managed, Users, and Domains.
- Many issues in previous releases have also been fixed, along with various enhancements to status panels (especially DCD) and various graphing improvements in performance graphs displays. The "Remarks" field in the "NE Details" GUI can now hold up to 500 characters, instead of just 100.
- Added support for the following versions of NE firmware:
 - 55400 version 3724
 - TimeSource 1.06.06 and 1.06.07
 - TimeProvider 1.02.12 (fault only) and PM plots of TDEV/MTIE
 - DCD EA-20 Card
 - SSU-2000 E1-LRU Card
 - 55300 version 3807

Refer to [Supported Network Element Firmware](#), on page 40 for a listing of all NE firmware versions that are supported.

Features and Enhancements – Version 3.6

In addition to the features listed in the above sections, the following features and enhancements are included in version 3.6 of the TimePictra software:

- Support is added for the TimeProvider NE: full management of release 2.1, including GPS performance monitoring, and Japanese-specification signals; and full management of release 2.2, including the Retimer module and port name. Firmware download to the TimeProvider is also supported.
- Support is added for the TimeSource 3100 and 3600 retimer on the Status panel.
- Support is added for the 55400 NE: SSM, BPV, and CRC values appear on the Status panel.
- Support is added for the SSU-2000 NE: new firmware for the E1/2048 kHz Output module is supported.
- Added capability to update all port_names for TimeProvider and SSU-2000 (previous version allowed only port_remarks) using an Excel-readable tab-separated-value (TSV) file.
- The HE Archive outputs Unix files that now have all the fields, not just an important few.
- Database tuning for both TP and Replication. The UNDO tablespace replaces RBS tablespace to tune some database initialization parameters, which improves the database performance.
- Implement security features. TimePictra now supports reuse max, change password on initial login, failed login attempts, password lock time, disable user being inactive, concurrent session, password expiration, and password grace time.
- When the Launch Pad is started, a window appears with the number of failed login attempts and the last login time. The Transaction log includes successful and failed login and logouts, and shows the current logged-in users.
- The Performance Monitor now includes a logarithmic scale, NA data is plotted as a gap in graphics, and positive and negative values are included on bar graphs.
- The Activity log retains only the most-recent 10 heartbeat commands and responses; this reduces the chance that the raw_log table fills too rapidly when many NEs are managed.
- Many other enhancements and issues have been fixed in version 3.6 of the TimePictra software. Refer to Appendix L, General Constraints, Issues, and Enhancements in the *TimePictra 3.6 User's Guide*.

Features and Enhancements – Version 3.6.1

In addition to the features listed in the above sections, the following features and enhancements are included in version 3.6.1 of the TimePictra software:

- Support is added for the following TimeProvider 3.0 functions:
 - Embedded NTP server
 - Integrated TPIU/IMC card

- RS 422
- CAS/CCS framing (both inputs and outputs)
- SSM bit output programmability
- Support is added for provisioning the following SSU-2000 modules:
 - Japanese Composite Clock Input Module
 - Japanese Composite Clock Output Module
 - Japanese Sinewave Input Module
 - Japanese Sinewave Output Module
- Support is added for TimeSource 1.06.09, 1.06.10 and 1.06.11
- Corrected issues in TimeSource status panel LED
- Changed expansion shelves naming in SSU-2000
- Corrected issue caused when trying to display DCD 5.05.02 expansion shelves
- Added navigation arrows in DCD NE status
- Corrected issue for SSU-2000 NE Status auto-refresh functionality
- Enhancement: Separated SSU-2000 GPS options from other input cards in Configuration form
- Corrected issue caused when managing five full SSU-2000 shelves
- In TimeProvider configuration form, show date and time are blank but the setting feature is still available

Options

The following optional products are supported for the current version of TimePictra:

SNMP Agent Interface

The SNMP agent allows the TimePictra management system to communicate via the SNMP protocol to an upper level Network Management system, to allow complete integration with network operation centers.

Resiliency

The TimePictra Resiliency option provides the ability to continually replicate Oracle databases containing telecommunications network management information, thus providing a fully functioning and up-to-date backup system (Secondary Master) that can be put into immediate service if the primary network management workstation (Primary Master) fails. The Resiliency option's database replication functions also ensure that little or no raw or processed performance, alarm, event, and configuration data is lost when the primary workstation controlling telecommunications network equipment goes off-line.

Performance Analyzer

The Performance Analyzer option is a tool that is used to collect performance data from managed network elements in TimePictra. This data can then be used with Symmetricom's TimeMonitor analyzer software. This option, in conjunction with TimeMonitor, provide an advanced synchronization measurement analysis tool.

System Overview

The TimePictra software is integrated with the Network Node Manager platform and Web-based forms. The graphical user interface is, for the most part, consistent when presented either via OpenView or the Web. Use of OpenView adds the ability to view the network topology on a map. The system presents a graphical representation of the network synchronization topology and allows for management and monitoring of Network Elements (NEs).

The software can be thought of as having two main duties: transaction handling and event handling. Transaction handling involves the processing of command transactions (request-and-response actions) between the TimePictra application and the NEs in the synchronization network. Event handling involves the processing of alarms and other events from the NEs.

The software blocks are shown in [Figure 1-1](#), and briefly described in the following paragraphs.

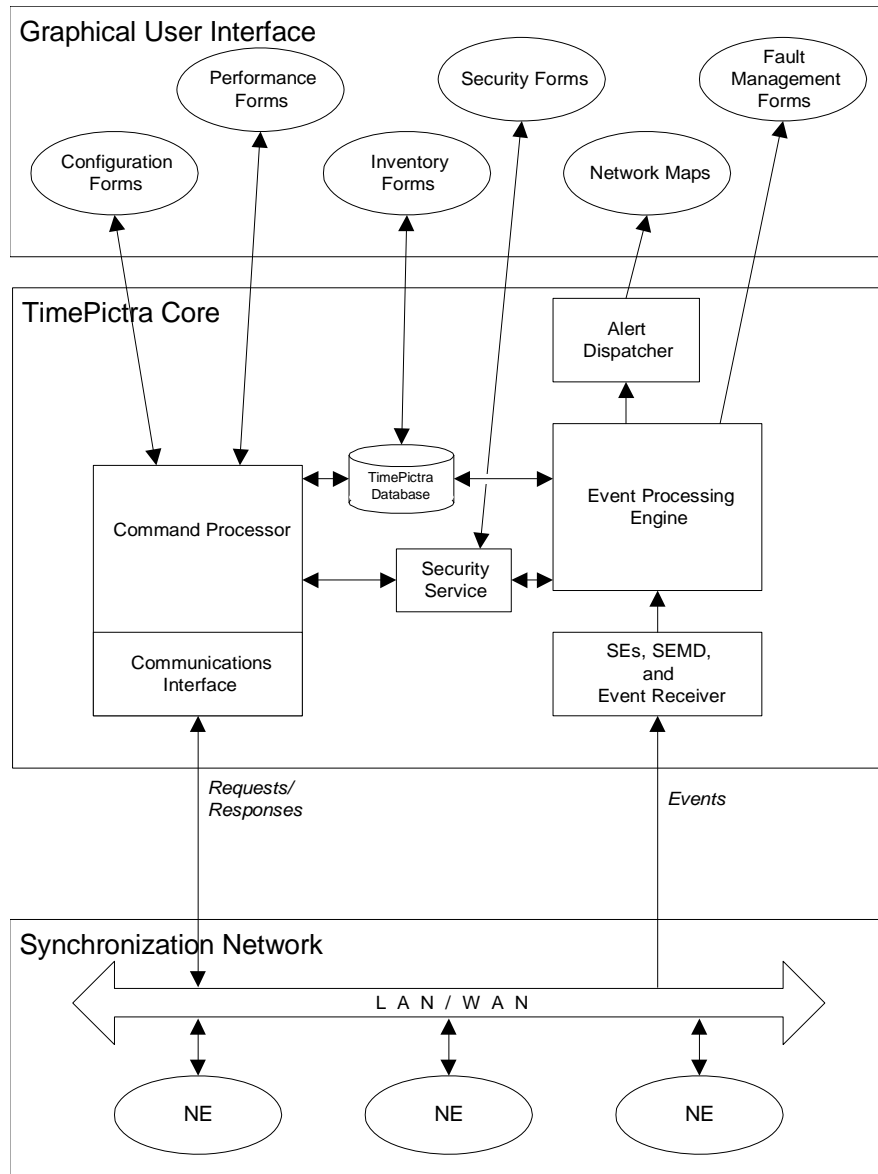


Figure 1-1. TimePictra Software Block Diagram



Note: The software modules described below do not necessarily represent actual software processes.

Event Handling

The software modules involved in Event Handling include the Event Receiver, Event Processing Engine, Alert Dispatcher, Fault Management Forms, and Network Map. The function of each of these modules is described in the following paragraphs.

Service Elements, SEMD, and Event Receiver

Service Elements (SEs) handle communication links between the software and the NEs in the network. SEs are created and deleted on an as-needed basis as NEs are managed and unmanaged. SEs also update the database regarding NE state changes, and handle response timeouts. SEs can handle communication links for approximately 50 NEs each and are created dynamically as needed

The *Service Element Management Daemon (SEMD)* is launched when the software is started. The SEMD is responsible for dynamically creating SEs as NEs are managed. Once an SE is created, the SEMD is responsible for monitoring the health of the SE, and notifying the SE when the database has a command to send to a NE under its control. When NEs are unmanaged, the SEMD is responsible for deleting SEs that no longer maintain links to any managed NEs.

The *Event Receiver* receives events from the managed NEs in the synchronization network and forwards valid events to the Event Processing Engine.

Event Processing Engine

The Event Processing Engine receives events from the Event Receiver and determines their status and type. Depending on the status and type of an event, the Event Processing Engine logs the event into the appropriate event database table and if necessary sends an alert message to the Alert Dispatcher (alert messages result from events that signal a change of status in NEs).

Alert Dispatcher

The Alert Dispatcher receives alert messages from the Event Processing Engine. It then sends messages as appropriate to the Network Maps in each registered session of software.

Network Maps

These are graphical representations of the synchronization network. Network Maps are created using the software and are comprised of either actively managed or unmanaged NE icons or domains containing groups of NEs and other domains.

Fault Management Forms

These are the user interfaces to the fault management functions of the software. The fault management forms are the Network Element Status, Alarm Viewer, Event History Log, and Fault Analysis forms. Since there can be several registered sessions of the software, there can be multiple active fault management forms. Specifically, there can be up to two Alarm Viewers or Event History Logs open per OVW session (note that the Alarm Viewer can be invoked via the Network Element Status form).

Transaction Handling

The software modules involved in Transaction Handling include the Communications Interface, Object-Oriented Command Processing Engine, Security Service, Security Forms, Configuration Forms, Performance Forms, and Inventory Forms. The following list describes the function of each of these modules.

Communications Interface

The Communications Interface handles the connection and message transport operations between the TimePictra platform and the remote interface of the NEs. It receives TL1 requests from the Command Processing Engine and sends them to the NEs as well as receives TL1 responses from the NEs and sends them to the Command Processing Engine.

Object-Oriented Command Processing Engine

The Command Processing Engine handles transactions (request/response actions) between software processes and NEs. Depending on the nature of the transaction, the Command Processing Engine might interface with the configuration database, or directly with the NE.

As an example, if a software process requests the current configuration of an NE, the Command Processing Engine will extract the necessary information from the database if it's available, or it will generate and pass the necessary TL1 commands to the Communications Interface in order to retrieve the configuration information from the NE. When handling a response, the Command Processing Engine receives the TL1 response from the Communications Interface, extracts the necessary information, and appropriately processes it (passes the response data to the requesting process, updates the database, etc.).

Security Service

Provides security management functions for the software. Security class, level, and authentication are provided by the Security Service.

Security Forms

These are the user interfaces to the security management functions of the software. The current software release contains forms for system user and NE user administration, and management domain administration.

Configuration Forms

These are the user interfaces to the configuration management functions of the software. The configuration forms include the current NE configuration forms and the Firmware Download form.

Current NE configuration modifications made using the Configuration:Modify form take priority over modifications made via a local interface. Since there can be several registered sessions of the software, there can be multiple active Configuration forms. Specifically, there can be no more than one Configuration:Modify form open per NE. No more than two Configuration:View forms per OVW session is recommended.

Performance Forms

This is the user interface to the performance management functions of the software, called the Performance Monitor. Since there can be several registered sessions of the software, there can be multiple active Performance forms. Specifically, there should be no more than one Performance Monitor form open per NE (no more than two per OVW session is recommended).

Inventory Forms

This is the user interface to the inventory management functions of the software. Since there can be several registered sessions of the software, there can be multiple active Inventory forms. Specifically, it is recommended that there be no more than two Inventory forms open per OVW session

Web Subsystem

The web subsystem facilitates the management of network elements through a Web-based graphical user interface. The GUIs are Oracle Forms-based, using Oracle JInitiator. Display on client platforms is handled through Java applets, which are downloaded on-demand from server to client from the Oracle 9i Application Server, which runs on the TimePictra server platform. The TimePictra database serves as the central repository for network management-related information.

[Figure 1-2](#) shows the major subsystems that comprise the Web subsystem.

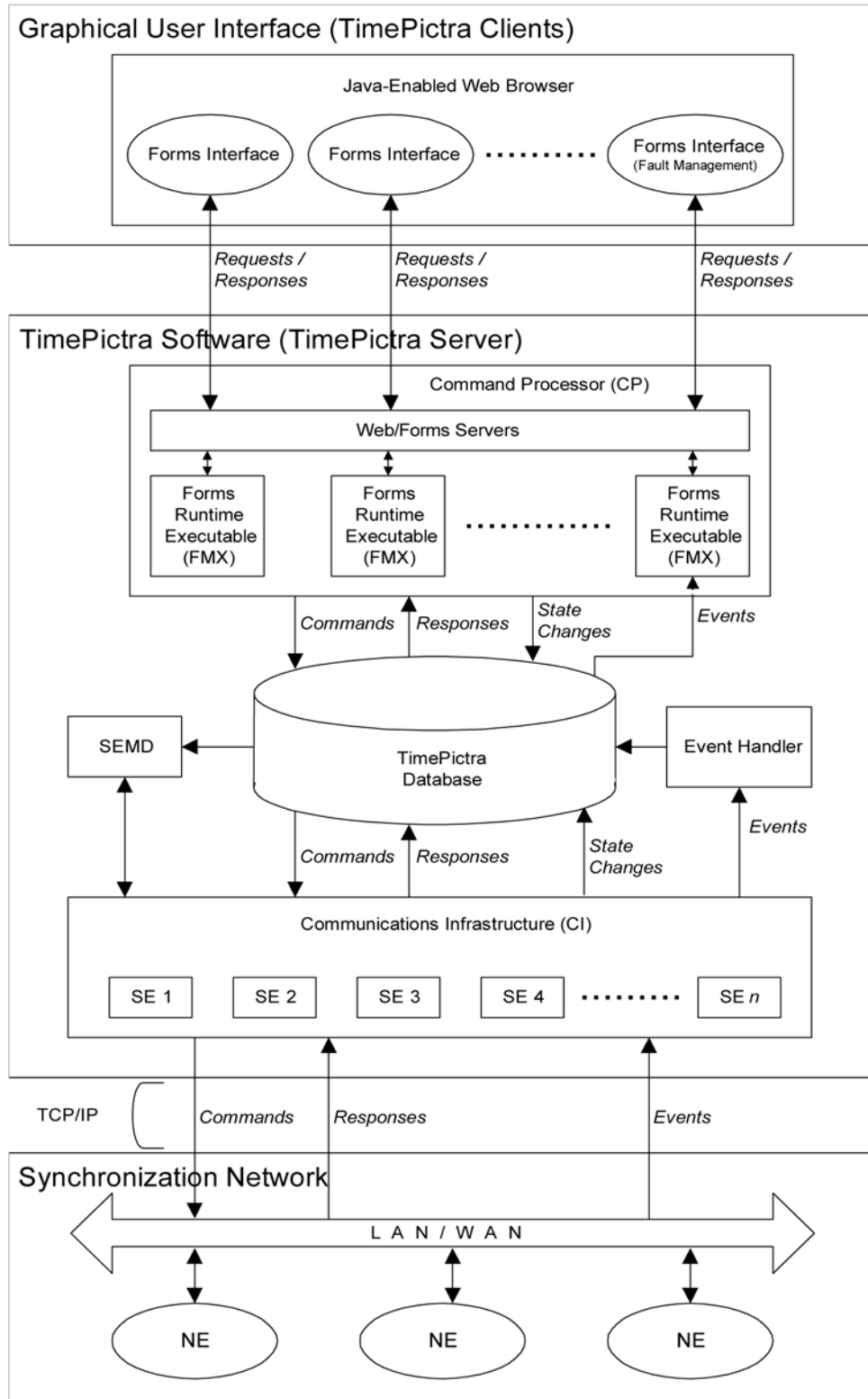


Figure 1-2. Block Diagram

The following brief descriptions explain the general responsibilities of the major subsystems, and their function during transaction handling and event handling operations.

Communications Infrastructure and Service Element Management Daemon

The *Communications Infrastructure (CI)* subsystem is made up of *Service Elements (SEs)*, that handle the communication links between the software and the NEs in the network. SEs are created and deleted on an as-needed basis as NEs are managed and unmanaged. SEs also update the database regarding NE state changes, and handle response timeouts. SEs can handle communication links for approximately 50 NEs.

The *Service Element Management Daemon (SEMD)* is launched when the software is started. The SEMD is responsible for dynamically creating SEs as NEs are managed. Once an SE is created, the SEMD is responsible for monitoring the health of the SE, and notifying the SE when the database has a command to send to a NE under its control. When NEs are unmanaged, the SEMD is responsible for deleting SEs that no longer maintain links to any managed NEs.

During transaction handling, the SEs forward TL/1 commands from the database to the NEs under their control. They also capture response streams from the NEs, place them into the database, and update the TL1_State in the database to signal to the Command Processor that a response is available (TL1_State serves as a signal between the various software subsystems as to the status of TL/1 commands and responses). SEs also parse the response stream for events, and forward the events to the Event Handler as part of event handling.

Event Handler

The *Event Handler* receives all events that have been parsed from the NE response streams by the SEs, and forwards those events that are valid to the TimePictra Database.

TimePictra Database

The TimePictra Database serves as the central data repository for network element management information, as well as information regarding the other TimePictra subsystems. The database contains tables that store information regarding the configuration attributes of the NEs, the state of the NEs, pending TL/1 commands, responses from NEs, and NE alarms and events.

During transaction handling, the TimePictra database receives and stores pending TL/1 commands from the Command Processor. The TimePictra database also receives and stores responses that have been forwarded from SEs. As part of event handling, the TimePictra database receives and stores alarms and events that have been forwarded by the Event Handler, and forwards these events on-request to fault management-related Forms Runtime Executables (FMXs).

Command Processor

The *Command Processor (CP)* contains the Oracle *Web Server* and is distributed across various *Forms Runtime Executables (FMXs)*, and an associated database library. A given FMX is started when the user starts the associated Forms Interface by invoking a dialog box associated with the TimePictra user session.

During transaction handling, an FMX receives requests from its associated Forms Interface, constructs the TL/1 commands that are necessary to satisfy the requests, forwards the TL/1 commands to the TimePictra database, and updates the TL1_State to signal the SEMD that a command is pending. For responses, an FMX receives pertinent TL/1 responses from the TimePictra database, extracts the information necessary to satisfy the original Forms Interface requests, and sends the final response information to the associated Forms Interface in the client session. The FMXs that are associated with Fault Management operations handle the retrieval, processing, and forwarding of alarm and event information from the TimePictra Database to the associated Forms Interfaces (Launch Pad, Alarm Viewer, and Event Log) on-demand as part of event handling.

Graphical User Interface

In the Web subsystem, the Graphical User Interface (GUI) consists of *Forms Interface* applets that run within a *Java-Enabled Web Browser*, typically Internet Explorer. The Web Browser uses the Oracle JInitiator plug-in, which is the Oracle Java Virtual Machine that allows Oracle Developer applications, such as Forms, to run within the browser. The Forms Interfaces simply pass user actions to the associated FMXs in the CP, and display responses to the user.

Upon TimePictra session start-up, the browser launches a separate HTML page. From that page, the initial Forms Interface applet - the "Launch Pad" - starts. All other Forms Interface applets are then spawned from the "Launch Pad."

Heartbeat, Configuration Alignment, and Alarm Synchronization Processes

The software uses a Heartbeat process to periodically check the connectivity between TimePictra and each NE being managed. The Configuration Alignment (Config_Align) daemon ensures that the settings of certain NE types as stored in the TimePictra database are the same as the NE's actual settings. An Alarm Synchronization process ensures that the alarms as displayed to the user match the alarms active at the NEs. The following paragraphs explain these processes:

Heartbeat Daemon

A Heartbeat task, also known as the *Heartbeat job*, periodically checks to determine whether or not each NE is available (with the exception of those NEs of the "Generic" NE Type).

In operation, the Heartbeat task goes through the list of managed NEs in the TimePictra database and performs the following function on each NE:

Every 15 to 20 minutes, the Heartbeat daemon starts up and sends TL1 commands simultaneously to each network element, then waits a “common” waiting period of 150 seconds for the NEs to respond to the command. After the “common” waiting period expires, the Heartbeat daemon processes the responses from the NEs, sets the “available” flag in the database to FALSE for any NEs that do not respond, and generates a “network element not available” (NENA) system alarm for those NEs. If the SNMP option is installed, the SNMP agent also sends a trap to indicate the alarm. To reduce the size and increase the amount of meaningful data in the activity log, only the last 10 heartbeat commands and responses are stored.



Note: An NE’s “available” flag is used by TimePictra to display the status of the NE to the user.

- For NEs that are marked as “unavailable” in the TimePictra database (that is, have their “available” flag set to FALSE), the Heartbeat daemon sends TL-1 commands to them every 3 to 4 minutes, and waits for their response. For any NE that responds, the Heartbeat daemon sets its “available” flag to TRUE, and clears its NENA system alarm (if the SNMP option is installed, the SNMP agent also sends a trap to indicate the alarm has been cleared). This part of the process repeats every 3 to 4 minutes for unavailable NEs.
- In addition, the following further processing is performed for NetSync 55400, TimeHub 5500, and TimeProvider NEs that respond to the TL-1 commands sent by the Heartbeat daemon:
 - The Heartbeat daemon compares the “last configuration change time” that is returned as part of the NE’s response against the “last configuration change time” field that is stored in the TimePictra database for the NE. If the two values are different, the Heartbeat daemon sets the NE’s “aligned” flag to FALSE.



Note: The state of the “aligned” flag is used by the Config_Align daemon. Refer to [Configuration Alignment](#), on page 37 for more information.



Note: If the date on a unix machine is moved backwards, heartbeat does not work until the date matches the last heartbeat time. To re-enable heartbeat, you can:

1. Delete and then re-create the NE, or
 2. Update the last heartbeat time for each NE in the database to match the current time in the unix machine.
-

Configuration Alignment



Note: The Configuration Alignment process applies only to NetSync 55400, TimeHub 5500, and TimeProvider NEs that are being managed by TimePictra.

When modifications to an NE's configuration are made using TimePictra's Modify Configuration dialog box, TimePictra automatically ensures that the NE's configuration is *aligned* with its configuration as stored in the TimePictra database. Whenever some other application, such as local Craft software, Telnet, or the TimePictra Pass-Through Interface dialog box modifies an NE's configuration, those changes are not automatically stored in the TimePictra database, hence, the NE's actual configuration becomes *unaligned* with the database.

The TimePictra Configuration Alignment process, also known as the *Config_Align job*, automatically re-aligns the configuration of any NEs that are determined to be unaligned by the Heartbeat job (see [Heartbeat Daemon](#), on page 35).

In operation, when the Heartbeat job determines an NE's configuration to be unaligned, the Config_Align daemon activates and performs a background manage operation on the NE, and logs a new entry into the Transaction Log. If the SNMP option is installed, the SNMP agent also sends a "Remarks Attribute Value Change" trap to indicate the alignment operation has taken place.



Note: A typical background manage operation can involve the uploading of hundreds or thousands of attributes from an NE to TimePictra over the network, depending on the NE involved.

To avoid malfunctions, the Config_Align daemon contains the following features:

- If, for some reason, the Config_Align daemon does not receive any alignment requests within 30 minutes, it activates and checks for alignment requests.
- If an NE is unaligned and the Modify Configuration dialog box is currently opened for it, the Config_Align daemon marks the NE as "manage later," and waits until the Modify Configuration dialog box is closed before performing the alignment operation again for that NE.
- If an NE is currently reachable on the network but the background manage operation fails, the Config_Align daemon marks the NE as "error in manage," and tries the background manage operation again within six hours (with an average of three hours). If that re-try fails, subsequent attempts take place every six hours until the background manage operation succeeds, as after the user has successfully remanaged the NE.
- If the Config_Align daemon gets caught in an endless background manage loop, as when an unforeseen software bug causes the "last configuration change time" record to change continually, a utility, called "config_align.ks," can be run to disable (or enable) the Config_Align daemon. Refer to [Enable or Disable the Config_Align Daemon](#), on page 68 for information on the "config_align.ks" utility.

Alarm Synchronization

The software periodically obtains a list of active alarms from each NE and compares these with the alarms in its database, which are the alarms shown in the Alarm Viewer. During this comparison, any alarms that are in the TimePictra database (hence, still active in the Alarm Viewer) but are no longer active in any NE are considered to be expired alarms. When these alarms are detected, they are marked as “Cleared By System,” and transferred from the Alarm Viewer to the Event Log.



Note: In the current version, the alarm synchronization process synchronizes the alarms at start-up and then repeats every 12 hours.

The `alarm_discharge.ks` script enables and disables a confirmation query to discharge alarms. This script is described in the Discharge Alarms section in Chapter 6 of the *TimePictra User's Guide*.

System Requirements

The software requires a workstation or server running the HP UNIX (HP-UX) operating system.



Caution: To prevent possible system failures and slow response time, TimePictra *requires* a dedicated machine that runs the TimePictra application *only*. Do *not* install “third-party” applications or tools on the machine that runs the TimePictra application unless advised to do so in this or other TimePictra documentation.

This requirement is a mandatory part of the TimePictra support and maintenance contract. TimePictra is a high-performance and highly complex, feature-rich network element management system, and it requires all the resources (CPU, Memory, and Hard Disk) of the machine in order to perform its functions. Third-party applications, tools, or scripts may make it difficult for the Symmetricom support labs to effectively reproduce customer issues.

Do not install customer-developed scripts, Veritas, etc. or other third-party database administration, monitoring, maintenance scripts on the machine, since TimePictra performs all these tasks within the application.

The recommended configuration is:

- 2 GB RAM (4 GB+ for over 500 NEs) and 70 GB Hard Disk Space

- HP C3700 or higher compatible Server



Note: A C3700 or higher C-Class workstation can be used if the user configuration is four concurrent X-Term users or eight Web users. A D/K-Class server with more than one processor is recommended if the user configuration is eight concurrent X-Term users or eight+ Web users. Also, performance and load testing has shown that for over a thousand network elements, multiple processors are necessary to prevent the CPU from becoming a bottleneck. Because every network is different, it is advised to at least purchase a machine that is capable of adding an additional CPU as an upgrade for larger networks.

- 21-inch 1280-by-1024 Monitor
- DAT External Tape Drive
- HP-UX version 11i: Minimal Technical Operating Environment

Prerequisites

- Oracle 9i version 9.2.0.7.0 (Database Standard Edition), *and*:
- Oracle 9i version 1.0.2.2.2 (Application Server Enterprise Edition)
- Java SDK 1.3.1.02.00 (downloadable from the Internet)
- HP OpenView Network Node Manager release 6.2x (optional)
- Gateway machine name and IP address
- TimePictra CD
- June 2005 Quality Pack for HP-UX 11i (downloadable from the Internet)

TimePictra Web Client System Requirements (Windows NT/98/2000/XP Clients)

The following is the recommended configuration for running a TimePictra user session on a Windows Web client:

- Pentium-class computer system with P4 processor (or better)
- 512 MB of system RAM (1 GB or more recommended)
- 50 MB of free hard disk space (200 MB or more recommended)
- Microsoft® Internet Explorer version 6.0 or higher

WITH THE FOLLOWING PLUG-INS...

- Oracle JInitiator 1.3.1.22 (included with TimePictra)
- Adobe Acrobat® Reader version 5.0 or higher

OR....

- Netscape® Navigator/Communicator version 4.7 or higher

WITH THE FOLLOWING PLUG-INS....

- Oracle JInitiator 1.3.1.22 (included with TimePictra)
- Adobe Acrobat® Reader version 5.0 or higher

Supported Network Element Firmware

Table 1-2 shows the versions of communication card firmware that are supported by the TimePictra Release 3.6.1 software for each supported NE:

Table 1-2. Supported NE Firmware Versions

NE	Supported NE Communication Card Firmware Versions
TimeProvider	IOC Fw 1.01.02 (Hw 1.0), IOC Fw 1.02.12 (Hw 2.1), IOC Fw 1.03.04 (Hw 2.2), IOC Fw 1.04.02 (Hw 3.0)
TimeHub 5500	R4209C, R4315C, R4328E
SSU-2000	D.00, H.01, J.00, L.00
Net Sync 55400/55409	R3946B, R3851D, 4119D, 3724A (NIMC cards), 3724D (ITH cards)
Net Sync 55300A	3704D, 3807
TimeSource 3500/3000 (NA)	1.06.06, 1.06.07, 1.06.10
TimeSource 3600/3100 (Intl.)	1.06.04, 1.06.09, 1.06.11
DCD	5.01.05, 5.04.02, DCD 5.05.02, MIS-23 (fault management only)
TSG-3800	D.04, E.06, E.16
PRR10	D.00

TimePictra On-Line Help

The current version of the software contains an on-line help system that can be accessed from the TimePictra Main Page, which is displayed in the Web Browser, or via the OpenView menus. The help consists of indexed chapters of the *TimePictra User's Guide*. The chapters are in Portable Document Format (PDF), for display in any viewer capable of displaying files in PDF format.

Responsibilities of the System Administrator

The system administrator is responsible for maintenance of the TimePictra system. This requires the system administrator to understand both the hardware and the software installed in the server.

The user 'otroot' is the TimePictra system administrator. TimePictra system operations (Unix server side, not WEB or OpenView clients) require the user to log in as otroot, with primary group of dba. This includes TimePictra Daemons, TimePictra Database, and TimePictra Application Server. The 'otroot' user has access to both the Unix operating system and Oracle databases and therefore the password must be kept very secure.



Note: A user cannot log in to the Oracle database without first logging in as the otroot Unix user.



Recommendation: Although the Unix operating system is extremely secure, it is the customer's responsibility to carefully manage the otroot password to prevent unauthorized access. The password should only be shared with a limited number of trusted employees.

The main responsibilities of the system administrator are as follows:

- Periodic backup of system files and the system database.
- Archive of event log and performance data files.
- Updates to the operating system, software, and license when necessary.
- Implementation of system security measures.

Prerequisite Knowledge

As stated previously, the procedures in this manual assume you have HP-UX, HP OpenView, Oracle database, Developer, and Web Application Server administration experience. This knowledge is useful, and in some cases necessary when performing the tasks in this manual.

Related Documentation

In some cases, procedures in this guide might refer you to procedures or other information contained in additional documentation, such as user or TL1 programming documentation for the NEs that are manageable by TimePictra.

The Administration Utility

The procedures in this manual explain how to accomplish system administration tasks using a Software Administration Utility, also known as the “osmfadmin” utility, whenever possible. This utility provides a menu-driven interface for various system administration tasks. It also provides a help menu, from where you can view the help files for the various administration scripts, view the latest on-line guides, etc. The “osmfadmin” utility can be started by typing the following command at the login prompt.

```
osmfadmin
```

The utility is located in the /opt/osmf/utils directory. The utility can be run at any time by any valid HP-UX user, however, most operations require the user be logged in as otroot, with primary group of dba.



Notes:

1. The osmfadmin utility should be started from the otroot home directory only.
 2. If a database-related operation is attempted by any user other than otroot, the utility will notify the user that only user otroot can perform the operation.
-

The main menu and sub-menus of the “osmfadmin” utility are shown in [Table 1-3](#).

Table 1-3. “osmfadmin” Menus

Main Menu	Sub-Menus
Status	(none)
Backups	Database Backup Menu - Archive Event History/Performance Logs - Perform Online Database Backup - Return to Previous menu - Exit
Database Administration	Database Administration Menu - Startup Database - Shutdown Database - Startup TimePictra daemons - Shutdown TimePictra daemons - Create New Database - Return to Previous Menu - Exit
Web Server Administration ¹	Web Server Administration Menu - Startup Web Server - Shutdown Web Server - Show Status of Web Server - Return to Previous Menu - Exit
Help and Documentation	Help Menu - otarchive.ks - otddbbackup.ks - otdbrecover.ks - osmfweb - System Backup/Recovery - Return to Previous Menu - Exit
Exit	(none)

Note:

¹ In TimePictra systems that contain the Software Resiliency option, an additional menu becomes available between the Web Server Administration and Help and Documentation menu, called the Replication Administration Menu.

Chapter 2 Starting and Stopping TimePictra

The procedures in this chapter explain how to start and stop a server-side software session.

In This Chapter

- [Start a Software Session](#)
- [Stop a Software Session](#)
- [Error Message Troubleshooting Guide](#)

Start a Software Session

Use the following procedure to start a session of the software.



Note: All steps might not be necessary, for example, the TimePictra workstation (or server) might already be powered on.

Power-Up the TimePictra Workstation/Server

1. If the TimePictra workstation (or server) has already been powered up, skip to [Step 4](#), on page 46 under [Verify the Oracle Database is Running](#), on page 46.
2. Set the power switches on the monitor and TimePictra workstation/server to on. The power indicators light when power is switched on.

As the workstation/server starts up, it runs a series of self tests during which numerous messages appear. Once the start-up sequence is complete, the HP CDE login window appears.

3. Log in at the HP CDE login screen as `otroot`, and enter the `otroot` password.

After the login is complete, a terminal window containing the HP-UX `otroot` prompt might appear. If this window does not appear, open one.

Verify the Oracle Database is Running



Note: The Oracle database is started upon power-up of the TimePictra workstation/ server. The following steps verify it is running, and start it if necessary.

4. Type the following at the `otroot` prompt to check if the Oracle database is running:

```
ps -ef | grep -eMV10 -etnslsnr
```

The information returned should suggest that the necessary Oracle database processes are running, and should appear similar to the following:



Note: The PIDs, times, order, etc., will be different. The important fact is that the information returned should show that database-related processes are running.

```

otroot 7901 7900 0 23:14:33 ?          0:00 oracleMV10
      (DESCRIPTION=(LOCAL=YES))
      (ADDRESS=(PROTOCOL=beq)))
otroot 7457      1 0 23:11:00 ?          0:00 ora_ckpt_MV10
otroot 7451      1 0 23:11:00 ?          0:00 ora_pmon_MV10
otroot 7473      1 0 23:11:01 ?          0:00 ora_arc0_MV10
otroot 7885 7884 0 23:14:27 ?          0:00 oracleMV10
      (DESCRIPTION=(LOCAL=YES))
      (ADDRESS=(PROTOCOL=beq)))
otroot 7459      1 0 23:11:01 ?          0:00 ora_smon_MV10
otroot 7895 7882 0 23:14:28 ?          0:00 oracleMV10
      (DESCRIPTION=(LOCAL=YES))
      (ADDRESS=(PROTOCOL=beq)))
otroot 7467      1 0 23:11:01 ?          0:00 ora_s001_MV10
otroot 7475      1 0 23:11:01 ?          0:00 ora_arc1_MV10
otroot 7873      1 0 23:14:24 ?          0:00 ora_j005_MV10
otroot 7453      1 0 23:11:00 ?          0:00 ora_dbw0_MV10
otroot 7461      1 0 23:11:01 ?          0:00 ora_reco_MV10
otroot 7869      1 0 23:14:24 ?          0:00 ora_j003_MV10
otroot 7469      1 0 23:11:01 ?          0:00 ora_d000_MV10
otroot 7465      1 0 23:11:01 ?          0:00 ora_s000_MV10
otroot 7899 7898 0 23:14:28 ?          0:00 oracleMV10
      (DESCRIPTION=(LOCAL=YES))
      (ADDRESS=(PROTOCOL=beq)))
otroot 7463      1 0 23:11:01 ?          0:00 ora_cjq0_MV10
otroot 7863      1 0 23:14:24 ?          0:00 ora_j001_MV10
otroot 7455      1 0 23:11:00 ?          0:00 ora_lgwr_MV10
otroot 7471      1 0 23:11:01 ?          0:00 ora_d001_MV10
otroot 7865      1 0 23:14:24 ?          0:00 ora_j002_MV10
otroot 7871      1 0 23:14:24 ?          0:00 ora_j004_MV10
otroot 7892 7883 0 23:14:28 ?          0:00 oracleMV10
      (DESCRIPTION=(LOCAL=YES))
      (ADDRESS=(PROTOCOL=beq)))
otroot 7444      1 0 23:10:59 ?          0:00
      /opt/oracle/app/oracle/product/
      DB/bin/tnslsnr LISTENER -inherit

```

5. If the information returned in the previous step indicates the Oracle database is running, skip to [Step 8](#), on page 48. If no information is returned, continue with the next step.
6. From the Korn shell (ksh) in the otroot home directory, start the TimePictra Administration utility :

```
osmfadmin
```

When started, the TimePictra Administration Utility main menu appears.

7. Choose the following menu items, in the order shown, to start the Oracle database (enter the number next to the menu item).
 - Database Administration (from the osmfadmin main menu)
 - Startup Database (from the Database Administration menu)

Start the TimePictra-related Software Processes

8. Type the following command to start the TimePictra Administration utility if it is not currently running:

```
osmfadmin
```



Note: The above command must be run from the Korn shell (ksh), as user otroot in the otroot home directory.

