

INFOWATCH

InfoWatch Traffic Monitor 7.0

Administration Guide

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http://www.infowatch.com

TABLE OF CONTENTS

1 Introduction 7
1.1 Who Should Read this Guide 7
1.2 Set of Documents 7
1.3 Technical Support 7
2 Traffic Monitor Overview 8
2.1 InfoWatch Traffic Monitor Features 8
2.1.1 In Stream/At The Gateway Traffic Interception 8
2.1.1.1 SMTP Traffic Interception Scheme 8
2.1.1.2 POP3 Traffic Interception Scheme 11
2.1.1.3 HTTP Traffic Interception Scheme 12
2.1.1.4 HTTPS Traffic Interception Scheme 15
2.1.1.5 ICQ Traffic Interception Scheme 18
2.1.1.6 NRPC Traffic Interception Scheme 19
2.1.1.7 IMAP4 Traffic Interception Scheme 20
2.1.2 Other Interception Channels 20
2.1.3 Revision of Files from the Corporate Network 21
2.1.4 Processing Traffic, Received from Third-party Systems 21
2.2 InfoWatch Traffic Monitor Subsystems (Red Hat Enterprise Linux) 22
2.3 Licensing 23
3 System Installation Types 27
4 Configuring System After Installation 28
4.1 Changing the Preset Password 28
4.2 Preliminary Settings 28
4.2.1 Configuring Time Synchronization 29
4.2.2 Configuring Sphinx for Distributed Installation 29
4.3 General Settings 30
4.3.1 Configuring Server to Work with SPAN, or Port Mirroring Technology 30
4.3.1.1 Configuring Traffic Monitor Server as Sniffer 31
4.3.1.2 Configuring Traffic Monitor Server to Receive Copy of Traffic from Sniffer 32
4.3.1.3 Creating Traffic Monitor Cluster 33
4.3.1.4 Configuring Licensing Server (in case of Cluster) 34
4.3.2 Intercepting Traffic, Transmitted via ICAP Protocol 34
4.3.2.1 Configuring ICAP 35
4.3.2.2 Configuring Blue Coat SG Series as an ICAP-client 36
4.3.2.3 Recommendations on SQUID Configuration 37

4.3.2.4 Recommendations on Cisco IronPort Configuration ... 40
4.3.2.5 Recommendation on configuring McAfee Web Gateway ... 42
4.3.2.6 UserGate Setting ... 43
4.3.2.7 Disabling ICAP ... 46
4.3.3 Configuring Inline Operation for Multiple Interceptors ... 47
4.4 Configuring Traffic Interception ... 47
4.4.1 Configuring SMTP Traffic Interception ... 49
4.4.1.1 SPAN, or Port Mirroring ... 49
4.4.1.2 Receiving Copies from Mail Server ... 49
4.4.1.3 Inline Mode ... 50
4.4.1.4 Configuring Mail Servers for SMTP Traffic Interception ... 53
4.4.2 Configuring POP3 Traffic Interception ... 59
4.4.3 Configuring HTTP Traffic Interception ... 59
4.4.3.1 SPAN, or Port Mirroring ... 59
4.4.3.2 Inline Mode ... 59
4.4.4 Configuring HTTPS Traffic Interception ... 60
4.4.4.1 Inline Mode ... 60
4.4.5 Configuring SMTP Traffic Interception ... 60
4.4.5.1 SPAN, or Port Mirroring ... 60
4.4.6 Configuring NRPC Traffic Interception ... 61
4.4.6.1 SPAN, or Port Mirroring ... 61
4.4.7 Configuring IMAP4 Traffic Interception ... 61
4.4.8 Receiving Objects Intercepted by InfoWatch Device Monitor ... 61
4.4.9 Revision of Files from the Corporate Network ... 62
4.5 Process autorun ... 62
4.5.1 Check of Process Autostart ... 62
4.5.2 Enabling and Disabling Process Autorun ... 64
4.6 Remote database interaction module ... 65
4.6.1 Configuring Data Collection in a Branch Network ... 66
4.6.2 Configuring the Client of the Remote Database Management Module ... 66
4.6.3 Configuring the Server of the Remote Database Management Module ... 67
4.7 Configuring OCR Extractors ... 68
4.8 Configuring Notifications for Users and Employees ... 71
4.9 Limiting the number of events that can be found ... 72
4.10 Configuring InfoWatch Device Monitor Server ... 72
4.10.1 <applicationSettings> Section ... 73
4.10.2 <system.diagnostics> Section ... 77
4.10.3 Deleting Device Monitor temporary files ... 79
4.11 Service-to-service cooperation setup (Consul service) ... 80
4.11.1 Starting and stopping the service ... 80
4.11.2 Registering services in Consul ... 81

4.11.3 Distributed installation ... 83
4.11.4 Network rules configuration to access Consul ... 85
4.11.5 consul.json configuration file and iwtm-consul.service unit-file ... 85

5 Configuring Crawler Interceptor ... 88
5.1 Configuring Network Access ... 88
5.2 Crawler Configuration Files ... 90
5.2.1 Configuration File of Crawler Server ... 90
5.2.1.1 Changing Account Used for Crawler Server's Service Start ... 91
5.2.1.2 SharePoint scanning scripts ... 91
5.2.2 Configuration File of Crawler Scanner ... 92
5.2.3 Disabling Traffic Encryption between Components ... 93
5.3 Crawler Log Files ... 94
5.4 Automatic deletion of Crawler events ... 94

