

CHAPTER 1 Overview 1-1

Introducing Cisco Packet Analyzer 1-1

Overview of the Packet Analyzer Platforms 1-3

How to Use Packet Analyzer to Analyze Your Traffic 1-4

Before You Begin 1-4

CHAPTER 2 Getting Started 2-1

Before You Begin 2-1

Quick Start 2-2

Where to Go to Learn How to Customize Your Packet Analyzer 2-2

CHAPTER 3 Monitoring and Analyzing Traffic 3-1

How To Make Dashboards Work for You 3-2

How Do I Solve My Problem? 3-2

Troubleshooting Application Slowness 3-3

Using Traffic Summary 3-4

Using Response Time Summary 3-5

Using Site Summary 3-6

Using Alarm Summary 3-7

Utilizing Sites to Create a Geographically- or Organizationally-Familiar Deployment 3

Analyzing Traffic 3-9

Analyzing Site Traffic **3-10**

Analyzing Application Traffic 3-10

Analyzing Host Traffic 3-11

Applications Detail 3-11

NetFlow Interface Traffic Analysis **3-11**

DSCP Detail 3-12

DSCP 3-12

Encapsulation 3-13

URL Hits 3-13

Viewing Collected URLs 3-13

Filtering a URL Collection List 3-13

```
Detailed Traffic Analysis Views
        Sites Detailed Views 3-14
        Site Conversations Detailed Views
                                           3-14
        Applications Detailed Views
        Application Groups Detailed Views
                                            3-14
        Application Traffic By Hosts Detailed Views
        Top Application Traffic Detailed Views
        Hosts Detailed Views
                               3-15
        Host Conversations Detailed Views
        Encapsulations Detailed Views
        DCSPs Detailed Views
    About Analyze Traffic Charts
                                 3-16
Optimizing WAN 3-16
    Ensuring WAN Optimization
    Analyzing Traffic for Optimization Using the Top Talkers Detail
    Analyzing Application Performance after WAAS Optimization
                                                                3-18
        Comparing Transaction Time (Client Experience)
        Comparing Traffic Volume and Compression Ratio
        Planning Capacity Using Average Concurrent Connections (Optimized vs. Passthru) 3-18
        Optimizing Usage Using Multi-Segment Network Time (Client LAN - WAN - Server LAN) 3-18
    Monitoring WAAS Traffic Across Multi-Segments
                                                     3-18
    Monitoring WAAS Single-Segment Traffic
Measuring Response Time 3-19
    Application Response Time
                               3-21
    Network Response Time 3-21
    Server Response Time
                           3-22
    Client Response Time
                           3-22
    Client-Server Response Time
    Application Response Time Distribution
    Network Response Time Distribution
    Server Response Time Distribution
    Client Response Time Distribution
    Client-Server Response Time Distribution
                                             3-24
    Server Application Responses
    Server Application Transactions
    Server Network Responses
    Client-Server Application Responses
    Client-Server Application Transactions
    Client-Server Network Responses 3-25
```

	Viewing Interface Information 3-26
	Viewing Health Data 3-26
	Switch Health Options 3-27
	Router Health Options 3-30
	Analyzing Media 3-32
	RTP Streams 3-33
	Understanding the RTP Stream Data 3-33
	Monitoring RTP Streams 3-34
	Voice Call Statistics 3-35
	Video Streams 3-36
	Understanding the Video Stream Data 3-36
	Monitoring Video Stream Data 3-38
	Video Channels Statistics 3-38
	Calls Table 3-39
	RTP Conversation 3-40
	Site MOS 3-40
	Video Channels Table 3-40 Video Stream Conversations 3-41
	Using the Packet Analyzer Application Programming Interface 3-42
	nturing and Deceding Declerts 44
d	pturing and Decoding Packets 4-1
	How Do I Solve My Problem? 4-1
	Manually Starting a Capture 4-2
	Using Alarm-Triggered Captures 4-3
	Scheduling Captures 4-3
	Troubleshooting Application Slowness Using Alarms 4-4
	Application Performance Monitoring Using Capture and Decode 4-5
	Creating and Managing Capture Sessions 4-6
	Configuring Capture Sessions 4-6
	Configuring Software Filters 4-7
	Creating a Software Capture Filter for a Capture Session 4-7
	Editing a Software Capture Filter 4-7
	Important Notes about Software Capture Filters 4-8
	Understanding Software Capture Filter Options 4-8

Configuring Hardware Filters 4-9

Viewing Capture Sessions

Creating Packet Analyzer Appliance Hardware Filters **4-9**Understanding Hardware and Software Capture Sessions Filters