When started, the TimePictra Administration Utility main menu appears.

9. Choose the following menu item to check the status of the TimePictra-related software processes:

- Status (from the osmfadmin main menu)

The report that is returned contains information on the current status of the TimePictra-related software processes. The following shows what the report will indicate if these processes are running:

```
#####  
Name                               Status  Message  
COMMAND DISPATCHER                 UP      since JAN-12-2001 11:20:27  
SEMD                                UP      since JAN-12-2001 11:20:27  
EVENT RECEIVER                     UP  
EVENT ACTION                       UP  
OV COMMAND PROCESSOR               UP  
OV ALERT                           UP  
DATABASE JOBS                      UP  
  
                                     Status of SE processes  
Port                               Status  PID      Time Started  
5000                               UP      25959   JAN-10-2001  
10:28:15  
5001                               UP      25965   JAN-10-2001  
10:28:18  
5002                               UP      25968   JAN-10-2001  
10:28:21  
  
System Health Check  
#####  
DISK SPACE within limits  
DATABASE TABLES within limits
```

10. If the status report indicates that the TimePictra-related software processes are running, skip to [Step 14](#), on page 49. If the status report indicates that any of the TimePictra-related software processes are not up (DOWN), continue with this procedure.

11. Choose the following TimePictra menu items to start the TimePictra-related software processes:

- Database Administration (from the osmfadmin main menu)
- Startup TimePictra Daemons (from the Database Administration menu)



Notes:

1. The TimePictra daemons will not start if any of the daemons are already running. If any of the TimePictra daemons are running, choose the Shutdown TimePictra Daemons menu item from osmfadmin's Database Administration menu, then choose Startup TimePictra Daemons to restart them.
 2. If a valid license file is not appropriately installed on the TimePictra system, the TimePictra daemons will not start, and a message indicating the nature of the problem will be returned. If a license file is not installed or is incorrect, it must be corrected before continuing. Refer to [Install the TimePictra License File](#), on page 54 for more information.
-

12. From the TimePictra main menu, choose Status to re-check the status of the TimePictra system.

The status report returned should indicate that all TimePictra-related software processes are up.

13. From the TimePictra main menu, choose Exit to return to the HP-UX prompt.

Start the Oracle 9i Application Server, if necessary

14. Type the following command to start the TimePictra Administration utility if it is not currently running:

```
osmfadmin
```



Note: The above command must be run from the Korn shell (ksh) as user "otroot" in the otroot home directory.

When started, the TimePictra Administration Utility main menu appears.

15. Choose the following menu items in the order shown to check if the Oracle Web-related processes are running (type the number next to the menu item to choose the item):

- Web Server Administration (from the osmfadmin main menu)
- Show Status of Web Server (from the Web Server Administration menu)

The information returned should appear similar to the following (the PIDs will be different), and should suggest that all necessary Oracle 9i AS processes are running (UP and running):

```
Status of Oracle Web server for TimePictra
#####
TimePictra related Oracle Apache processes:

otroot 11337      1  0  Oct 29  ?           0:33
  /opt/oracle/app/oracle/product/9iAS/Apache/Apache/bin/httpd -d
otroot 15625 11337  0 23:11:31 ?           0:00
  /opt/oracle/app/oracle/product/9iAS/Apache/Apache/bin/httpd -d
otroot 15622 11337  0 23:11:30 ?           0:00
  /opt/oracle/app/oracle/product/9iAS/Apache/Apache/bin/httpd -d
otroot 15623 11337  0 23:11:30 ?           0:00
  /opt/oracle/app/oracle/product/9iAS/Apache/Apache/bin/httpd -d
otroot 15627 11337  0 23:11:31 ?           0:00
  /opt/oracle/app/oracle/product/9iAS/Apache/Apache/bin/httpd -d
otroot 15626 11337  0 23:11:31 ?           0:00
  /opt/oracle/app/oracle/product/9iAS/Apache/Apache/bin/httpd -d
otroot 15620 11337  0 23:11:29 ?           0:00
  /opt/oracle/app/oracle/product/9iAS/Apache/Apache/bin/httpd -d
otroot 15608 11337  0 23:07:54 ?           0:00
  /opt/oracle/app/oracle/product/9iAS/Apache/Apache/bin/httpd -d
otroot 15624 11337  0 23:11:31 ?           0:00
  /opt/oracle/app/oracle/product/9iAS/Apache/Apache/bin/httpd -d
#####
ORACLE Forms Server Status:

  Forms Server is UP.
#####
```

If the information returned suggests that the Web-related processes are running, the TimePictra software session startup procedure is complete. If the information returned indicates that some of the related processes are not running (DOWN), continue with the next step.



Note: Use the Page Up and Page Down keys to view all of the Web Server status information if necessary.

16. Choose the following osmfadmin menu item to start the Oracle Web-related processes:

- Startup Web Server (from the Web Server Administration menu)



Note: Oracle startup messages are logged to the file /tmp/web_startup.log.

17. Repeat [Step 15](#), on page 49 to check the status of the Web Server and to ensure that all related processes are now reported and the Forms Server is UP.

Stop a Software Session

The following procedure explains how to stop TimePictra.



Caution: Failure to correctly end the session might result in corruption of system data or data loss.



Note: To perform system maintenance, such as system backup, you might need to shut down the software and related Oracle processes. When the workstation/server is properly shut down using the command:

```
shutdown -h
```

the software and related processes are brought down gracefully. If you need to shut down the software and related processes, but not the workstation or server, use the following steps.

1. Log into HP-UX as otroot, and enter the otroot password.
2. Type the following command to start the TimePictra Administration utility if it is not currently running:

```
osmfadmin
```



Note: The above command must be run from the Korn shell (ksh) as user “otroot” in the otroot home directory.

When started, the TimePictra Administration Utility main menu appears.

3. Choose the following menu items in the order shown to shut down the Oracle Web Server:
 - Web Server Administration (from the osmfadmin main menu)
 - Shutdown Web Server (from the Web Server Administration menu)
4. Choose the following menu items in the order shown to cause all TimePictra-related processes to terminate:
 - Database Administration (from the osmfadmin main menu)
 - Shutdown TimePictra Daemons (from the Database Administration menu)

5. Choose the following menu items in the order shown to shut down the Oracle database:
 - Database Administration (from the osmfadmin main menu)
 - Shutdown Database (from the Database Administration menu)
6. Choose the following menu item to check the status of the TimePictra system from osmfadmin Main Menu:
 - Status (from the osmfadmin main menu)

The status report should indicate that the TimePictra-related processes are no longer up.

Error Message Troubleshooting Guide

When starting, stopping, or checking the status of TimePictra, if you see the message 'multiple processes running' or 'more than one instance of a PID running' perform the following steps to clear the error.



Note: This error message only occurs if the previous startup or shutdown was not clean. Check the system status and if the messages persists, use the following procedure.

1. Shutdown TimePictra
2. Shutdown the Web Server
3. Shutdown and restart the Database
4. Start the Web Server
5. Start TimePictra

This should cleanup old messages and anything left out by a shutdown or restart that was not clean.

Chapter 3 Routine System Administration

This chapter explains how to install or update the software license, check the health of the TimePictra server and processes, how to archive performance history data and events, how to clean up temporary files, and how to run the config_align.ks utility.

In This Chapter

- [Install the TimePictra License File](#)
- [Check the Health of the System \(osmfssystem\)](#)
- [Check Status of TimePictra Processes \(osmfstatus\)](#)
- [Archive Performance History Data and Events](#)
- [Monitor and Maintain System Files](#)
- [Enable or Disable the Config_Align Daemon](#)

Install the TimePictra License File

The *TimePictra license file* determines the features and capabilities of a given installation of the TimePictra software. Such details as the number of users that can be created on the system, the quantity of network elements that the system can manage, and the optional features that the system can run, are specified in the TimePictra license file. The TimePictra software will not start unless a valid license file has been obtained and properly installed.

Ordering a License or License Upgrade

Authentic TimePictra license files can be obtained from Symmetricom. If, subsequent to system purchase, you wish to upgrade your system's capabilities, contact Symmetricom Global Services and request a license upgrade.

When you contact Symmetricom Global Services for an initial license or license upgrade, support personnel will ask you about your TimePictra systems and the capabilities you are requesting for each system. The support person will need to know the existing capabilities of each system, as well as the upgrades needed. The following details are needed for each TimePictra system in order to process your request:

- The license type (demonstration or permanent).
- The host name and IP Address of the system(s) on which the TimePictra software is or will be installed.
- The types of NEs (SSU, PRS, Node Clock, and/or multi-vendor) that the software will manage.
- The total number of NEs of each type that the software will manage.
- The optional modules (SNMP, Replication, PM Utility) that will be used with the software.
- The number of users to be created on the TimePictra system.

Upon processing your order, Symmetricom Global Services will supply you with a new license file containing the desired number of authentic licenses, which can then be installed as explained later in this section.



Notes:

1. The license file is based on the IP address of the system on which the TimePictra software is installed, so a unique license file is needed for each installation of TimePictra software.
 2. If the Replication option is being used, Symmetricom will supply you with two license files; one for the primary machine and one for the secondary machine.
-

The License File

The TimePictra license file is a plain ASCII text file containing the details of the license agreement. [Figure 3-1](#) shows an example TimePictra license file.

```
# TimePictra license file for "MyCompany"
# This file is not configurable! Changing this file in any way will make
# TimePictra unoperational.
#
# TimePictra IP address :1.2.3.4
# TimePictra Host name  :tpictral
# Company Name          :MyCompany
# Generated by          :user, SYMMETRICOM
# Date/Time             :Wednesday, June 02,2004 at 19:01:38
#
TimePictra 1.2.3.4 DEMO EXPIRING 30-06-2004 1CFCCBFA7E052DA0BA15DE74DE3D48B8
SSU 10000 55F3BBEE8F85D5C5AD9A15E3C7FAD398
PRS 10000 5E7E8AF9F9234518BAD4761429FFF463
NODECLOCK 10000 4AB692BAD55A8EFAD7F5E1E655A58CAD
MULTIVENDOR 10000 64445F3251633657BA1E5F0096F2098A
SNMP A725637DAF0AEDA5C3F17734E104ACE4
REPLICATION 4544ABEACE241FCF52555463B466E401
PMUTILITY C6B123424096AAF3F57B66568E7DF0D
TimePictra-USERS 20 DF4D1CC0DEA543F54A770A27FD4A011
```

Figure 3-1. Example TimePictra License File

- **Lines 1 through 10** - The first ten lines of the license file shown in [Figure 3-1](#) are comments, as indicated by the “#” character at the beginning of each line. *Only commented lines in a license file can be modified. Modifying any other lines in a license file will render the entire file useless, and installing it in a TimePictra system will render the system non-functional until an authentic license file is installed.*

The eleventh through nineteenth lines in [Figure 3-1](#) contain the actual details of the license agreement. The following explains each of these lines in the example license file:

- **Line 11** - TimePictra identifies the product, 1.2.3.4 is the system’s IP address, and DEMO EXPIRING indicates that the license is a demonstration license, set to expire on June 30, 2004. If the license is a permanent license, DEMO EXPIRING is replaced by PERMANENT, and no expiration date appears. The remainder of the line is important only to the software.
- **Line 12** - SSU 10000 indicates that the license allows up to 10000 NEs of the SSU type to be managed by the software. The remainder of the line is important only to the software.
- **Line 13** - PRS 10000 indicates that the license allows up to 10000 NEs of the PRS type to be managed by the software. The remainder of the line is important only to the software.

- **Line 14** - `NODECLOCK 10000` indicates that the license allows up to 10000 NEs of the Node Clock type to be managed by the software. The remainder of the line is important only to the software.
- **Line 15** - `MULTIVENDOR 10000` indicates that the license allows up to 10000 multi-vendor NEs to be managed by the software. The remainder of the line is important only to the software.
- **Line 16** - `SNMP` indicates that the license authorizes the software to run with the SNMP option. The remainder of the line is important only to the software.
- **Line 17** - `REPLICATION` indicates that the license authorizes the software to run with the Replication option. The remainder of the line is important only to the software.
- **Line 18** - `PMUTILITY` indicates that the license authorizes the software to run with the Performance Monitor Utility option. The remainder of the line is important only to the software.
- **Line 19** - `TimePictra-USERS 20` indicates that the license authorizes 20 total users to be created on the TimePictra system. The remainder of the line is important only to the software.

Installing the License File

1. Obtain the license file from Symmetricom.

Contact Symmetricom Global Services (SGS) using the contact information found elsewhere in this manual. Upon processing your order, SGS will send the plain-text license file as an email attachment.

2. View the license file to ensure that the details of the license agreement match what was ordered. Refer to [The License File](#), on page 55 for information on the contents of the license file.



Caution: Do not modify the contents of the license file. Modifying any lines in a license file other than those that begin with “#” will render the entire file useless, and installing it in a TimePictra system will render the TimePictra installation non-functional.

3. Contact SGS if you find any discrepancies between the license file and your order, otherwise, continue with the next step.
4. If necessary, change the name of the license file to `tp.lic`.
5. Log into HP-UX on the TimePictra system as `otroot`, and enter the `otroot` password.
6. FTP the license file to the `/opt/osmf/config/` folder on the TimePictra system.

If you are installing license files for more than one TimePictra system, ensure that the IP address listed in the file matches the IP address of the system it is being installed on.

7. Modify permissions on the file so that otroot and the dba group can read and execute the file. All other users should not be allowed to read, write to, or execute the file.

Check the Health of the System (osmfssystem)

The “osmfssystem” script is run on the TimePictra server platform to determine the overall health of the platform. Database table and disk utilization are also monitored using the script. The script is configured to run automatically (see [Automatic Script Execution](#), on page 57), or it can be run manually to perform a system health check at any time (see [Manual Script Execution](#), on page 58).



Note: The “osmfssystem” script can effectively be executed by running the “osmfadmin” utility, then choosing the Status menu item in the “osmfadmin” main menu. Certain script options cannot be included when running the “osmfssystem” script via the “osmfadmin” utility. For more options, like e-mail notification, run the “osmfssystem” script from the command line (see [Manual Script Execution](#), on page 58).

Automatic Script Execution

The “osmfssystem” script is located in the /opt/osmf/utills directory. The script is configured to run automatically, via cron, every 20 minutes. The following entry is included in the /var/spool/cron/crontabs/otroot file:

```
00,20,40 * * * * { . /opt/osmf/config/env/osmf-db.env;  
/opt/osmf/utills/osmfssystem -an; }
```

This periodic run will check disk space usage and TimePictra database table utilization. Default disk thresholds are set at product installation time. These values are configurable within the body of the “osmfssystem” script. The following are the default values.

Directory	Default Values
/	ROOT_LIMIT_PERCENT=70
/stand	STAND_LIMIT_PERCENT=60
/opt	OPT_LIMIT_PERCENT=80
/home	HOME_LIMIT_PERCENT=70
/var	VAR_LIMIT_PERCENT=80

Directory	Default Values
/tmp	TMP_LIMIT_PERCENT=80
/usr	USR_LIMIT_PERCENT=80
/*	DEFAULT_LIMIT_PERCENT=80
/SD_CDROM	CDROM_LIMIT_PERCENT=101

Each numeric value in the above table is a threshold value that represents a percent of the total space available for the respective logical volume. If the naming convention is different for the volumes, then the default limit will be selected. These values can be adjusted to fit the environment. The goal is to give some warning in case there is a problem with disk space.

The database table thresholds are preconfigured by the software and should not be changed. If any monitored tables are more than 50 percent utilized, the software will generate a warning email message which is sent to the otroot user. The mailing list can be modified to include anyone who should be notified of warnings. The ADMIN variable in the body of the “osmfssystem” script contains the list of users to notify. For non-critical database thresholds, email will be sent once a week. For non-critical disk thresholds, email will be sent once a day. For critical threshold crossings, email will be sent every time the automated script runs (every 20 minutes by default).

Manual Script Execution

The script can be run manually at any time. Note that the user must have the proper permission to access the database status information. If proper permissions are not granted, the script will ignore the request for this information when run.

The command and its options are as follows (the script is located in the /opt/osmf/utills directory):

```
osmfssystem <-a|d|c|t><n|v|nv>[h]
```

The first three options (a, d, t) determine the function that the script will perform; only one of these options should be issued per command line. The second three options (n, v, nv) determine the output of the script; if the command is issued without the “n” or “v” option, no output will be generated. The last option (h) returns the help file for the script.

Option	Description
-a	Perform all available checks for which a user has permissions.
-c	Clears the TimePictra archive and log files generated by the system, and by default runs every ten minutes in otroot's cron.

Option	Description
-d	Perform a disk space check.
-t	Check the size of and warning threshold values for the following TimePictra database tables: <ul style="list-style-type: none"> ■ historic_events ■ pm_log ■ current_alarms ■ raw_log ■ nes 50 percent is the first threshold which will generate a warning message. The user must be otroot to access this information.
-n	E-mail notification if warning conditions exist. If this option is selected, e-mail will be sent to all users assigned to the ADMIN variable in the "osmfsystem" script. E-mail will only be sent if a warning threshold has been crossed. E-mail messages are limited to once a week for database warnings, and once a day for disk warnings. Critical warning e-mail will be sent every time the script is run.
-v	Verbose output. This option must be selected to display any information to stdout.
-h	Display the help file for the "osmfsystem" script.

Example "osmfsystem" E-Mail Message

The following text might be included in an e-mail message sent by "osmfsystem" in response to the current alarms table becoming full. The e-mail, which would have the subject "WARNING: TimePictra System Status," would be sent to the otroot user and any users included in the script's ADMIN variable. Since this e-mail is being sent in response to a critical threshold crossing, it will continue to be sent every time the script runs until the condition is remedied.

```
#####
WARNING: Database Table Space threshold has been crossed
Table Space current_alarms is Greater than 100% CRITICAL
#####
```

Check Status of TimePictra Processes (osmfstatus)

The "osmfstatus" script is run on the TimePictra server platform to determine the status of various TimePictra processes, such as the Command Dispatcher, Service Element Manager Daemon (SEMD), and Service Elements (SEs). An option is included which also displays status information for each NE under control of each SE process.

The command and its options are as follows (the script is located in the /opt/osmf/utills directory):

```
osmfstatus [-v][-S SE_Port_#][-h]
```

Options	Description
-v	Indicates verbose tracing of the status. When this option is selected, status information for the network elements under control of each of the Service Elements is returned.
-S	Returns the status of only the SE connected at the port given in the SE_Port_# parameter.
-h	Displays the help file for the "osmfstatus" script.

Figure 3-2 shows an example output of the osmfstatus script when no options are given. In this example, one SE process is running at port 5018.

```
Name                Status      Message
COMMAND DISPATCHER  UP         since JUN-16-2004 10:53:11
SEMD                UP         since JUN-16-2004 10:53:11
EVENT RECEIVER      UP
EVENT ACTION        UP
OV COMMAND PROCESSOR UP
OV ALERT            UP
DATABASE JOBS       UP

                                Status of SE processes
Port                Status      PID         Time Started
5018                UP         4008        JUN-21_2004 12:59:17
```

Figure 3-2. Example "osmfstatus" Output with No Options

Table 3-1 explains the various fields in the status portion for the TimePictra processes.

Table 3-1. TimePictra Process Status Fields

Column	Description
Name	The name of the TimePictra process.
Status	UP if the process is currently running, or DOWN if the process is currently not running. The Command Dispatcher and SEMD will give an "Unknown Database Error" if the database is down.
Message	If the process is currently running, this column will give the date and time when the process was started, if it is available. If the process is currently not running, this column will be blank.

Table 3-2 explains the various fields in the status portion for the SE Processes.

Table 3-2. SE Process Status Fields

Column	Description
Port	The port at which the Service Element is connected. Each SE process will be connected at a different port.
Status	UP if the process is currently running, or DOWN if the process is currently not running.
PID	The Process Identifier of the SE process.
Time Started	If the process is currently running, this column will give the date and time when the process was started. If the process is currently not running and was shut down in a normal fashion, this column will show NA (not available). <i>Note:</i> If an SE process is forcibly shut down (killed, for example) the SEMD process will restart it.

Figure 3-3 shows a sample output of the osmfstatus script when the verbose option is used. In this example, all TimePictra processes are up, and one SE process is running at port 5018. Note that in verbose mode, status is also given for Network Elements being managed by the SE processes.

```

Name                Status      Message
COMMAND DISPATCHER  UP         since JUN-16-2004 10:53:11
SEMD                UP         since JUN-16-2004 10:53:11
EVENT RECEIVER      UP
EVENT ACTION        UP
OV COMMAND PROCESSOR UP
OV ALERT            UP
DATABASE JOBS       UP

                        Status of SE processes
=====
Port ..... 5018
State ..... UP
Process Id ..... 4008
Operational since ..... JUN-21_2004 12:59:17
Network Elements Managed :
  Name      Type      Status   Address      Port      Last Comm. Time
TIMEHUB1    TimeHub   Y/Y     192.207.8.109 2006     JUN-21_2004 18:45:21
TIMEHUB2    TimeHub   N/N     192.207.10.181 6007     JUN-21_2004 17:25:25
=====
    
```

Figure 3-3. "Example "osmfstatus" Output in Verbose Mode

The Port, State, Process Id, and Operational since fields are the same as the Port, Status, PID, and Time Started fields described above. Table 3-3 explains the various fields in the status portion for each Network Element being managed.

Table 3-3. Network Element Status Fields

Column	Description
Name	The name of the Network Element. This is the CLLI code for the NE that was entered when the NE was added to the network topology. <i>Note:</i> NE does not actually get assigned to a Service Element until the NE is managed by TimePictra.
Type	The type of Network Element.
Status	The status in this column is given in the form X/Y. The first indication (X) shows the status of the AVAILABLE flag, which is Y if the NE is responding to commands from TimePictra, or N if the NE is not responding to commands. The second indication (Y) shows the status of the SERVICE AVAILABLE flag, which is Y if the TCP/IP connection between TimePictra and the NE is working, or N if the TCP/IP connection is not working. <i>Note:</i> The above two status flags can be used to effectively troubleshoot communications problems between NEs and TimePictra. For example: - A status of N/Y can indicate that the TCP/IP connection between TimePictra and the Router is good, but that the Management card is faulty, not connected to the Router, or the connection is faulty. - A status of N/N indicates that a working connection between TimePictra and the Router does not exist. Note that a status condition Y/N will never exist since if the TCP/IP connection is not working, the NE will never respond to commands from TimePictra.
Address	The network address (IP address) of the NE.
Port	The port through which the NE is assigned to communicate with TimePictra.
Last Comm. Time	The date and time when network communications last took place between the SE process and the NE.

Archive Performance History Data and Events



Note: The purpose of the archive script described in this section is to maintain the database within limits under normal operating conditions, not for system backup purposes. Backup and recovery utilities, which are described in the System Backup and Recovery chapter, are provided to backup the system so that the system can be recovered in the event of a failure.

A process copies events and performance history data that is older than 15 days to special *archive tables* in the database. These archive tables have pre-allocated space for a large number of events. Software functionality problems might occur if the tables fill up. The archive tables, therefore, should periodically be cleaned. The following procedure can be used to export the data contained in the archive tables, and consequently clean them out.

In the following procedure, an archive script is run. This script does the following:

- Copies performance history data and events from the archive tables to a report file.
- Names the report file to reflect the date range of the data it contains.
- Deletes the information from the archive tables.
- Removes any entries that have accumulated in the event error log (which contains any events that could not be processed due to an error).

To complete the archive process, the system administrator should copy the export file to an offline storage device, such as a local tape drive, and then delete the report file from the system. The following procedure explains this.



Note: The following procedure must be performed as part of regularly-scheduled system maintenance to ensure that the system continues to operate efficiently. Symmetricom recommends that the procedure be performed at least once every week if a large number of NEs are managed.

1. If not logged into HP-UX as otroot, log in as otroot, then enter the otroot password.
2. Type the following command from the otroot home directory to start the TimePictra Administration utility:

```
osmfadmin
```

When started, the TimePictra Administration Utility main menu appears.

3. Choose the following menu items in the order shown to run the archive script (type the number next to the menu item to choose the item):

- Backups (from the TimePictra Administration main menu)
- Archive Event History/Performance Logs (from the Database Backup menu)

The archive script produces a report file in the /var/tmp directory with the name “expolddate-mrdate” where olddate is the date of the oldest data in the file, and mrdate is the date of the most recent data in the file. As an example, if the oldest data in the file was generated on June 15, 2004 and the most recent data in the file was generated on June 24, 2004, the file name would be exp040615-040624. When the archive script finishes running, the osmfadmin Database Backup Menu returns.



Note: If the archive script determines that the archive tables contain no data, the message “No events found for archiving” is returned.

The report file is a text file that can be viewed using any text editor. The report file is comma delimited and can be imported into a spreadsheet for sorting and review. The report file contains information needed to interpret the data in the file. Refer to [Example Archive Report File](#), on page 64 for an example of a typical report file.



Note: Perform the following steps to copy the file to the local tape drive.

4. Ensure that a tape is inserted into the local tape drive (/dev/rmt/0mn).
5. Exit the osmfadmin utility, then copy the report file to the tape.

You can use any of a number of methods to copy the file (tar, cpio, etc.). For example, if the file being copied to tape is exp040615-040624, the following can be used:

```
find /var/tmp/exp040615-040624 | cpio -ocmxvB /dev/rmt/0mn
```

6. After the file has been copied to the local tape drive with no errors, type the following command to delete the report file:

```
rm reptfile
```

Where reptfile is the name of the report file.

Example Archive Report File

```
Historic Events Archive
```

```
=====
```


980,TimeHub_local,IMC,3,NSA,04-05-21 13:39:43,SNPWRA,Power
Supply A failed

979,TimeHub_local,CLK2,3,SA,04-04-16 10:35:59,SNFREE,Freerun
mode

974,TimeHub_local,CLK1,3,SA,04-01-16 16:37:37,SNFREE,Freerun
mode

975,TimeHub_local,CLK1-1,3,NSA,04-01-17
16:36:49,RDSSMFL,Reading SSM Failed

976,TimeHub_local,CLK1-2,3,NSA,04-01-17
16:36:49,RDSSMFL,Reading SSM Failed

977,TimeHub_local,CLK1-10,3,NSA,04-05-13
11:35:20,INDISQ,Input disqualified

978,TimeHub_local,CLK1-11,3,NSA,04-01-17
16:36:49,INDISQ,Input disqualified

Performance Log Archive

=====

Transaction Log Archive

=====

2,I,SECW,04-05-28 12:03:54,SSU,1,ssu2000_15001,,,,,,,,

4,U,SECW,04-05-28
12:04:17,SSU,1,ssu2000_15001,,MANAGED,,N,Y,,

6,U,SECW,04-05-28
12:04:42,SSU,1,ssu2000_15001,,MANAGED,,Y,Y,,

7,,MDHARAW,04-05-28 22:07:32,Launch Pad,,DATABASE
TAMPER,USER_PROFILE Table,,,Data was tampered for the said
user.,,,

Monitor and Maintain System Files

In time, certain TimePictra-related files can become large or numerous, and adversely affect system performance. In other cases, certain files might become obsolete. Monitoring, and then truncating or deleting these files as is necessary helps ensure that the system continues to operate at a peak level of performance.

The following files should be monitored by the system administrator:

- Error and trace files in the `/opt/oracle/app/oracle/admin/MV10/bdump` directory.
- Certain temporary files in the `/var/tmp` directory.
- TimePictra log files in the `/var/opt/osmf/share/log` directory.
- The `alert_MV10.log` file in the `/opt/oracle/app/oracle/admin/MV10/bdump` directory.
- The `listener.log` file in the `/opt/oracle/app/oracle/admin/MV10/bdump` directory.

The remainder of this section explains whether maintenance of each of these groups of files involves deleting or truncating them.

Cleaning Up Error and Trace Files

Over time, error and trace files can accumulate in the `/opt/oracle/app/oracle/admin/MV10/bdump` directory. The names of these files begin with `mv10` and have the `.trc` extension.

The system administrator should periodically check the `/opt/oracle/app/oracle/admin/MV10/bdump` directory to ensure that a large number of these files have not accumulated in the directory. If a large number of the error and trace files have accumulated, type the following command to remove them:

```
rm /opt/oracle/app/oracle/admin/MV10/bdump/mv10*.trc
```



Note: In TimePictra Release 3.6.1, the Oracle archive files in the `/opt/oracle/app/oracle/admin/MV10/arch` directory are automatically deleted every 20 minutes. The TimePictra/Oracle administrator does not have to monitor them.

Cleaning Up Temporary Files

Some forms, such as the Event History Log and Alarm Viewer, will on occasion create large files in the `/var/tmp` directory. These files are created when, for example, the Event History Log dialog box is open and you scroll to view events that are out of view. In this case, the scrolled events are placed into a temporary file with the name `AAApid.TMP` (`pid` is a process identifier). If the quantity of events is large, an attempt to view all of them can result in a large temporary file.

As long as no forms are opened, there should be no temporary files of the form AAApid.TMP left in the /var/tmp directory which have TimePictra users or user otroot as owners. The system administrator might periodically check the /var/tmp directory with no forms opened to ensure that these temporary files have been cleaned up properly.

If these temporary files do appear in the directory under the above-mentioned conditions, type the following commands to remove them:

```
cd /var/tmp  
rm AAA* .TMP
```



Note: There may be more than one AAApid.TMP file in the directory. It is safe to remove them all as long as no forms are opened and they are owned by TimePictra users or user otroot. It is also important to note that there might be other files in the directory that start with AAA, but only those with the .TMP extension should be deleted. These .TMP files will only be left if there was a system or application problem which did not allow the automatic cleanup process to complete.

Truncating the alert_MV10.log and listener.log Files

Over time, the alert_MV10.log file and the listener.log file in the /opt/oracle/app/oracle/admin/MV10/bdump directory can grow to a large size. While these files must not be deleted, they can be safely truncated often as part of the disk space management effort.

The system administrator should check the size of the alert_MV10.log file and the listener.log files often, and truncate them using the following commands:

```
> /opt/oracle/app/oracle/admin/MV10/bdump/alert_MV10.log  
  
> /opt/oracle/app/oracle/admin/MV10/bdump/listener.log
```

Truncating TimePictra Log Files

Several TimePictra-related log files are stored in the /var/opt/osmf/share/log directory. Over time, these files can grow large. While these files must not be deleted, they can be safely truncated occasionally as part of the disk space management effort.

The system administrator should occasionally check the size of the log files in the /var/opt/osmf/share/log directory, and truncate them if necessary. The following procedure explains this:

1. Enter the following commands to check the size of the log files:

```
cd /var/opt/osmf/share/log
```

```
ll *.log
```

The above commands list all of the files in the `/var/opt/osmf/share/log` directory that have the `.log` extension. The file size, in bytes, precedes the month in the command output.

2. Enter the following command as many times as is necessary to truncate files that have become large:

```
> /var/opt/osmf/share/log/<fname>.log
```

Where `<fname>` is the name of the log file to be truncated.

Enable or Disable the Config_Align Daemon

The Config_Align daemon, also known as the TimePictra Configuration Alignment process, automatically re-aligns the configuration of certain NEs that are determined to be unaligned by the TimePictra software. In certain rare occasions, as when an unforeseen software bug causes an NE's "last configuration change time" record to change continually, the Config_Align daemon can get caught in an endless loop. In such cases, a utility called "config_align.ks" can be run to disable the Config_Align daemon.

The following procedure can be used as necessary to execute the "config_align.ks" utility to disable the Config_Align daemon. Note that the procedure also explains how to enable the Config_Align daemon using the utility.



Note: The "config_align.ks" utility is located in the `/opt/osmf/DB/unsupported` directory.

1. If not logged into HP-UX as `otroot`, log in as `otroot`, then enter the `otroot` password.
2. Type one of the following commands as is appropriate to run the "config_align.ks" utility, using the appropriate option to either enable or disable the Config_Align daemon:

- *To enable/disable the Config_Align daemon for a specified NE:*

```
/opt/osmf/DB/unsupported/config_align.ks NE <ne_name>  
{ENABLE | DISABLE}
```

- *To enable/disable the Config_Align daemon for all NEs of a specified type:*

```
/opt/osmf/DB/unsupported/config_align.ks NETYPE <ne_type>  
{ENABLE | DISABLE}
```

- *To enable/disable the Config_Align daemon for all NEs managed by TimePictra:*

```
/opt/osmf/DB/unsupported/config_align.ks ALL {ENABLE |  
DISABLE}
```

When the “config_align.ks” utility successfully runs, the message `DONE` is returned.

Chapter 4 System Backup and Recovery

The procedures in this chapter can be used to perform regularly scheduled backups of the TimePictra system. If a disaster occurs, such as a database or system crash that leads to data corruption, the recovery information in this chapter can be used to recover from the failure.

In This Chapter

- [System Backup](#)
- [Backup Procedures](#)
- [System Recovery](#)

System Backup

It is important to maintain a recent backup of the entire TimePictra operating system. In the event of hardware failure, operator error, or other disaster, the backup will provide the most direct path to restoration of the system and user data.

Backup Categories

The TimePictra system-level backup can be divided into three broad backup categories:

HP-UX Core System Backup

The HP-UX core system backup is an offline image backup of the boot disk. This will backup the entire disk which provides a complete path to recovery from the time the backup was performed. There should always be a HP-UX Core Backup media prepared by the System Administrator.

System Backup

This is an online backup of all files *except* the TimePictra database. (in other words, excluding the /opt/oradata directory which contains the TimePictra database files). This will backup the entire system, applications, and user files needed to recover from a system that is already running. This backup does not provide the low level formatting of the disk drive as the HP-UX core system backup does.



Note: If the TimePictra database directory (/opt/oradata) is a link, then the directory that /opt/oradata points to should be excluded from the System Backup.

One method of performing the online System Backup is with SAM, the System Administration Manager, which is part of the HP-UX product. SAM offers the Backup and Recovery menu which allows automated backups as well as interactive backups and recoveries. Files may be included or excluded when defining the scope of the backup or recovery. Each Backup may be automated and set to run at a predetermined time without user interaction.

Full and Incremental backups may be performed using SAM. Full backup will backup the entire system. Incremental backups will backup any file that has changed since the last Full backup.

It is best if the Oracle and TimePictra processes are not running for this backup. Oracle and TimePictra have processes which will have file locks. They may show some indication of this during the backup. This should not inhibit the backup from completing. For best results, however, the Oracle and TimePictra processes should be shut down. It is still possible to depend on the HP-UX Core System Backup for the system recovery at this level, if the applications cannot be interrupted. Even though the TimePictra-associated applications may be running during the backup, they *should not* be running during a system recovery.

TimePictra Database Backup

The TimePictra Server platform automatically performs nightly backups of database-related files via a backup utility which runs as a cron job. The operating system, application software, and user files should be backed up by the System Administrator.

Special considerations should be observed when backing up an online database. The database will have active files and locks that may prevent some backup programs from accessing certain files. It is strongly recommended that the TimePictra database be excluded from the system backup. The backup of the TimePictra database files should be performed using the backup utility which takes online backups, (“hot backups”) and is designed specifically for the TimePictra database.

Backup Requirements

Based on different needs and configurations, backup requirements and methods will vary. As part of the TimePictra system management solution, the following backup scenario is recommended:

HP-UX Core System Backup

Offline Core system backup should be done every 3 months, or whenever hardware additions or software changes are made. This backup will ensure a properly bootable system in the event of a disk replacement. This backup must be scheduled and users notified since the system must be offline.

System Backup

Complete backup of system (excluding the TimePictra Database) should be done once every week using SAM or other backup utility.



Note: To exclude the TimePictra database from the system backup, exclude the /opt/oradata directory. If /opt/oradata is a link, then the directory that /opt/oradata points to should be excluded.



Note: It is recommended that you shutdown the TimePictra and Oracle processes during a System Backup. This is not required, however, a greater level of data integrity is possible while the applications are not running.

TimePictra Database Backup

TimePictra database backup should be done every night using the backup utility.

The HP-UX Core System Backup should be considered very important and be kept current. Based on needs, the System Backup may be performed more or less frequently. If no changes are made to the system or user files between backups, the System Backup cycle time may be increased. If frequent changes are made to user files, then incremental backups may also be scheduled in the System Backups. The TimePictra database should be backed up at least once a day, which is the default configuration shipped with the software.

Backup Procedures

The following backup procedures are included as part of the TimePictra management solution.

HP-UX Core System Backup

The following procedure creates a system recovery tape which is a clone of the entire boot disk including all software. Most importantly, the file system infrastructure is reproduced so HP-UX will not have to be reinstalled. The backup tape allows the system to be recovered to the same point as when the backup was performed.

1. Shutdown the TimePictra platform by typing the following command:

```
/etc/shutdown -h now
```

2. Power the platform off and then back on, and then press the ESC key when the following message appears on the screen:

```
Processor is booting from first available device.  
To discontinue, press any key within 10 seconds.
```



Note: The above step initiates an attended boot.

3. Load the HP-UX Support CD in the CD-ROM drive.
4. Type `search`:

A list of all potential boot devices will be displayed, such as the following (your system might show different PATH information):

PATH Number	Device Path	Device Type
-----	-----	-----
P0	FWSCSI.6.0	SEAGATE ST32430W
P1	FWSCSI.5.0	SEAGATE ST32430W
P2	SESCSI.3.0	HP C1533A
P3	SESCSI.2.0	TOSHIBA CD-ROM
XM-5401TA		

5. Type `boot path_num`

Where `path_num` is the path number of CD-ROM device where the Support CD is loaded. For example, type `boot P3` if the CD-ROM device is P3.

6. Answer Y to the question `Interact with IPL?`
7. Type `ode copyutil` at the ISL prompt.

Note the legend of the “copyutil” output after it scans the system for devices:

`Ty` - Device Type 'D' for Disk and 'T' for Tape.
`Indx` - Index number used for referencing the device.
`Rev` - Firmware Revision of the device.
`Size` - Size of the Disk drive or "N/A" for a Tape drive.