6 Monitoring ... 96
6.1 Monitoring Subsystem for Distributed Architecture ... 96
6.1.1 Configuring Connection to Device Monitor ... 96
6.1.2 Configuring Indicators Manually ... 97
6.1.3 Configuring Addresses of Time Synchronization Server for Monitoring Subsystem ... 97
6.1.4 Configuring Threshold Value for Load Indicator ... 97
6.1.5 Configuring Notifications ... 97
6.1.5.1 Configuring Notifications on Indicator Threshold Exceeding ... 98
6.1.5.2 Configuring Sending Notification Mails via Postfix ... 99

7 Database Administration ... 100
7.1 Oracle ... 100
7.1.1 Changing Preset Passwords ... 100
7.1.2 Tablespaces in InfoWatch Traffic Monitor database ... 100
7.1.3 Managing Daily Tablespaces ... 101
7.1.3.1 Configuring Location of Files within File System ... 101
7.1.3.2 Configuring Storage Modes for Tablespace Files ... 103
7.1.3.3 Archiving Daily Tablespaces ... 104
7.1.3.4 Restoring Daily Tablespaces ... 107
7.1.3.5 Deleting Daily Tablespaces ... 107
7.1.4 Database Backup ... 110
7.1.4.1 Creating Database Backup ... 111
7.1.4.2 Restoring the Database from the Backup ... 115
7.1.5 Database Routinely Maintenance ... 117
7.2 PostgreSQL ... 118
7.2.1 Changing Preset Passwords ... 119
7.2.2 Tablespaces in InfoWatch Traffic Monitor database ... 119

7.2.3 Managing Daily Tablespaces ... 119
7.2.3.1 Archiving Daily Tablespaces ... 120
7.2.3.2 Restoring Daily Tablespaces ... 122
7.2.3.3 Configuring Location of Files in File System ... 123
7.2.3.4 Configuring Storage Modes for Tablespace Files ... 124
7.2.3.5 Deleting Daily Tablespaces ... 126
7.2.4 Database Backup ... 128
7.2.4.1 Creating Database Backup ... 128
7.2.4.2 Restoring the Database from the Backup ... 130
7.2.5 Database Server Routinely Maintenance ... 132

8 Administrating the Server End of InfoWatch Traffic Monitor ... 134
8.1 Traffic Monitor Server Processes ... 134
8.1.1 List of Traffic Monitor Server End Processes ... 134
8.1.2 Using Traffic Monitor Server End Processes ... 141
8.2 Setting Traffic Monitor Server End Configuration Files ... 143
8.3 Configuring OCR ... 143
8.3.1 Configuration File ocr_custom.xml ... 144
8.4 Configuring Settings for HTTP-Requests Transferred through ICAP Protocol ... 146
8.5 Configuring Settings of Enclosures Archives Processing ... 146
8.5.1 The extractors.xml Configuration File ... 146
8.6 Archiving a Mail Queue Directory ... 149
8.7 Logging System Work ... 149
8.8 File queues ... 151
8.9 Recovering the System after Failures ... 153
8.10 Managing Languages Including Morphological Support ... 154
8.10.1 Adding New Language for Events Search. Morphology and Adding Terms. ... 154
8.10.2 Updating Installed Language Including Morphological Support ... 155
8.10.3 Deleting Search Language and Terms ... 156
8.11 Configuring Forwarding Data to SIEM ... 156
8.11.1 Configuring SIEM Side ... 157
8.11.1.1 Table Representation of TM Events ... 157
8.11.1.2 User Audit Table View ... 162
8.11.2 Configuring TM Side ... 166
8.11.2.1 Forwarding Logs to SIEM ... 167
8.11.2.2 Log Management for TM DB User Sessions ... 167
8.11.2.3 Managing Siem User ... 168
8.11.3 Type of Logs, Transmitted to SIEM ... 170
8.12 Deleting Temporary Files ... 170

9 Appendix A. Username and Password Creation Recommendations 171

10 Appendix B. Monitoring Indicators 173

1 Introduction

This guide provides information on InfoWatch Traffic Monitor administration: configuration of the system after installation, disaster recovery, routine maintenance.

1.1 Who Should Read this Guide

The guide is intended for InfoWatch Traffic Monitor Server administrators, which are familiar with the basics of Microsoft Windows and Linux and have the skills of Oracle and Postgre SQL DBMS administration.

1.2 Set of Documents

For more information see the following documents:

- «*InfoWatchTraffic Monitor. Installation Guide*».

The document describes how to install, configure, update, and uninstall the InfoWatch Traffic Monitor.

- «*InfoWatch Traffic Monitor. Administration Guide*».

Contains information on System administration (database, server-end).

- «*InfoWatch Traffic Monitor. User Guide*».

The document describes operation with InfoWatch Traffic Monitor: configuration setting, data export/import, creating policies for objects processing.

- «*InfoWatch Traffic Monitor. Configuration files guide*».