CHAPTER 4

Analyzing Device Interface and Health Data

4-14

```
Working with Capture Files
                                 4-15
        Analyzing Capture Files
                                 4-15
             Drilling Down into Packet Error Details
        Downloading Capture Files 4-16
        Deleting a Capture File
        Deleting Multiple Capture Files
        Understanding Capture Sessions
                                          4-17
    Utilizing Capture Data Storage
        About Capturing to Data Storage
                                          4-19
        Installing and Configuring Local and External Storage
             Configuring the iSCSI and SAS Array 4-20
            Locating the Packet Analyzer IQN and SAS Address
                                                                4-20
             Connecting to the iSCSI Array 4-21
             Preparing LUNs for File Storage in iSCSI and SAS
             Using LUNs to Store Packets in iSCSI and SAS from a Capture Session
             Logging In and Out of External Storage LUNs
             Connecting and Disconnecting iSCSI and SAS
             Configuring External SAS port 4-23
        Recovering Data Storage 4-24
    Working with Capture Query
                                  4-25
        Creating a New Query 4-26
        Canceling a Query
                             4-26
        Decoding a Query
                            4-26
        Downloading Query Files
                                   4-27
        Deleting a Query 4-27
        Duplicating a Query 4-27
    Inspecting Packet Decode Information for Suspicious Traffic
        Analyzing Packets in the Packet Decoder
        Filtering Packets Displayed in the Packet Analyzer Packet Decoder
        Viewing Detailed Protocol Decode Information 4-30
        Understanding the Packet Analyzer Packet Decoder
        Customizing Display Filters
             Creating Custom Display Filters
             Editing or Deleting Custom Display Filters
Performing User and System Administration 5-1
    Performing System Administration 5-1
        Monitoring Packet Analyzer Health and Traffic Statistics
                                                                 5-2
```

Setting Network Parameters

CHAPTER 5

```
Setting the SNMP Agent
                                  5-3
            Working with Packet Analyzer Community Strings
        Synchronizing Your System Time
                                         5-5
            Understanding Packet Analyzer System Time
        Setting Up E-Mail Notifications for Alarms
        Sharing Packet Analyzer Data by Enabling Web Data Publication
                                                                      5-7
        Setting Remote Servers to Receive Syslog Messages
        Configuring Hosts to Receive SNMP Traps from Packet Analyzer
                                                                      5-8
        Customizing System Preferences 5-9
        Importing/Exporting Configuration Details
                                                 5-9
    Troubleshooting Using Diagnostics Tools 5-9
        System Alerts 5-9
        Audit Trail 5-10
        Tech Support 5-10
    Controlling User Access
        Local Database
            Resetting Passwords
                                  5-12
            Changing Predefined Packet Analyzer User Accounts on the Switch or Router
            Creating a New User
        Establishing TACACS+ Authentication and Authorization 5-14
        Configuring a TACACS+ Server to Support Packet Analyzer Authentication and Authorization 5-14
            Configuring a Cisco ACS Server, Version 4.2 5-15
            Configuring a Cisco ACS Server, Version 5.x 5-16
            Configuring a Generic TACACS+ Server 5-18
        Current User Sessions 5-18
    Managing System Data 5-19
        Handling Backups 5-19
        Shrinking Storage Requirements
Packet Analyzer Deployment 6-1
        Deploying in the Data Center
        Deploying in a Campus Environment 6-1
        Deploying in the Branch 6-2
        General Usage Scenarios 6-2
        Packet Analyzer Integrations with Monitoring and Reporting Applications
    Deployment Examples 6-2
        Using Packet Analyzer to Monitor VolP Quality
                                                     6-3
        Auto-Discovery Capabilities of Packet Analyzer
        Creating Custom Applications
```