8. Type `backup`.
9. Enter the Disk Index number of the disk to be copied.
10. Enter the Tape Index number of the tape device to copy to.
11. Load the tape into the tape drive when prompted by the “copyutil” program.
12. When ready, type `y` to continue.

Copyutil will display the status of the backup as follows:

```

.....10% completed
.....20% completed
.....30% completed
.....40% completed
.....50% completed
.....60% completed
.....70% completed
.....80% completed
.....90% completed
.....100% completed
END of BACKUP
Please wait while I rewind the tape

```

13. Switch off the power to the TimePictra platform, then switch it back on and boot the system as normal.

14. Store the Backup tape in a secure area.

System Backup

The following procedure explains how to perform a full system backup.



Note: An automated System Backup schedule can be setup in SAM. This schedule must not conflict with the “otddbbackup.ks” database backup which is automatically performed every night. A different backup tape must be used for the System Backup. The “otddbbackup.ks” database backup runs every night at 12:00 am. This time may be adjusted to fit the needs of the environment. Since the System Backup must not interfere with the database backup, the System Administrator should be available to change the tape between backup schedules. If the System Backup is performed once a week for example, then the System Administrator might choose to perform an interactive backup instead of an automated backup.

1. Log in as otroot and enter the otroot password.
2. Type the following commands to source the TimePictra environment, then start the osmfadmin utility:

```
. /opt/osmf/config/env/osmf-db.env  
osmfadmin
```



Note: The above command must be run from the Korn shell (ksh) in the otroot home directory.

3. Choose the following osmfadmin menu items to stop HP OpenView and the TimePictra-related software processes:
 - Database Administration (from the osmfadmin main menu)
 - Shutdown TimePictra daemons (from the Database Administration menu)
4. Choose the following menu items in the order shown to shut down the Web Server:
 - Web Server Administration (from the osmfadmin main menu)
 - Shutdown Web Server (from the Web Server Administration menu)
5. Choose the following menu items in the order shown to stop the TimePictra database:
 - Database Administration (from the osmfadmin main menu)
 - Shutdown Database (from the Database Administration menu)

- Exit the osmfadmin utility, then log in as root and type the following command to start SAM:

```
/usr/sbin/sam
```

- Double click on the “Backup and Recovery” icon.
- Double click on the “Interactive Backup and Recovery” icon.
- Select “Backup Device” from the list that appears.
- Select “Backup Files Interactively” from the “Actions” menu.
- Select “Specified Files” from the “Select Backup Scope” menu.
- Include the following files under “Include Files:”

```
/ >Add  
/stand >Add  
/opt >Add  
/var >Add  
/tmp >Add  
/usr >Add  
/home >Add
```



Note: In the “Include Files” list, include any other mounted logical volumes that you desire to back up.

- Exclude the following files under “Exclude Files:”

```
/opt/oradata >Add
```

- Select “OK,” then select “OK” in the box that appears.



Note: SAM might give a warning about more than one user being logged on to the system. If such a warning appears, select “Yes” to proceed.

- Select “Yes” in the Confirmation box that appears to proceed.

After you click “Yes” to confirm and proceed, SAM will begin the Backup session and will display messages similar to the following:

```
Starting interactive backup...
br_backup: Invoking fbackup. See /var/sam/log/br_log for
details.
fbackup(1421): no history is available for graph file
/etc/sam/br/graphFDAa01970 (below level 0)
fbackup(1004): session begins on Tue Jan 16 13:07:52 2001
```

In addition, each file will be listed on the display as it is backed up.

16. Allow the Backup session to complete, then exit SAM when done.

TimePictra Database Backup

There are three ways to HOT backup the TimePictra database:

- Allow the automated cron job to backup the database to tape every night at 12:00 am.
- Log in as otroot, then run the command `/opt/osmf/DB/admin/otddbbackup.ks` to back up the TimePictra database to tape, or `/opt/osmf/DB/admin/otddbbackup.ks -file dir_path` to back up the TimePictra database to files in the directory specified by *dir_path*. Refer to the `osmfddbbackup.doc` file included with the software in the `/opt/osmf/doc` directory for more information, or use the help provided as part of the `osmfadmin` utility.



Note: In order for the `otddbbackup.ks` utility to run successfully with the `-file` option, adequate free space must be available on the backup filesystem to receive the database information, and the directory path specified must already be created and be writable by the “otroot” user.

- Type the `osmfadmin` command, choose “Perform Online Database Backup” from the “Backups” menu, and choose the applicable sub-menu option. The “`osmfadmin`” utility allows interactive online database backups to tape (“Perform Online Database Backup to Tape”) as well as to a specified directory (“Perform Online Database Backup to Filesystem”).

In any case, the database backup utility produces an output, which is sent to a file in the `/tmp` directory with the file name “`backup.log.date`” where *date* is the date when the utility was run (for example, `backup.log.040109` if the utility ran on January 9, 2004). The following is an example of what the output file might look like:

```
Database backup started on Wed Dec 7 11:11:10 PST 2005
.....

List of data files copied as part of the hot backup :
.....
/opt/oradata/MV10/APPL01.DBF      1336936448
/opt/oradata/MV10/APPL02.DBF      1336936448
/opt/oradata/MV10/APPL03.DBF      1336936448
/opt/oradata/MV10/APPL04.DBF      1336936448
```

```

/opt/oradata/MV10/IND01.DBF          314574848
/opt/oradata/MV10/SYSTEM01.DBF      209717248
/opt/oradata/MV10/TOOLS01.DBF       10487808
/opt/oradata/MV10/UNDOTBS01.DBF     786434048
/opt/oradata/MV10/UNDOTBS02.DBF     786434048
/opt/oradata/MV10/UNDOTBS03.DBF     786434048
/opt/oradata/MV10/UNDOTBS04.DBF     786434048

```

List of archive redo log files backed up along with their size
.....
/opt/oracle/app/oracle/admin/MV10/arch/MV1032.ARC 4060160

List of log files backed up along with their size
.....
/opt/oradata/MV10/MV10_01A.LOG 52429824
/opt/oradata/MV10/MV10_01B.LOG 52429824
/opt/oradata/MV10/MV10_02A.LOG 52429824
/opt/oradata/MV10/MV10_02B.LOG 52429824
/opt/oradata/MV10/MV10_03A.LOG 52429824
/opt/oradata/MV10/MV10_03B.LOG 52429824

List of control files backed up along with their size
.....
/opt/oracle/app/oracle/admin/MV10/MV10_01.ctl 849920
/opt/oracle/app/oracle/admin/MV10/MV10_02.ctl 849920
/opt/oracle/app/oracle/admin/MV10/MV10_03.ctl 849920

```

Database backup completed successfully on Wed Dec  7 11:23:17 PST 2005
File filemark is 0 for /opt/oradata/MV10/APPL01.DBF
File filemark is 1 for /opt/oradata/MV10/APPL02.DBF
File filemark is 2 for /opt/oradata/MV10/APPL03.DBF
File filemark is 3 for /opt/oradata/MV10/APPL04.DBF
File filemark is 4 for /opt/oradata/MV10/IND01.DBF
File filemark is 5 for /opt/oradata/MV10/SYSTEM01.DBF
File filemark is 6 for /opt/oradata/MV10/TOOLS01.DBF
File filemark is 7 for /opt/oradata/MV10/UNDOTBS01.DBF
File filemark is 8 for /opt/oradata/MV10/UNDOTBS02.DBF
File filemark is 9 for /opt/oradata/MV10/UNDOTBS03.DBF
File filemark is 10 for /opt/oradata/MV10/UNDOTBS04.DBF
FILE filemark is 11 for archived redo log files
File filemark is 12 for redo log files
FILE filemark is 13 for control files
FILE filemark is 14 for openview files

```



Note: The filemark information will appear in the output file even when the TimePictra database is backed up to a filesystem rather than a tape.

System Recovery

In the event of data loss, data can be recovered from the backup archives. Different levels of recovery might be necessary depending on the amount of data loss. The following explains the three recovery procedures and the type of data included in each procedure.

- *Complete System Recovery* - This procedure is used if the boot disk and the HP-UX Core System is replaced. A fully functional system is produced.
- *Using SAM for Recovery* - This procedure restores applications or user files. Restoring with SAM is only necessary if the data restored in Complete System Recovery is not current. SAM allows restoration of changes since the last Complete System Recovery.
- *Restoring the TimePictra Database from Tape or Filesystem* - This procedure restores database files with the files that were backed up using the `otdbbackup.ks` script.

The three recovery procedures follow.

Complete System Recovery

This procedure is used if the boot disk and the HP-UX Core System is replaced. The procedure makes use of the HP-UX Support CD and previously created backup tape.

1. Replace the faulty drive and assure the new drive's SCSI address is set the same as the old drive. Refer to the manufacturer's hard drive documentation for setting the SCSI address. The default SCSI address for the boot disk on the TimePictra platform is "6."
2. Power the platform on, and then press the ESC key when the following message appears on the screen:

```
Processor is booting from first available device.  
To discontinue, press any key within 10 seconds.
```



Note: The above step initiates an attended boot:

3. Load the HP-UX Support CD in the CD-ROM drive.
4. Type `search`:

A list of all potential boot devices will be displayed, such as the following (your system might show different PATH information):

PATH Number	Device Path	Device Type
P0	FWSCSI.6.0	SEAGATE ST32430W
P1	FWSCSI.5.0	SEAGATE ST32430W
P2	SESCSI.3.0	HP C1533A
P3	SESCSI.2.0	TOSHIBA CD-ROM
XM-5401TA		

5. Type `boot path_num`

Where `path_num` is the path number of CD-ROM device where the Support CD is loaded. For example, type `boot P3` if the CD-ROM device is P3.

6. Answer Y to the question `Interact with IPL?`

7. Type `ode copyutil` at the ISL prompt.

Note the legend of the “copyutil” output after it scans the system for devices:

Ty - Device Type 'D' for Disk and 'T' for Tape.
Indx - Index number used for referencing the device.
Rev - Firmware Revision of the device.
Size - Size of the Disk drive or "N/A" for a Tape drive.

8. Type `restore`.

9. Enter the Disk Index number of the disk to be restored.

10. Enter the Tape Index number of the tape device to copy from.

11. Load the Core System backup tape into the tape drive when prompted by the “copyutil” program.



Note: Copyutil will check the type of disk drive to recover to. If the disk drive is different than what the backup was taken from, copyutil will ask if you want to continue. It is important that the size of the disk drive be the same as the drive the backup was taken from, and that there is enough space on the new disk to hold the data from the backup.

12. When ready, type `y` to continue.

Copyutil will display the status of the recovery as follows:

```

.....10% completed
.....20% completed
.....30% completed
.....40% completed
.....50% completed
.....60% completed

```

```
.....70% completed
.....80% completed
.....90% completed
.....100% completed
Restored Successfully
Please wait while I rewind the tape
```

13. After the Restore process completes, the data has been restored onto the new disk drive. You can now exit the program and cycle the TimePictra platform's power off and then on. When the power is cycled, the system will boot from the new installed disk.

If there were no major changes to the Operating System since the last “copyutil” backup was performed, then the following procedure can be bypassed. If any application or user files need to be recovered, perform the following procedure to recover them.



Note: All application and user files are included on the HP-UX Core Backup. You might not need to restore any other system files once the above procedure is complete.

Using SAM for Recovery

This procedure provides the example scenario where the directory named `/opt/oracle` is lost and must be recovered. Directory naming varies among systems, use the appropriate directory name when performing the following procedure.

Recover the `/opt/oracle` directory to the system.

1. Insert the correct backup tape in the tape drive.
2. Log in as root, then type the following command to start SAM:

```
/usr/sbin/sam
```

3. Double click the “Backup and Recovery” icon.
4. Double click the “Interactive Backup and Recovery” icon.
5. Select “Recovery Files and Directories...” from the “Use Remote Backup Device” menu (the “Use Remote Backup Device” menu is part of the “Actions” menu).
6. In the “Recover Files and Directories” dialog box, click the “Select Recovery Scope...” button, then click “OK.”
7. Include the following files under “Include Files:”

```
/opt/oracle >Add
```

8. Click “OK.”

Recover Database Files to Synchronize Oracle Files.

9. Perform the procedure in [Restoring the TimePictra Database from Tape or Filesystem](#), on page 83. Refer to that procedure for information on recovering the TimePictra database. The TimePictra database is brought to the level of the `otdbbackup.ks` run from which the recovery is being done in that procedure.

Restart the Oracle Database.

10. Start the `osmfadmin` utility (type `osmfadmin`), then choose the following menu items in the order shown to re-start the Oracle database:

- Database Administration (from the `osmfadmin` main menu)
- Startup Database (from the Database Administration menu)

The system is now at the same point as when `otdbbackup.ks` was last run.

Restoring the TimePictra Database from Tape or Filesystem

This procedure restores the TimePictra database from a tape or filesystem with files that were backed up using the `otdbbackup.ks` script.



Caution: The Oracle database and HP OpenView must be shut down prior to performing the following steps. The following can be used to shut down the Oracle database and HP OpenView:

- Type the command `osmfadmin` as `otroot` from the `otroot` home directory.
- Choose the following `osmfadmin` menu items:
 - Database Administration (from the `osmfadmin` main menu)
 - Shutdown TimePictra Daemons (from the Database Administration menu)
 - Shutdown Database (from the Database Administration menu)

The important point is that it is necessary for all Oracle processes to be shut down.

1. If not logged into HP-UX as user `root`, log in as `root`, then enter the root password.
2. Ensure that the TimePictra environment is set by typing the following command:

```
. /opt/osmf/config/env/osmf-db.env
```



Note: The above command must be run from the Korn shell (`ksh`).

3. If the database is to be recovered from tape, insert the tape containing the files that you want to recover (the `otdbbackup.ks` tape) into the local tape drive (disregard this step if the database is to be recovered from a directory).

4. Type either of the following commands as is appropriate to produce a listing of the files to be recovered:

- `/opt/osmf/DB/admin/otdbrecover.ks -list` if recovering from tape
- `/opt/osmf/DB/admin/otdbrecover.ks -list -file dir_path` if recovering from the files in directory path *dir_path*

There should be several sets of files listed. For example, the listing returned should appear similar to, but not necessarily identical to, the following if recovering from tape:

```
Tape filemark is 0 for /opt/oradata/MV10/APPL01.DBF
Tape filemark is 1 for /opt/oradata/MV10/APPL02.DBF
Tape filemark is 2 for /opt/oradata/MV10/APPL03.DBF
Tape filemark is 3 for /opt/oradata/MV10/APPL04.DBF
Tape filemark is 4 for /opt/oradata/MV10/IND01.DBF
Tape filemark is 5 for /opt/oradata/MV10/SYSTEM01.DBF
Tape filemark is 6 for /opt/oradata/MV10/TEMP01.DBF
Tape filemark is 7 for /opt/oradata/MV10/RBS01.DBF
Tape filemark is 8 for /opt/oradata/MV10/TOOLS01.DBF
Tape filemark is 9 for redo log files
Tape filemark is 10 for archived redo log files
Tape filemark is 11 for control files
Tape filemark is 12 for OpenView files
```



Note: If recovering from a filesystem, the individual files to be recovered will be listed. Since the RBS tablespace is replaced by UNDO table space, there are slight changes in the output for recovery from tape. Refer to [Example “otdbrecover.ks -recover” Output](#), on page 85.

If the listing verifies that the proper files are available, continue with the next step. If the listing indicates that the files are invalid, no listing is returned, or a message is returned indicating there is some other problem, troubleshoot the problem before continuing.

5. Type either of the following commands as is appropriate to recover the files:

- `/opt/osmf/DB/admin/otdbrecover.ks -recover` if recovering from tape
- `/opt/osmf/DB/admin/otdbrecover.ks -recover -file dir_path` if recovering from the files in directory path *dir_path*

As each file is recovered, its name is displayed on the screen (refer to the example output following this procedure). When the recovery procedure is complete, the prompt returns to the screen.

6. Start the `osmfadmin` utility (type `osmfadmin`), then choose the following menu items in the order shown to re-start the Oracle database:

- Database Administration (from the osmfadmin main menu)
- Startup Database (from the Database Administration menu)

The system is now at the same point as when otddbbackup.ks was last run.

Example “otdbrecover.ks -recover” Output

The following is an example of what the output might look like when recovering the TimePictra database from a filesystem:

```
User verified
```

```
WARNING:
```

```
#####  
You are about to recover TimePictra oracle database.  
If you have an existing TimePictra database and do not  
want to loose the data, DO NOT run ./otdbrecover.ks .  
This process will replace all TimePictra Oracle database  
related files. Shutdown all Oracle processes  
before attempting a recovery.
```

```
You must have the TimePictra otddbbackup tape or files in place.
```

```
#####  
Do you wish to proceed with the recovery process?  
enter y or n
```

```
Y  
./otdbrecover.ks will proceed now  
Removing old Archive files  
Recovering files
```

```
WARNING
```

```
You about to overwrite files which could cause data loss  
Do you wish to continue? (y or n)
```

```
Y  
/opt/oradata/MV10/APPL01.DBF  
/opt/oradata/MV10/APPL02.DBF  
/opt/oradata/MV10/APPL03.DBF  
/opt/oradata/MV10/APPL04.DBF  
/opt/oradata/MV10/IND01.DBF  
/opt/oradata/MV10/SYSTEM01.DBF  
/opt/oradata/MV10/TOOLS01.DBF  
/opt/oradata/MV10/UNDOTBS01.DBF  
/opt/oradata/MV10/UNDOTBS02.DBF  
/opt/oradata/MV10/UNDOTBS03.DBF  
/opt/oradata/MV10/UNDOTBS04.DBF  
/opt/oradata/MV10/MV10_01A.LOG  
/opt/oradata/MV10/MV10_01B.LOG  
/opt/oradata/MV10/MV10_02A.LOG
```

```
/opt/oradata/MV10/MV10_02B.LOG  
/opt/oradata/MV10/MV10_03A.LOG  
/opt/oradata/MV10/MV10_03B.LOG  
/opt/oracle/app/oracle/admin/MV10/arch/MV1019.ARC  
/opt/oracle/app/oracle/admin/MV10/MV10_01.ctl  
/opt/oracle/app/oracle/admin/MV10/MV10_02.ctl  
/opt/oracle/app/oracle/admin/MV10/MV10_03.ctl  
/var/opt/OV/share/databases/openview/defmap/defmap_db.pag  
/var/opt/OV/share/databases/openview/defmap/defmap_db.dir  
/var/opt/OV/share/databases/openview/mapdb/mapinfo.pag  
/var/opt/OV/share/databases/openview/mapdb/mapinfo.dir  
/var/opt/OV/share/databases/openview/mapdb/default/current/map.lock  
/var/opt/OV/share/databases/openview/mapdb/default/current/submapinfo.pag  
/var/opt/OV/share/databases/openview/mapdb/default/current/submapinfo.dir  
/var/opt/OV/share/databases/openview/ovwdb/ovserver  
/var/opt/OV/share/databases/openview/ovwdb/current/id_keeper.pag  
/var/opt/OV/share/databases/openview/ovwdb/current/id_keeper.dir  
/var/opt/OV/share/databases/openview/ovwdb/current/field_info.pag  
/var/opt/OV/share/databases/openview/ovwdb/current/field_info.dir  
/var/opt/OV/share/databases/openview/ovwdb/current/obj_info.pag  
/var/opt/OV/share/databases/openview/ovwdb/current/obj_info.dir  
/var/opt/OV/share/databases/openview/ovwdb/current/value_info.pag  
/var/opt/OV/share/databases/openview/ovwdb/current/value_info.dir  
/var/opt/OV/share/databases/openview/ovwdb/current/name_info.pag  
/var/opt/OV/share/databases/openview/ovwdb/current/name_info.dir  
/var/opt/OV/share/databases/openview/ovwdb/current/enum_info.pag  
/var/opt/OV/share/databases/openview/ovwdb/current/enum_info.dir  
18254161 blocks  
Recovery passed
```



Note: After recovery is complete, OpenView users will need to restart their client sessions to see the OV maps correctly.

Chapter 5 Installation

The software is shipped on a CD-ROM that contains the current version of the software. The procedures in this chapter explain how to install or upgrade TimePictra, as well as install the necessary supporting software.

In This Chapter

- [Overview](#)
- [Initial Installation](#)
- [Upgrading TimePictra](#)
- [Additional details on Upgrading TimePictra in a Resiliency Scenario](#)
- [Additional Details on Patching TimePictra in a Resiliency Scenario](#)
- [Removing TimePictra](#)

Overview

The TimePictra Release 3.6.1 software is shipped on a CD-ROM. The CD-ROM contains the necessary files to install TimePictra Release 3.6.1 either as an initial installation, or as an upgrade to an existing TimePictra installation.

This chapter contains the following sections:

- **Initial Installation:** Go to this section when TimePictra Release 3.6.1 is to be installed for the first time, and no TimePictra database currently exists.



Caution: If the procedures in the Initial Installation section are used to upgrade the software, the entire TimePictra database will be destroyed. When upgrading the software, see [Upgrading TimePictra](#), on page 107.

- **Upgrading TimePictra**, on page 107: Go to this section when an earlier version of the TimePictra software is currently installed, and is to be upgraded to TimePictra Release 3.6.1.
- **Removing TimePictra**, on page 113: Go to this section when the TimePictra product and all relevant data is to be permanently uninstalled from the server.

Initial Installation



Caution: If the procedures in this section are used to upgrade the software, the entire TimePictra database will be destroyed. When upgrading the software, go to the section entitled [Upgrading TimePictra](#), on page 107.

Ensure that the hardware and software that the TimePictra system will be installed on meets minimum system requirements.

Refer to [System Requirements](#), on page 38 in [Chapter 1](#) for a listing of the current hardware and software system requirements.

Install HP-UX 11i Minimal Technical Operating Environment

The following procedure explains how to install HP-UX 11i.

1. Insert the HP-UX 11i Installation CD into the CD-ROM drive on the system on which TimePictra is to be installed, then start the system.
2. When prompted by the system to select a different graphics monitor type, do not act, letting the displayed countdown timer expire instead.
3. Press any key when the following message appears:

Processor is booting from the first available device.
To discontinue, press any key within 10 seconds.

4. At the prompt, type `search`, then press **Enter**. This will make the system search all bootable devices.
5. At the prompt, type the following:

```
boot <path_no>;
```

Where `<path_no>` is the displayed Path Number for the device that denotes the CD-ROM drive, for example, `boot P0`.

6. Enter `No` when the `Interact With IPL` message appears.
After typing `No`, the system will do some processing, during which time various messages appear on the screen.
7. The next menu displayed by the system asks you to select the language to be installed. Enter the *number* for the desired language (for example, if US English is desired, enter `26`), then press **Enter** twice; once to enter the choice, and then a second time when the confirmation message appears to confirm the choice.



Note: For the following several steps, the display is actually an ASCII-character representation of a GUI, and the mouse is not active. To make GUI selections, use the arrow keys on the keyboard as well as the **Tab** key to move the cursor around the interface, and then press the **Enter** key to enter selections.

8. Select the `Install HP-UX` option from the menu that appears, then press **Enter**.
9. In the resulting “User Interface and Media Options” screen, select the **Advanced Installation** radio button, then scroll to **OK** and press **Enter**.
10. Under the subsequent menu, select the **System** tab and enter the appropriate information into the “Hostname,” “IP Address,” “subnet mask,” “time,” and “root password” fields.
11. Select the **Set Root Password...** button, then enter a root password and confirm it.
12. Select the **Network Services...** button, then configure the gateway under the **Static Routes** tab for the default destination.

After entering the appropriate information into the “Gateway (IP Address)” and “Destination Hop Count” fields, tab to **Add**, then press **Enter**.



Note: You can configure DNS if desired, but DNS configuration is not required.

13. Tab to **OK** and press **Enter** to go back to the **System** tab.



Note: If DNS was not configured, a warning will appear. Dismiss this warning by selecting **OK**.

14. Select the **File System** tab, press **Enter**, then configure the logical volumes as shown in [Table 5-1](#).

Table 5-1. Logical Volumes

Mount Dir	Usage	Size	Size Type
/stand	HFS	304	Fixed MB
/	VxFS	1000	Fixed MB
/tmp	VxFS	1000	Fixed MB
/home	VxFS	1000	Fixed MB
/usr	VxFS	4000	Fixed MB
/var	VxFS	6000	Fixed MB
/opt	VxFS	30000	Fixed MB

15. After configuring the logical volumes, select **Go!**, then press **Enter**.
16. If a confirmation screen appears, select **Go!** again, then press **Enter**.

The OS installation now starts and takes some time to complete. At some point during the installation, the system will prompt you to enter the second OS installation CD in the CD-ROM drive.
17. When prompted, enter the subsequent installation CDs in the CD-ROM drive as instructed, and press **Enter**.
18. When the OS finishes installing, the machine will reboot a few times and you will again be asked to enter a number that corresponds to your chosen language. Enter the number for the desired language, press **Enter**, then press **Enter** again in the confirmation message that appears to confirm.

After pressing **Enter** to confirm, X-Windows will start, and you will again be given a menu to choose your language.
19. Click the **English** button.
20. In the next series of screens, you will be asked to confirm your language settings. An option is provided to specify unused languages for removal. If the other languages will not be used, select the check-box to remove unused languages.
21. If desired, select the language variant (US English, UK English, etc.).

22. In the “Additional Language Selections” screen, leave the default settings intact, click **Next**, then click **Finish** on the summary screen that appears.



Note: HP-UX 11i installation is now complete.

Install the June 2005 11i Quality Pack

The following procedure explains how to install the June 2005 11i Quality Pack.

1. Log into the HP Common Desktop Environment (HP CDE) as user root, and enter the root password.
2. Download the June 2005 11i Quality Pack from the Hewlett-Packard Web site. To do this, go to www.hp.com, search for “HP-UX Quality Pack,” and download the patch file onto the server.
3. Open up a terminal window with “root” as the user.
4. Start the Unix software install utility (swinstall) by entering the following command at the shell prompt:

```
swinstall
```

5. Perform the following actions:
 - a. Under “Source Depot Path...” in the “Specify Service” screen, enter the absolute path name where the patch was downloaded (`/<depot_path>/GOLDQPK11i_11.11.depot`).
 - b. Click **OK**.
 - c. Select both packs in the “Software Selection” window, then click on **Actions, Install....**
 - d. Once install analysis passes, click **OK**.
 - e. Click **Yes** in the confirmation box that appears to start the patch installation.
 - f. Click **Done** when the patch installation is complete.
 - g. Click **OK** in the note box that appears to reboot the system.

UNIX Kernel Configuration

Use the following procedure to configure the UNIX kernel.

1. Log into the HP Common Desktop Environment (HP CDE) as user root, and enter the root password.
2. Open up a terminal window with “root” as the user.
3. Enter the following command at the prompt in the terminal window to start system administration manager:

```
sam
```

4. In the System Administration Manager screen that appears, double-click the **Kernel Configuration** icon, then double-click the **Configurable Parameters** icon.
5. In the “Kernel Configuration” screen, edit the kernel parameters shown in [Table 5-2](#), if necessary.



Note: All kernel parameters not mentioned in [Table 5-2](#) should be set to values appropriate (at least default values) for the server TimePictra will be running on.

It is recommended that a qualified user with experience in HP-UX Kernel Tuning review the parameter value changes with considerations based on available resources, such as the amount of memory, amount of CPUs, disk size and type, etc.

6. To change any of the parameters, perform the following steps:
 - a. Select the parameter to be changed.
 - b. Double click on the parameter, or select **Modify Configurable Parameter** in the **Action** menu.
 - c. Select the information in the field labeled “Formula/Value,” enter the new value shown in [Table 5-2](#), then click **OK**.



Note: Many more configurable parameters will appear in the “Kernel Configuration” screen than the ones shown below, and their order might change based on your actual hardware configuration. Simply follow the message boxes as presented to set the kernel parameters that other kernel parameters rely on.

Table 5-2. Kernel Parameters

Kernel Parameter	New Value
KSI_ALLOC_MAX	(NPROC * 8)
MAX_THREAD_PROC	256
MAXDSIZ	1073741824 bytes
MAXDSIZ_64BIT	2147483648 bytes
MAXFILES	2048 bytes
MAXFILES_LIM	2048 bytes
MAXSSIZ	134217728 bytes
MAXSSIZ_64BIT	1073741824 bytes
MAXSWAPCHUNKS	16384 ¹
MAXUPRC	((NPROC * 9) / 10)
MSGMAP	(MSGTQL + 2)

Table 5-2. Kernel Parameters (Continued)

Kernel Parameter	New Value
MSGMNI	NPROC
MSGSEG	32767
MSGTQL	NPROC
NCALLOUT	(NKTHREAD + 16) ¹
NCSIZE	((8 * NPROC + 2048) + VX_NCSIZE) ¹
NFILE	(15 * NPROC + 2048)
NFLOCKS	4096
NINODE	(8 * NPROC + 2048)
NKTHREAD	((NPROC * 7) / 4) + 16)
NPROC	4096
SEMMAP	(SEMMNI + 2) ¹
SEMMNI	4096
SEMMNS	(SEMMNI * 2)
SEMMNU	(NPROC - 4)
SEVMX	32768
SHMMAX	AvailMem
SHMMIN	1
SHMMNI	512
SHMSEG	32
VPS_CEILING	64

Note:

¹ These parameters are obsolete on 11.23 PA-RISC and IPF. They no longer need to be set. Set NCSIZE = (NINODE + 1024).

7. In the “Kernel Configuration” screen’s menu, click **Actions, Process New Kernel**, then click **Yes** in the confirmation box that appears to begin processing the kernel.
8. In the “Reboot the system” box that appears, select the **Move Kernel Into Place and Shutdown/Reboot System Now** radio button and the **Overwrite/stand/system** check-box, then click **OK**.
9. Click **OK** to dismiss the note box that appears.
10. When the confirmation box appears asking if you want to reboot, click **Yes**.

Install the Java SDK

Oracle requires that versions 1.3.1.02 and 1.2.2.13 of the Java SDK be installed on the system. Use the following procedure to install the Java SDK.

1. Log into the HP Common Desktop Environment (HP CDE) as user root, and enter the root password.
2. Mount the CD-ROM with the Java SDK depot on it, or download it from www.hp.com/products1/unix/java.
3. Open up a terminal window with “root” as the user.
4. Start the Unix software installation utility (swinstall) by entering the following command at the shell prompt:

```
swinstall
```

5. Perform the following actions:
 - a. Under “Source Depot Path...” in the “Specify Source” screen, enter the absolute path name where the depot was downloaded for SDK version 1.3.1.02:

```
/<depot_path>/sdk_13102os11.depot
```
 - b. Click **OK**
 - c. Select the pack in the “Software Selection” window, then click **Actions, Install...**
 - d. Once install analysis passes, click **OK**.
 - e. Click **Yes** to start the SDK installation.
 - f. Click **Done** when installation is complete.
6. Repeat [Step 5](#), on page 94 for SDK version 1.2.2.13.
7. Exit out of the swinstall utility by selecting **Exit** in the **File** menu.

Install Oracle 9i Database Version 9.2.0.1.0

Use the following procedure to install Oracle 9i Database version 9.2.0.1.0.

1. Open up a terminal window with “root” as the user.
2. Enter the following commands as user “root” to create symbolic links in the /usr/lib directory, as recommended by Oracle:

```
cd /usr/lib
ln -s /usr/lib/libX11.3 libX11.sl
ln -s /usr/lib/libXIE.2 libXIE.sl
ln -s /usr/lib/libXext.3 libXext.sl
ln -s /usr/lib/libXhp11.3 libXhp11.sl
```

```
ln -s /usr/lib/libXi.3 libXi.sl  
ln -s /usr/lib/libXm.4 libXm.sl  
ln -s /usr/lib/libXp.2 libXp.sl  
ln -s /usr/lib/libXt.3 libXt.sl  
ln -s /usr/lib/libXtst.2 libXtst.sl
```

3. Perform the following actions to create the “pfs_fstab” file in the /etc directory:



Note: The pfs_fstab file is used by the PFS process to mount PFS format CDs. If the pfs_fstab file has been created before in any other installation, skip this step.

- a. Enter the following command to start the vi editor and create the file:

```
vi /etc/pfs_fstab
```

- b. Using vi editor commands, edit the file to contain the following entry:

```
/dev/dsk/c1t2d0 /SD_CDRROM pfs-rrrip xlat=unix 0 0
```

- c. Press **Esc**, then enter the following to save the file and exit the vi editor:

```
:wq!
```



Note: /dev/dsk/c1t2d0 is the special device file for the CD-ROM drive. If it is different on your system, make changes to the above command accordingly. Do not create the file if it already exists with the above entry.

4. Create a user called “oracle,” with group “dba” (create group dba if it does not already exist). This can be done with the UNIX system administration manager utility as user “root” by performing the following actions.

- a. Enter the following command to start the system administration manager:

```
sam
```

- b. In the System Administration Manager screen that appears, double-click on the **Accounts for Users and Groups** icon.

- c. Double-click on the **Groups** icon.

- d. Select **Add...** from the **Actions** menu.

- e. Enter a group name of `dba`, and then click the **OK** button.

- f. Click **OK** in the “Group has been added to the system” message box to dismiss it.

- g. Select **Users** from the **List** menu.

- h. Select **Add...** from the **Actions** menu.

- i. In the dialog box that appears, enter `oracle` in the “Login Name” field.

- j. Click the **Primary Group Name...** button.

- k. Select **dba** from the list, and then click **OK**.

- l. Select **/usr/bin/ksh** as the Start-Up Program.

- m. Click **OK** in the “Add a User Account” dialog box.

- n. Enter a password and then confirm the password in the dialog box that appears.

- g. In the “Available Products” screen, select **Oracle 9i Database 9.2.0.1.0 product**, and click **Next**.
- h. In the “Installation Types” screen, select **Standard Edition**, and click **Next**.
- i. In the “Database Configuration” screen, select **Software Only**, and click **Next**.
- j. In the “Choose JDK Home Directory” screen, enter `/opt/java1.3` into the text field, then click **Next**.
- k. In the “Summary” screen, click the **Install** button to begin the installation.
- l. When prompted to insert the second CD, perform the following steps as user “root” in a separate shell:
 - i. Enter the following command to unmount the CD:

```
pfs_umount /SD_CDROM
```
 - ii. Take the first CD out of the drive.
 - iii. Insert the second CD in the drive and enter the following command:

```
pfs_mount /SD_CDROM
```
- m. Once the second CD is mounted, click **OK** in the disk location box.
- n. When prompted to insert the third CD, perform the following steps as user “root” in a separate shell:
 - i. Enter the following command to unmount the CD:

```
pfs_umount /SD_CDROM
```
 - ii. Take the second CD out of the drive.
 - iii. Insert the third CD in the drive and enter the following command:

```
pfs_mount /SD_CDROM
```
- o. Once the third CD is mounted, click **OK** in the disk location box.
- p. When a dialog box appears containing a request that you run a script as the root user, follow the stated instructions, then click **OK** to close the dialog box.
- q. Click **Exit** when completed.

11. Unmount the CD using the following command:

```
/usr/sbin/pfs_umount /SD_CDROM
```

Install Release 2 Patch Set 6 Version 9.2.0.7 for HP-UX PA-RISC (64-bit)

The version 9.2.0.7 is available from Oracle. TimePictra Release 3.6.1 has been tested and verified to work with this patch. Download the patch file onto the TimePictra server from <http://metalink.oracle.com>, and follow the instructions that are included with the patch to install it. You do not need to follow any instructions to migrate an existing database, as the TimePictra database has not been created yet.

Install Oracle 9i Application Server

Use the following procedure to install the Oracle 9i Application Server.

1. Open up a terminal window with “root” as the user.
2. Insert CD 1 of the Oracle 9i Application Server into the CD-ROM drive, then enter the following commands to mount the PFS format CD:

```
/usr/sbin/pfs_mountd & (if necessary)
/usr/sbin/pfsd & (if necessary)
/usr/sbin/pfs_mount /SD_CDROM
```

3. Enter the following commands to set the environment:

```
su - oracle
export ORACLE_BASE=/opt/oracle/app/oracle
export ORACLE_HOME=$ORACLE_BASE/product/9iAS
export ORACLE_TERM=hp
export ORACLE_OWNER=oracle
export DISPLAY=`hostname`:0.0
```

4. Enter the following command to start the Oracle Application Server installation utility:

```
/SD_CDROM/runInstaller
```



Note: If you don't have the 500MB in the /tmp logical volume required by the installation, export the TMP variable to point to a directory in a logical volume that does. For example:

```
mkdir /opt/oracle/tmp
export TMP=/opt/oracle/tmp
```

-
5. Perform the following actions when prompted by the Oracle Application Server installation utility:
 - a. Click **Next** in the “Welcome” screen.
 - b. On the “File Location” screen, make sure that destination is pointing to the **ORACLE_HOME** location, then click **Next**.
 - c. Select the **Enterprise Edition** radio button and **click Next**.
 - d. Click **Next** in the “Installation Overview” screen.
 - e. Click **Next** in the “Destination Oracle Home For 9.0.1 RSF-Based ...” screen.
 - f. In the “Component Configuration and Startup” screen, hold down the **Ctrl** key while selecting **Oracle9iAS Forms and Reports Services** and **Oracle HTTP Server in Non-SSL mode**, then click **Next**.
 - g. Click **Next** at both of the “Apache Listener Configuration for Oracle9iAS...” screens that appear.
 - h. Enter `/opt/java1.2` as the JDK home in the “Choose JDK Home Directory” screen, then click **Next**.
 - i. Leave all Wireless-related configuration windows blank, clicking **Next** for each one (there are three of them).
 - j. Click **Install** in the “Summary” window.
 - k. Swap the CDs as prompted, remembering to pfs unmount (`pfs_umount /SD_CDROM`) and pfs mount (`pfs_mount /SD_CDROM`) each subsequent CD.

- l. When a dialog box appears containing the request that you run a script as the root user, follow the stated instructions, then click **OK** to close the dialog box.
 - m. Exit out of the Oracle Application Server installation utility.
6. Unmount the CD using the following command:

```
/usr/sbin/pfs_umount /SD_CDROM
```

Install Network Node Manager

The following procedure is used to install Network Node Manager.