The document describes the frequently used configuration files.

1.3 Technical Support

If you cannot resolve issues which arise when using the System or have questions regarding the use of the System, you can contact the Technical Support Service:

- If you purchased the product from an InfoWatch partner, contact the Technical Support Service of this partner company.
- If you purchased the product directly from InfoWatch, you can contact our Technical Support Service at support@infowatch.com.

Technical Support Service is available to assist you Mon-Fri, 7 AM – 9 PM (Moscow time, GMT+3), except weekends and public holidays in Russian Federation.

You can also visit online support at our website at: http://infowatch.com/support.

Before contacting the Technical Support Service, please refer to the Knowledge Base at our web-site: https://kb.infowatch.com/. The knowledge base may already contain the answer to your question or a description of the problem you are having.

2 Traffic Monitor Overview

In this chapter:

- InfoWatch Traffic Monitor Features;
- InfoWatch Traffic Monitor Components;
- Licensing.

2.1 InfoWatch Traffic Monitor Features

InfoWatch Traffic Monitor allows you to control corporate network information flows in order to detect and prevent unauthorized use of confidential data.

Main features of InfoWatch Traffic Monitor:

- In Stream/At The Gateway Traffic Interception - interception of traffic transferred in stream/at the gateway via SMTP, POP3, HTTP, HTTPS, OSCAR (ICQ), NRPC (IBM Notes);
- Other interception channels
- Revision of Files from the Corporate Network;
- Processing Traffic, Received from Third-party Systems;
- Analyzing content of intercepted traffic in order to detect violation of the corporate security policy
- Filtering intercepted traffic by allowing/prohibiting delivery of particular data

2.1.1 In Stream/At The Gateway Traffic Interception

The chapter contains information about traffic types and their interception schemes:

- SMTP Traffic Interception Scheme;
- POP3 Traffic Interception Scheme;
- HTTP Traffic Interception Scheme;
- HTTPS Traffic Interception Scheme;
- ICQ Traffic Interception Scheme;
- NRPC Traffic Interception Scheme;
- IMAP4 Traffic Interception Scheme.

SMTP Traffic Interception Scheme

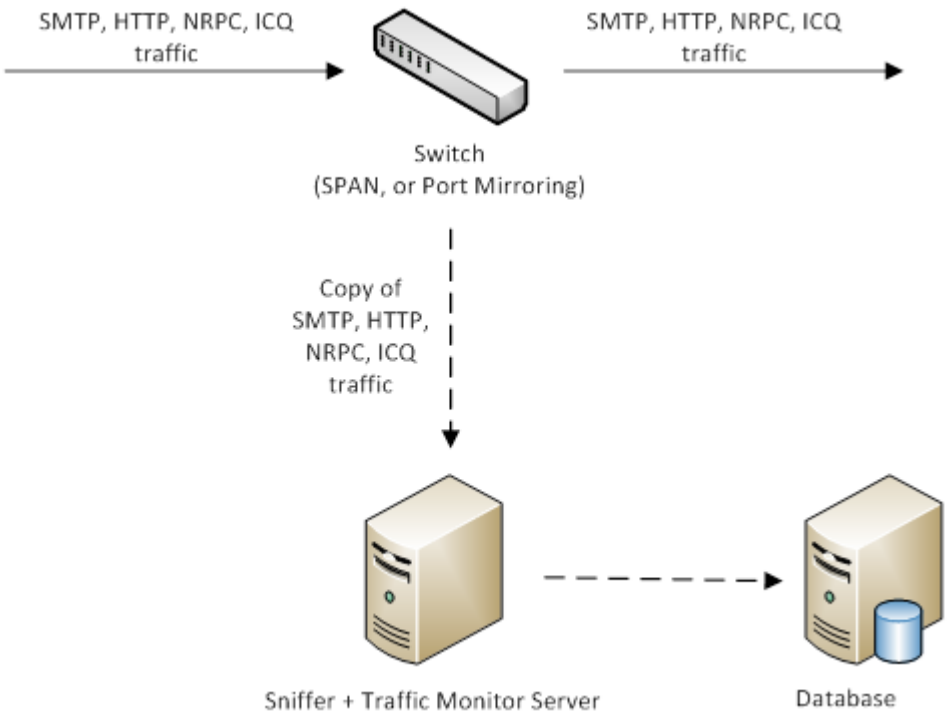
Method 1:

Traffic is being intercepted from a managed switch by using SPAN Port, or Port Mirroring technology.

Big number of managed network switches allows duplicating traffic from one or several ports or VLAN on a separate port.

In this case the customized switch port is being attached to Traffic Monitor Server network interface. Server interface is being switched to promiscuous mode, which allows accepting all incoming packages. This interface does not require an IP-address.

The most effective is to mirror internal switch port or internal proxy-server interface.