CHAPTER 6

CHAPTER 7

```
Integrating Packet Analyzer with Prime Infrastructure
        Integrating Packet Analyzer with Third Party Reporting Tools
                                                                    6-6
        Monitoring Cisco WAAS and Measuring Its Impact
    Monitoring
                6-9
        Using Packet Analyzer to Monitor QoS/DiffServ (DSCP)
        Using Packet Analyzer for Historical Trends via Interactive Report
        Using Packet Analyzer to Evaluate Application-Level Performance Monitoring for TCP-Interactive
        Applications
        Using Packet Analyzer to Evaluate Application-Level Performance Monitoring for UDP Real-Time
        Applications
                       6-14
    Troubleshooting
                      6-14
        Using Packet Analyzer for Problem Isolation
        Using Packet Analyzer for SmartGrid Visibility
Customizing Cisco Packet Analyzer
                                        7-1
    Advanced Configuration Overview
    Setting Up Traffic Configurations
        Configuring Traffic to Monitor
             Creating a SPAN Session for RISE Appliance
             Creating a SPAN Session for Appliances and other Virtual Platforms
             Editing a SPAN Session for RISE Appliance
             Editing a SPAN Session for Appliances and other Virtual Platforms
        Setting Up Packet Analyzer Data Sources 7-6
             Forwarding SPAN Traffic
             Forwarding ERSPAN Traffic 7-6
             Forwarding VACL Traffic 7-14
             Forwarding NetFlow Traffic 7-15
             Forwarding CEF Traffic 7-22
             Managing WAAS and WAN Traffic
                                                7-23
        Configuring Hardware Deduplication
                                              7-29
    Setting Up Alarms and Alarm Thresholds
                                              7-30
        Configuring Alarm Actions
        Viewing Alarm Actions
                               7-33
             Understanding Trigger Capture
                                            7-33
        Defining Thresholds
                               7-34
             Setting Host Thresholds 7-35
             Setting Conversation Thresholds
                                              7-35
             Setting Application Thresholds
             Setting Response Time Thresholds
```

```
Setting DSCP Thresholds
        Setting RTP Stream Thresholds
        Setting Voice Signaling Thresholds
        Setting NetFlow Interface Thresholds
        Setting Video Stream Thresholds
        Setting MDI Stream Thresholds
        Editing or Deleting an Alarm Threshold
                                                7-39
Setting Up Data Export 7-40
    Configuring NetFlow Export Templates
                                           7-40
        Creating NetFlow Export Templates
                                            7-40
        Editing NetFlow Export Templates
        Deleting NetFlow Export Templates
                                            7-41
    Sharing Files 7-41
        Using SMB file sharing on Windows
                                             7-41
        Using SFTP file sharing on Windows
                                             7-41
    Scheduling Data Report Exports
        Creating a Scheduled Report Export 7-42
        Editing a Scheduled Export Job 7-43
        Deleting a Scheduled Export Job 7-43
        Downloading a Scheduled Report 7-44
        Renaming a Scheduled Report 7-44
        Deleting a Saved Reports 7-44
Accessing Device Interface and Health Details
    Understanding How Platform-Specific Packet Analyzer Handle Managed Device Data
    Configuring and Viewing Managed Device Information 7-45
        Configuring Managed Device Information on Appliances
        Configuring Managed Device Information on RISE Appliances 7-47
        Viewing Managed Device Information
Configuring Network Parameters
    Configuring Sites
        Defining a Site
                        7-49
        Viewing Defined Sites
                                7-49
        Editing a Site 7-50
        Configuring Sites Using Subnets
    Setting Interface Speed using NetFlow Interface Capacity
        Creating or Editing a NetFlow Interface
    Configuring DSCP Groups
        Creating a DSCP Group
        Editing a DSCP Group 7-53
```

```
Deleting a DSCP Group 7-54
    Configuring Application Classification 7-54
        Adding More Detail into Dashboard and Application Reports
            About Deeper Application Classification 7-55
             About Protocol Packs and Application Classification
             About Packet Analyzer Classic Deep Packet Application Classification 7-56
        Creating Deeper Visibility Into Application Traffic
             Creating Custom Applications 7-57
             Editing Custom Application Classifications
                                                       7-57
             Deleting an Application Rule 7-58
             Understanding Application Traffic
        Configuring Application Groups
             Creating an Application Group 7-60
             Editing or Deleting an Application Group
                                                     7-60
             Deleting an Application Group
        Filtering Encapsulations 7-61
    Setting Up Packet Analyzer Monitoring
        Setting Aggregation Intervals
        Configuring Response Time
        Setting Up Media Monitoring
        Creating RTP Filters 7-65
        Configuring URL Collections
             Enabling a URL Collection
                                        7-66
             Changing a URL Collection
                                        7-66
             Disabling a URL Collection
        Configuring WAAS Monitored Servers
                                                7-67
Understanding Packet Analyzer Traffic Sources A-1
    Data Source Overview
        Ports and Hardware Details A-3
    Understanding How the Packet Analyzer Uses SPAN
       A-4
    Understanding How the Packet Analyzer Uses VACLs in Catalyst Switch
    Understanding How the Packet Analyzer Uses NetFlow
        Understanding NetFlow Interfaces
        Understanding NetFlow Flow Records A-6
        Managing NetFlow Data Sources
    Understanding How the Packet Analyzer Uses WAAS
```