1. Insert the CD containing Network Node Manager (NNM) into the CD-ROM drive.
2. Open up a terminal window with “root” as the user.
3. Enter the following command to mount the NNM CD under directory /SD_CDROM:

```
mount /dev/dsk/c1t2d0 /SD_CDROM
```



Note: /dev/dsk/c1t2d0 is the special device file for the CD-ROM drive. If it is different on your system, then make changes to the command accordingly.

4. Perform the following actions when prompted to install NNM using the install script:
 - a. Enter the following command to change directories to the directory where the install script is located:

```
cd /SD_CDROM/
```
 - b. Enter the following command to start the NNM install script:

```
./install
```
 - c. Answer **No** when prompted with the question “Do you want to install Japanese language??”.
 - d. When prompted with the question “Do you want to install manpages?,” answer **Yes** if you want to install the manual pages, or **No** if you do not.
 - e. Answer **No** when prompted with the question “Do you want NNM to discover your network automatically after the installation?”
 - f. Answer **No** when prompted with the question “Do you want NNM user interface to be displayed after the installation?”
 - g. Answer **Yes** when prompted with the question “Do you want to continue with this installation?” Openview installation will now continue and will take some time to finish.

- h. When prompted with the question “Would you like to view release notes now?”, answer `Yes` if you want to review the release notes now, or `No` if you wish to review them at a later time.



Note: In case of reported errors, go through the log file and do what is required.

5. Enter the following command to change directories to the root directory:

```
cd /
```

6. Unmount the CD using the following command:

```
umount /SD_CDROM
```

Install TimePictra

Use the following procedure to install the TimePictra software.

1. Open up a terminal window with “root” as the user.
2. Insert the TimePictra CD into the CD-ROM drive, then enter the following commands to mount the PFS format CD:

```
/usr/sbin/pfs_mountd & (if necessary)
/usr/sbin/pfsd & (if necessary)
/usr/sbin/pfs_mount /SD_CDROM
```

3. Start the Unix software install utility (`swinstall`) by entering the following command at the shell prompt:

```
swinstall
```

4. Acknowledge any notes that appear.
5. In the “Specify Source” screen, select **Local CD ROM** in the “Source Depot Type” drop-down list.
6. Acknowledge any notes that appear.
7. Enter the full path for the location on the CD-ROM where TimePictra installation depot is present, then click **OK**.
8. Select **TimePictra 3.6.1 Full Installation** from the dialog box that pops up.
9. Select **Install...** from the **Actions** menu.
10. If analysis completes successfully, click **OK** to start the TimePictra installation.
11. Click **Done** in the Install window that pops up after the installation is complete.
12. Exit out of the `swinstall` utility.

TimePictra Database Creation

Use the following procedure to create the TimePictra database.

1. Enter the following command to switch users to user “otroot”:

```
su - otroot
```

2. Enter the following command in the otroot home directory to start the TimePictra Administration Utility:

```
osmfadmin
```

3. Type the following menu items, in the order shown, to start the Oracle database creation process (enter the number next to the menu item).

- **Database Administration** (from the osmfadmin main menu)
- **Create New Database** (from the Database Administration menu)

4. When prompted with a warning, type `y` and press **Enter**.
5. Verify the Oracle settings that appear, type `y`, then press **Enter**.
6. Select the number corresponding to the number of network elements the database will need to store information about, then and press **Enter**.
7. When database creation is complete, type the following menu item to exit the osmfadmin utility.
 - **Exit** (from the Database Administration menu)

Configure Web Services

The following procedure explains how to configure the Apache Web Server.

1. Perform the following actions to edit the Apache Web Server configuration file using the vi editor:

- a. Enter the following command to open the file for editing:

```
vi /opt/osmf/config/env/httpd.conf
```

- b. Using vi editor commands, search for the line beginning with `ServerAdmin`. Change the e-mail address after the `ServerAdmin` directive to the valid e-mail address of the machine’s administrator.
- c. Search for the line beginning with `ServerName`. Change `"your_server_name"` after the `ServerName` directive to either the hostname (`tp3` for example) or the fully qualified domain name (`tp3.symmetric.com.com` for example). Make sure that what you choose as the `ServerName` can be resolved via DNS.
- d. Press **Esc**, then enter the following to save the file and exit the vi editor:

```
:wq!
```

2. Enter the following command to return to the root prompt:

```
exit
```

3. The installation of Oracle 9iAS, which was performed earlier during this initial installation procedure, typically starts a few processes as user “oracle.” Enter the following commands to bring those processes down:

```
su - oracle
. /opt/osmf/config/env/osmf-http.env
f60ctl stop port=9001
apachectl stop
ps -ef | grep rwm60 | grep oracle | while read a b c; do
  kill -9 $b ; done;
```



Note: Kill is used because Oracle does not include a script to bring the processes down gracefully.

4. Enter the following commands to modify the permissions of a few directories so that the “otroot” user has permission to write to them:

```
chmod 775 $ORACLE_HOME/guicommon6/tk60/admin/uiprint.txt
chmod -R 775 $ORACLE_HOME/ . . /Apache/Apache/logs
chmod 775 $ORACLE_HOME/ . . /Apache/Jserv/logs/jserv.log
chmod -R 775 $ORACLE_HOME/reports60/server
```

5. Using the vi editor as you did in [Step 1](#), on page 101, perform the following actions to configure Print Services:
 - a. Edit the file \$ORACLE_HOME/guicommon6/tk60/admin/uiprint.txt to point to a system printer, using the commented instructions that are in the file.
 - b. Type `exit` to return to the root prompt, then edit the file `/opt/osmf/config/env/osmf-http.env` to change the text `myprinter` to a valid system printer in the variables `TK2_PRINTER` and `TK2_PRINT`, and also uncomment the variables.
6. Enter the following command to allow the oracle user to bring up the installation screen:

```
xhost + `hostname`
```

7. Enter the following command to ensure that the DISPLAY variable points to a valid X-server where the TimePictra web processes are running:

```
export DISPLAY=`hostname`:0.0
```

This is necessary to print and display certain web graphics such as pie charts and performance graphs.

8. Enter the following command to switch users to user “otroot”:

```
su - otroot
```

9. Enter the following command in the otroot home directory to start the TimePictra Administration Utility:

```
osmfadmin
```

10. Type the following menu items, in the order shown, to bring up the Web Server processes (enter the number next to the menu item).

- **Web Server Administration** (from the osmfadmin main menu)
- **Startup Web Server** (from the Web Server Administration menu)

11. Open a Web browser on a Windows system and enter the following URL:

```
http://<your_server_name>:8080
```

You should see the TimePictra main page. If the TimePictra main page appears, web services have been correctly configured.

12. Close the Web browser and continue with [Install Oracle 9iAS/6iserver Patch 16](#), on page 103.

Install Oracle 9iAS/6iserver Patch 16

The following procedure is used to install Oracle 9iAS/6iserver patch 16.



Note: Before proceeding further, contact Oracle and obtain patch 16 from them.

1. Enter the following command to switch users to user “otroot,” if necessary:

```
su - otroot
```

2. Enter the following command in the otroot home directory to start the TimePictra Administration Utility, if it is not currently running:

```
osmfadmin
```

3. Type the following menu items, in the order shown, to stop the Web processes.

- **Web Server Administration** (from the osmfadmin main menu)
- **Shutdown Web Server** (from the Web Server Administration menu)
- **Exit** (from the Web Server Administration menu)

4. Enter the following command to switch users to user “oracle”:

```
su - oracle
```

5. Enter the following command to source the TimePictra Web environment:

```
. /opt/osmf/config/env/osmf-http.env
```

6. Enter the following commands to copy the Patch 16.zip file to your \$ORACLE_HOME/6iserver directory:

```
cd $ORACLE_HOME  
cp -r <patch_directory> .
```

7. Follow the instructions included with the patch to uncompress it.

8. Shut down all processes that might be using the Oracle files you are about to patch.
9. Change directories to the patch directory that you have just expanded (this directory should be called `developer6i_patch16`) and run the file called `patch_install.sh` to install the patch.
10. After the patch finishes installing, enter the following command to run a script that recompiles a few binaries related to the files that were just replaced:

```
$ORACLE_HOME/patch/patch_link.sh
```

As the script runs, output is logged to `$ORACLE_HOME/make.log`.



Note: The patch installation is now complete. If you need more detail or are having some situation-specific issues, contact Oracle and ask for the latest, most up-to-date installation procedure for the patch.

Create a Unix User on the TimePictra Server

In an initial installation, a user by the name of `sec` (belonging to the security class) is automatically created in the TimePictra database. This user can start a Web-based TimePictra user session by using a User Name of `SECW` and a password of `SECW`. For this `sec` user to start a X-windows-based Openview Synchronization Map user session, a UNIX user named “`sec`” needs to be defined on the TimePictra Server. The following procedure accomplishes this.

1. Open up a terminal window with “`root`” as the user.
2. Enter the following command at the `root` prompt to start the System Administration Manager utility:

```
sam
```
3. Double-click the **Accounts for Users And Groups** icon.
4. In the subsequent window, select **Users**.
5. In the subsequent window, click on **Action** from the main menu, then select the **Add...** menu option.
6. In the subsequent window, enter `sec` in the “Name” field, then click **OK**.
7. Change the other options as desired, or leave them set to their default values.
8. Enter the password for the user and then confirm it to complete the creation process.
9. Exit out of `sam`.
10. Edit the `.profile` file for the `sec` user by adding the following lines to the file using the `vi` editor:


```
if [ -r /opt/osmf/config/env/osmf-http.env ]; then  
  . /opt/osmf/config/env/osmf-http.env  
fi  
export DISPLAY='hostname':0.0
```

The above lines source the environment to start the TimePictra session.



Note: For a user to start an X-windows-based TimePictra user session from a UNIX machine other than the TimePictra server, make sure to use the following export DISPLAY command for the current host machine:

```
export DISPLAY='hostname':0.0
```

Install the TimePictra License File

TimePictra will not start if an authentic license file has not been correctly installed in the TimePictra system. Refer to [Chapter , Install the TimePictra License File](#) in [Chapter 3](#) for license file installation instructions.

Verify the Installation

The following procedure verifies the TimePictra installation.

Verify that all TimePictra-related processes start

1. Type the following command to switch users to user “otroot”:

```
su - otroot
```

2. Type the following command to source the TimePictra HTTP environment:

```
./opt/osmf/config/env/osmf-http.env
```



Note: The above command must be run from the Korn shell (ksh).

3. Type the following command to start the osmfadmin utility:

```
osmfadmin
```



Note: The above command must be run from the Korn shell (ksh) in the otroot home directory.

4. Type the following menu items, in the order shown, to start the TimePictra processes (enter the number next to the menu item).

- **Database Administration** (from the osmfadmin main menu)
- **Startup TimePictra Daemons** (from the Database Administration menu)

- **Return to Previous Menu** (from the Database Administration menu)
5. Type the following menu items, in the order shown, to start up the Web Server.
 - **Web Server Administration** (from the osmfadmin main menu)
 - **Startup WebServer** (from the Web Server Administration menu)
 6. Type the following menu item to check the status of the Web Server.
 - **Show Status of Web Server** (from the Web Server Administration menu)

The information that is returned should suggest that all processes are UP.
 7. Type the following menu items to check the status of the TimePictra daemons, and perform a system health check.
 - **Return to Previous Menu** (from the Web Server Administration menu)
 - **Status** (from the osmfadmin main menu)
 - **Exit** (from the osmfadmin main menu)

The information that is returned for the status should suggest that all processes are UP.

Start a web-based user session

8. Open a Web browser on a Windows system and enter the following URL:

```
http://<your_server_name>:8080
```

You should see the TimePictra main page.
9. Click the **Launch TimePictra 3.6.1** button to start a client session. You will need to download and install the Jinitiator plugin the first time you do this. You should see the Oracle Jinitiator interface and TimePictra login prompt.
10. Type `secw` as the username and password in the Logon box that appears, and the Launch Pad should appear.

Start a X-windows-based user session

11. Open up a terminal window with “root” as the user.
12. Enter the following commands to start an HP OpenView session:

```
/opt/OV/bin/ovstart -v  
su - sec  
tpstart
```



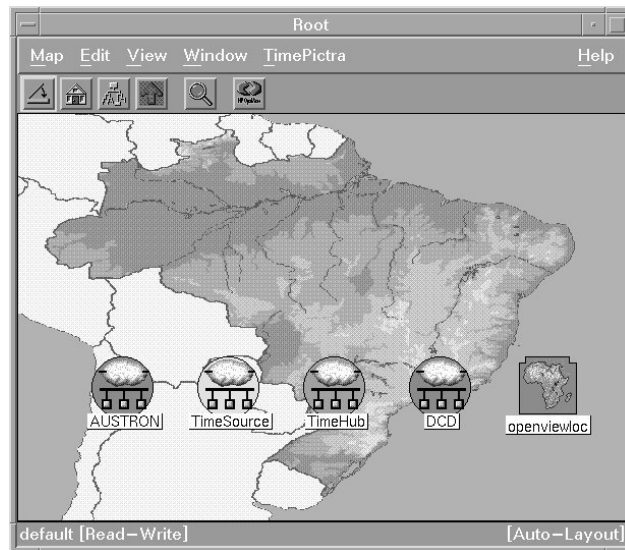
Note: If, after entering the `tpstart` command, the following message is displayed:

```
open TimePictra.log failed
: Permission denied
```

Enter the following commands as user “root” to allow write access to the `TimePictra.log` file from the `tpstart` process:

```
chown otroot:dba
/var/opt/osmf/share/log/TimePictra.log
chmod 0777 /var/opt/osmf/share/log/TimePictra.log
```

When the X-windows-based user session starts, the main “Root” map will be displayed on the monitor, and will appear similar to the following:



If all TimePictra-related processes start, and you can view the Launch Pad and the OpenView synchronization map, TimePictra has been successfully installed.

Upgrading TimePictra

Follow the steps in the following procedure to upgrade from TimePictra 3.6 to TimePictra 3.6.1.



Note: There is no need to re-install or upgrade the TimePictra Oracle database.

1. Back up the TimePictra system. Ideally a full system backup would be preferred, but if the system can not be taken offline a simple database backup will do.
2. Insert the TimePictra 3.6.1 CD into the CD-ROM drive.
3. Open up a terminal window with “root” as the user.
4. Enter the following command to switch users to user “otroot”:

```
su - otroot
```

5. Enter the following command in the otroot home directory to start the TimePictra Administration Utility:

```
osmfadmin
```

6. Type the following menu items, in the order shown, to shut down the Web server and TimePictra processes (enter the number next to the menu item).
 - **Web Server Administration** (from the osmfadmin main menu)
 - **Shutdown Web Server** (from the Web Server Administration menu)
 - **Return to Previous Menu** (from the Web Server Administration menu)
 - **Database Administration** (from the osmfadmin main menu)
 - **Shutdown TimePictra Daemons** (from the Database Administration menu)
 - **Exit** (from the Database Administration menu)
7. If the Resiliency option is installed, uninstall it using the procedure in [Chapter 6, TimePictra Resiliency Option](#).



Note: The Resiliency option can be reinstalled after TimePictra is upgraded using the appropriate procedure in [Chapter 6, TimePictra Resiliency Option](#).

8. If the SNMP option is installed, shut it down using the procedure in [Chapter 7, TimePictra SNMP Agent Option](#).
9. If necessary, enter the following command to switch users to user “otroot”:

```
su - otroot
```

10. Enter the following command in the otroot home directory to start the TimePictra Administration Utility, if necessary:

```
osmfadmin
```

11. Type the following menu items, in the order shown, to shut down the Oracle database:
 - **Database Administration** (from the osmfadmin main menu)
 - **Shutdown Database** (from the Database Administration menu)
 - **Exit** (from the Database Administration menu)

12. Enter the following command to ensure that no otroot processes are running:

```
ps -ef | grep otroot
```

The command will produce no output if no otroot processes are running.

13. Enter the following command to return to the root prompt:

```
exit
```

14. Enter the following commands to PFS mount the TimePictra Release 3.6.1 CD:

```
/usr/sbin/pfs_mountd & (if necessary)  
/usr/sbin/pfsd & (if necessary)  
/usr/sbin/pfs_mount /SD_CDROM
```

15. Type the following command to run the software installer:

```
swinstall
```

16. Dismiss any message that appears.
17. In the “Specify Source” window that appears, select **Local CD ROM** in the “Source Depot Type” drop-down list.
18. Dismiss any message that appears.
19. Under the Source Depot Path, enter `<cd_mount_directory>/DEPOT`, then click **OK**.
20. Select **TimePictra 3.6.1 Update** from the list that pops up.
21. Select **Install...** from the **Action** menu.
22. Dismiss the note that appears.
23. If analysis completes successfully, click on **OK** to start the **TimePictra** upgrade.



Note: After upgrading, you must re-manage the NE before using feature such as audit.

The database will be brought up and upgraded with new enhancements in the update. This might take a few minutes. When it is finished, bring all of the TimePictra-related processes back up as user “otroot” using the osmfadmin utility.



Notes:

1. The logfile, which is available by pressing the **Logfile...** button in the software installer window while the upgrade is in progress, gives you further information about the details of the product update.

2. If, upon attempting to start TimePictra on the upgraded system, the following message appears:

```
TP License: Invalid path
```

Shut down and then restart the Oracle database using the osmfadmin utility.

3. After TimePictra is upgraded, existing TimePictra users are modified as follows:

- Password expiry is set to 90 days.
- Default functionality access is assigned to each user based on the group that the user is assigned to (refer to “Features Available to Each User Class” in the *TimePictra User’s Guide* for more information).

Cleaning the JAR Cache

When the upgrade is complete, perform the following steps to clean the Jar Cache to remove older images.

1. Ensure the Launch Pad and related browser windows are closed.
2. Select **Start > Control Panel** on the client PC.
3. Open the JInitiator 1.3.1.22 JInitiator Control Panel.
4. Click the Cache tab.
5. Go to the location in the Location field using Windows Explorer.
6. Delete all files listed there. They contain old images related to the TimePictra version before the upgrade.
7. Start the TimePictra Launch Pad. New jar files should be downloaded.

Additional details on Upgrading TimePictra in a Resiliency Scenario

Perform the following steps to upgrade TimePictra in a Resiliency scenario.



Note: You do not need to remove (i.e. `swremove`) Resiliency for this procedure. Also, do not use `osmfadmin` to stop the resiliency processes. Use only `replication.ks` to control the starting and stopping of resiliency.

1. Stop web processes on the Primary Master with `osmfadmin`.
2. Stop Resiliency on the Primary Master with the command `/opt/osmf/REP/utils/replication.ks stop` as user `otroot`.
3. Stop Resiliency on the Secondary Master with the command `/opt/osmf/REP/utils/replication.ks stop` as user `otroot`.
4. Stop the database on the Secondary Master.
5. Upgrade the Secondary Master following the upgrade instructions.
6. While the Secondary Master is upgrading:
 - Stop the TimePictra processes on the Primary Master.
 - Stop the database on the Primary Master.
 - Upgrade the Primary Master following the upgrade instructions.
7. Wait for the Primary Master to finish upgrading. The database should be up when the upgrade finishes.
8. Start resiliency on the Primary Master with the command `/opt/osmf/REP/utils/replication.ks start` as user `otroot`. This step usually completes in less than a minute.
9. Start resiliency on the Secondary Master with the command `/opt/osmf/REP/utils/replication.ks start` as user `otroot`. This step may take up to 30 minutes depending on the size of your network. The 30 minute mark was hit with a managed network of 1,400 network elements.
10. Start TimePictra daemons on Primary Master.
11. Start web processes on the Primary Master using `osmfadmin`.

Additional Details on Patching TimePictra in a Resiliency Scenario

Perform the following steps to patch TimePictra in a Resiliency scenario.



Note: You do not need to remove (i.e. `swremove`) Resiliency for this procedure. Also, do not use `osmfadmin` to stop the resiliency processes. Use only `replication.ks` to control the starting and stopping of resiliency.

1. Stop web processes on the Primary Master with `osmfadmin`.
2. Stop Resiliency on the Primary Master with the command `/opt/osmf/REP/utils/replication.ks stop` as user `otroot`.
3. Stop Resiliency on the Secondary Master with the command `/opt/osmf/REP/utils/replication.ks stop` as user `otroot`.
4. Patch the Secondary Master, following the patch instructions.
5. Patch the Primary Master following the patch instructions. TimePictra daemons must be shut down by the upgrade script on the Primary Master for this step.
6. Start resiliency on the Primary Master with the command `/opt/osmf/REP/utils/replication.ks start` as user `otroot`. This step usually completes in less than a minute.
7. Start resiliency on the Secondary Master with the command `/opt/osmf/REP/utils/replication.ks start` as user `otroot`. This step may take up to 30 minutes depending on the size of your network. The 30 minute mark was hit with a managed network of 1,400 network elements.
8. Start TimePictra daemons on the Primary Master.
9. Start web processes on the Primary Master using `osmfadmin`.

Removing TimePictra



Caution: This is a destructive procedure. Users must be very careful, as the procedure removes the TimePictra product and all relevant data except the database and third party software such as Oracle, OpenView, and java. This procedure should be followed as part of a migration process only. Be sure to backup the database before proceeding with this procedure (refer to [Chapter 4, System Backup and Recovery](#) in this manual).

Uninstalling TimePictra

The following procedure lists the steps required to remove (uninstall) the TimePictra software.

1. Open up a terminal window with “root” as the user.
2. Enter the following command to switch users to user “otroot”:

```
su - otroot
```
3. Enter the following command in the otroot home directory to start the TimePictra Administration Utility:

```
osmfadmin
```
4. Type the following menu items, in the order shown, to shut down the Web server and TimePictra processes (enter the number next to the menu item).
 - **Web Server Administration** (from the osmfadmin main menu)
 - **Shutdown Web Server** (from the Web Server Administration menu)
 - **Return to Previous Menu** (from the Web Server Administration menu)
 - **Database Administration** (from the osmfadmin main menu)
 - **Shutdown TimePictra Daemons** (from the Database Administration menu)
 - **Exit** (from the Database Administration menu)
5. If the Resiliency option is installed, uninstall it using the procedure in [Chapter 6, TimePictra Resiliency Option](#).
6. If the SNMP option is installed, uninstall it using the procedure in [Chapter 7, TimePictra SNMP Agent Option](#).
7. If necessary, enter the following command to switch users to user “otroot”:

```
su - otroot
```
8. Enter the following command in the otroot home directory to start the TimePictra Administration Utility, if necessary:

```
osmfadmin
```

9. Type the following menu items, in the order shown, to shut down the Oracle database:

- **Database Administration** (from the osmfadmin main menu)
- **Shutdown Database** (from the Database Administration menu)
- **Exit** (from the Database Administration menu)

10. Enter the following command to ensure that no otroot processes are running:

```
ps -ef | grep otroot
```

The command will produce no output if no otroot processes are running.

11. Enter the following command to return to the root prompt:

```
exit
```

12. Enter the following command to start the UNIX uninstaller:

```
/usr/sbin/swremove
```

A list of all of the products that are currently installed on the server is displayed.

13. On the screen that appears, select **TimePictra** and then select **Remove...** in the **Action** menu.
14. If removal analysis completes successfully, click on **OK** to start the TimePictra removal. If remove analysis fails, go through the log file by clicking the **Logfile...** button and take corrective actions.
15. Click the **Done** button, then exit out of the UNIX uninstaller.
16. Enter the following command to remove the Oracle Database:

```
rm -r /opt/oradata
```



Note: Take care to enter the pathname correctly.

Chapter 6 TimePictra Resiliency Option

This chapter provides information necessary to install, manage, and maintain the TimePictra Software Resiliency Option.

In This Chapter

- [Introduction and General Information](#)
- [Installing the Resiliency Option on Primary and Secondary Masters](#)
- [Enabling Resiliency on the Primary and Secondary Masters](#)
- [Checking the Status of Resiliency](#)
- [Operating Scenarios and Troubleshooting](#)
- [Removing the Resiliency Option](#)
- [TimePictra Database Tables](#)
- [Known Issues](#)

Introduction and General Information

This section describes the Resiliency option and provides an overview of Resiliency administration and system administrator requirements.

Description of the TimePictra Resiliency Option

The TimePictra Resiliency Option provides the ability to continually replicate Oracle database data from one server to a secondary server. This functionality provides an up-to-date backup system (Secondary Master) that can assume the production role (Primary Master) whenever there is a need. If the Primary Master fails or needs maintenance, the Secondary Master can act as the Primary Master until the original server is ready to resume control.

The Resiliency Option will replicate all database tables that are necessary for proper operations.



Note: Information outside the database, such as UNIX login users, is not replicated and must be accounted for by the System Administrator.

Features of TimePictra Resiliency Option

The following features are included in the Resiliency Option software:

- The ability to continually replicate database information on a real-time basis from Production System to Backup System.
- An up-to-date backup system that can immediately assume control of the synchronization network should the primary system fail or require maintenance.
- A full set of internal utilities to take care of backend administration.
- A menu-driven interface that provides complete access to resiliency features and utilities.
- A status utility to see the current status and condition of resiliency operations.

Resiliency Server Administration

All Resiliency administration and configuration is done with the *Replication Administration Menu* of the TimePictra *osmfadmin* utility. The system administrator should become comfortable using this utility and understand the impact of each menu choice. Some situations can lead to data loss if the user does not understand the impact of the menu choice. The various Replication Administration Menu menu choices are explained below.

Replication Process Status

This menu choice shows the status of Resiliency processes, hostname designations of Primary Master and Secondary Master, and the time of the last snapshot update.

Synchronize Secondary Master Database

This menu choice copies snapshot database tables to main database tables on the Secondary Master. This action erases any data contained in the secondary database and replaces it with snapshot information which was delivered from the Primary Master. The operation performs no action on the Primary Master.

Relocate Production Database on Secondary Master to Primary Master

This menu choice copies the Secondary Master database, which is acting as the Production Server, to the Primary Master. This operation is used to switch back to Primary Master after using the Secondary Master as the production server for any given period of time.

Configure Secondary Master acting as Production Server to Role of Primary Master

This menu choice configures the Secondary Master Database acting as the Production server to role of Primary Master, and designates its database as the Production Database. The existing Primary Master role is changed to that of Secondary Master.

Relocate Primary Master Database

This menu choice switches the roles of Primary Master and Secondary Master. This is used when TimePictra management operations need to relocate from one server to the other.

Enable/Disable Replication

This menu choice calls up the Replication Management menu, which is a sub-menu of the Replication Administration Menu. The following four paragraphs explain the Replication Management menu choices:

Enable & Start Replication on Primary Master

This menu choice enables and starts the Resiliency process on the Primary Master. This is normally done at installation and activation time.

Enable & Start Replication on Secondary Master

This menu choice enables and starts the Resiliency process on the Secondary Master. This is normally done at installation and activation time.

Stop & Disable Replication on Primary Master

This menu choice disables and stops the Resiliency process on the Primary Master. This option is normally not used, but is available for troubleshooting and system administration control.

Stop & Disable Replication on Secondary Master

This menu choice disables and stops the Resiliency process on the Secondary Master. This option is normally not used, but is available for troubleshooting and system administration control.

Replication Help

This menu choice accesses additional documentation which may be of use.

Responsibilities of the System Administrator

The system administrator is responsible for maintenance of the TimePictra system and the Resiliency Option. This requires the system administrator to understand both the workstation hardware and all of the software installed in both the Primary and Secondary Master workstations. The main responsibilities of the system administrator include the following:

- Installing the Resiliency Option software.
- Preparing both the Primary and Secondary Master workstations for replication using the *osmfadmin* utility.
- Monitoring the condition of the Primary and Secondary Master systems using the health-check command (Status *osmfadmin* menu command).
- Moving the Primary designation from the Primary Master to the Secondary Master (using the *osmfadmin* utility) when the Primary Master goes offline.
- Stopping Resiliency processes on the Primary Master workstation (using the *osmfadmin* utility) when the Primary Master workstation will be out of service for an extended period.
- Stopping Resiliency processes on the Primary or Secondary Master workstation as required.
- Troubleshooting Resiliency Option problems.
- Ensuring that UNIX-level user information is kept in synchronization on the Primary and Secondary Master workstations.

Installing the Resiliency Option on Primary and Secondary Masters

In order to access the files necessary for replication, the system administrator needs to install TimePictra Resiliency Option from the CD provided by Symmetricom, Inc. The procedure for installing the TimePictra Resiliency Option is done using the standard HP-UX software install utility, "swinstall". Once the TimePictra Resiliency Option has been installed, the TimePictra Administration utility is used to enable and start Resiliency processes. This is done as user "otroot".

Prerequisites for Installing the Resiliency Option

The following prerequisites are needed for a first-time installation of the Resiliency Option:

- An authentic TimePictra license file that enables the Resiliency option must be installed on both systems. Refer to the section entitled [Install the TimePictra License File](#) in [Chapter 3](#) for more information.



Note: If a proper license file is not installed on the systems, the following message appears when you attempt to start Resiliency:

```
#####  
TPLIC:REPLICATION not allowed  
Please contact Symmetricom support.  
#####
```

-
- TimePictra Software version 3.0 or later installed with all required patches on two different systems. One of the systems will act as the Primary Master and the other will act as the Secondary Master.
 - TimePictra Resiliency Option CD should be available.
 - Both servers should be connected to the LAN and be able to communicate with each other.
 - Determination of which server will act as Primary Master should be made at this time.

The installation procedure is same for both the Primary and Secondary Masters. During this procedure, files required to enable replication are placed on the servers. These files are then used by the "osmfadmin" utility for Resiliency administration.

Installing the Resiliency Option on the Primary Master

The following procedure is used to install the Resiliency Option on the Primary Master.

1. Open up a terminal window with "root" as the user on the Primary Master.
2. Insert the TimePictra Resiliency Option CD into the CD-ROM drive, then enter the following commands to mount the PFS format CD if necessary:

```
/usr/sbin/pfs_mountd &  
/usr/sbin/pfsd &  
chmod 775 /etc/pfs_fstab  
/usr/sbin/pfs_mount /SD_CDROM
```

3. Enter the following command to ensure that the DISPLAY variable points to a valid X-server where the TimePictra processes are running:

```
export DISPLAY='hostname':0.0
```

4. Type the following command to run the software installer:

```
swinstall -s /SD_CDROM/DEPOT
```

5. Select **Change Options...** in the **Options** menu in the window that appears.
6. Dismiss the note that appears by clicking **OK**.
7. In the “Options” window that appears, uncheck the `Enforce dependency analysis errors in agent` check-box, then click **OK**.
8. Select **TimePictra Resiliency Option** from the list that pops up.
9. Select **Install...** from the **Actions** menu.
10. Dismiss the note that appears by clicking **OK**.
11. If analysis completes successfully, click on **OK** to start the TimePictra Resiliency option installation.



Note: If the version of TimePictra that is currently installed is greater than version 3.0, the install analysis Status field will show the message `Ready with Warnings`. This message in this case is normal; continue with the installation.

12. Click **Done** when the installation is done.
13. Exit out of the swinstall utility by selecting **Exit** in the **File** menu.
14. Enter the following command to unmount the CD:

```
pfs_umount /SD_CDROM
```

15. Log out and close the shell.

Installing the Resiliency Option on the Secondary Master

To install the Resiliency Option on the Secondary Master, follow the same procedure used for [Installing the Resiliency Option on the Primary Master](#), on page 119.



Note: The HP-UX command `swinstall` is used to install the required files for replication. At this point, the Resiliency option has not yet been configured and activated.

Setting the time on the Primary and Secondary Masters

If a significant difference exists between the time settings on the Primary and Secondary masters, some time-related features of TimePictra might be adversely affected. The time difference between the two settings should be set within 30 seconds. The UNIX `date` command can be used to set the time on each system.

Configuring Remote Shell Parameters of the Primary and Secondary Masters

Once Resiliency is installed, Resiliency administration functions are performed using `osmfadmin` (the TimePictra Administration Utility) as user "otroot". The `osmfadmin` utility can be used either from the Primary or Secondary Master to administer and change the Resiliency configuration. For the purposes of Resiliency administration and maintenance (using the Primary Master), the system administrator should have remote login capability on the Secondary Master, and the server needed to access the Secondary Master, as user "otroot" and vice versa. Privileges need to be granted to allow user "otroot" to access the Primary Master from the Secondary Master and to access the Secondary Master from the Primary Master.

Configuring the Primary Master to Allow Remote Shell Operation from the Secondary Master

Use the following procedure to configure the Primary Master to allow remote shell operation from the Secondary Master.

1. Open up a terminal window with "otroot" as the user on the Primary Master.
2. Enter the following command to open the `.rhosts` file in the vi editor:

```
vi /home/otroot/.rhosts
```

3. Using vi editor commands, enter the following line into the `.rhosts` file:

```
<secondary_master_hostname> otroot
```

Where `<secondary_master_hostname>` is the actual hostname of the Secondary Master workstation.

4. Save the file using the applicable vi editor commands.
5. Log into the Secondary Master workstation as the "otroot" user, and enter the following command:

```
remsh <primary_master_hostname>
```

A shell prompt should be displayed.

6. Enter the `hostname` command to verify that there has been a successful login to the Primary Master workstation. If an error is displayed, verify that the syntax is correct and/or view the `.rhosts` manpage (`man .rhosts`).
7. Log out and close the shell.

Configuring the Secondary Master to Allow Remote Shell Operation from the Primary Master

Use the following procedure to configure the Secondary Master to allow remote shell operation from the Primary Master.

1. Open up a terminal window with “otroot” as the user on the Secondary Master.
2. Enter the following command to open the `.rhosts` file in the vi editor:

```
vi /home/otroot/.rhosts
```

3. Using vi editor commands, enter the following line into the `.rhosts` file:

```
<primary_master_hostname> otroot
```

Where `<primary_master_hostname>` is the actual hostname of the Primary Master workstation.

4. Save the file using the applicable vi editor commands.
5. Log into the Primary Master workstation as the “otroot” user, and enter the following command:

```
remsh <secondary_master_hostname>
```

A shell prompt should be displayed.

6. Enter the `hostname` command to verify that there has been a successful login to the Secondary Master workstation. If an error is displayed, verify that the syntax is correct and/or view the `.rhosts` manpage (`man .rhosts`).
7. Log out and close the shell.

The Resiliency option installation and commissioning is complete. The system administrator can now use the Resiliency status option to see status on either of the workstations.

Enabling Resiliency on the Primary and Secondary Masters

Once Resiliency Option files are installed on both servers, it is time to configure the roles of each server. The determination of which workstation will be the Primary Master, and act as the production server in normal operating conditions, must be finalized before enabling and starting Resiliency. Keep the following concepts in mind when making this determination:

- The Production server is the server from which TimePictra will be running and is actively managing network elements. The Production server can be setup to run from the Primary Master or the Secondary Master servers. There can be only one active production server at any given time. Network elements should never be managed by both the Primary Master and Secondary Master servers at the same time. Precautions are in place to help avoid this circumstance, but it is possible for the system administrator to override this and have both servers trying to communicate with network elements. This situation can lead to database inconsistency and loss of data and must be avoided. The role of the Production server must be known by all management functions and a clear process must be incorporated when switching the roles of the servers.
- The Primary Master (PM) is the server which will normally be running as the Production server. The PM will replicate data to the Secondary Master if both servers are running replication and a communication link is available. In normal operating conditions, the TimePictra daemons are up and running on this server.
- The Secondary Master (SM) will act as the stand-by system and be ready to assume the role of Production server when needed. In normal operation conditions, the TimePictra daemons are not running on the Secondary Master server.

Prerequisites

- Determination of PM and SM roles are assigned to workstations.
- Communication link and permissions are in place.
- TimePictra daemons are not running.
- Oracle database is up and running.



Notes:

1. Enable or Disable are Resiliency configuration change operations, and are only allowed if both the Primary and Secondary Masters have Resiliency installed, their databases are running, and they are able to communicate through *remsh* with each other as user "otroot."
 2. Resiliency cannot be enabled on the Secondary Master if it has not yet been enabled on the Primary Master.
-

Enabling and Starting Resiliency on the Primary and Secondary Masters

Use the following procedure to enable Resiliency on the Primary Master and Secondary Master.

1. Open up a terminal window with “otroot” as the user on the Primary Master.
2. Enter the following command in the otroot home directory to run the osmfadmin utility:

```
osmfadmin
```

3. Type the following menu items, in the order shown, to enable Resiliency (enter the number next to the menu item).
 - **Replication Server Administration** (from the osmfadmin main menu)
 - **Enable/Disable Replication** (from the Replication Administration menu)
4. *If Resiliency has never been enabled on the local machine*, the system prompts you to enter the hostname for the Primary Master and Secondary Master. Enter the hostnames as appropriate at the prompts.
5. Type the following menu item to start Resiliency on the Primary Master server.
 - **Enable & Start Replication on Primary Master** (from the Replication Management menu)
6. When prompted by the confirmation message, type **y** to continue.
7. When prompted again to continue, press **Enter**.
8. When prompted with the message `Enable and Start Replication on Secondary Master`, type **y** to enable and start Resiliency on the Secondary Master.



Notes:

1. Check the output for any errors. If the operation is unsuccessful, look at the error message generated and make necessary corrections.
2. The process of enabling Resiliency on the Secondary Master stops the Oracle Web Server and TimePictra processes if these operations are running.
3. Oracle Web Server or TimePictra processes cannot be started on the Secondary Server if Resiliency is running on it.

-
9. Start the TimePictra processes on the Primary Master once Resiliency is enabled on it.

Checking the Status of Resiliency

When Resiliency is running, the Primary Master sends snapshot updates to the Secondary Master on a regular basis. The status of Resiliency can be monitored from both the Primary Master and Secondary Master. The status utility checks the connection between the Primary Master and Secondary Master, the status of processes, and the condition of the database during the check. The system administrator is responsible for monitoring the status of the TimePictra servers as well as the state of replication. The administrator should always be aware which server is the Primary Master and which is the Secondary Master. The status of replication should be checked frequently to ensure it is running correctly.