For more information on functionality *see* ''SPAN, or Port Mirroring''

Advantages:

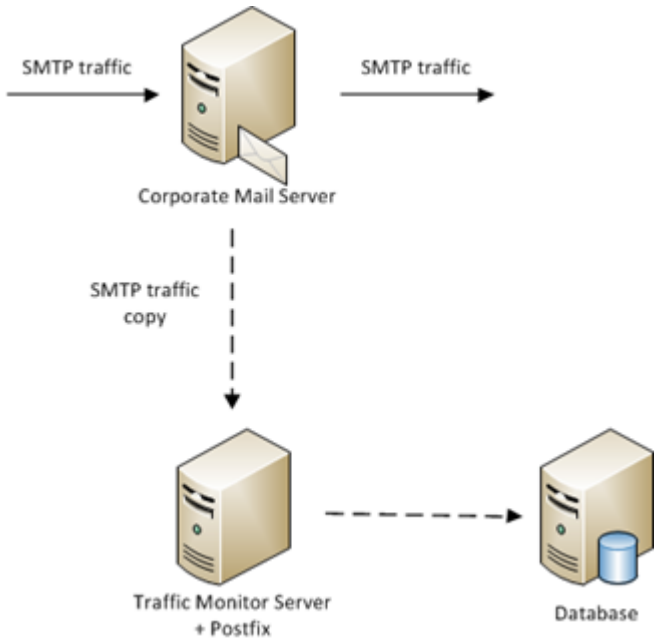
- This method allows to analyze traffic safely even in the isolated network segment. System can never influence analyzed traffic, regardless of Server state.
- SMTP traffic of external servers is being analyzed as well (for example, Mail.ru traffic, given that SMTP protocol is being used)

Shortcomings:

- Under heavy load of switch, packages can be partially lost, especially, when the traffic is being mirrored from two ports to one, therefore we need:
  - switch with corresponding functionality;
  - additional network adapter on monitoring server.
- Among shortcomings, internal communications are not being controlled.

Method 2:

On a corporate mail server it is necessary to setup a rule, sending shadow copy (BCC) for each sent message. Copy should be sent to mail address with mail domain, which has the same IP-address as Traffic Monitor Server. Most of mail servers have such functionality.



For more information on functionality see "Receiving Copies from Mail Server"

Advantages:

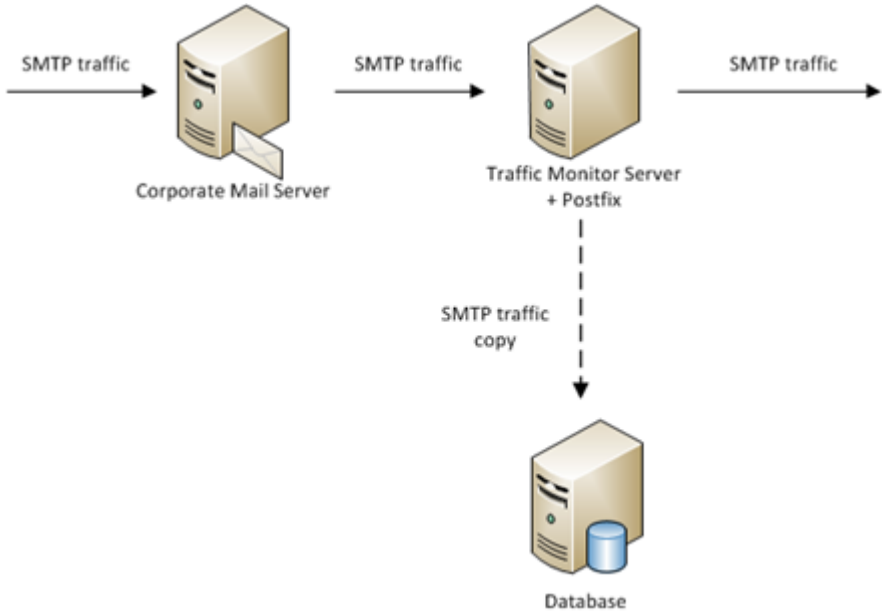
- Apart from external, it allows analyzing company's internal communications;
- When MS Exchange 2007 or newer is used there is functionality to analyze communications of a certain user group;
- Guarantees entire mail analysis.

Shortcomings:

- Requires settings of a corporate mail server to be changed;
- External mail servers (if allowed to use) is not being controlled;
- Upon Traffic Monitor Server inaccessibility, users will receive mail about shadow copy delivery error;
- Additional mail server load.

Method 3:

Monitoring server is being used as an intermediate mail server. Monitoring server includes Postfix mail server.



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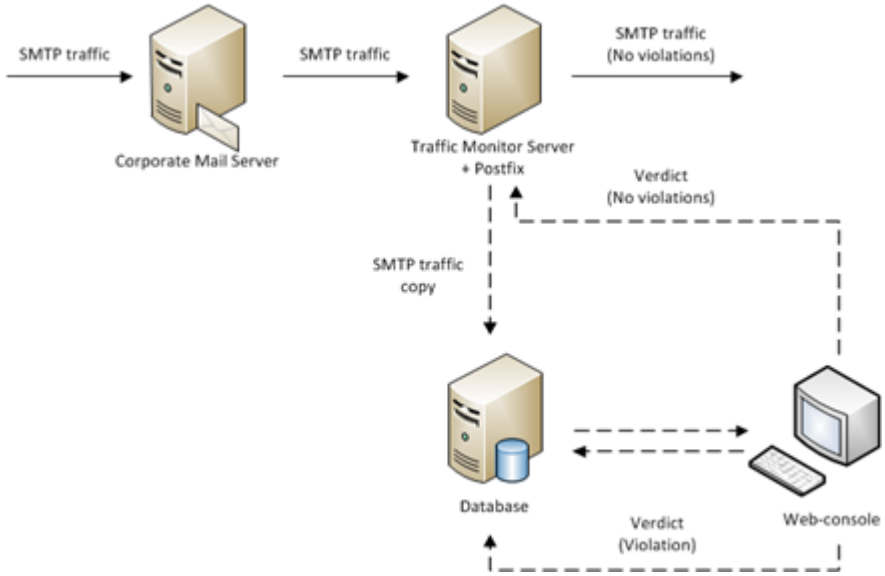


Block

For more information on the functionality see *"*Inline Mode*"*.