Understanding How the Packet Analyzer uses CEF A-8

APPENDIX **A**

Understanding UCSE Physical Interfaces A-8

Configuring Packet Analyzer Security

APPENDIX B

Idle Timeout **B-1** SSL/TLS Security B-1 Configuring a Self-Signed Certificate **B-1** Configuring a CA-Signed Certificate Configuring SSL/TLS Parameters Configuring SSL/TLS Ciphersuites **B-3** Configuring SSL/TLS Protocols SSH Security B-4 Configuring SSH Authorized Keys Configuring SSH Ciphers and MACs Secure File Transfers **B-5** Protecting Against Man-in-the-Middle Attacks B-5 SSH Known Hosts B-5 SSL/TLS CA Certificates B-6 Software Image Upgrades **B-6 Understanding Packet Analyzer Behavior Reference** APPENDIX C Menu Bar C-2 Filters C-2 Quick Filter C-2 Advanced Filter C-3 **Displaying Detailed Views** C-3 **Accessing Context Menus** C-3 Performing a Quick Capture Determining How to Use Sites to View Data C-4 Filtering Traffic for Viewing on the Dashboards C-4 Filtering Data Using Global Search C-5 Switching Chart Formats Using the Chart View / Table View Accessing Other Tasks Using Mouse-Over for Details Changing the Time Interval Using Zoom/Pan Charts Using Sort Grid to Change Sort Order C-6 Displaying Bits or Bytes or Packets in Charts Statistics C-7

Context-Sensitive Online Help C-7

Feedback C-7

APPENDIX D GUI Field Descriptions D-1

Setup User Interface Windows Create SPAN Session Dialog Box D-2 Packet Analyzer Data Sources Dialog Box D-3 Edit SPAN Session Dialog Box SNMP Credential Options in Packet Analyzer Data Sources Window Device System Information Dialog Box Alarm Configuration Window Threshold Configuration Window D-6 Host Alarm Thresholds Window Conversation Alarm Thresholds Window D-7 Application Alarm Thresholds Configuration Window Response Time Alarm Threshold Configuration Window DSCP Alarm Threshold Configuration Window RTP Streams Threshold Configuration Window Voice Signaling Threshold Configuration Window NetFlow Interface Threshold Configuration Window Video Stream Threshold Configuration Window Video MDI Stream Threshold Configuration Window Router System Information Window Switch/Managed Device System Information D-13 **NBAR Interfaces Window** D-14 Site Configuration Window D-14 Subnet Detection Window D-15 Sites Window D-15 Add NetFlow Interface Window D-15 DSCP Group Setup Dialog Box **DSCP Group Label Formats Application Window Applications Window URL-Based Applications Window** Response Time Configuration Window D-20 Media Monitor Setup Window D-20 **URL Collection Configuration Window** D-21 NetFlow Export Template Window D-22 Add Managed Device Monitor User Interface Windows D-24

D-4

All Alarms Table

D-30

```
Applications Detail Window
    Application Groups Detail Window
    Application Response Time (ART) Metrics
                                             D-31
    Client Server Application Responses Window D-33
    Client-Server Application Transactions Window
    Client-Server Network Responses Window D-34
    DSCP Detail Window
                          D-35
    Host Detail Window
                         D-35
    Interfaces Stats Table
                          D-36
    Last 50 Alarms Table
                         D-37
    Server Application Responses Window
    Server Application Transactions Window
    Server Network Responses Window
    Calls Table D-39
    RTP Stream for Selected Call Report Statistics
    Video Signaling Channel
                             D-40
    Video Stream Conversations
                              D-42
    Media Signaling Sessions
    RTP Stream for Selected Media Signaling Session
    RTP Conversations Table D-43
Capture User Interface Windows
                                D-43
    Capture Analysis Window
    Capture Session Fields
    Capture Setting Fields
    Custom Decode Filter Dialog Box
    Custom Decode Subexpressions Fields
    Error Scan Window D-49
    Hardware Filter Dialog Box D-49
    Cisco Security Packet Analyzer Decode Window
                                                  D-50
    Software Filter Dialog Box D-50
    Capture Query Fields D-52
Administration User Interface Windows
                                       D-53
    System Overview D-54
    SNMP Agent
    E-Mail Setting
                    D-55
    Preferences
                  D-55
    New User Dialog Box
                          D-56
    User Privileges D-57
    TACACs+ Authentication and Authorization
    Current User Sessions
                           D-58
```

Report Descriptions **D-58**

APPENDIX E	Troubleshooting Network and Packet Analyzer Issues E-1
	Resolving Typical Packet Analyzer Issues E-1
	Troubleshooting Login Issues E-2
	Understanding Typical Error Messages E-3
	Frequently Asked Questions about Packet Analyzer Behavior E-3
	Troubleshooting WAAS Data Issues E-4
	Troubleshooting Video Streams E-5
	Using the CLI to Troubleshoot Issues E-5
	Locating Packet Drops E-5
	Handling an Unresponsive Packet Analyzer F-6

Using the CLI to Troubleshoot Performance Agent (PA) **E-6**