The status of replication can be viewed using the `osmfadmin` utility. To view the status of Resiliency operations and process status, use the "Status of Replication" menu item under the "Replication Administration" menu in `osmfadmin`.

Resiliency Status Information

The `osmfadmin` "Status of Replication" menu item reports the following:

- Whether or not Resiliency processes are running.
- Whether or not both the Primary Master and the Secondary Master are available and communicating.

Checking Resiliency Status

Use the following procedure to check Resiliency status.

1. Log into either the Primary Master or Secondary Master as user "otroot."
2. Enter the following command in the otroot home directory to run the `osmfadmin` utility:

```
osmfadmin
```

3. Type the following menu items, in the order shown, to show the status of Resiliency (enter the number next to the menu item).
 - **Replication Server Administration** (from the `osmfadmin` main menu)
 - **Replication Process Status** (from the Replication Administration menu)

A sample Resiliency status output is shown below:

```
Verifying Server Configuration. Please wait ...
Replication status
Role           Status      Server
Primary_Master up          demo1
Secondary_Master up          demo3
```

```
#####
Status Primary_Master:

      JOB WHAT                                B LAST_DATE NEXT_DATE
-----
      761 begin mv_repd_master.do; N          02-03-29 11:32:30
            end;
Status Secondary_Master:

Last Resync : 02-03-29 14:38:59
#####
```

Check the Resiliency status output for any errors. If the operation is unsuccessful, look at the error messages generated and make necessary corrections.

Operating Scenarios and Troubleshooting

The information in this section describes what steps the system administrator should take if a problem or condition exists which affects normal operating conditions.

The following operating scenarios are described in this section:

- [Scenario 1](#) - Primary Master is up, Secondary Master is up.
- [Scenario 2](#) - Primary Master is down, Secondary Master is up.
- [Scenario 3](#) - Relocation of Primary Master to Secondary Master.
- [Scenario 4](#) - Replication is automatically stopped due to communication loss.
- [Scenario 5](#) - Primary Master is up, Secondary Master is down.

Scenario 1

This is the normal operating scenario. The Primary Master is serving as the production server and replicating data to the Secondary Master. The Primary Master is running the TimePictra application.

The following table shows the state of TimePictra-related functions:

Hostname	Tp1	Tp2
Function	PM	SM
Database	Up	Up
TP daemons	Up	Down
Replication	Up	Up

Hostname	Tp1	Tp2
Web Server	Up	Down
OV daemons	Up	Either
Ethernet	Up	Up

Prerequisites

Successful installation of TimePictra and the Resiliency Option.

Required Action

Normal system administration monitoring.

Scenario 2

In this scenario, the Primary Master has failed and cannot perform as the production server. The Secondary Master was up when the Primary Master failed.



Note: Failure on the Primary Master might be related to factors such as platform or software failure, power failure, or the network being down.

The following table shows the state of TimePictra-related functions:

Hostname	Tp1	Tp2
Function	PM	SM
Database	?	Up
TP daemons	?	Down
Replication	?	Up
Web Server	?	Down
OV daemons	?	Either
Ethernet	?	Up

Prerequisites

- Verify that the failure exists and transition to the backup server is really needed.
- Communicate to the user community that you intend to switch TimePictra servers.

Required Action



Note: The estimated time to perform the Required Action is less than 5 minutes.

1. Determine the issue with the Primary Master. If estimated Primary Master downtime exceeds process recommendations, then have the Secondary Master assume the role of production server as follows:
 - a. Enter the following command as user `otroot` in the `otroot` home directory to start the TimePictra Administration Utility on the Secondary Master:

```
osmfadmin
```
 - b. Type the following menu items, in the order shown, to synchronize the Secondary Master database (enter the number next to the menu item).
 - **Replication Server Administration** (from the `osmfadmin` main menu)
 - **Synchronize Secondary Master Database** (from the Replication Administration menu)
 - c. Acknowledge the warning message that appears by typing **y** and then **Enter**.
 - d. Type the following menu items, in the order shown, to start the TimePictra daemons.
 - **Return to Previous Menu** (from the Replication Administration menu)
 - **Database Administration** (from the `osmfadmin` main menu)
 - **Startup TimePictra daemons** (from the Database Administration menu)
 - e. Type the following menu items, in the order shown, to start the Web server.
 - **Return to Previous Menu** (from the Database Administration menu)
 - **Web Server Administration** (from the `osmfadmin` main menu)
 - **Startup Web Server** (from the Web Server Administration menu)
 - **Exit** (from the Web Server Administration menu)
2. Resume network monitoring using the TimePictra application.

The following table shows the state of TimePictra-related functions after the Required Action:

Hostname	Tp1	Tp2
Function	PM	SM
Database	?	Up
TP daemons	?	Up

Hostname	Tp1	Tp2
Replication	?	Down
Web Server	?	Up
OV daemons	?	Either
Ethernet	?	Up

3. When the Primary Master issue has been resolved, either of the following two options can be used:

- **Option a** - Relocate the production database on the Secondary Master to the Primary Master.



Note: Use this option when the production server needs to move back to the original server to resume normal operating conditions.

- **Option b** - Update the Secondary Master acting as the production server to the role of the Primary Master. The existing Primary Master then performs the role of Secondary Master.



Note: Use this option when the production server needs to stay in its current location for a period of time and normal operating conditions need to resume.

Option a



Note: The estimated time to perform Option a is less than 30 minutes.

1. Enter the following command as user `otroot` in the `otroot` home directory to start the TimePictra Administration Utility *on the Secondary Master*:

```
osmfadmin
```

2. Type the following menu items, in the order shown, to relocate the production database on the Secondary Master to the Primary Master (enter the number next to the menu item).

- **Replication Server Administration** (from the `osmfadmin` main menu)
- **Relocate Production Database on Secondary Master to Primary Master** (from the Replication Administration menu)

3. Acknowledge the warning message that appears by typing **y** and then **Enter**.

Several messages will appear. Watch the screen for errors during the relocation process.

4. Type the following menu items, in the order shown, to shut down the Web server.
 - **Return to Previous Menu** (from the Replication Administration menu)
 - **Web Server Administration** (from the osmfadmin main menu)
 - **Shutdown Web Server** (from the Web Server Administration menu)
 - **Exit** (from the Web Server Administration menu)
5. Enter the following command as user otroot in the otroot home directory to start the TimePictra Administration Utility *on the Primary Master*:

```
osmfadmin
```

6. Type the following menu items, in the order shown, to start the TimePictra daemons.
 - **Database Administration** (from the osmfadmin main menu)
 - **Startup TimePictra daemons** (from the Database Administration menu)
7. Type the following menu items, in the order shown, to start up the Web server.
 - **Return to Previous Menu** (from the Database Administration menu)
 - **Web Server Administration** (from the osmfadmin main menu)
 - **Startup Web Server** (from the Web Server Administration menu)
 - **Exit** (from the Web Server Administration menu)
8. Resume network monitoring using the TimePictra application.

The following table shows the state of TimePictra-related functions after Option a:

Hostname	Tp1	Tp2
Function	PM	SM
Database	Up	Up
TP daemons	Up	Down
Replication	Up	Up
Web Server	Up	Down
OV daemons	Up	Either
Ethernet	Up	Up

Option b



Note: The estimated time to perform Option b is less than 30 minutes.

1. Enter the following command to start the TimePictra Administration Utility *on the Primary Master*:

```
osmfadmin
```

2. Type the following menu items, in the order shown, to configure the Secondary Master acting as the production server to the role of Primary Master (enter the number next to the menu item).

- **Replication Server Administration** (from the osmfadmin main menu)
- **Configure Secondary Master acting as Production Server to Role of Primary Master** (from the Replication Administration menu)

3. Acknowledge the warning message that appears by typing **y** and then **Enter**.

1. Enter the following command as user otroot in the otroot home directory to start the TimePictra Administration Utility *on the other server, which is now the Primary Master*:

```
osmfadmin
```

2. Type the following menu items, in the order shown, to start the TimePictra daemons.

- **Database Administration** (from the osmfadmin main menu)
- **Startup TimePictra daemons** (from the Database Administration menu)

3. Type the following menu items, in the order shown, to start up the Web server.

- **Return to Previous Menu** (from the Database Administration menu)
- **Web Server Administration** (from the osmfadmin main menu)
- **Startup Web Server** (from the Web Server Administration menu)
- **Exit** (from the Web Server Administration menu)

4. Resume network monitoring using the TimePictra application.

The following table shows the state of TimePictra-related functions after Option b:

Hostname	Tp2	Tp1
Function	PM	SM
Database	Up	Up
TP daemons	Up	Down
Replication	Up	Up

Hostname	Tp2	Tp1
Web Server	Up	Down
OV daemons	Up	Either
Ethernet	Up	Up

Scenario 3

In this scenario, both servers are operating in normal conditions. The Primary Master might need to be moved from one location to another, or normal IT maintenance might be scheduled. In such situations it might be desirable to relocate the role of Primary Master to the Secondary Master. In this case, the Primary Master will become the Secondary Master and the Secondary Master will become the Primary Master. This process is called Relocation of Primary Master.

The following table shows the state of TimePictra-related functions:

Hostname	Tp1	Tp2
Function	PM	SM
Database	Up	Up
TP daemons	Up	Down
Replication	Up	Up
Web Server	Up	Down
OV daemons	Up	Either
Ethernet	Up	Up

Prerequisites

TimePictra daemons will be shutdown during this operation. Users must log off and will not have access to TimePictra during the operation. Communicate this to the user community.

Required Action



Note: The estimated time to perform the Required Action is less than 30 minutes.

1. Schedule a time for the Relocation of Primary Master operation.
2. Enter the following command as user otroot in the otroot home directory to start the TimePictra Administration Utility *on the current Primary Master*:

```
osmfadmin
```

3. Type the following menu items, in the order shown, to shut down the Web server (enter the number next to the menu item).

- **Web Server Administration** (from the osmfadmin main menu)
- **Shutdown Web Server** (from the Web Server Administration menu)

4. Type the following menu items, in the order shown, to relocate the Primary Master database.

- **Return to Previous Menu** (from the Web Server Administration menu)
- **Replication Server Administration** (from the osmfadmin main menu)
- **Relocate Primary Master Database** (from the Replication Administration menu)

5. Acknowledge the message that appears by typing **y** and then **Enter**.

6. Type the following menu item to exit the osmfadmin utility.

- **Exit** (from the Replication Administration menu)

7. Enter the following command as user otroot in the otroot home directory to start the TimePictra Administration Utility *on the new Primary Master, which was previously the Secondary Master*:

```
osmfadmin
```

8. Type the following menu items, in the order shown, to start the TimePictra daemons.

- **Database Administration** (from the osmfadmin main menu)
- **Startup TimePictra daemons** (from the Database Administration menu)

9. Type the following menu items, in the order shown, to start up the Web server.

- **Return to Previous Menu** (from the Database Administration menu)
- **Web Server Administration** (from the osmfadmin main menu)
- **Startup Web Server** (from the Web Server Administration menu)
- **Exit** (from the Web Server Administration menu)

The following table shows the state of TimePictra-related functions after the Required Action:

Hostname	Tp2	Tp1
Function	PM	SM
Database	Up	Up
TP daemons	Up	Down
Replication	Up	Up
Web Server	Up	Down
OV daemons	Up	Either
Ethernet	Up	Up



Note: The Primary Master now resides on the workstation that was previously the Secondary Master.

Scenario 4

In this scenario, normal operating conditions are in place and some issue, such as loss of DCN, has prevented communications between the Primary Master and Secondary Master servers. Replication has been automatically disabled due to this prolonged condition. The following condition will trigger this automatic process on the Primary Master:

- Loss of communication between the Primary Master and Secondary Master for over 24 hours.

The following table shows the state of the TimePictra-related functions:

Hostname	Tp1	Tp2
Function	PM	SM
Database	Up	Up
TP daemons	Up	Down
Replication	Down	Up
Web Server	Up	Down
OV daemons	Up	Down
Ethernet	Down	?

Required Action



Note: The estimated time to perform the Required Action is less than 5 minutes.

1. Remedy the communication issue between the Primary Master and Secondary Master.
2. Enter the following command as user otroot in the otroot home directory to start the TimePictra Administration Utility *on the Primary Master*:

```
osmfadmin
```

3. Type the following menu items, in the order shown, to enable and start replication on the Primary Master (enter the number next to the menu item).
 - **Replication Server Administration** (from the osmfadmin main menu)
 - **Enable/Disable Replication** (from the Replication Administration menu)
 - **Enable & Start Replication on Primary Master** (from the Replication Management menu)
4. Type the following menu items, in the order shown, to verify the status of the Resiliency and TimePictra daemons.
 - **Return to Previous Menu** (from the Replication Management menu)
 - **Return to Previous Menu** (from the Replication Administration menu)
 - **Status** (from the osmfadmin main menu)
5. Start TimePictra using the necessary procedures in the section entitled [Start a Software Session](#) in [Chapter 2](#), then resume normal operating conditions on the Primary Master.

The following table shows the state of the TimePictra-related functions after the Required Action:

Hostname	Tp1	Tp2
Function	PM	SM
Database	Up	Up
TP daemons	Up	Down
Replication	Up	Up
Web Server	Up	Down

Hostname	Tp1	Tp2
OV daemons	Up	Down
Ethernet	Up	Up

Scenario 5

In this scenario, the Secondary Master is down because of any of the following reasons:

- The Network is down
- A Power failure has occurred
- Unscheduled maintenance is being performed
- System problems exist

The following table shows the state of the TimePictra-related functions:

Hostname	Tp1	Tp2
Function	PM	SM
Database	Up	?
TP daemons	Up	Down
Replication	Up	?
Web Server	Up	Down
OV daemons	Up	Down
Ethernet	Up	?

Required Action



Note: The estimated time to perform the Required Action is less than 30 minutes.

1. Determine the issue with the Secondary Master and estimate how long it will be unavailable.
2. Take one of the following actions:

- Allow the Primary Master to continue as-is and keep running in Resiliency mode. When the Secondary Master is restored and running again, Resiliency will resume.
- If the Secondary Master is going to be down for more than 24 hours, perform the following:

- a. Enter the following command as user `otroot` in the `otroot` home directory to start the TimePictra Administration Utility *on the Primary Master*:

```
osmfadmin
```

- b. Type the following menu items, in the order shown, to disable and stop replication on the Primary Master (enter the number next to the menu item).

- **Replication Server Administration** (from the `osmfadmin` main menu)
- **Enable/Disable Replication** (from the Replication Administration menu)
- **Stop & Disable Replication on the Primary Master** (from the Replication Management menu)

- c. Acknowledge the message that appears by typing **y** and then **Enter**.

- d. If necessary, type the following menu items, in the order shown, to start the TimePictra processes on the Primary Master.

- **Return to Previous Menu** (from the Replication Management menu)
- **Return to Previous Menu** (from the Replication Administration menu)
- **Database Administration** (from the `osmfadmin` main menu)
- **Startup TimePictra daemons** (from the Database Administration menu)

- e. Continue TimePictra management operations on the Primary Master machine until the Secondary Master issue is resolved.

- f. When the Secondary Master is restored, type the following menu items, in the order shown, to enable and restart replication on the Primary Master.

- **Return to Previous Menu** (from the Database Administration menu)
- **Replication Server Administration** (from the `osmfadmin` main menu)
- **Enable/Disable Replication** (from the Replication Administration menu)
- **Enable & Start Replication on Primary Master** (from the Replication Management menu)

- g. Acknowledge the message that appears by typing **y** to continue.

- h. Press **Enter** again to continue when prompted.

- i. If necessary, type the following menu items, in the order shown, to start the TimePictra processes on the Primary Master.

- **Return to Previous Menu** (from the Replication Management menu)

- **Return to Previous Menu** (from the Replication Administration menu)
- **Database Administration** (from the osmfadmin main menu)
- **Startup TimePictra daemons** (from the Database Administration menu)

The following table shows the state of TimePictra-related functions after the Required Action

Hostname	Tp1	Tp2
Function	PM	SM
Database	Up	Up
TP daemons	Up	Down
Replication	Up	Up
Web Server	Up	Down
OV daemons	Up	Either
Ethernet	Up	Up

Removing the Resiliency Option

The following procedure lists the steps required to remove (uninstall) the TimePictra Resiliency option.

1. Open up a terminal window with “root” as the user.
2. Enter the following command to switch users to user “otroot”:

```
su - otroot
```

3. Enter the following command in the otroot home directory to run the osmfadmin utility:

```
osmfadmin
```

4. Type the following menu items, in the order shown, to shut down the Web server and TimePictra processes (enter the number next to the menu item).
 - **Shutdown Web Server** (from the Web Server Administration menu)
 - **Return to Previous Menu** (from the Web Server Administration menu)
 - **Database Administration** (from the osmfadmin main menu)
 - **Shutdown TimePictra Daemons** (from the Database Administration menu)
 - **Exit** (from the Database Administration menu)
5. Type the following at the otroot prompt to check if the Oracle database is running:

```
ps -ef | grep -eMV10 -etnslnr
```

The information returned should suggest that the necessary Oracle database processes are running, and should appear similar to the following:



Note: The PIDs, times, order, etc., will be different. The important fact is that the information returned should show that database-related processes are running.

```
otroot 7901 7900 0 23:14:33 ?          0:00 oracleMV10 (DESCRIPTION=(LOCAL=YES)
      (ADDRESS=(PROTOCOL=beq)))
otroot 7457      1 0 23:11:00 ?          0:00 ora_ckpt_MV10
otroot 7451      1 0 23:11:00 ?          0:00 ora_pmon_MV10
otroot 7473      1 0 23:11:01 ?          0:00 ora_arc0_MV10
otroot 7885 7884 0 23:14:27 ?          0:00 oracleMV10 (DESCRIPTION=(LOCAL=YES)
      (ADDRESS=(PROTOCOL=beq)))
otroot 7459      1 0 23:11:01 ?          0:00 ora_smon_MV10
otroot 7895 7882 0 23:14:28 ?          0:00 oracleMV10 (DESCRIPTION=(LOCAL=YES)
      (ADDRESS=(PROTOCOL=beq)))
otroot 7467      1 0 23:11:01 ?          0:00 ora_s001_MV10
otroot 7475      1 0 23:11:01 ?          0:00 ora_arc1_MV10
otroot 7873      1 0 23:14:24 ?          0:00 ora_j005_MV10
otroot 7453      1 0 23:11:00 ?          0:00 ora_dbw0_MV10
otroot 7461      1 0 23:11:01 ?          0:00 ora_reco_MV10
otroot 7869      1 0 23:14:24 ?          0:00 ora_j003_MV10
otroot 7469      1 0 23:11:01 ?          0:00 ora_d000_MV10
otroot 7465      1 0 23:11:01 ?          0:00 ora_s000_MV10
otroot 7899 7898 0 23:14:28 ?          0:00 oracleMV10 (DESCRIPTION=(LOCAL=YES)
      (ADDRESS=(PROTOCOL=beq)))
otroot 7463      1 0 23:11:01 ?          0:00 ora_cjq0_MV10
otroot 7863      1 0 23:14:24 ?          0:00 ora_j001_MV10
otroot 7455      1 0 23:11:00 ?          0:00 ora_lgwr_MV10
otroot 7471      1 0 23:11:01 ?          0:00 ora_d001_MV10
otroot 7865      1 0 23:14:24 ?          0:00 ora_j002_MV10
otroot 7871      1 0 23:14:24 ?          0:00 ora_j004_MV10
otroot 7892 7883 0 23:14:28 ?          0:00 oracleMV10 (DESCRIPTION=(LOCAL=YES)
      (ADDRESS=(PROTOCOL=beq)))
otroot 7444      1 0 23:10:59 ?          0:00 /opt/oracle/app/oracle/product/
      DB/bin/tnslnr LISTENER -inherit
```

6. If the information returned in the previous step indicates the Oracle database is running, skip to [Step 9](#), on page 139. If no information is returned, continue with the next step.
7. Enter the following command to start the TimePictra Administration Utility:


```
osmfadmin
```
8. Type the following menu items, in the order shown, to start the Oracle database.
 - **Database Administration** (from the osmfadmin main menu)
 - **Startup Database** (from the Database Administration menu)
 - **Exit** (from the Database Administration menu)
9. Enter the following command to return to the root prompt:

```
exit
```

10. Enter the following command to start the UNIX uninstaller:

```
swremove
```

A list of all of the products that are currently installed on the server is displayed.

11. On the screen that appears, select **TimePictra Resiliency Option** and then select **Remove...** in the **Action** menu.
12. If removal analysis completes successfully, click on **OK** to start the TimePictra Resiliency option removal. If remove analysis fails, go through the log file by clicking the **Logfile...** button and take corrective actions.
13. Click the **Done** button, then exit out of the UNIX uninstaller.

TimePictra Database Tables

The following database tables represent the data which is needed to facilitate duplication of systems.

PM_LOG

TL1_CMDS

NE_FILTER

PASSTHRU_CMDS

SESSION_NE_FILTER

SESSION_TYPE_FILTER

TYPE_FILTER

USER_PREFS

USER_SEVERITY_MAP

TEMPLATE_CMDS

TEMPLATES

ACTION_ASSOCIATION

ACTION_DESCRIPTION

ALM_EVTS

NES_ST

NES_TEMPLATE

CARDS

OUTPUT_PORTS2

CH_THRESHOLDS

INPUT_CH
INVENTORIES
TR_LOG
CURRENT_ALARMS
GROUPS
NES
USER_PROFILES
VF
HISTORIC_EVENTS
PO
SO
VW
ALM_EVT_MAPPINGS
PM_PHASE_LOGS
USERPREFS
TP_PROFILE

Known Issues

1. Once the Secondary Master has been prepared from the Primary Master, automatic events from PRR10 netyes will no longer be logged into the Event History log, if the events reported already exist on the NE.
2. After the Secondary Master has been prepared from the Primary Master, an attempt to start TimePictra processes might lead to a "TRUNCATE TABLE mv_status_notifications" message. If this happens, the OV Alert Daemon might not come up. To fix the problem, stop TimePictra, stop Openview, start Openview, and start TimePictra. The sample output is as follows:

```
Starting SE Monitoring Daemon...
Sending output to /home/otroot/nohup.out
Starting Command Dispatcher...
Sending output to /home/otroot/nohup.out
Starting Event Receiver...
Starting Event Action...
Sending output to /home/otroot/nohup.out
TRUNCATE TABLE mv_status_notifications
ERROR at line 1:
ORA-00054: resource busy and acquire with NOWAIT specified
Starting OV Command Processor...
Sending output to /home/otroot/nohup.out
Starting OV Alert...
Sending output to /home/otroot/nohup.out
```

3. Once a relocation operation is performed, the user might see one or two NEs displayed in red in Openview (a different color from their Launch Pad counterpart). In this case, NE status is corrected after the next Automatic Alarm Sync. The user can also execute the `resync_alarms.ks` script provided under `/opt/osmf/DB/admin` to revalidate Network Element severity status.
4. Positional data for "Root" level Openview maps is not replicated. (This refers to the X, Y coordinates of each Network Element and Domain Icon on the top level Openview map.) Openview APIs do not allow access to this data and thus this information is not transferred between the Primary Master and Secondary Master servers. If positional data is desired at the top level, it is recommended that one domain be created at the "Root" level and the sync network layout be created within that domain. All positional data will be replicated at that level.

Chapter 7 TimePictra SNMP Agent Option

This chapter provides information necessary to install, manage, and maintain the TimePictra SNMP Agent option.

In This Chapter

- [Introduction and General Information](#)
- [Installing the TimePictra SNMP Agent Option](#)
- [Configuring the TimePictra SNMP Agent](#)
- [More Details on Setting Up SNMPD.cnf Files](#)
- [Starting and Stopping the TimePictra SNMP Agent](#)
- [Removing the TimePictra SNMP Agent Option](#)
- [Troubleshooting](#)
- [Special Features and Limitations of the SNMP Agent](#)
- [Traps and Fields](#)

Introduction and General Information

This section describes the SNMP agent option, provides information about the MIB, and system administrator requirements.

Description of the SNMP Agent Option

TimePictra (TP) provides a user friendly Graphical User Interface (GUI) to facilitate the management of NEs. It also provides an SNMP agent to interface with higher-layer network management systems. The SNMP agent is the component that supports this SNMP interface.

The SNMP agent works as a proxy agent, translating the requests and responses between the external SNMP manager and the TimePictra Element Management System.

The SNMP agent translates (as required) the information (commands, data, status information, events, etc.) that passes between TimePictra software and a higher-layer network management system. The SNMP agent provides the following functions:

- Allows higher-layer manager to access up to 1500 network elements (NEs).
- Enables the manager to perform standard SNMP GET and SET operations as per the information model.
- Translates TimePictra-generated events to SNMP traps so that the manager can process them.

[Figure 7-1](#) shows that within the TimePictra application, the SNMP agent interacts with other modules using the TimePictra Shared Libraries.

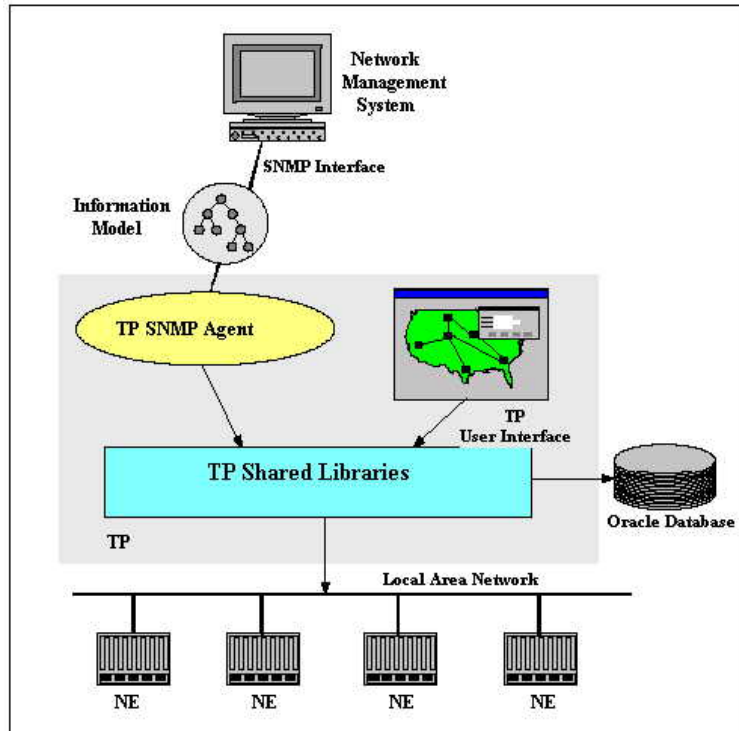


Figure 7-1. The Information Model and TimePictra

In a general sense, the SNMP agent has two main functions - forwarding of events (event forwarding) and handling requests. Event forwarding involves the processing and forwarding of events from network elements and the system itself to the higher-layer manager. Request handling involves the processing of GET/SET requests between the higher-layer manager and the system or network elements.

Event Forwarding

The SNMP agent application emits traps, which could be either due to change on the NE side or due to the change on the database side. In the TimePictra model, the database first receives events from various sources and places those events into corresponding tables. Then the DBAgent, which is a part of TimePictra application, forwards those events to the Trap SubAgent. The Trap Subagent maps these events to SNMP traps and dispatches them to the configured managers.

In the TimePictra event model shown in [Figure 7-2](#), the database does the following in the order shown:

- Receives TL1 events from the Service Element (SE) or the user interface.
- Processes them.
- Notifies the SNMP agent of the events.

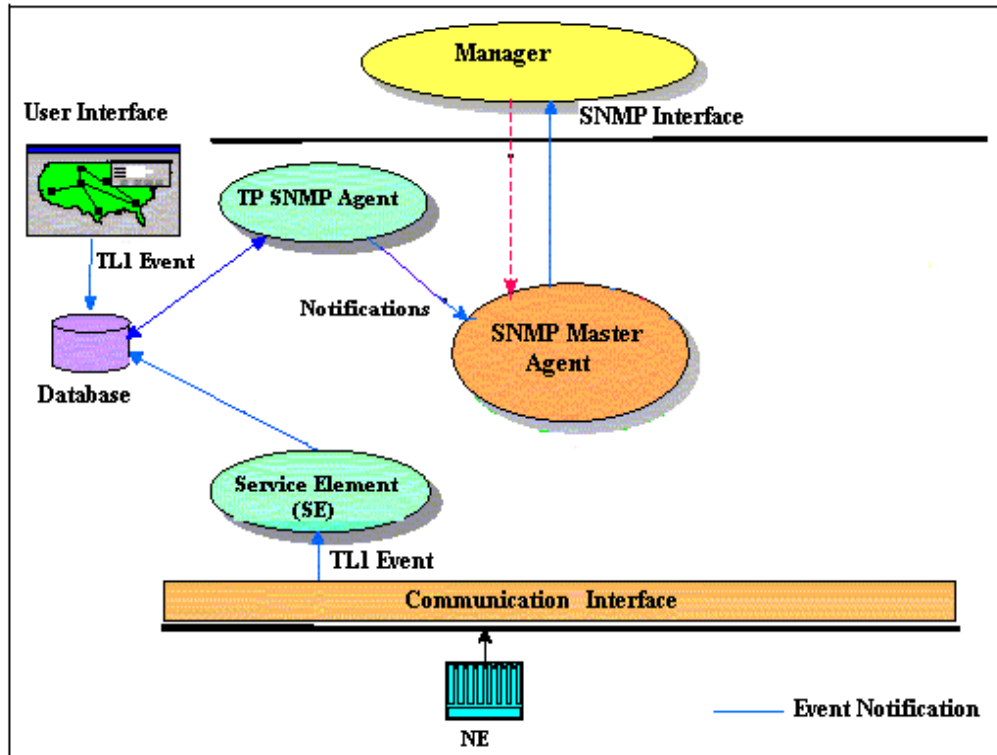


Figure 7-2. TimePictra Event Model

Events and Traps can be classified under the categories shown in [Table 7-1](#)

Table 7-1. Events and Traps

Event/ Trap	Description
NE Alarms	These are the alarmed events generated by the NEs
NE Events	These are the non-alarmed events generated by the NEs
SystemAlarms	These are alarmed events generated by TimePictra
SystemEvents	These are non-alarmed events generated by TimePictra
NE Creation/Deletion	These are Network Element Creation/Deletion traps that are emitted for NEs
Attribute Value Change	These traps are generated whenever there is any change in the attributes
All Attribute Value Change	Any change in the configuration parameters of a NE generates these traps
ErrorMessage	These traps are generated when there is an error message from the GES Package

Handling Requests

The SNMP agent receives SNMP requests from the manager over a SNMP-UDP Stack. The request will be for a GET or SET operation on a NE. The SNMP agent validates these requests based on the community name and if valid, sends it to the TimePictra application.

After getting the response from TimePictra, the SNMP agent builds the corresponding SNMP responses and sends them to the requesting manager.

Information Model

All information supported by TimePictra SNMP is modeled in the TimePictra SNMP MIB. [Figure 7-3](#) and [Figure 7-4](#) show the MIB structure.

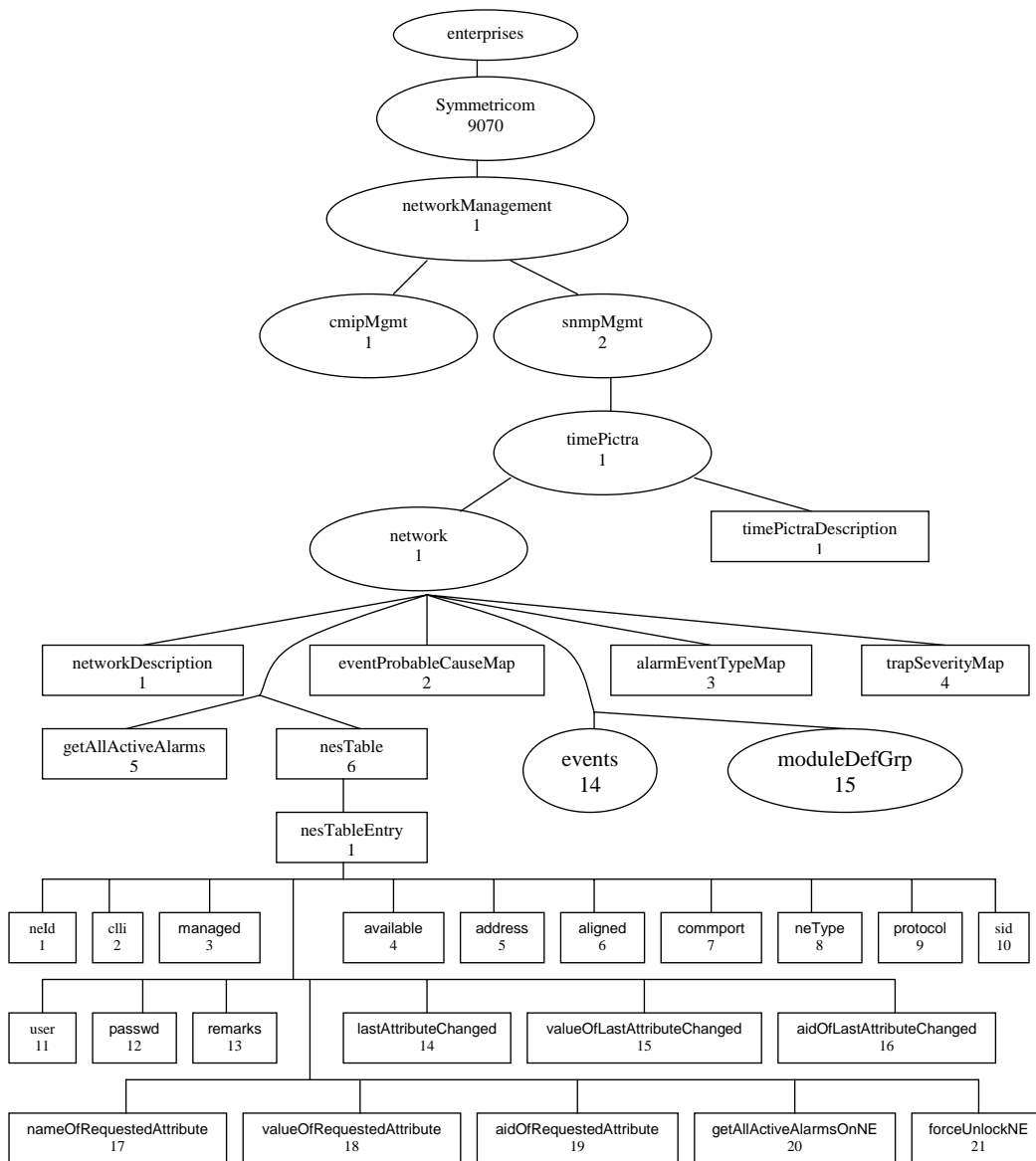


Figure 7-3. TimePictra SNMP MIB Structure (1 of 2)

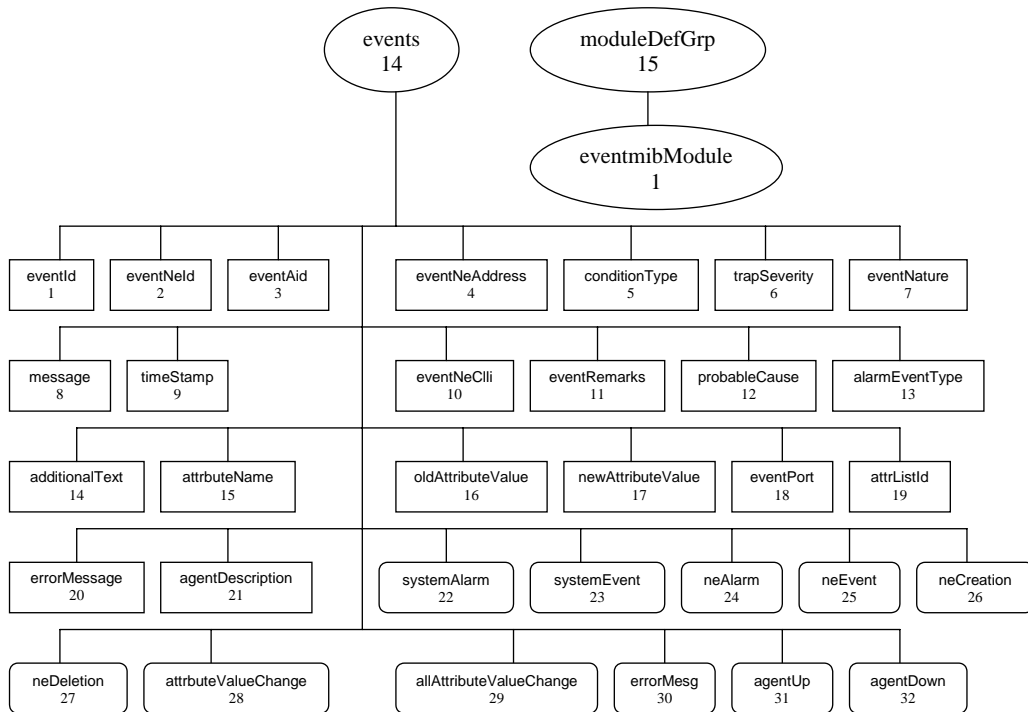


Figure 7-4. TimePictra SNMP MIB Structure (2 of 2)

FAQ Regarding the MIB

What is eventmibModule and moduleDefGrp in the generic SNMP Mib?

We organized our Generic MIB definitions as a group of MIB modules. Eventsmibmodule (a MODULE-IDENTITY) contains the trap and related definitions. The module moduleDefGrp is an object identity under which we register all other MIB modules. In the future, if we want to create a module, we can create it and register it under moduleDefGrp.

What is 'events' and NOTIFICATION-TYPE?

It may seem that sub-attributes of a 'notification-type' should fall under the 'notification-type,' but in the actual Mib declaration, both fall under the 'events' object identity.