Advantages:

Allows enabling mail traffic block functionality.

Shortcomings:

- Requires settings of a corporate mail server to be changed;
- External mail servers (if allowed to use) is not being controlled;
- Upon monitoring server inaccessibility, users cannot send mail, in case server reservation has not been provided (for example, through MX-records).

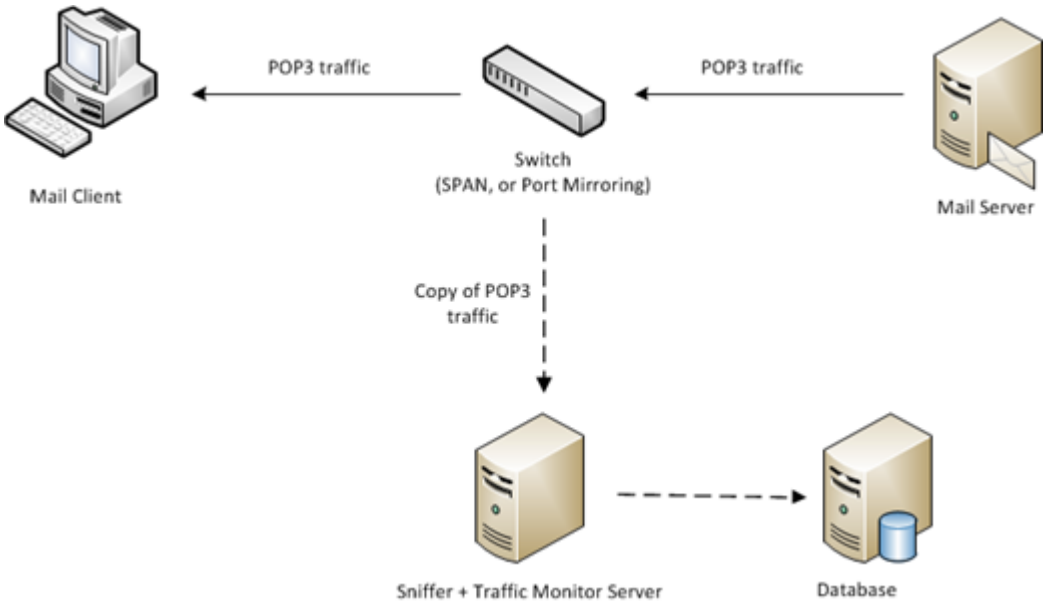
POP3 Traffic Interception Scheme

Traffic is intercepted from a managed switch by using SPAN Port, or Port Mirroring technology.

A large number of managed network switches allows duplicating traffic from one or several ports or VLAN to a single port.

In this case the customized switch port is connected to Traffic Monitor Server network interface. Server interface is switched to promiscuous mode, which allows accepting all incoming packages. This interface does not require an IP-address.

The most effective is to mirror the internal switch port or internal proxy-server interface.



For more information on functionality see "Configuring POP3 Traffic Interception".

HTTP Traffic Interception Scheme

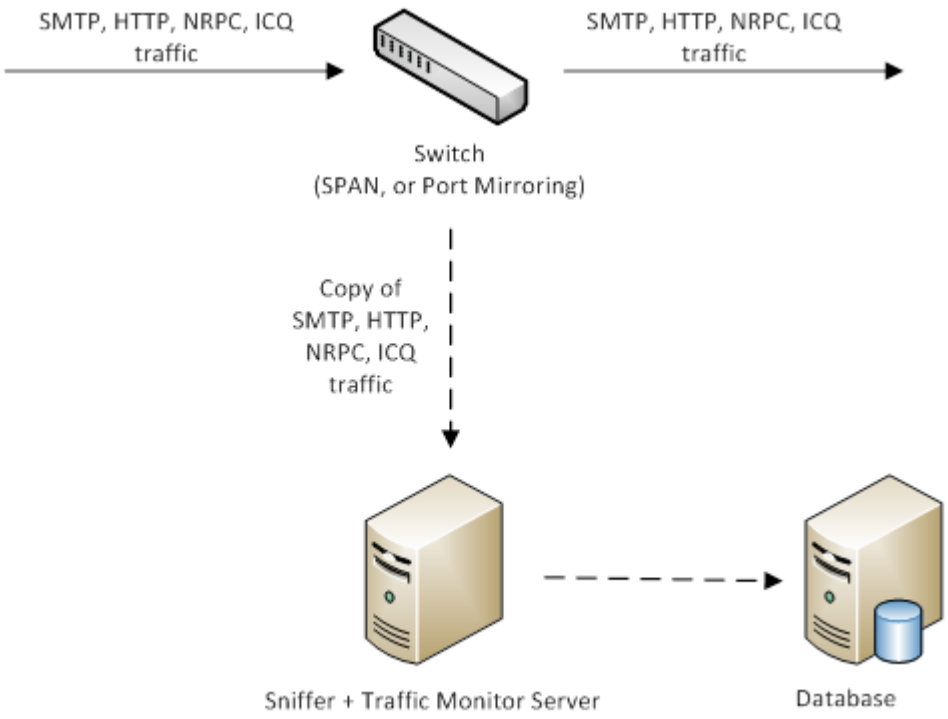
Method 1:

Traffic is intercepted from a managed switch by using SPAN Port, or Port Mirroring technology.

A large number of managed network switches allows duplicating traffic from one or several ports or VLAN to a single port.

In this case the customized switch port is connected to Traffic Monitor Server network interface. Server interface is switched to promiscuous mode, which allows accepting all incoming packages. This interface does not require an IP address.

The most effective is to mirror the internal switch port or internal proxy server interface.



For more information on functionality see *"SPAN, или Port Mirroring"*.

Advantages:

- This method allows to analyze traffic safely even in the isolated network segment. System can never influence the analyzed traffic, regardless of Server state.

Shortcomings:

- Under heavy load on the switch, some packages can be lost, especially, when the traffic is mirrored from two ports to a single port. To prevent the loss of packages, you should use:
  - a switch with corresponding functionality;
  - an additional network adapter on the monitoring server.

Special case 1:

In case monitoring server is located in virtual environment, in addition to switch port setup, to monitor traffic an individual virtual switch is being created with promiscuous mode enabled. Switch should be connected to an individual physical interface. This method allows you to analyze the traffic of virtual machines running through a virtual switch.

This method works on VMware ESXi servers. On Hyper-V this functionality is implemented with limitations starting with version 2012 Hyper-V.

Special case 2:

Instead of managed switch, HUB can be used. This variant's disadvantage is HUB device's is low transmission capacity, as well as inability to buy a device in connection to removal from production.

Method 2:

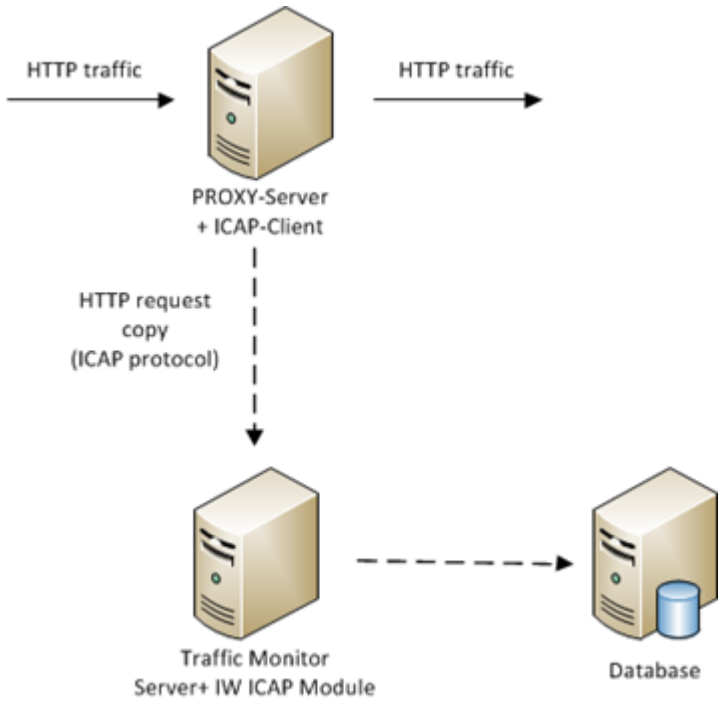
Traffic copy, which is transmitted via ICAP protocol, is intercepted from corporative proxy server.

Traffic Monitor Server is positioned as an ICAP server. In case there is a proxy server in company, which supports ICAP protocol, it is possible to use this functionality for analysis of HTTP traffic.

The following proxy servers support this option:

- Cisco Ironport
- SQUID (given that the package has been compiled including ICAP support)
- Blue Coat SG
- Zimbra Proxy (as a part of Zimbra ZCS)

> **Note:**
>
> To work with other proxy servers maintaining ICAP is possible, but this requires preliminary compatibility test.