NOTIFICATION-TYPE is a macro from standards denoting that the definition is a trap. 'events' is an object identity registered to keep all the information related to traps. We register all traps and related attributes under 'events.'

What are OBJECT-TYPE, OBJECT-IDENTITY and MODULE-IDENTITY?

The OBJECT-TYPE construct is used to define an object type. An object type is a class of management information or a mechanism to organize related object types. This construct is used to define table, row, columnar and scalar objects.

The OBJECT-IDENTITY construct is used to assign an OID value to an object identifier in a MIB Module.

The MODULE-IDENTITY construct is used to specify information about SNMP MIB modules. This includes revision history, name of the organization which has authority over definitions, contact for technical queries, etc.

Is it possible to acknowledge an active alarm on TimePictra using SNMP?

It is not possible to acknowledge an active alarm on TimePictra through the SNMP agent. Managers can only view the alarms emitted by the SNMP agent. This feature is not supported in current SNMP agent implementation.

How do we collect performance data from the SSUs via the SNMP Mib?

Current SNMP MIB does not have objects to query performance-related data for a particular NE. This feature is not supported in the current SNMP agent implementation.

Can TL1 Command Bundles be triggered via the SNMP interface?

This feature is not supported in the current SNMP agent implementation.

What attributes can be set via SNMP on each element?

All attributes that are settable via the standard TimePictra Configuration Modify interface are settable via the SNMP interface also. For example, you can set the following attributes of the ITH card for the 55400 NE through the SNMP agent:

DSCTIME, HFQLEVL, MANCHAN, PIRANGE, REVERT, SPRDCHN, SYNCMDE, WTRSS, etc.

All the NETYPES (TS, HP4, HP5, etc.) that are managed by TimePictra are accessible from the SNMP agent.

Does the SNMP MIB provide status of the 'Resiliency' machines?

This feature is not supported in the current SNMP agent implementation.

I cannot find 'attrNameListId' in the MIB file 'event-mib.my'.

attrNameListId is used in 'event-mib.my' but defined in another mib file called 'timepictra.my'. MIB Attribute 'attrListId' (OID: 1.3.6.1.4.1.9070.1.2.1.1.14.19) is also used in Event 'errMesg'.

What is the 'errorMesg' event?

When you get an 'errorMesg' event, it means that the SNMP GET/SET operation performed from the SNMP Manager (e.g., NetCool, HP OpenView, etc.) has failed. This event tells the NetCool user what failed and why it failed. In that instance, the NetCool NMS user has to check TimePictra EMS to get into specifics and analysis. SNMP protocol has some limitations, and that is why this innovation was developed: to send error information back (to the SNMP Manager) with the errorMesg Event. If the GET/SET fails, the "errorMessage" will have the attributeName on which the operation has failed.

What is 'eventNeClli' and 'eventNeld'?

'eventNeClli' (INTEGER) (1.3.6.1.4.1.9070.1.2.1.1.14.2) is the unique alphanumeric (can have numbers in it) name a customer sees on the Launch Pad or maps. It is a unique name given to a specific network element.

'eventNeld' (OCTET_STRING) (1.3.6.1.4.1.9070.1.2.1.1.14.10) is a unique numeric ID used inside TimePictra and not as useful to a customer as 'eventNeClli'. It is a unique numeric ID given to a specific network element.

How can a customer uniquely identify a specific alarm or event?

For a customer's own logical ID for a event or alarm, just using 'eventId' is enough but one can also use 'eventId + eventNeClli + eventAid + conditionType' for more clarity and information.

Can 'eventId' be used to match a clear event with the related alarm or event?

No; 'eventId' uniquely identifies any event, be it a clear event, normal event, or alarm. To match a clear event with related alarms/events, one has to match "eventNeClli + eventAid + conditionType" between the alarm/event and the clearing event. If a customer's logical id primary purpose is to match clear events with event/alarms, then the logical id should have "eventNeClli + eventAid + conditionType".

What is "getAllActiveAlarms"?

When a manager does an SNMP GET on variable "getAllActiveAlarms", all alarms present in TimePictra for all NEs are reported by the SNMP agent to the SNMP Manager. It is important to note the alarms are not queried directly from the NEs themselves because the TimePictra database (from where the alarms are picked) is always current with all of the active alarms on the NEs.

Can a manager distinguish between automatic alarms and alarms that result from doing SNMP GET on variable "getAllActiveAlarms"?

No, this feature is not in the current SNMP Mib, but "all" such synchronization alarms (that come from by doing SNMP GET on variable "getAllActiveAlarms") should arrive to MOM (Manager or Managers) within seconds after MOM makes the GET request. Note that the word *synchronization* is not used in the context of timing and frequency products.

System Requirements

The hardware and software described in the following sections is required to run the SNMP agent.

Software Requirements

In addition to the software requirements detailed in the section entitled [System Requirements](#) in [Chapter 1](#), the SNMP agent requires the Master Agent. The Master Agent is the agent protocol engine and performs authentication, authorization, access control, and privacy functions. The EMANATE Master Agent comes with the EMANATE tool kit 15.x which receives both SNMPv1 and SNMPv2 traps. (This Agent is provided and used with the TimePictra SNMP Agent Option)

Hardware Requirements

The SNMP agent runs on the same workstation on which the TimePictra software runs. Refer to the section entitled [System Requirements](#) in [Chapter 1](#) for information on the hardware required to run the TimePictra Software.

Prerequisite Knowledge

The procedures in this manual assume that the system administrator is experienced in HP-UX 11.xx, Master Agent, and TimePictra administration. This knowledge is useful, and in some cases, necessary when performing tasks in this manual.

Responsibilities of the System Administrator

The System Administrator is responsible for maintenance of the TimePictra system and the SNMP agent. The main responsibilities of the system administrator are as follows:

- Installing the SNMP agent Software.
- Configuring the SNMP agent.
- Ensuring that the TimePictra and the SNMP agents are running correctly.

Installing the TimePictra SNMP Agent Option

The UNIX installation program, *swinstall*, is used to install the SNMP agent. The *swinstall* program does the following:

- Checks for hardware and software dependencies.
- Copies the SNMP agent's files to their respective directories. The SNMP agent will be installed in the directory `/opt/osmf/SNMP`. The following directory structures will be created for the SNMP agent:

```
/opt/osmf/SNMP (main directory)
/opt/osmf/SNMP/bin (agent executable)
/opt/osmf/SNMP/config (contains configuration files)
/opt/osmf/SNMP/mibs (contains the mib files)
/opt/osmf/SNMP/utils (contains scripts)
/opt/osmf/tpagent (contains the tpagent script)
```

- Modifies the TimePictra database to flag the availability of the SNMP option.
- Registers the SNMP agent with the Master Agent.
- Configures the boot/shutdown sequence for the SNMP Agent Option.

Prerequisites for Installing the SNMP Agent

The following prerequisites are needed for a first-time installation of the SNMP agent:

- TimePictra must be already installed.
- An authentic TimePictra license file that enables the SNMP option must be installed. Refer to the section entitled [Install the TimePictra License File](#) in [Chapter 3](#) for more information.



Note: If a proper license file is not installed on the system, the following message appears when you attempt to start SNMP:

```
#####  
TPLIC:SNMP not allowed  
Please contact Symmetricon support.  
#####
```

-
- The TimePictra database must be running.
 - The TimePictra SNMP Agent Option CD must be available.

Installing the SNMP Agent

To install the SNMP agent, use the UNIX swinstall utility, as described in the following procedure.

1. Open up a terminal window with “root” as the user.
2. Insert the TimePictra SNMP Agent Option CD into the CD-ROM drive, then enter the following commands to mount the PFS format CD if necessary:

```
/usr/sbin/pfs_mountd &  
/usr/sbin/pfsd &  
chmod 775 /etc/pfs_fstab  
/usr/sbin/pfs_mount /SD_CDROM
```

3. Enter the following command to ensure that the DISPLAY variable points to a valid X-server where the TimePictra processes are running:

```
export DISPLAY='hostname':0.0
```

4. Enter the following command to start the UNIX software installer:

```
swinstall -s /SD_CDROM/DEPOT
```


5. Select **Change Options...** in the **Options** menu in the window that appears.
6. Dismiss the note that appears by clicking **OK**.
7. In the “Options” window that appears, uncheck the `Enforce dependency analysis errors in agent` check-box, then click **OK**.
8. In the Software Selection window, select **TimePictra SNMP Option**.
9. Select **Install...** in the **Actions** menu.
10. Dismiss the note that appears by clicking **OK**.

Install analysis should begin and then complete successfully. If the analysis fails, examine the log file by clicking the **Logfile...** button and rectify any problems that exist before proceeding.



Note: If the version of TimePictra that is currently installed is greater than version 3.0, the install analysis Status field will show the message `Ready with Warnings`. This message in this case is normal; continue with the installation.

11. After install analysis completes, click **OK** to begin the SNMP agent option installation.

The installation phase should complete with no errors.
12. When the status shows `Completed`, click **Done**.
13. Exit out of the `swinstall` utility by selecting **Exit** in the **File** menu.
14. Enter the following command to unmount the CD:

```
pfs_umount /SD_CDRUM
```
15. Log out and close the shell.

Configuring the TimePictra SNMP Agent

The Master Agent reads its configuration information from the file `/opt/osmf/SNMP/config/snmpd.cnf` when starting. The following procedure explains how to configure the SNMP agent.

1. Open up a terminal window with “root” as the user.
2. Using the vi editor, customize the snmpd.cnf file by modifying the keyword line “snmpTargetAddrEntry” to the IP address of the machine that will receive SNMP traps from TimePictra. Only the IP address should be changed.

As an example, if the machine that will receive SNMP traps has an IP address of 192.168.10.178, modify the line to appear as follows:

```
snmpTargetAddrEntry   trgName snmpUDPDomain  
192.168.10.178:162 100 0 whereToGo \  
  
v2cExampleParams nonVolatile 255.255.255.255:0 2048
```



Note: By default, any manager can perform GET/SET operations.

3. Using the vi editor, set the start flag to 0 in the following configuration files, if they exist:
 - /etc/rc.config.d/SnmpTrpDst
 - /etc/rc.config.d/SnmpHpunix
 - /etc/rc.config.d/SnmpMaster
 - /etc/rc.config.d/SnmpMib2
4. Enter the following command to ensure that the port used by the SNMP agent is in the /etc/services file:

```
grep snmp-trap /etc/services
```



Note: The above command must be run from the Korn shell [ksh].

This should result in the following output:

```
snmp-trap 162/udp trapd #Simple Network Management Protocol  
Traps
```

5. If the above line is missing from or is incorrect in the /etc/services file, use the vi editor to correct it.
6. Enter the following commands to stop any SNMP daemons that are running:

```
ps -ef | grep snmp | while read a b c; do kill -9 $b ; done;
```



Note: Although not normal or recommended, some TimePictra customers might want to leave the system default SNMP daemons running while still using the TimePictra SNMP agent. In such a case, perform the following steps:

1. Stop the TimePictra SNMP agent, then shut down TimePictra.
2. Using the vi editor, edit the `/opt/osmf/config/env/osmf-db.env` file to add the following two lines at the end of the file (after `export PATH`):

```
export SR_SNMP_TEST_PORT=7161
export SR_TRAP_TEST_PORT=7162
```

3. Re-start TimePictra, then start the TimePictra SNMP agent.

The TimePictra SNMP agent can now be reached via port 7161, and traps will be generated to port 7162 instead of the default ports.

More Details on Setting Up SNMPD.cnf Files

The `snmpd.cnf` file can be configured for the following:

- Configuring a Master Agent to block all SNMPV1 requests
- Configuring a Master Agent to use different community name instead of default "public" community name
- Configuring a Master Agent to send Notifications to manager(s) using default community name public
- Configuring a Master Agent to send notifications (both V1 & V2) to manager with different community name
- Configuring a Master Agent to send Symmetricom MIB related notifications to the manager with a unique community name

Configuration Files

The Configuration files used are as follows:

- `/opt/osmf/SNMP/config/snmpd.cnf`
- `snmp_tree.cnf` is used by TPSNMP agent

Configuring /opt/osmf/SNMP/conf/snmpd.cnf

The environment variable SR_AGT_CONF_DIR gives the path of the configuration file the Master Agent uses.

Configuring the Master Agent to block all SNMPV1 requests.

To accept only V2 requests, delete all vacmAccessEntries that do not apply to SNMPv2c from the snmpd.cnf file. Also, delete all the entries that use the vacmAccessSecurityModel snmpv1 or snmpv3. The following is an example command that retains the entries that use snmpv2c:

```
vacmAccessEntry Anyone - snmpv2c noAuthNoPriv exact All All  
All nonvolatile
```

Similarly, to receive both SNMPv2c and SNMPv3 requests, delete the entries related to SNMPv1 from the snmpd.cnf file.



Note: Whenever the snmpd.cnf file is modified, you must restart the Master Agent.

Configuring the Master Agent to use a different community name instead of the default "public" community name:

Use the following steps to configure the Master Agent to use a different community name.

1. Search for "snmpCommunityEntry" in the snmpd.cnf file to locate an entry similar to the following:

```
snmpCommunityEntry t0000000 public public localSnmPID - -  
nonVolatile
```

2. To change the community name from "public" to "webpass" replace the word "public" in both places in the command with "webpass" as follows:

```
snmpCommunityEntry t0000000 webpass webpass localSnmPID - -  
nonVolatile.
```

3. Restart the Master Agent.

With the above changes, you can access all MIB objects with a Community name of "webpass".

Configuring the Master Agent to use a different community name for symmetricom mibs and block V1 request for symmetricom mibs.

Use the following steps to configure the Master Agent to use a different community name for symmetricom Mibs and to block V1 requests for symmetricom MIBs.

1. Search for "snmpCommunityEntry" with a command similar to the following.

```
snmpCommunityEntry t0000000 public public localSnmpID - -  
nonVolatile
```

2. Add a copy of the above entry and enter a different name for communityIndex (in the above entry, it is t000000). Replace both "public" entries with the desired community name, for example webpass. The modified entry is as follows:

```
snmpCommunityEntry t0000001 webpass webpass localSnmpID - -  
nonVolatile
```

3. Search for "vacmAccessEntry" to locate an entry similar to the following:

```
vacmAccessEntry Anyone - snmpv2c noAuthNoPriv exact All All  
All nonVolatile
```

Using the above entry, change Anyone to SymmetricomAccess (or any other name) and replace "All" with "symm". The modified entry is as follows:

```
vacmAccessEntry SymmetricomAccess - snmpv2c noAuthNoPriv  
exact symm symm symm nonVolatile
```

The first "symm" entry is for vacmAccessReadViewName, the second "symm" entry is for vacmAccessWriteViewName, and the third "symm" entry is for vacmAccessNotifyViewName.

4. Search for "vacmViewTreeFamilyEntry" to locate an entry as follows:

```
vacmViewTreeFamilyEntry All iso - included nonVolatile
```

In the above entry, change iso to enterprises.symmetricom, and replace "included" with "excluded" to prevent accessing symmetricom objects (this prevents you from accessing enterprises.9070 using a default community name). The modified entry is as follows:

```
vacmViewTreeFamilyEntry All enterprise.9070 -excluded  
nonVolatile
```

Add one more entry for accessing Symmetricom objects.

```
vacmViewTreeFamilyEntry symm enterprises.9070 -included  
nonVolatile
```

5. Restart the Master Agent.

With the above changes, you can access "enterprises.symmetricom" with a community name of your choice (in this case webpass) and block V1 request for symmetricom mibs.

Configuring the Master Agent to use a different community name for Symmetricom MIBs and to accept both V1 and V2 requests

1. Search for "snmpCommunityEntry" to locate an entry similar to the following:

```
snmpCommunityEntry t0000000 public public localSnmpID - -  
nonVolatile
```

2. In the above entry, give a different name for communityIndex (in the above entry it is t0000000). Then replace both "public" entries with the desired community name, for example webpass.

```
snmpCommunityEntry t0000001 webpass webpass localSnmpID - -  
nonVolatile
```

3. Search for "vacmAccessEntry" to locate an entry similar to the following:

```
vacmAccessEntry Anyone - snmpv2c noAuthNoPriv exact All All  
All nonVolatile
```

In the above entry, replace Anyone with SymmetricomAccess (or any other name) and replace "All" with "symm". The modified entry appears as follows:

```
vacmAccessEntry SymmetricomAccess - snmpv2c noAuthNoPriv  
exact symm symm symm nonVolatile
```

The first symm is for vacmAccessReadViewName, the second symm is for vacmAccessWriteViewName, and the third symm is for vacmAccessNotifyViewName.

Similarly, if the Master Agent can accept V1 requests as well, then add a copy of the above entry and change vacmAccessSecurityModel (in the above case, change snmpv2c to snmpv1) as follows:

```
vacmAccessEntry SymmetricomAccess - snmp1 noAuthNoPriv exact  
symm symm symm nonVolatile
```

4. Search for "vacmViewTreeFamilyEntry" to locate an entry with the following details:

```
vacmViewTreeFamilyEntry All iso - included nonVolatile
```

5. Modify the above entry by changing iso to enterprises.symmetricom and change "included" to "excluded" to prevent accessing symmetricom objects (this prevents accessing enterprises.9070 using the default community name). The modified entry is as follows:

```
vacmViewTreeFamilyEntry All enterprise.9070 -excluded  
nonVolatile
```

6. Add one more entry to access Symmetricom objects as follows:

```
vacmViewTreeFamilyEntry symm enterprises.9070 -included  
nonVolatile
```

7. Restart the Master Agent.

With the above changes you can access "enterprises.symmetricom" with a community name of your choice (in the above case webpass).

Configuring the Master Agent to send Notifications to the manager(s) using default community name public

1. Search for "snmpCommunityEntry" to locate an entry similar to the following:

```
snmpCommunityEntry t0000000 public public localSnmpID - -  
nonVolatile
```

In the above entry, t000000 is the communityIndex and public is the community name.

2. Search for "vacmAccessEntry" to locate an entry similar to the following:

```
vacmAccessEntry Anyone - snmpv2c noAuthNoPriv exact All All  
All nonVolatile
```

In the above entry, the third "All" stands for vacmAccessNotifyViewName. If you want to send v1 notifications, then edit the above entry by changing the vacmAccessSecurityModel as follows:

```
vacmAccessEntry Anyone - snmpv1 noAuthNoPriv exact All All  
All nonVolatile
```

3. Search for snmpTargetParamsEntry to locate an entry similar to the following:

```
snmpTargetParamsEntry v2cExampleParams 1 snmpv2c public  
noAuthNoPriv nonVolatile
```

The above entry is for sending the V2 traps for the community name public.

To configure for V1 traps, add one more entry and change the "snmpTargetParamsSecurityModel" to snmpv1 as follows:

```
snmpTargetParamsEntry v1cExampleParams 0 snmpv1 public  
noAuthNoPriv nonVolatile
```

4. Search for "snmpTargetAddrEntry" to locate an entry similar to the following:

```
snmpTargetAddrEntry 32 snmpUDPDomain 127.0.0.1:0 100 3  
Console \  
v2cExampleParams nonVolatile 255.255.255.255:0 2048
```

To send the traps for a single manager, for example 134.15.15.16, edit the above entry as follows:

```
snmpTargetAddrEntry testV2Trap snmpUDPDomain 134.15.15.16:0
100 3 genV2Trap \ v2cExampleParams nonVolatile
255.255.255.255:0 2048
```

In the above entry, testV2Trap is snmpTargetAddrName and genV2Trap is snmpTargetAddrTagList. The above entry is for sending V2 traps. If you want to send V1 traps in addition to V2, use the following:

```
snmpTargetAddrEntry testV1Trap snmpUDPDomain 134.15.15.16:0
100 3 genV1Trap \ v1ExampleParams nonVolatile
255.255.255.255:0 2048
```

The above entry is for sending V1 traps. The testV1Trap is snmpTargetAddrName and genV1Trap is snmpTargetAddrTagList.

To send the traps for multiple managers, edit the snmpTargetAddrName and snmpTargetAddrTagList with the desired value.

5. Search for snmpNotifyEntry to locate an entry similar to the following:

```
snmpNotifyEntry 31 Console trap nonVolatile
```

Modify the above entry as follows:

```
snmpNotifyEntry xx genV2Trap trap nonVolatile
```

where xx is the snmpNotifyName and genV2Trap is snmpNotifyTag. Similarly, for v1 traps the entry is as follows:

```
snmpNotifyEntry yy genV1Trap trap nonVolatile
```

where yy is the snmpNotifyName and genV1Trap is snmpNotifyTag.

6. Search for "vacmViewTreeFamilyEntry" to locate an entry with the following details:

```
vacmViewTreeFamilyEntry All iso -included nonVolatile
```

If the above entry is not present in the file, you must enter it.

7. Restart the Master Agent.

With the above configurations, the agent sends all the notifications to the manager(s) with a default community name public.

Configuring the Master Agent to send notifications (both V1 & V2) to the manager with a different community name.

1. Search for "snmpCommunityEntry" to locate an entry similar to the following:

```
snmpCommunityEntry t0000000 public public localSnmpID - -  
nonVolatile
```

In the above entry, t0000000 refers to communityIndex and public is the community name. You can replace the default community name public with webpass as follows:

```
snmpCommunityEntry t0000000 webpass webpass localSnmpID - -  
nonVolatile
```

2. Search for "vacmAccessEntry" to locate an entry similar to the following:

```
vacmAccessEntry Anyone - snmpv2c noAuthNoPriv exact All All  
All nonVolatile
```

In the above entry, the third "All" refers to vacmAccessNotifyViewName.

To enable only V1 notifications, modify the vacmAccessSecurityModel entry as follows:

```
vacmAccessEntry Anyone - snmpv1 noAuthNoPriv exact All All  
All nonVolatile
```

3. Search for snmpTargetParamsEntry to locate an entry similar to the following:

```
snmpTargetParamsEntry v2cExampleParams 1 snmpv2c public  
noAuthNoPriv/ nonVolatile
```

The above entry sends only V2 traps for the community name public. After replacing public with webpass, the entry is as follows:

```
snmpTargetParamsEntry v2cExampleParams 1 snmpv2c webpass  
noAuthNoPriv nonVolatile
```

To send V1 traps, add one more entry and change the "snmpTargetParamsSecurityModel" (snmpv2c) with snmpv1, for example:

```
snmpTargetParamsEntry v1ExampleParams 0 snmpv1 webpass  
noAuthNoPriv nonVolatile
```

4. Search for "snmpTargetAddrEntry" to locate an entry with the following details:

```
snmpTargetAddrEntry 32 snmpUDPDomain 127.0.0.1:0 100 3  
Console \ v2cExampleParams nonVolatile 255.255.255.255:0  
2048
```

To send the trap for a single manager, for example to 134.15.15.16, add a copy of the above entry as follows:

```
snmpTargetAddrEntry testV2Trap snmpUDPDomain 134.15.15.16:0  
100 3 genV2Trap \ v2cExampleParams nonVolatile  
255.255.255.255:0 2048
```

The above entry is for sending V2 traps. The testV2Trap is snmpTargetAddrName and genV2Trap is snmpTargetAddrTagList. If you want to send V1 traps in addition to V2, enter the following:

```
snmpTargetAddrEntry testV1Trap snmpUDPDomain 134.15.15.16:0  
100 3 / genV1Trap v1ExampleParams nonVolatile  
255.255.255.255:0 2048
```

The above entry is for sending V1 traps. The testV1Trap is snmpTargetAddrName and genV1Trap is snmpTargetAddrTagList.

To send the traps for multiple managers, add a copy of the above entry and change the target address, snmpTargetAddrName, and snmpTargetAddrTagList with the desired values.

5. Search for snmpNotifyEntry to locate an entry similar to the following:

```
snmpNotifyEntry 31 Console trap nonVolatile
```

Add a copy of the above entry and change 31 to some other name and change Console to genV2Trap (or any other name) and the entry will be as follows:

```
snmpNotifyEntry xx genV2Trap trap nonVolatile
```

Where xx is the snmpNotifyName and genV2Trap is snmpNotifyTag.

Similarly, for v1 traps the entry is as follows:

```
snmpNotifyEntry yy genV1Trap trap nonVolatile
```

Where yy is the snmpNotifyName and genV1Trap is snmpNotifyTag

6. Search for "vacmViewTreeFamilyEntry" to locate an entry similar to the following:

```
vacmViewTreeFamilyEntry All iso -included nonVolatile
```

If the above entry is not present, then enter it.

7. Restart the Master Agent.

In the above configurations, the agent sends all the notifications to the manager(s) with the community name webpass.

TimePictra SNMP Traps to Multiple Destinations

The following are sample entries that are needed in the `snmpd.cnf` file. The second entry results in traps being forwarded to 134.15.15.10, port 7589.

`Snmpd.conf` has a short descriptions for the parameters.

```
snmpTargetAddrEntry trgName5 snmpUDPDomain 134.15.15.33:7589 100 0  
whereToGo \ v2cExampleParams nonVolatile 255.255.255.255:0 2048
```

```
snmpTargetAddrEntry trgName6 snmpUDPDomain 134.15.15.10:7589 100 0  
whereToGo \ v2cExampleParams nonVolatile 255.255.255.255:0 2048
```

Ensure that the agent is restarted after updating `snmpd.conf`.

Starting and Stopping the TimePictra SNMP Agent

The startup and shutdown processes of the SNMP Master Agent and Sub Agent are integrated with TimePictra system boot and system shutdown. If you want to start the SNMP agent manually, follow the steps given below.

Starting the SNMP Agent

1. Open up a terminal window with “root” as the user.
2. Enter the following command to ensure that the SNMP ports are defined correctly in the `/etc/services` file:

```
grep snmp /etc/services
```



Note: The above command must be run from the Korn shell [ksh].

This should result in the following output:

```
snmp 161/udp  
snmp-trap 162/udp
```

3. If the above information is not set correctly in the `/etc/services` file, use the `vi` editor to correct it.
4. Enter the following command to source the environment:

```
. /opt/osmf/config/env/osmf-db.env
```

5. Enter the following command to start the SNMP agent:

```
tpagent start SNMP
```



Note: If any errors are encountered during startup, refer to the section entitled [Troubleshooting](#) in this chapter.

Stopping the SNMP Agent

1. Open up a terminal window with “root” as the user.
2. Enter the following command to source the environment:

```
. /opt/osmf/config/env/osmf-db.env
```

3. Enter the following command to stop the SNMP agent:

```
tpagent stop SNMP
```

Removing the TimePictra SNMP Agent Option

The following procedure is a destructive procedure. You must be very careful, as it completely removes the SNMP agent option and all relevant data. The uninstall procedure is performed using the standard UNIX package removal script *swremove*.



Note: Ensure that the TimePictra Database is running and that all SNMP daemons are down before beginning the removal process.

To uninstall the SNMP agent, follow the steps in the following procedure.

1. Open up a terminal window with “root” as the user.
2. Enter the following command to source the environment:
3. Enter the following command to stop the SNMP daemons running on the server:

```
. /opt/osmf/config/env/osmf-db.env
```

```
tpagent stop SNMP
```

4. Enter the following command to switch to user “otroot”:

```
su - otroot
```

5. Enter the following command to check if the Oracle database is running:

```
ps -ef | grep -eMV10 -etnslnr
```

The information returned should suggest that the necessary Oracle database processes are running, and should appear similar to the following:



Note: The PIDs, times, order, etc., will be different. The important fact is that the information returned should show that database-related processes are running.

```
otroot 7901 7900 0 23:14:33 ?          0:00 oracleMV10 (DESCRIPTION=(LOCAL=YES)
      (ADDRESS=(PROTOCOL=beq)))
otroot 7457      1 0 23:11:00 ?          0:00 ora_ckpt_MV10
otroot 7451      1 0 23:11:00 ?          0:00 ora_pmon_MV10
otroot 7473      1 0 23:11:01 ?          0:00 ora_arc0_MV10
otroot 7885 7884 0 23:14:27 ?          0:00 oracleMV10 (DESCRIPTION=(LOCAL=YES)
      (ADDRESS=(PROTOCOL=beq)))
otroot 7459      1 0 23:11:01 ?          0:00 ora_smon_MV10
otroot 7895 7882 0 23:14:28 ?          0:00 oracleMV10 (DESCRIPTION=(LOCAL=YES)
      (ADDRESS=(PROTOCOL=beq)))
otroot 7467      1 0 23:11:01 ?          0:00 ora_s001_MV10
otroot 7475      1 0 23:11:01 ?          0:00 ora_arcl_MV10
otroot 7873      1 0 23:14:24 ?          0:00 ora_j005_MV10
otroot 7453      1 0 23:11:00 ?          0:00 ora_dbw0_MV10
otroot 7461      1 0 23:11:01 ?          0:00 ora_reco_MV10
otroot 7869      1 0 23:14:24 ?          0:00 ora_j003_MV10
otroot 7469      1 0 23:11:01 ?          0:00 ora_d000_MV10
otroot 7465      1 0 23:11:01 ?          0:00 ora_s000_MV10
otroot 7899 7898 0 23:14:28 ?          0:00 oracleMV10 (DESCRIPTION=(LOCAL=YES)
      (ADDRESS=(PROTOCOL=beq)))
otroot 7463      1 0 23:11:01 ?          0:00 ora_cjq0_MV10
otroot 7863      1 0 23:14:24 ?          0:00 ora_j001_MV10
otroot 7455      1 0 23:11:00 ?          0:00 ora_lgwr_MV10
otroot 7471      1 0 23:11:01 ?          0:00 ora_d001_MV10
otroot 7865      1 0 23:14:24 ?          0:00 ora_j002_MV10
otroot 7871      1 0 23:14:24 ?          0:00 ora_j004_MV10
otroot 7892 7883 0 23:14:28 ?          0:00 oracleMV10 (DESCRIPTION=(LOCAL=YES)
      (ADDRESS=(PROTOCOL=beq)))
otroot 7444      1 0 23:10:59 ?          0:00 /opt/oracle/app/oracle/product/
      DB/bin/tnslsnr LISTENER -inherit
```

6. If the information returned in the previous step indicates the Oracle database is running, skip to [Step 9](#), on page 166. If no information is returned, continue with the next step.

7. Enter the following command in the otroot home directory to run the osmfadmin utility:

```
osmfadmin
```

8. Type the following menu items, in the order shown, to start the Oracle database.

- **Database Administration** (from the osmfadmin main menu)

- **Startup Database** (from the Database Administration menu)
- **Exit** (from the Database Administration menu)

9. Enter the following command to return to the root prompt:

```
exit
```

10. Enter the following command to start the UNIX uninstaller:

```
/usr/sbin/swremove
```

A list of all the products that are currently installed on the server is displayed in the window that appears.

11. Select **TimePictra SNMP Option**, then select **Remove...** in the **Actions** menu.

12. If removal analysis completes successfully, click on **OK** to start the TimePictra SNMP option removal. If remove analysis fails, go through the log file by clicking the **Logfile...** button and take corrective actions.

13. Click the **Done** button when removal is complete, then exit out of the swremove utility by selecting **Exit** from the **File** menu.

Troubleshooting

This section explains how to enable tracing, and provides some SNMP agent troubleshooting hints.

Enabling Tracing

In the SNMP agent, the following types of tracing can be enabled:

- TimePictra Tracing.
- Master Agent Tracing.



Note: Tracing should only be used for short periods of time, or when troubleshooting. Large amounts of data can be generated during tracing, which might affect disk space if it is left running.

To enable TimePictra tracing, follow the steps in the following procedure.

1. Open up a terminal window with “root” as the user.
2. Enter the following command to stop the SNMP agent if it is running:

```
tpagent stop SNMP
```

3. Export the following environment variables:

- *SV_TRACEMASK*: This variable specifies the global mask for trace output. For 'SNMP Agent,' specify the value as 0x4000.
- *SV_TRACELEVEL*: This variable specifies the level of trace information to record. For 'SNMP Agent,' specify the value as 07.



Note: The variable *SV_TRACEFILE* specifies the output file to output the trace information. This variable is set to the file `/var/opt/osmf/share/log/tpsnmpd.trc` within the SNMP agent code, so it need not be exported.

4. Enter the following command to start the SNMP agent:

```
tpagent start SNMP
```

Troubleshooting Hints

This section provides solutions for some common problems that might be encountered during application usage. [Table 7-2](#) includes SNMP troubleshooting hints.

Table 7-2. Troubleshooting Hints

Common Errors	Cause and Corrective Action
General Errors	
Failure in GET/SET operations	<p>Case 1: Configuration errors in Master Agent Configuration file.</p> <p>Corrective Action:</p> <ul style="list-style-type: none"> ■ Stop the SNMP agent ■ Stop the Master Agent ■ Open the Master Agent configuration file and configure the community names properly. Refer to the section entitled Configuring the TimePictra SNMP Agent in this chapter. ■ Restart the Master Agent and SNMP agent. <p>Case 2: Problem with the GES package.</p> <p>Corrective Action: Copy the GES package to the server and enter the <code>./opt/osmf/DB/mv/install_ges.ks</code> command to install the package.</p> <p><i>Note:</i> The <code>./opt/osmf/DB/mv/install_ges.ks</code> script must be run as user “otroot.”</p>

Table 7-2. Troubleshooting Hints (Continued)

Common Errors	Cause and Corrective Action
Failure in receiving Traps	<p>Case 1: Master Agent configuration issues. Corrective Action: Open the Master Agent configuration file and configure the trap destinations properly. Refer to the section entitled Configuring the TimePictra SNMP Agent in this chapter.</p> <p>Case 2: Database Agent is not up. Corrective Action: Start the Database Agent.</p> <p>Case 3: Entries in the <i>env</i> table are not set. Corrective Action: Enter the following commands to execute two scripts:</p> <pre>./opt/osmf/SNMP/utills/tp_snmpflag.ks ./opt/osmf/DB/trlog/trlog.ks enable</pre>

Table 7-2. Troubleshooting Hints (Continued)

Common Errors	Cause and Corrective Action
System Generated Errors	
	<p>Case: Events are not logging into tpn.</p> <p>Corrective Action: Enter the following command to execute a script to enable the trlog triggers: <code>./opt/osmf/DB/trlog/trlog.ks enable</code></p>
NE Generated Errors	
	<p>Case: Events are not logging into tpn.</p> <p>Corrective Action a Enter the following command at the SQL prompt to start the DB jobs: <code>@opt/osmf/admin/osmf_db_jobs.run</code></p> <p>Corrective Action b Enter the following command at the SQL prompt to enable the triggers AFTER_INS_UPD_CURRENT_ALARMS and AFTER_INS_HISTORIC_EVENTS: <code>@opt/osmf/DB/mv/aa.trg</code></p>

Special Features and Limitations of the SNMP Agent

In this section, the special features supported by the TimePictra SNMP agent and any known limitations are explained.

Special Features

A simple “snmpset” sets a list of attributes in a Network Element, not a single attribute of interest. Here, however, you can set the value of single attribute.

The manager needs to know about the current alarm status in order to SYNC up with the SNMP agent. Therefore the “snmpget,” which basically has the functionality of retrieving all the attribute values, has been modified to get all active alarms and the alarms that are specific to a requested Network Element.

SET a Single Attribute

A single attribute value can be set. To set the value of a single attribute of a Network Element, send the SET request in the following format:

```
snmpset <ipaddress/hostname> <attribute aid> <ne_id> <aid>
<attr_name_list_id> <attribute type> <"attribute
name=attribute value">
```

For example, to set attribute ECHO with the value ON. The SET command should be given as follows:

```
snmpset 134.15.15.7
1.3.6.1.4.1.167.1.1.1.2.4.54.5.67.79.77.45.49.8.84.83.51.48.
45.67.79.77. Octetstring "ECHO=ON"
```

Get getAllActiveAlarms Attribute

When the manager sends a GET request for an attribute, the SNMP agent polls the current alarms table. If there are any alarms in the table, the SNMP agent emits all the traps corresponding to each alarm. The syntax is as follows:

```
snmpget <ipaddress/hostname> <attribute oid>
```

Get getAllActiveAlarmsOnNE Attribute

When the manager sends a GET request for an attribute, the SNMP agent polls the current alarms table. If there are any alarms in the table for the requested NE, the SNMP agent emits traps corresponding to each alarm. The syntax is as follows:

```
snmpget <ipaddress/hostname> <attribute oid.NEindex>
```

Limitations of the SNMP Agent

Getting a single attribute value of a particular NE from the database is not supported in the current version of the TimePictra SNMP agent.

Traps and Fields

Table 7-3 explains the SNMP traps and fields.

Table 7-3. Traps and Fields

Occasion/Event of Occurrence of Traps	Emitted Traps	Fields
Error message from the GES Package.	ErrorMessage	Event Neld EventAid AttributeListId EventClli Error Message
Change in the configuration parameters of the NE	AllAttributeValueChange	EventNeld EventNeAddress EventNeClli EventAid AttributeListId NewAttributeValue

Table 7-3. Traps and Fields (Continued)

Occasion/Event of Occurrence of Traps	Emitted Traps	Fields
Change in the attributes of nesTable, cardsTable, almEvtTable, inputChannelTable, portTable, thresholdsTable, or tl1CmdsTable.	AttributeValueChange	EventId EventNeId EventNeAddress EventNeCli EventAid AttributeListId AttributeName OldAttributeValue NewAttributeValue
NE deletion.	NeDeletion	EventNeId EventNeAddress EventNeCli
NE creation	NeCreation	EventNeId EventNeAddress EventNeCli
An event from a NE with an event severity of none, noalarm, or clear	NeEvent	EventId EventNeId EventNeCli EventNeAddress EventAid EventPort Event Severity Event Nature Condition Type Message TimeStamp
An event from a NE with an event severity of major, minor, or critical.	NeAlarm	EventId EventNeId EventNeCli EventNeAddress EventAid EventPort Event Severity Event Nature Condition Type Message TimeStamp

Table 7-3. Traps and Fields (Continued)

Occasion/Event of Occurrence of Traps	Emitted Traps	Fields
An event from the TimePictra Software with an event severity of none, noalarm, or clear	SystemEvent	EventNeId EventId EventNeAddress EventNeClli EventAid EventPort Event Severity Event Nature Condition Type Message TimeStamp
An event from the TimePictra Software with an event severity of major, minor, or critical.	SystemAlarm	EventId EventNeId EventNeAddress EventNeClli EventAid EventPort Event Severity Event Nature Condition Type Message TimeStamp

Chapter 8 Commissioning an NE

This chapter explains how to configure various NEs to communicate with TimePictra.

In This Chapter

- [Configuring NEs to Communicate with TimePictra](#)

Configuring NEs to Communicate with TimePictra

Before Network Elements can be managed by the TimePictra software, some basic configuration is required on behalf of the system administrator. Since the software cannot initially communicate with the NE, this configuration must be performed via an alternate interface, such as a local craft interface or by issuing TL1 commands via a locally connected terminal. In addition, some switch settings on the NE might also need to be set.



Notes:

1. The procedures in this chapter serve as examples only. Refer to hardware and command documentation for the NE being commissioned for specific hardware information and configuration commands.
 2. Modifications of some network parameters using TL1 commands require a sequence be followed that is different than other parameters, to avoid inadvertent changes. This sequence is explained in the NE's command documentation when applicable.
-

Configuring a Terminal Server to Communicate with TimePictra

Certain NE's do not contain an ethernet port. Access to those NEs can be accomplished via a *Terminal Server*, which accepts TCP/IP communications from TimePictra and translates them to serial communications, which are accepted by the NE. The Terminal Server is typically connected to the serial communication port on the NE.

The following parameters on the Terminal Server typically must be set in order to establish communications with TimePictra.



Note:

Refer to the Terminal Server's documentation for the exact configuration commands.

- IP Address
- Subnet Mask
- Gateway
- The Local Port might need to be configured to ensure that the communication speed (BAUD Rate) matches with the NE.
- Once all the basic communication parameters are set on the Terminal Server, enable Remote Access capability.

Configuring a TimeHub to Communicate with TimePictra

Follow the steps in the following procedure to configure TimeHub to communicate with TimePictra.



Note: The following steps suggest the order in which the NE configuration should be performed. For details on how to modify particular parameters, refer to the documentation supplied with the interface used (TL1 commands or local craft interface).

1. Ensure that the Security/Password Not Required switch (bit 1 of switch S1 on the NIMC assembly) and the Force Enable Local Port switch (bit 2 of switch S1 on the NIMC assembly) is set to Off (see [Figure 8-1](#)).
2. Connect to the IMC card using local port and create a user with name svsec and a security level of SECURITY with a password of up to ten characters. The password must contain at least one special character (such as a period, asterisk, ampersand, or percent) and at least one non-alphabetical character.
3. Verify that Remote Automatic Output is set to ALWAYS.
4. Note the value for SCRAMBLE. This parameter will be considered when the NE is managed by TimePictra.
5. Set the following network parameters:
 - *NE IP Address* - Change this to the IP address for the NE being configured.
 - *TimePictra Host IP Address* - Change this to the IP address for the host on which the TimePictra software is running.
 - *Replication System IP Address (if necessary)* - Change this to the IP address for the TimePictra software replication system, if one is installed.



Note: If the replication option is not installed, the Replication System IP Address value should be left to 0.0.0.01, which is its default value.

- *Gateway Address* - Change this to the IP address of the default gateway.
 - *Sub-Network Address* - Change this to the IP address of the sub-network mask.
-



Note: The following network parameters do not need to be changed from their default values to support TimePictra software operation: Local Manager 1 Address (IPLM1), Local Manager 2 Address (IPLM2), Command Port (PORTCMD5), Auto Output Port (PORTAO), and Inactivity Time (INACTTIME).

6. Set the time and date at the NE.
7. Set the Security/Password Not Required switch and Force Enable Local Port switch (bits 1 and 2 of switch S1 on the NIMC assembly) to On (see [Figure 8-1](#)).

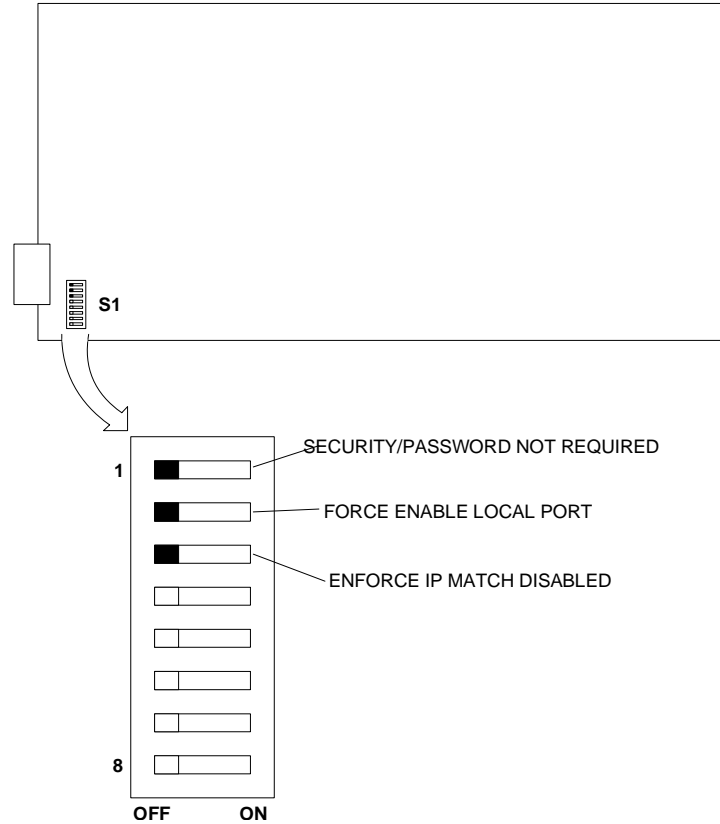


Figure 8-1. NIMC Assembly Switch Locations

Configuring a 55400A to Communicate with TimePictra

1. Set the Security/Password Required switch (bit 1 of switch S4 on the NIMC assembly) and the Force Enable Local Port switch (bit 3 of switch S4 on the NIMC assembly) to Off.
2. Connect to the IMC card using a local port and create a user with name svsec and a security level of SECURITY with a password of up to ten characters. The password must contain at least one special character (such as a period, asterisk, ampersand, or percent) and at least one non-alphabetical character.
3. Verify that Remote Automatic Output is set to ALWAYS.
4. Verify that Automatic Output Message Merge is set to N.

5. Set the following network parameters:

- *NE IP Address* - Change this to the IP address for the NE being configured.
- *TimePictra Host IP Address* - Change this to the IP address for the host on which the TimePictra software and database is running.
- *Replication System IP Address (if necessary)* - Change this to the IP address for the TimePictra software replication system, if one is installed.



Note: If the replication option is not installed, the Replication System IP Address value should be set to 0.0.0.0.

-
- *Gateway Address* - Change this to the IP address of the default gateway.
 - *Sub-Network Address* - Change this to the IP address of the sub-network mask.



Note: The following network parameters do not need to be changed from their default values to support TimePictra software operation: Local Manager 1 Address (IPLM1), Local Manager 2 Address (IPLM2), Command Port (PORTCMD5), Auto Output Port (PORTAO), and Inactivity Time (INACTTIME).

6. Set *Scramble* to γ .

7. Set the time and date at the NE.

8. Set the Enforce IPEM1/IPEM2/IPLM1/IPLM2 OR X25EM1/X25EM2 switch (bit 8 of switch S6 on the NIMC assembly) to Off.



Note: If, as for security reasons, your situation requires that the SSU accept communication only from the defined set of addresses (IPEM1, IPEM2, IPLM1, IPLM2, X25EM1, X25EM2), bit 8 of switch S6 should be set to On. When this switch is set to On, however, communications from all other addresses will be ignored, including management clients.

9. Set the Security/Password Required and the Force Enable Local Port switches (bit 1 and 3 of switch S4 on the NIMC assembly) to On.

Configuring a TimeSource 3X00 to Communicate with TimePictra

1. Enter the following command, using the defaults as a starting point, to configure IP port 5551 on the NE:

```
ED-COM::COM-5551:cc::echo=inh,compri=alw2;
```

2. The following parameters typically must also be set in order to establish communications with TimePictra.

- IP Address
- Subnet Mask
- Gateway
- The Primary Element Manager

Configuring a MIS-23 to Communicate with TimePictra

Follow the steps in the following procedure to configure a MIS-23 card to communicate with TimePictra.

1. A terminal server must be used for communications between the MIS-23 and TimePictra. The terminal server should be configured for hardware flow control, and the cable used to connect it to the MIS-23 should support the flow control lines. Echo should be set to off.
2. Connect the terminal server to the MIS-23 on its communication port. The communication port used needs to be programmed, using the defaults as a starting point, using the following command:

```
ED-EQPT::COM-X:cc::,ALW,,,,inh;
```

3. Before managing the MIS-23, configure it and load all unit configuration information on it. Refer to the MIS-23 TL1 documentation for details on the necessary commands.

Configuring DCDs to Communicate with TimePictra

Follow the steps in the following procedure to configure a DCD 5.01.05, DCD 5.04.02, or DCD 5.05.02 to communicate with TimePictra.

1. A terminal server must be used for communications between DCDs and TimePictra. The terminal server should be configured for hardware flow control, and the cable used to connect it to the DCD should support the flow control lines. Echo should be set to off.
2. Connect the terminal server to the DCD on any of its communication ports. The communication port used needs to be programmed, using the defaults as a starting point, using the following command:

```
ED-COM::COM-X:cc:,,,term2,,inh,alw1,alw,inh,,0;
```

3. Before managing the DCD, configure the MIS card and load all unit configuration information on it. Refer to the DCD's TL1 documentation for details on the necessary commands.

Configuring a PRR10 to Communicate with TimePictra

Follow the steps in the following procedure to configure the PRR10 to communicate with TimePictra.

1. Refer to the NE's hardware manual and use a configured terminal server on any of the NE's communication ports. Refer to the procedure [Configuring a Terminal Server to Communicate with TimePictra](#), on page 174 to configure the terminal server.
2. For the PRR10, in addition to the general network settings, the unit must be configured to operate in TL1 mode. Log onto the unit and enter the command, "comm mode t11" to accomplish this. Pressing the ; key a few times should verify that the NE is indeed in TL1 mode; a TL1 response should be generated every time the ; key is pressed.

Configuring TSG-3000 firmware versions D/E to Communicate with TimePictra

Follow the applicable steps in the following procedures to configure TSG-3000 firmware versions D/E to communicate with TimePictra.

Scenario 1: Ethernet not supported

1. Refer to the NE's hardware manual and use a configured terminal server on any of the NE's communication ports. Refer to the procedure [Configuring a Terminal Server to Communicate with TimePictra](#), on page 174 to configure the terminal server.
2. For the TSG-3000D/E, in addition to the general network settings, the unit must be configured to operate in TL1 mode. Log onto the unit and enter the command, "comm mode t11" to accomplish this. Pressing the ; key a few times should verify that the NE is indeed in TL1 mode; a TL1 response should be generated every time the ; key is pressed.

Scenario 2: Ethernet supported

The following parameters on the TSG-3000D/E must be set in order to establish communications with TimePictra.



Note:

Refer to the TSG-3000D/E documentation for the exact configuration commands.

- IP Address
- Subnet Mask
- Gateway

Connect to port 4000 when you manage the TSG-3000D/E NE.

Configuring a TimeProvider 1000/1100 to Communicate with TimePictra

Follow the steps in the following procedure to configure the TimeProvider 1000/1100 to communicate with TimePictra.

1. Create a username and password on the NE that will later be used when managing the NE.

Although the creation of a SECURITY-level user on the TimeProvider is not required, it is strongly advised to protect the NE. As an example, you can create a user with name svsec and a security level of SECURITY with a password of up to twenty characters. The password must contain at least one special character (such as a period, asterisk, ampersand, or percent) and at least one non-alphabetical character.

2. Set the following network parameters at the NE using the ED-EQPT command:

NE IP Address - Change this to the IP address for the NE being configured.

Gateway Address - Change this to the IP address of the default gateway.

Sub-Network Address - Change this to the IP address of the sub-network mask.

3. Set the time and date at the NE.

Configuring a SSU-2000 to Communicate with TimePictra

The following parameters on the SSU-2000 must be set in order to establish communications with TimePictra.



Note:

Refer to the SSU-2000 documentation for the exact configuration commands.

- IP Address
- Subnet Mask
- Gateway

Connect to port 2000 when you manage the SSU-2000 NE.

Chapter 9 Performance Utility Option

This chapter provides information necessary to use the TimePictra Performance Utility option to retrieve data and to perform administrative functions pertaining to data retrieval and scheduling. This documentation assumes you have a basic understanding of HP-UX and TimePictra.

In This Chapter

- [Description of the Performance Utility Option](#)
- [Retrieve \(Manual\) Performance Data](#)
- [Schedule \(Automatic Upload\) Jobs for Performance Data](#)
- [Performance Utility Administration and Troubleshooting](#)
- [Performance Utility Administration](#)

Description of the Performance Utility Option

The TimePictra Performance Utility option allows performance data to be manually retrieved, or scheduled for automatic retrieval from specified Network Elements (NEs). The Performance Utility's Retrieve screen (see [Figure 9-2](#) through [Figure 9-7](#)) allows you to manually collect performance data. The Performance Utility's Schedule screen (see [Figure 9-8](#) through [Figure 9-13](#)) allows you to schedule automatic performance data collection.

Scheduled phase data upload is supported for TSG-3800 and SSU-2000 only.

Data retrieval using the Performance Utility option is supported for the following NEs:

- TimeHub 5500
- Net Sync 55400/55409
- TimeSource 3000 (v1.04.02)
- TimeSource 3100 (v1.04.03)
- TimeSource 3500 (v1.04.02)
- TimeSource 3600 (v1.04.02)
- DCD 5.01.05
- DCD 5.04.02
- DCD 5.05.02
- DCD 5.05.04
- TSG-3800 (vD.04)
- TSG-3800 (vE TL1 ver G)
- SSU-2000

Phase Data Auto-upload

TimePictra's Performance Utility Scheduling function allows you to automatically retrieve T100 Phase Information (100 Sec Phase Average) from each active input on a TSG-3800E or SSU-2000E. The data file can provide a thirty-day phase history and as new phase data is appended to the file, older data is removed to maintain a thirty-day history.

TimePictra allows you to connect to an average of 200 NEs and collect data from an average of four inputs from each NE. Phase data is retrieved approximately once a day.

TimePictra logs phase data for each channel of each NE in one file. This allows you to download 30 days of phase data for all channels of one NE in one file. Additionally, up to five users can download the phase data at the same time.

Performance Data Plotting

Performance data can be saved either as text files, or as tab separated value (TSV) files. TSV files can be generated from the Performance Utility's Schedule screen and then downloaded to a desktop or laptop computer and imported and plotted using a spreadsheet application such as Microsoft Excel. For more advanced analysis, performance data can be imported into Symmetricom's advanced synchronization measurement analysis tool, TimeMonitor (see [Figure 9-1](#)).



Note: TimeMonitor is a separate Symmetricom product that runs on Windows based PCs. Contact your Symmetricom sales representative for information about this product.

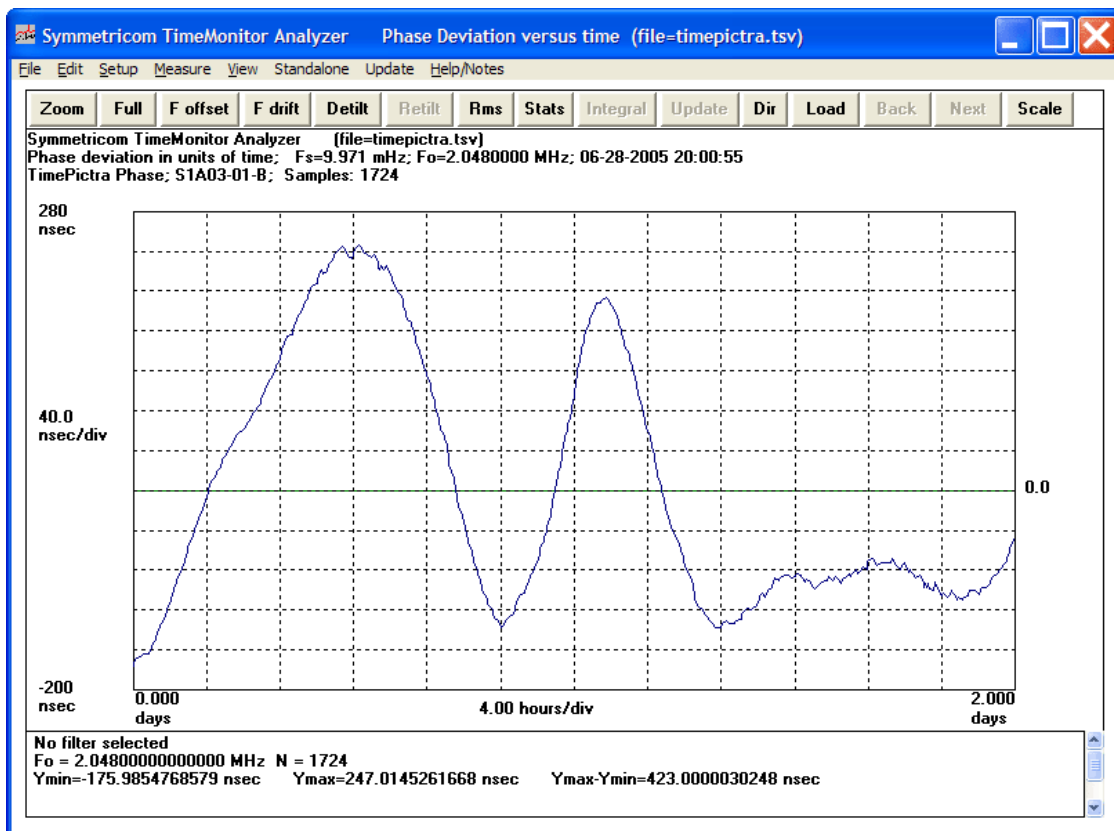


Figure 9-1. Sample TimeMonitor Display

Retrieve (Manual) Performance Data

The Performance Utility option provides a Retrieve dialog box that allows you to retrieve performance data for a specified time interval from a specified NE. Up to 24 hours of performance data can be retrieved. The measurement types and time constraints for which data can be retrieved vary according to the selected NE, but include MTIE, TDEV, PHASE1M, PHASE1S, etc. Data retrieved using this utility is saved to a user-specified file on the TimePictra server. If the TimePictra user session is Web-based, the text file can be copied over to the Web client.

Performance Utility - Retrieve dialog box

The Performance Utility - Retrieve dialog box is used to manually retrieve performance data from selected NEs. The information contained in the dialog box varies slightly depending on the NE type that is selected. [Figure 9-2](#) through [Figure 9-7](#), and [Table 9-1](#) briefly explain the Performance Utility - Retrieve dialog box for the NEs.

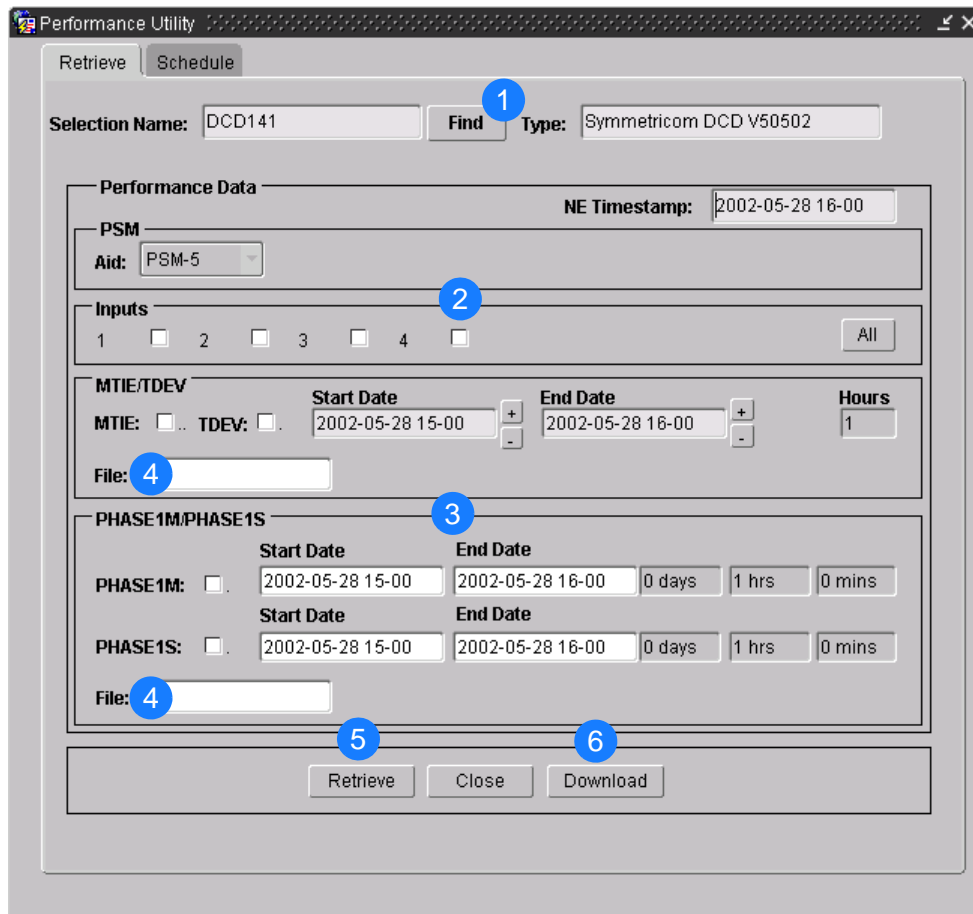


Figure 9-2. Performance Utility – Retrieve dialog box (DCD series)

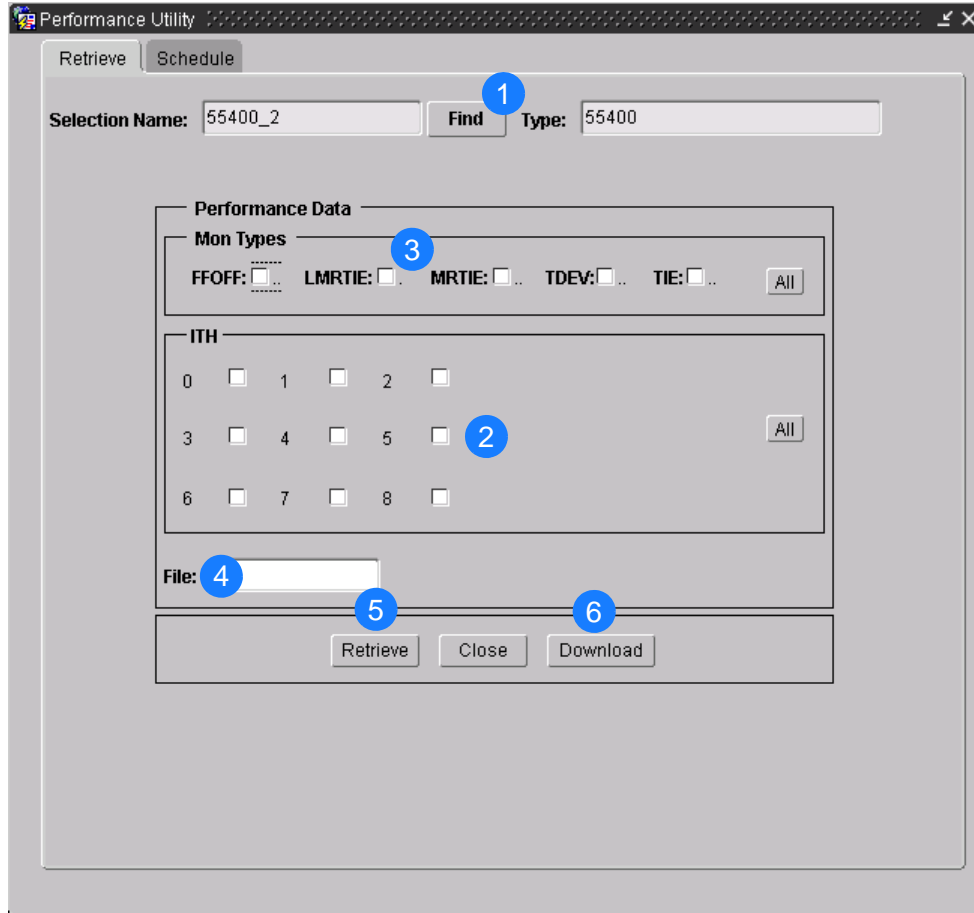


Figure 9-3. Performance Utility – Retrieve dialog box (NetSync 55400/55409)

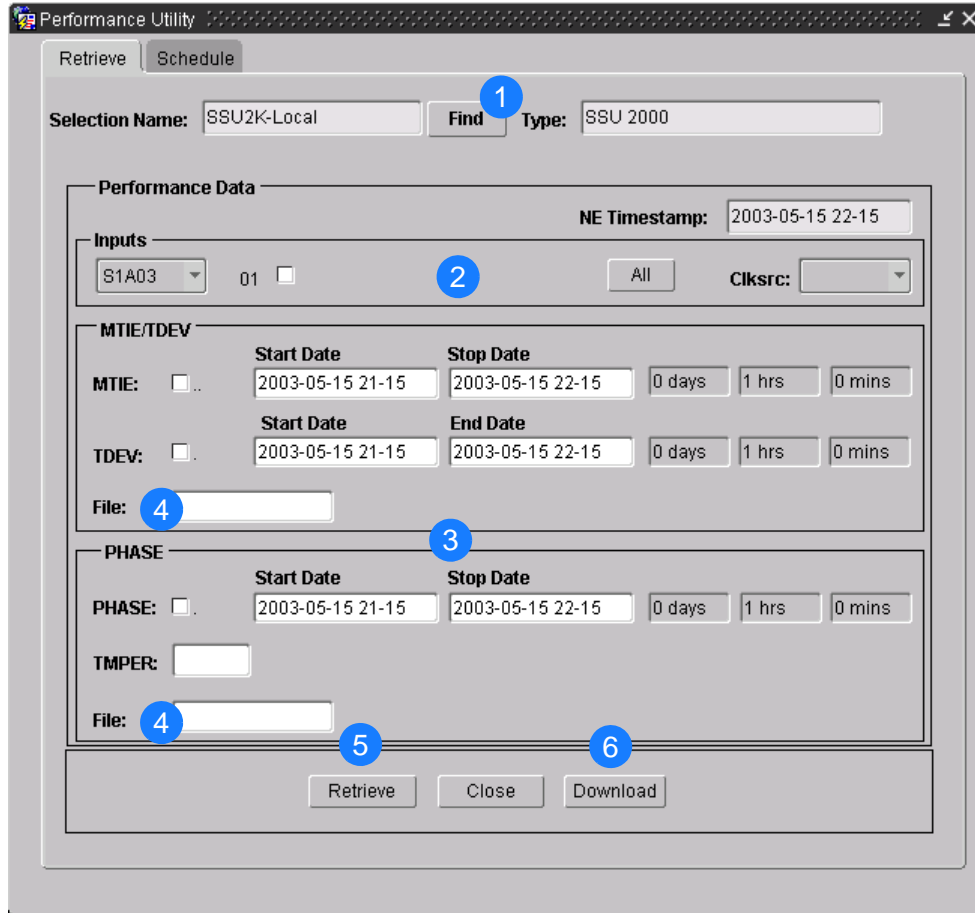


Figure 9-4. Performance Utility – Retrieve dialog box (SSU-2000)

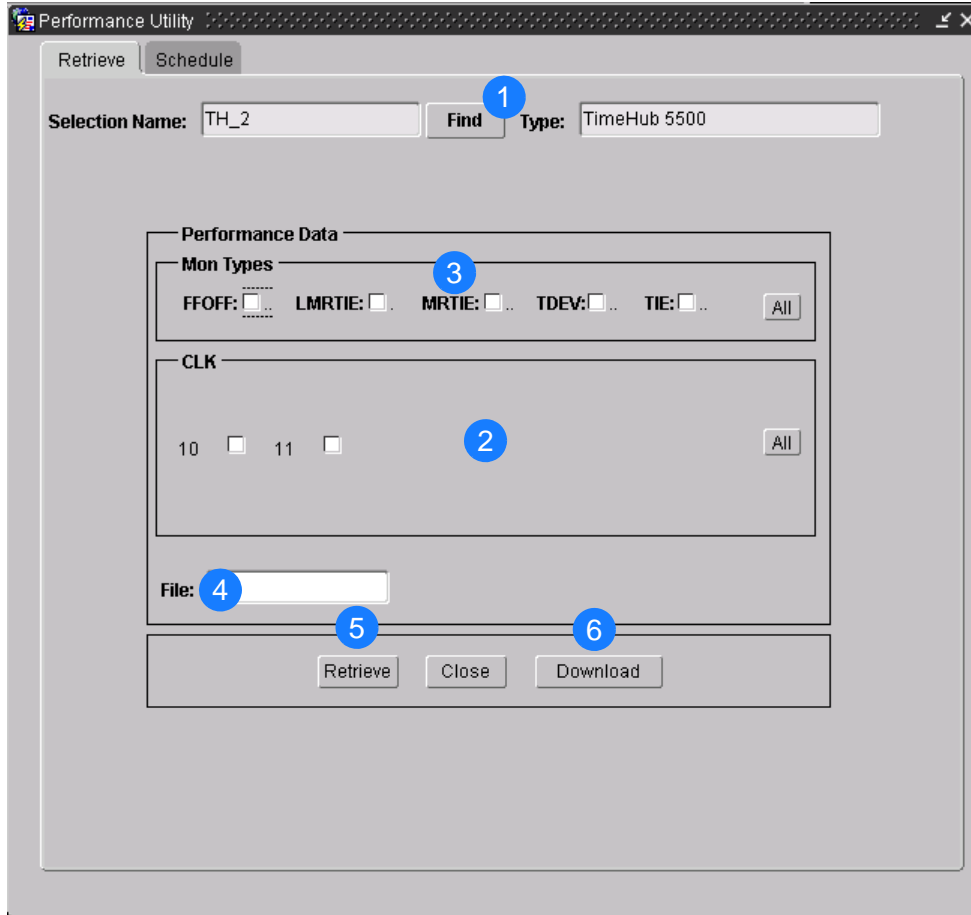


Figure 9-5. Performance Utility – Retrieve dialog box (TimeHub 5500)

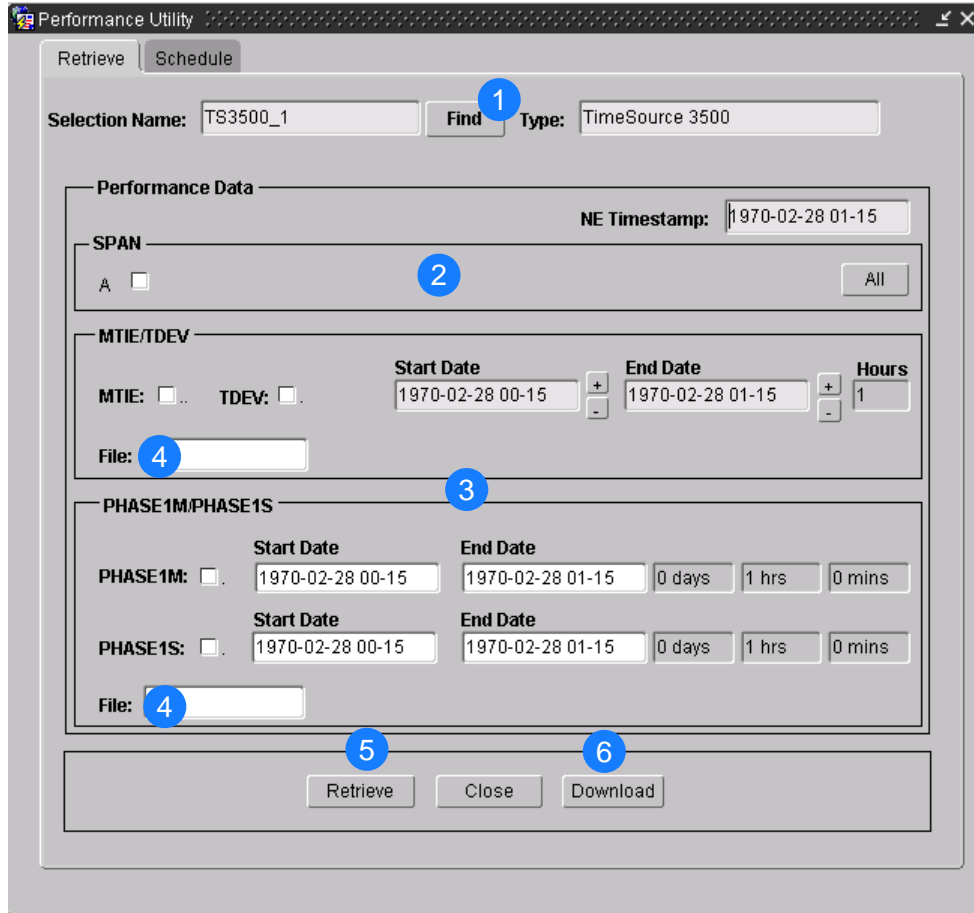


Figure 9-6. Performance Utility – Retrieve dialog box (TimeSource series)

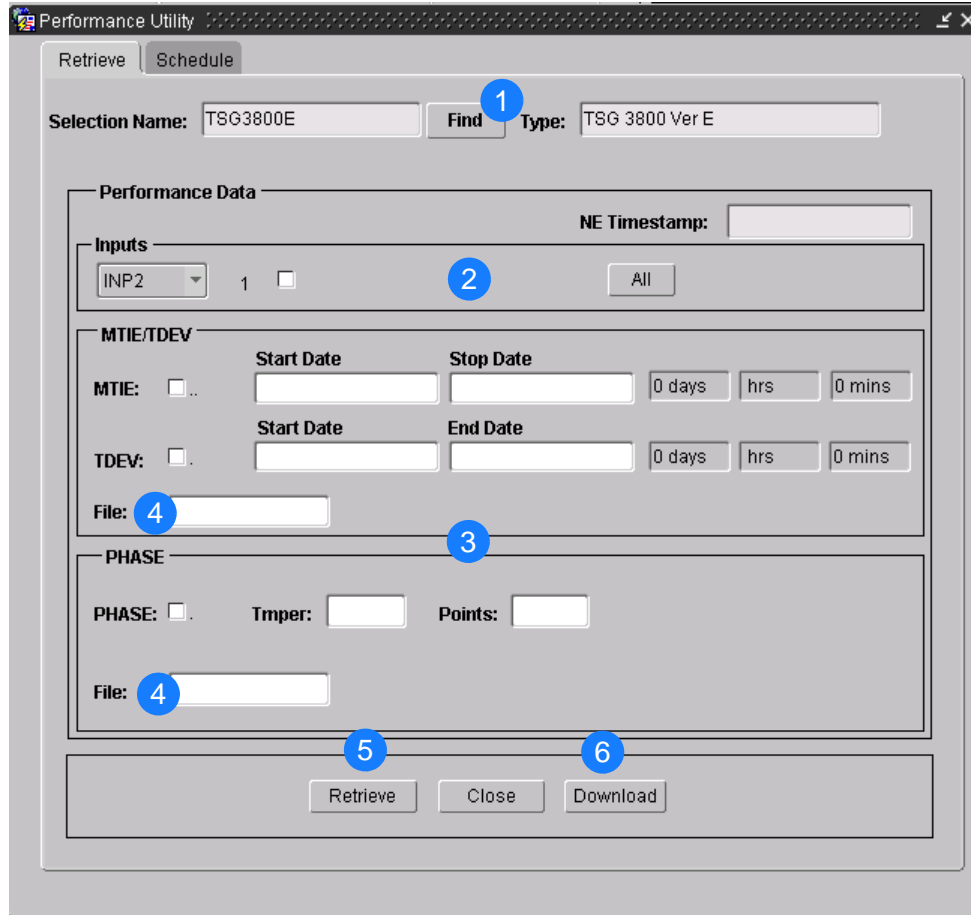


Figure 9-7. Performance Utility – Retrieve dialog box (TSG-3800)

Table 9-1. Performance Utility – Retrieve Dialog Box Description

Item	Description
1	<p>When the Performance Utility dialog box is first invoked, the NE that is selected in the Launch Pad during a web-based session or in the Synchronization Map during an X-Windows-based session is displayed in the Selection Name field, and data retrieval operations will take place with that NE. After the dialog box has been invoked, the NE can be changed using the Find button.</p> <p>The Type field shows the type of NE that is selected.</p>
2	<p>The inputs for which performance data will be retrieved are selected by selecting the applicable check boxes in this area. Depending on the NE, a card aid selector drop-down box is included in this area. Clicking the All button selects all inputs for the chosen card aid.</p> <p>The NE Timestamp field shows the date and time that is set on the selected NE.</p>

Table 9-1. Performance Utility – Retrieve Dialog Box Description (Continued)

Item	Description
3	<p>The following fields might appear in this area, depending on the NE that is selected:</p> <p>Measurement type - The measurement type or types (such as MTIE, TDEV, Phase, etc.) for which the performance data will be retrieved is selected by selecting the applicable check boxes.</p> <p>Date range - Certain NEs allow a subset of the available performance data to be retrieved by entering the time range in the Start Date and Stop Date/End Date fields. If these fields are left blank, all of the available performance data will be retrieved. To specify a time frame in fields that do not contain selector buttons, enter dates and times to reflect the beginning and end of the time frame. The format is YYYY-MM-DD HH-MI where YYYY is the year, MM is a numeric representation of the month (for example, 08 for August), DD is the day, HH is the hour in 24-hour format, and MI is the minutes.</p> <p>Time period (TMPER) - The time period for phase measurements (the averaging time) is entered into this field.</p> <p>Points - The number of data points to be retrieved is entered into this field.</p> <p>Clock Source (Clksrc) - The clock source used for the measurement is selected from the drop-down list in this field.</p>
4	<p>Enter the name of the file to which the retrieved performance data will be stored in this field. Any extension can be given, but the file will be stored in plain text format.</p> <p><i>Note:</i> The file is stored in the /var/tmp/perf_data directory on the TimePictra server.</p>
5	<p>After all of the necessary information has been entered into the dialog box, clicking the Retrieve button begins the retrieval operation. During the retrieval operation, the specified data is retrieved from the selected NE and stored to the specified file.</p>
5	<p>This feature is active only for Web-based user sessions.</p> <p>Clicking the Download button invokes a web browser containing an index to the files on the TimePictra server that contain data retrieved using the Performance Utility. These files can then be downloaded to the TimePictra client using the file download function of the web browser, such as the “Save Target As...” function in Internet Explorer.</p>

Retrieving Performance Data

Use the following procedure to retrieve performance data from a specified NE.