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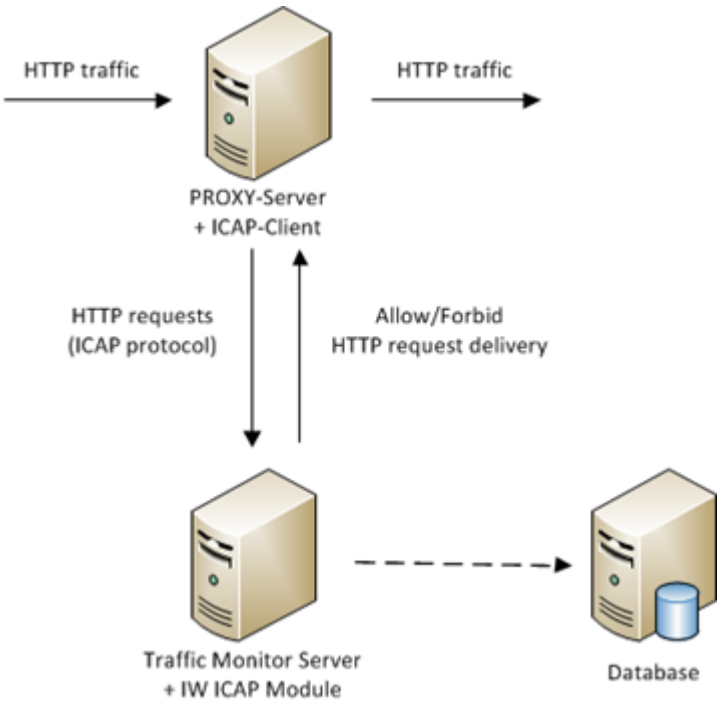

Block
For more information on functionality see "Inline mode".

Advantages:

- Guarantees all packages delivery;
- Traffic Monitor Server can work in blocking mode («inline») with some proxy servers.

Shortcomings:

- Proxy server with corresponding functionality is required;
- Additional proxy server load;
- Changing corporate proxy server setup;
- Slight increase in the response time of Internet resources is possible.

HTTPS Traffic Interception Scheme

> **Warning!**
>
> All methods of analyzing HTTPS traffic should be used with caution. The technology of analyzing HTTPS traffic is based on replacing a certificate of HTTPS session with a certificate issued by the proxy server (**man-in-the-middle attack**). On the user PC, the certificate must be considered a trusted one; otherwise, it will not be able to connect to an HTTPS resource. All HTTPS resources, which use personal certificates for identification (e.g., different client banks), must be excluded from interception.

Method 1:

Corporate proxy-server carries out certificate replacement and HTTPS traffic parsing. After parsing HTTPS traffic, the proxy server sends traffic as HTTP to Traffic Monitor Server via ICAP protocol.

The following proxy servers support this option:

- Cisco Ironport

- SQUID (given that the package has been compiled including ICAP support)
- Blue Coat SG
- Zimbra Proxy (as a part of Zimbra ZCS)

> **Note:**
>
> To work with other proxy servers, maintaining ICAP, is possible, but requires preliminary compatibility test.

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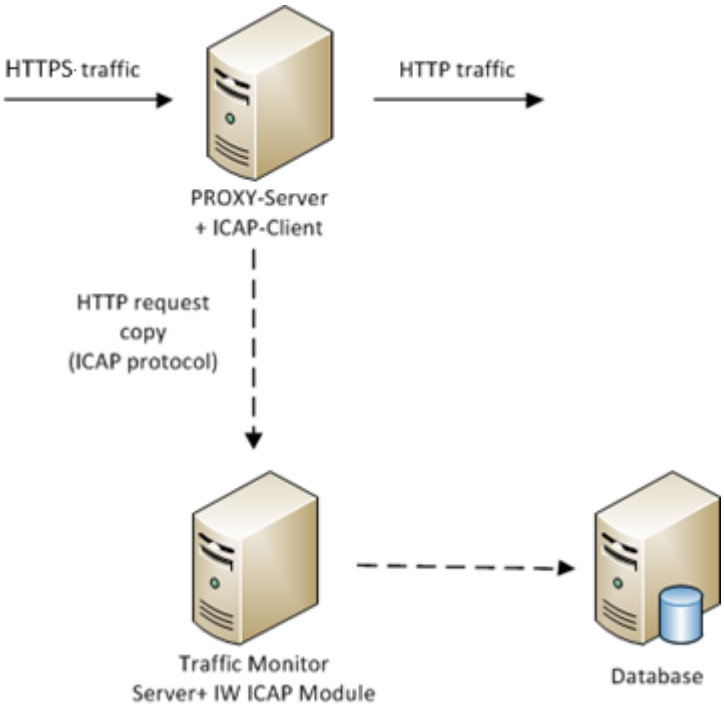
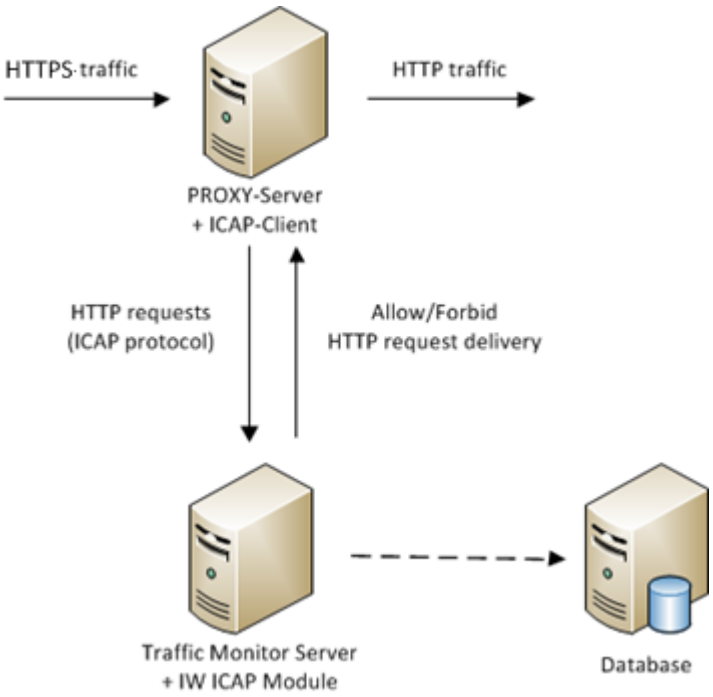


Blocking



For more information on this functionality, see *"'В разрыв" 1".*

Advantages:

- Entire HTTPS traffic is analyzed.