1. In the synchronization network map or Launch Pad, select the network element for which you want to retrieve performance data.
2. Invoke the Performance Utility dialog box:

Synchronization Map or Launch Pad - Choose Performance Utility from the Perf menu.

By default, the Retrieve tab should be selected in the dialog box.

3. Choose the inputs, and if applicable, the card aid and clock source for which performance data is to be retrieved, by selecting the card aid and clock source in the drop-down lists, and selecting the appropriate input check-boxes.
4. Choose the measurement types for which performance data is to be downloaded, by selecting the appropriate check-boxes.
5. If applicable, specify the subset of performance data to be retrieved by entering the time range into the Start Date and Stop Date/End Date fields.

Note: If this setting is not applicable to the selected NE, the field will not appear.

6. If applicable, specify the time period for phase measurements by entering the time period into the Tmper field.

Note: If this setting is not applicable to the selected NE, the field will not appear.

7. If applicable, specify the number of phase measurement points to be retrieved by entering the number of points into the Points field.

Note: If this setting is not applicable to the selected NE, the field will not appear.

8. Enter the file name to which the retrieved data will be stored into the File field.

Any file extension can be specified, however, the data will be stored in the file in plain-text format. Do not specify a directory in this field; the file is stored in the /var/tmp/perf_data directory on the TimePictra server, and cannot be changed

9. Click the Retrieve button.

When the data retrieval operation finishes, a message box containing the message `Retrieve successful` appears. Click OK to close the message box.

10. If the user session is Web-based and you wish to copy the file to the TimePictra client, click the Download button.

Clicking the Download button invokes a web browser containing an index to the files on the TimePictra server that contain data retrieved with the Performance Utility. You can click on the file links in the index to display the contents of the file.

11. Use the web browser's file download function to download the file to the Web client.

For example, in the Internet Explorer web browser, right click on the desired file name in the file index to display the right-click menu, choose the **Save Target As...** menu item, then enter the local destination for the file in the Save As dialog box that appears.

Schedule (Automatic Upload) Jobs for Performance Data

The Performance Utility option also provides a Schedule dialog box that allows you to retrieve performance data from a specified NE automatically at a specified time interval. The data retrieved is saved to a user-specified text file on the TimePictra server, and subsequent automated retrievals of data are appended to this file. From this screen, you can also generate tab separated value (TSV) files. The files can be downloaded to a desktop or laptop computer and then imported and plotted using a spreadsheet application such as Microsoft Excel, or for more advanced analysis, this data can be imported into Symmetricom's advanced synchronization measurement analysis tool, TimeMonitor. If the TimePictra user session is Webbased, the text file can be copied over to the Web client.



Note: TimeMonitor is a separate Symmetricom product that runs on Windows based PCs. Contact your Symmetricom sales representative for information about this product.

Performance Utility - Schedule dialog box

The Performance Utility - Schedule dialog box is used to schedule automated performance data retrieval jobs for selected NEs. The information contained in the dialog box varies slightly depending on the NE type that is selected. [Figure 9-8](#) through [Figure 9-13](#), and [Table 9-2](#) briefly explain the Performance Utility - Schedule dialog box for the NEs.

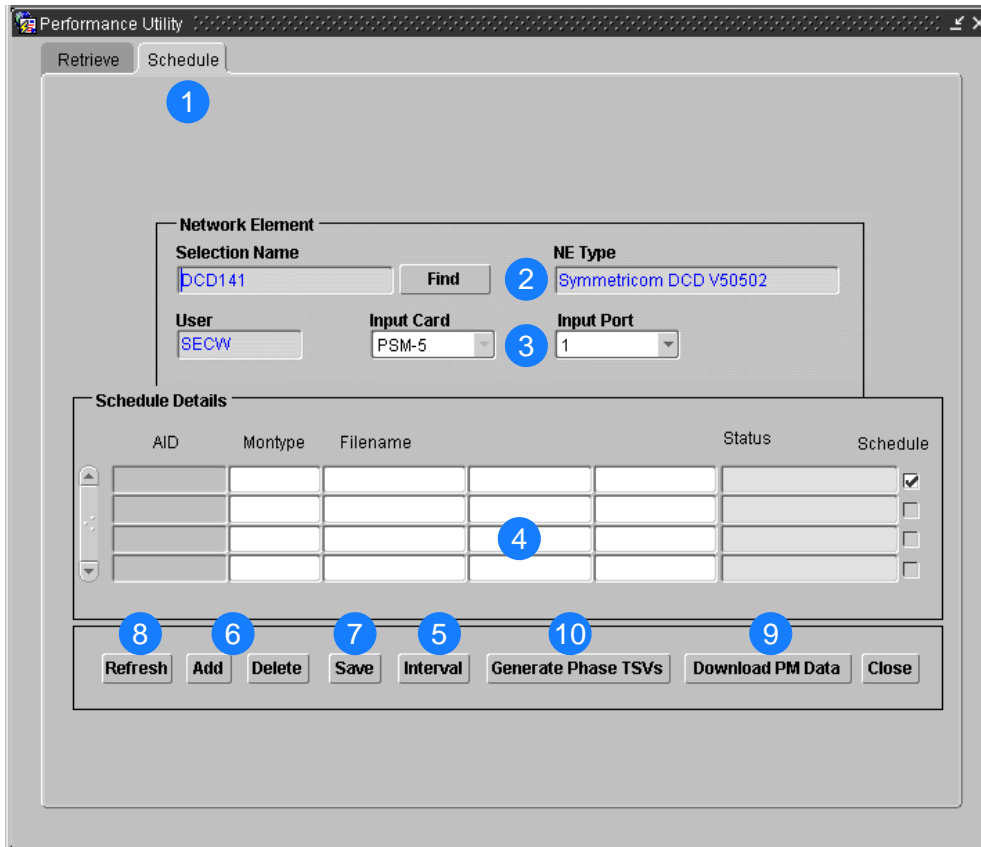


Figure 9-8. Performance Utility – Schedule dialog box (DCD series)

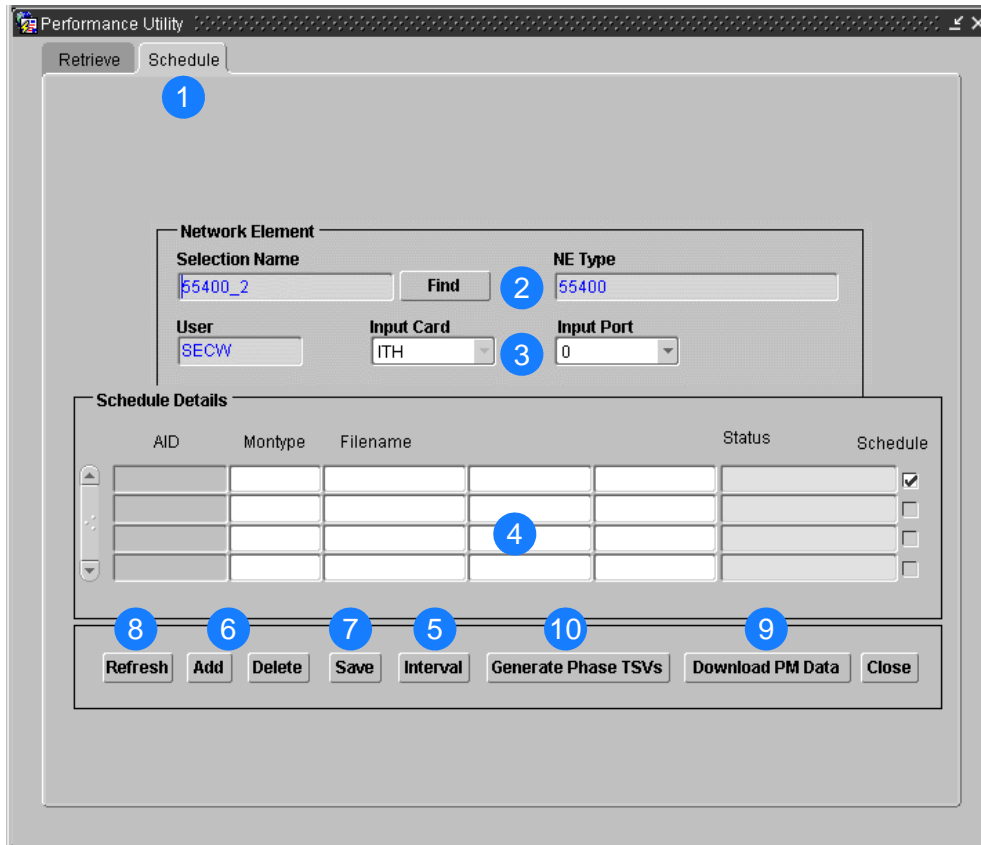


Figure 9-9. Performance Utility – Schedule dialog box (NetSync 55400/55409)

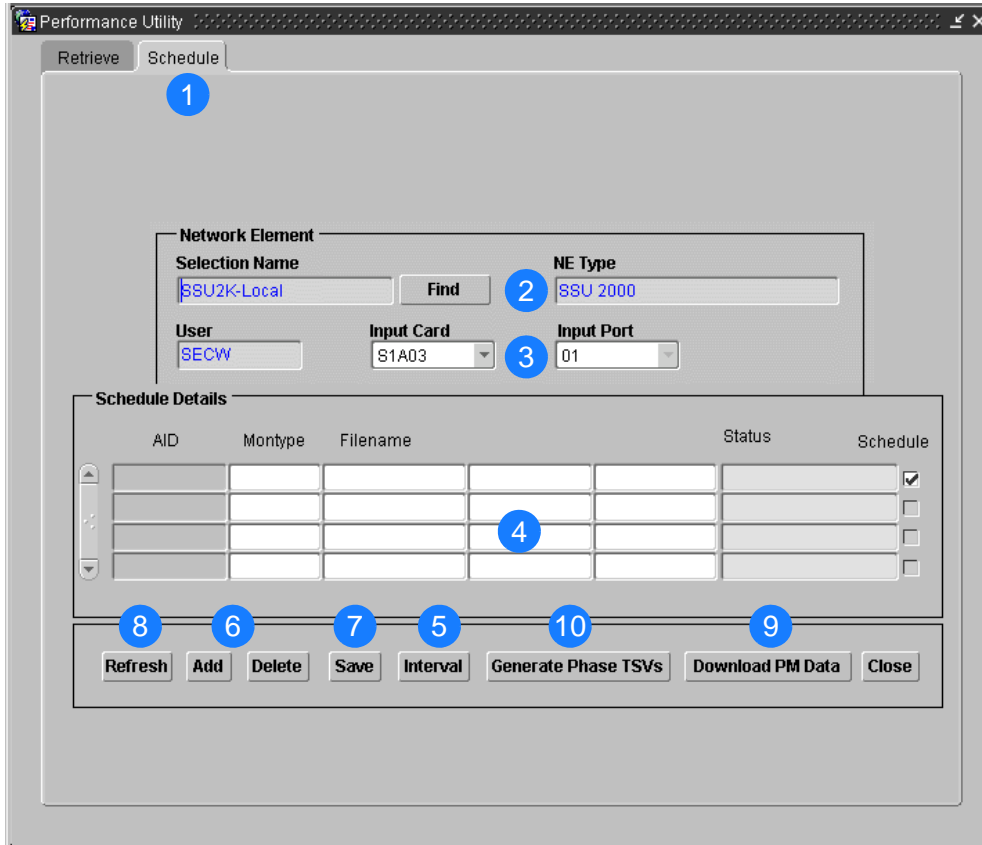


Figure 9-10. Performance Utility – Schedule dialog box (SSU-2000)

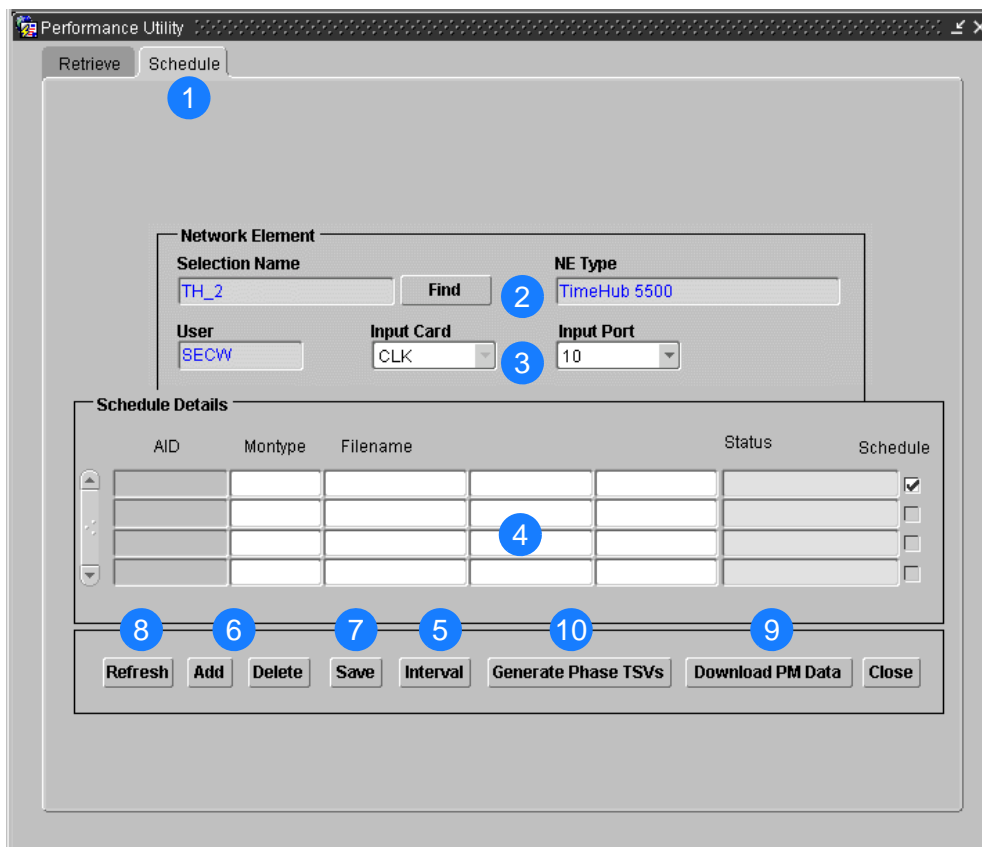


Figure 9-11. Performance Utility – Schedule dialog box (TimeHub 5500)

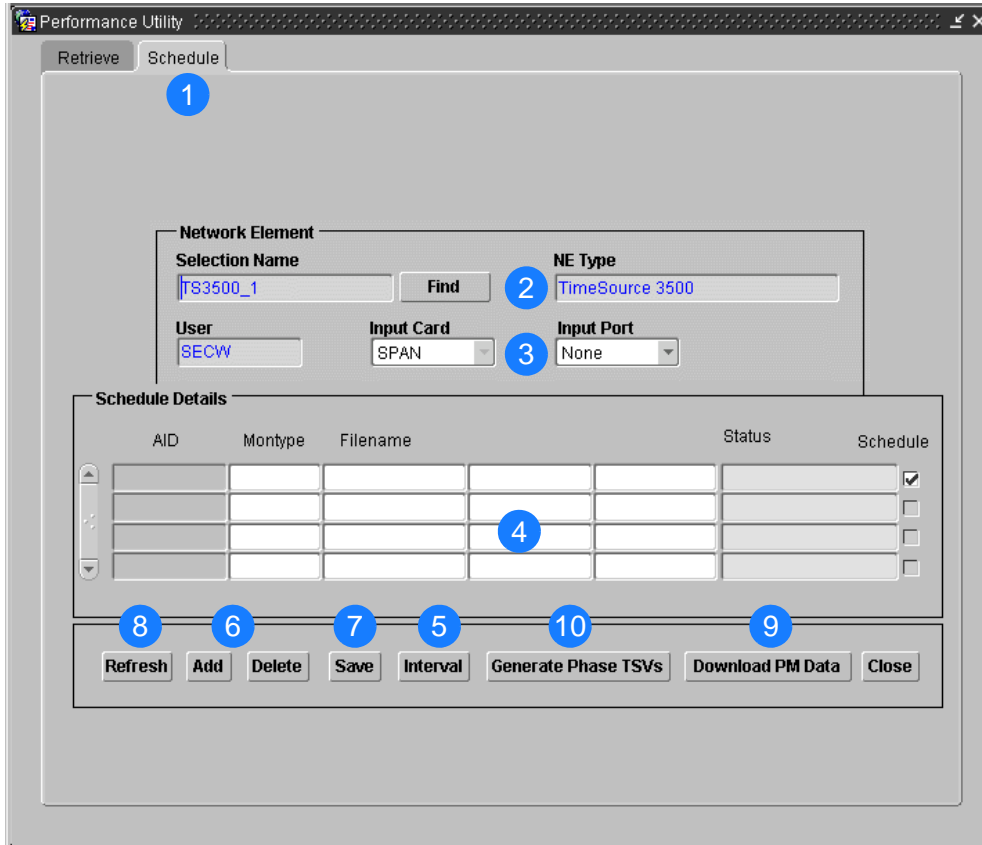


Figure 9-12. Performance Utility – Schedule dialog box (TimeSource series)

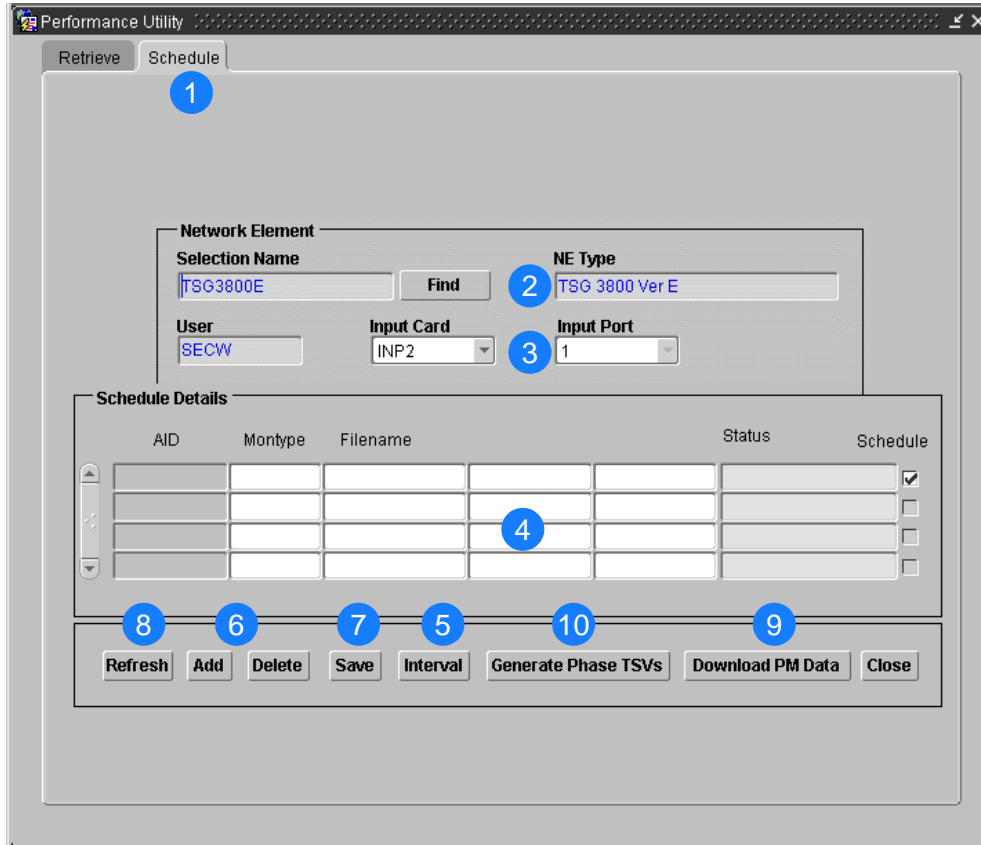


Figure 9-13. Performance Utility – Schedule dialog box (TSG-3800)

Table 9-2. Performance Utility – Schedule Dialog Box Description

Item	Description
1	When the Performance Utility dialog box is first invoked, the Retrieve tab is selected by default. You must select the Schedule tab to display the scheduler screen in the dialog box.
2	When the Performance Utility - Schedule dialog box is displayed, the NE that is selected in the Launch Pad during a web-based session or in the Synchronization Map during an X-Windows-based session is displayed in the Selection Name field, and scheduled data retrieval operations will take place with that NE. After the dialog box has been invoked, the NE can be changed using the Find button. The NE Type field shows the type of NE that is selected.
3	The Input Card and Input Port for which the data retrieval job is scheduled or to be scheduled is selected using these drop-down lists. The scheduled jobs that apply to the selected input card and port will be shown in the area below and any new jobs that are scheduled will apply to the selected card and port. The User field displays the user to which the current user session belongs.

Table 9-2. Performance Utility – Schedule Dialog Box Description (Continued)

Item	Description
4	<p>The details of scheduled jobs appear in this area as a series of job records - one job record to a line. It is also in this area where new jobs are scheduled.</p> <p>The field headers in this area vary somewhat depending on the NE that is currently selected. Some fields require direct entry, while double-clicking on other fields invokes a separate selector box in which a choice of selections is presented. The Status field, which is common to all NEs, shows the status of retrieval operations.</p> <p>Once a job record has been added, the Schedule check-box can be selected or deselected to effectively schedule or unschedule the job without needing to alter or delete the job details.</p>
5	<p>The interval at which automated performance data retrieval jobs run is set by clicking the Interval button and selecting the interval in the box that appears. An interval between 2 to 24 hours can be chosen, in two hour increments. Note that the interval applies to all scheduled jobs; data retrieval jobs cannot be scheduled at different time intervals.</p>
6	<p>The Add button is used when scheduling new data retrieval jobs. When the button is clicked, a blank job record is added, into which details of the scheduled job can be entered.</p> <p>Clicking the Delete button deletes the selected job record.</p>
7	<p>Clicking the Save button saves added or modified job records.</p> <p><i>Note:</i> If you attempt to exit from the dialog box, change the selected card or port, or refresh and changes have not been saved, a message box will appear asking if you want to save the changes.</p>
8	<p>Clicking the Refresh button refreshes the Status field of the job records.</p>
9	<p>This feature is active only for Web-based user sessions.</p> <p>Clicking the Download PM Data button invokes a web browser containing an index to the files on the TimePictra server that contain data retrieved with the Performance Utility. These files can then be downloaded to the TimePictra client using the file download function of the web browser, such as the Save Target As... function in Internet Explorer.</p>
10	<p>Clicking the Generate Phase TSVs button creates a tab separated value file (.tsv files can be opened with a spreadsheet application such as Microsoft Excel). When the file is created, a window appears indicating file creation was successful and that you can access the file by clicking the Download PM Data button.</p>

Scheduling Data Retrieval Jobs

Use the following procedure to schedule data retrieval jobs.



Note: In addition to using the procedure [Retrieving Performance Data](#), on page 192, the data retriever database job must be running in the background on the TimePictra server. Refer to [Performance Utility Administration and Troubleshooting](#), on page 204 for information on the data retriever database job.

1. In the synchronization network map or Launch Pad, select the network element for which you want to schedule a data retrieval job.

2. Invoke the Performance Utility dialog box:

Synchronization Map or Launch Pad - Choose Performance Utility from the Perf menu. By default, the Retrieve tab is selected in the dialog box.

3. Click on the Schedule tab to display the scheduler screen in the dialog box.
4. Specify the input card and port for which the data retrieval job is to be scheduled by selecting them in the Input Card and Input Port drop-down lists in the dialog box.

When the card and port is selected, job records for any jobs that have already been scheduled appear in the Schedule Details area of the dialog box. One job record appears per line.

5. Click the Add button to add a blank job record below the existing job records in the dialog box.

When a new job record is added, the Schedule check-box is selected by default.

6. In the new job record, double-click the Montype field to invoke a measurement type selector box, select the desired measurement type, then click OK to close the selector box.

7. Enter the file name to which the retrieved data will be stored in the Filename field into the new job record.



Note: Files are automatically stored in the /var/tmp/perf_data directory.

8. If applicable, specify the time period for phase measurements by double-clicking the Tmper field to invoke a time period selector box, selecting the desired time period, then clicking OK to close the selector box.



Note: If this setting is not applicable to the selected NE, the field will not appear.

9. If applicable, specify the clock source used for the measurement by double-clicking the Clksrc field to invoke a clock source selector box, selecting the desired clock source, then clicking OK to close the selector box.



Note: If this setting is not applicable to the selected NE, the field will not appear.

10. If applicable, specify the number of phase measurement points to be retrieved by entering the number of points into the Points field.



Note: If this setting is not applicable to the selected NE, the field will not appear.

11. If you wish to add the job record, but not schedule automated data retrieval at this time, click the Schedule check-box so that it is not selected.

Automated data retrieval can be scheduled at a later time by selecting the Schedule check-box.

12. Click the Save button to save the job record.
13. If desired, click the Interval button to invoke a PM data interval selector box, select the desired automated data retrieval time interval, then click OK to close the selector box.
14. If desired, click the Generate Phase TSVs button to create a tab separated value file, then click OK to close the confirmation window.
15. If desired, click the Download PM Data button to open a web browser containing an index to the files on the TimePictra server that contain data retrieved with the Performance Utility, then click OK to close the confirmation window.

Performance Utility Administration and Troubleshooting

The Performance Utility's automated data retrieval functionality requires that a database job be running in the background on the TimePictra server to manage the scheduling operation. This script is called the automated data retriever database job, and is also referred to as the retriever job.

The procedures in this section explain the various administrative tasks associated with the retriever job.

The PM Utility

The administration tasks explained in this chapter are accomplished through the "PM Utility." The PM Utility provides a menu-driven interface for the various administration tasks. The PM Utility can be started by typing the following command at the prompt.

```
/opt/osmf/DB/admin/startpmjob.ks
```

The PM Utility should be run with the user logged in as `otroot`.

The PM Utility menu is explained in [Table 9-3](#).

Table 9-3. PM Utility Menu

Menu Item	Description
Start PM job	Starts the automated data retriever database job.
Print job status	Prints the status of the retriever job.
Fix broken job	Fixes the runtime instance of the retriever job, if it is broken.
Stop PM job	Terminates (stops) the retriever database job if it is running.
Exit	Exits from the PM Utility.



Note: Once the Performance Utility option has been enabled on the TimePictra server, the system will automatically start and stop the data retriever database job. Under normal conditions, use of the menu driven PM Utility is not required.

Performance Utility Administration

The following sections explain the various administrative tasks associated with the retriever job.

Checking the Status of the Retriever Job

Use the following procedure to check the status of the retriever job.

1. If not logged into HP-UX as otroot, log in as otroot, then enter the otroot password.
2. Type the following command to start the PM Utility, if it is currently not running:

```
/opt/osmf/DB/admin/startpmjob.ks
```

When started, the PM Utility menu appears.

3. Choose the following menu item to display a retriever job status report on the display (type the number next to the menu item to choose the item):

- Print job status

If the retriever job is currently not running, no status report will be printed on the screen. If the retriever job is running, a status report that is similar to the following will appear:

```

JOB WHAT                NEXT_DATE                INTERVAL                B
===== =====
16 begin                03-05-15 13:00:04      sysdate + .166666666 N
    pm_utility.start_pmda_s  66666666666666666666
    scheduler; end;        666666666668
  
```

The fields in the status report are as follows:

- JOB - The job id of the current runtime instance of the retriever job.
- WHAT - The name of the internal database job.
- NEXT_DATE - The next date (YY-MM-DD) and time in 24-hour format when an automated data retrieval operation will take place.
- INTERVAL - The numeric portion of this expression indicates the interval, in portions of a day, at which data retrieval operations are scheduled to take place. In the above example, a data retrieval operation is scheduled to take place every four hours, or every .166666... days.
- B - Indicates whether the runtime instance of the retriever job is broken (Y) or not broken (N).

Starting and Stopping the Data Retriever Database Job

To check the current run status of the retriever job, see [Checking the Status of the Retriever Job](#), on page 205. Use the follow Procedure to start or stop the data retriever database job.

1. If not logged into HP-UX as otroot, log in as otroot, then enter the otroot password.
2. Type the following command to start the PM Utility, if it is currently not running:

```
/opt/osmf/DB/admin/startpmjob.ks
```

When started, the PM Utility menu appears.

3. Start or stop the data retriever database job, as is appropriate.

To start the data retriever database job, choose the following menu item (type the number next to the menu item to choose the item):

- Start PM job

After the data retriever database job starts, the message `job started and the job id is:<jobid>` appears, where `<jobid>` is the job id of the current runtime instance of the retriever job.

To stop the data retriever database job, choose the following menu item:

- Stop PM job

Fixing a Broken Runtime Instance of the Retriever Job

If the retriever job is running, yet data retrieval operations are not happening as scheduled, the runtime instance of the retriever job might be broken. To check the current status of the retriever job, use the following procedure. If the retriever job is running but is currently broken, then “Y” will appear in the “B” column of the status report. Use the following procedure to fix the runtime instance of the retriever job if it is broken.

1. If not logged into HP-UX as otroot, log in as otroot, then enter the otroot password.
2. Type the following command to start the PM Utility, if it is currently not running:

```
/opt/osmf/DB/admin/startpmjob.ks
```

When started, the PM Utility menu appears.

3. Choose the following menu item to fix the broken runtime instance of the retriever job (type the number next to the menu item to choose the item):

Fix broken job.

If the retriever job is running and is not currently broken, the message `job is not broken` appears.

4. Check the retriever job status again to ensure that it is no longer broken.

Index

A

- alarm synchronization [38](#)
- alert dispatcher [30](#)
- archive report file, example [64](#)
- archiving events [63](#)
- archiving performance history data [63](#)
- audience for this guide [14](#)

B

- backup
 - HP-UX core system [74](#)
 - system [76](#)
- backup procedures, system [72–79](#)
- backup requirements [73](#)
- block diagram
 - system [28, 144, 145, 147, 148](#)
 - web subsystem [33](#)

C

- cautions defined [16](#)
- cleaning up temporary files [66](#)
- command processor [35](#)
- commissioning
 - DCD 5.01.05 [178](#)
 - PRR10 [179](#)
 - terminal server [174](#)
 - TimeHub [175](#)
 - TimeProvider 1000/1100 [180](#)
 - TimeSource 3X00 [178](#)
 - TSG3000 versions D/E [179](#)
- commissioning network elements [173–180](#)
- communications infrastructure subsystem [34](#)
- communications interface [31](#)
- complete system recovery [80](#)
- Config_Align daemon
 - disabling [68](#)
 - enabling [68](#)
- configuration alignment [37](#)
- configuration forms [31](#)
- configuring NEs to communicate with TimePictra [174](#)
- configuring the resiliency option [121](#)
- configuring the SNMP agent option [153](#)
- conventions used in this guide [15](#)

D

- disabling the Config_Align daemon [68](#)
- documentation, related [17](#)

E

- enabling the Config_Align daemon [68](#)
- enabling the resiliency option [123](#)
- event handler [34](#)
- event handling [29–30](#)
- event processing engine [30](#)
- event receiver [30](#)
- events, archiving [63](#)
- example archive report file [64](#)

F

- fault management forms [30](#)
- features
 - pre-version 3.1 release of TimePictra [21](#)
 - version 3.1 of TimePictra [23](#)
 - version 3.2 of TimePictra [24](#)
 - version 3.3 of TimePictra [24](#)
 - version 3.4 of TimePictra [24, 25, 26](#)
- features, resiliency option [116](#)
- features, SNMP agent [169](#)
- features, TimePictra [21–24](#)
- fields, SNMP agent option [170](#)

G

- graphical user interface [35](#)

H

- health check [57](#)
- heartbeat daemon [35](#)
- HP-UX core system backup [74](#)

I

- information model, SNMP [147](#)
- initial installation of TimePictra [88–107](#)
- installation overview [88](#)
- installing the resiliency option [118](#)
- installing the SNMP agent option [151](#)
- installing TimePictra
 - configuring web services [101](#)
 - initial [88–107](#)
 - installing HP-UX 11i minimal technical operating environment [88](#)
 - installing June 2005 11i quality pack [91](#)
 - installing network node manager [99](#)
 - installing Oracle 9i application server [97](#)
 - installing Oracle 9i database version 9.2.0 [94](#)
 - installing Oracle 9iAS/6iserver patch 9 [103](#)
 - installing the Java SDK [94](#)
 - installing the TimePictra software [100](#)

- UNIX kernel configuration [91](#)
 - verifying the installation [105](#)

- inventory forms [32](#)

L

- license file [55](#)

- license, installing [54](#)

- limitations, SNMP agent [169](#)

M

- maps, network [30](#)

- MIB frequently asked questions [148](#)

N

- naming conventions [20](#)

- network elements supported by TimePictra [40](#)

- network elements, commissioning [173–180](#)

- network maps [30](#)

- notes defined [16](#)

O

- object-oriented processing engine [31](#)

- operating scenarios, resiliency [126](#)

- options

 - performance analyzer [28](#)

 - resiliency [27, 115–142](#)

 - SNMP agent [27, 143–172](#)

- Oracle database, checking run status [46](#)

- Oracle web application server, checking run status [49](#)

- osmfstatus script [59](#)

- osmfssystem script

 - automatic execution [57](#)

 - manual execution [58](#)

- otdbrecover.ks -recover output [85](#)

- overview, system [28–38](#)

P

- performance analyzer option [28](#)

- performance forms [32](#)

- performance history data, archiving [63](#)

- prerequisites [39](#)

- purpose of this guide [14](#)

Q

- questions regarding the MIB [148](#)

R

- recommendations defined [16](#)

- recovery

 - complete system [80](#)

 - restoring the TimePictra database [83](#)

 - using SAM [82](#)

- recovery procedures, system [80–85](#)

- related documentation [17](#)

- removing the resiliency option [138](#)

- removing the SNMP agent option [164](#)

- removing TimePictra [113–114](#)

- requirements, backup [73](#)

- resiliency option [27, 115–142](#)

 - checking status [125](#)

 - configuring [121](#)

 - enabling [123](#)

 - installing [118](#)

 - operating scenarios [126](#)

 - starting [123](#)

 - troubleshooting [126](#)

 - uninstalling (removing) [138](#)

- resiliency server administration [116](#)

- restoring the TimePictra database from tape or filesystem [83](#)

S

- security forms [31](#)

- security service [31](#)

- server administration, resiliency [116](#)

- service element management daemon [30, 34](#)

- service elements [30](#)

- SNMP agent option [27, 143–172](#)

 - configuring [153](#)

 - description [144](#)

 - features [169](#)

 - fields [170](#)

 - installing [151](#)

 - limitations [169](#)

 - removing [164](#)

 - starting [163](#)

 - stopping [163](#)

 - traps [170](#)

 - troubleshooting [166](#)

 - uninstalling [164](#)

- SNMP information model [147](#)

- software description [21](#)

- starting resiliency [123](#)

- starting the SNMP agent option [163](#)

- starting TimePictra [46–51](#)

- status of resiliency [125](#)

- stopping the SNMP agent option [163](#)

- stopping TimePictra [51–52](#)

- structure of this guide [15](#)

- supported network elements [40](#)

- system backup [76](#)

- system backup procedures [72–79](#)

- system block diagram [28, 144, 145, 147, 148](#)

- system health check [57](#)

- system overview [28–38](#)
 - alarm synchronization [38](#)
 - alert dispatcher [30](#)
 - command processor [35](#)
 - communications infrastructure subsystem [34](#)
 - communications interface [31](#)
 - configuration alignment [37](#)
 - configuration forms [31](#)
 - event handler [34](#)
 - event handling [29–30](#)
 - event processing engine [30](#)
 - event receiver [30](#)
 - fault management forms [30](#)
 - graphical user interface [35](#)
 - heartbeat daemon [35](#)
 - inventory forms [32](#)
 - network maps [30](#)
 - object-oriented processing engine [31](#)
 - performance forms [32](#)
 - security forms [31](#)
 - security service [31](#)
 - service element management daemon [30, 34](#)
 - service elements [30](#)
 - transaction handling [31–32](#)
 - web subsystem [32–35](#)
- system recovery procedures [80–85](#)
- system requirements
 - for SNMP [150](#)
 - prerequisites [39](#)
 - TimePictra platform [38](#)

T

- temporary files, cleaning up [66](#)
- TimePictra features [21–24](#)
- TimePictra license file [55](#)
- TimePictra license, installing [54](#)
- TimePictra platform system requirements [38](#)
- TimePictra processes, checking the status of [59](#)
- TimePictra resiliency option [115–142](#)
- TimePictra SNMP agent option [143–172](#)
- TimePictra-related software processes, starting [48](#)
- transaction handling [31–32](#)
- traps, SNMP agent option [170](#)
- troubleshooting
 - resiliency [126](#)
 - SNMP agent option [166](#)

U

- uninstalling the resiliency option [138](#)
- uninstalling the SNMP agent option [164](#)
- uninstalling TimePictra [113–114](#)
- upgrading TimePictra [107–110](#)
- using SAM for recovery [82](#)

W

- warnings defined [16](#)
- web address [18](#)
- web subsystem [32–35](#)
- web subsystem block diagram [33](#)
- who should read this guide [14](#)