Shortcomings:

- It is required to take into consideration the needs of all proxy-server users;
- Additional load on a proxy server;
- Need to make some preparations which include creating exclusions list and certificate distribution.

Special case:

InfoWatch engineers can install a free SQUID proxy server on the Traffic Monitor Server.

Advantages:

- It is possible to analyze HTTPS.

Shortcomings:

- SQUID engineer is required to maintain the service.

Method 2:

HTTPS traffic analysis is performed by InfoWatch Device Monitor.

For more information on this functionality see «InfoWatch Device Monitor. User guide»*.*

Advantages:

- An agent automatically puts its certificate to the trusted ones;
- Analysis of HTTPS traffic in company environment can be introduced gradually.

Shortcomings:

- Needs of a particular PC user should be taken into consideration.

ICQ Traffic Interception Scheme

Intercepting the copy of ICQ traffic (OSCAR protocol) which passes through equipment with SPAN technology support. ICQ traffic interception is possible over HTTP.

> **Warning!**
>
> Interception and analysis of encrypted ICQ traffic (including traffic transferred via SSL protocol) is not supported.

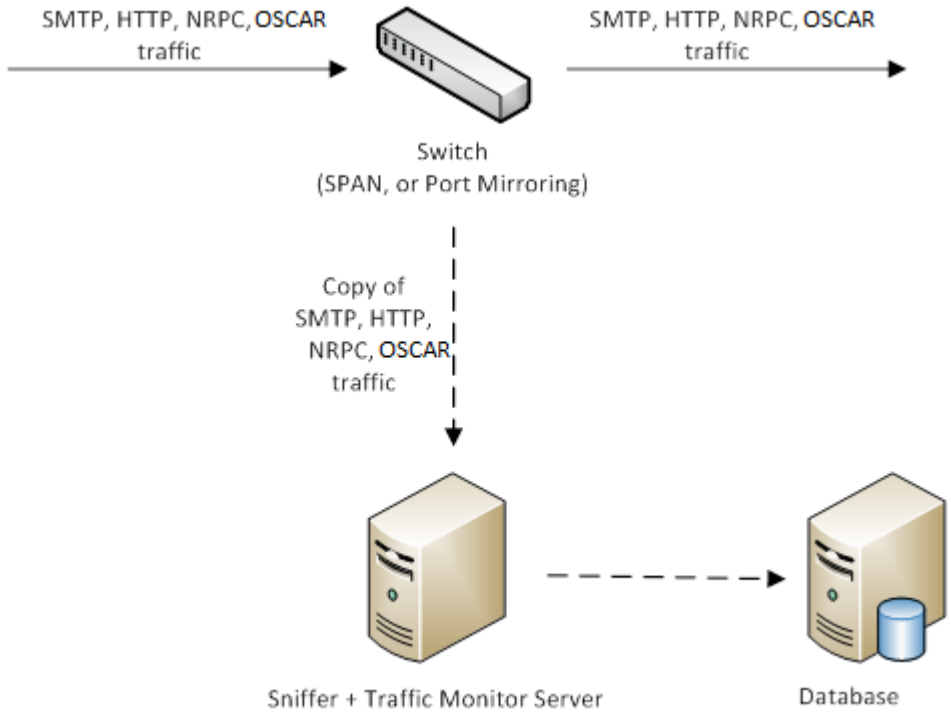
> **Note:**
>
> Direct file transfer is not supported. OSCAR protocol assumes that Traffic Monitor gets the file hosting service reference, from which the file can be loaded.

Traffic is intercepted from a managed switch by using SPAN Port, or Port Mirroring technology.

A large number of managed network switches allow duplicating traffic from one or several ports or VLAN to a single port.

In this case customized switch port is connected to Traffic Monitor Server network interface. Server interface is switched to promiscuous mode, which allows accepting all incoming packages. This interface does not require an IP-address.

It is most effective to mirror internal switch port or internal proxy-server interface.



For more information on functionality see "SPAN, or Port Mirroring".

Advantages:

Allows analyzing traffic safely even in an isolated network segment. System cannot influence the traffic being analyzed regardless of the Server state.

Shortcomings:

Under heavy load on the switch, some packages can be lost, especially, when the traffic is mirrored from two ports to a single port. To prevent the loss of packages, you should use:

- a switch with corresponding functionality;
- an additional network adapter on the monitoring server.

NRPC Traffic Interception Scheme

NRPC traffic copy interception (used in IBM Notes System) which passes through equipment with SPAN technology support.

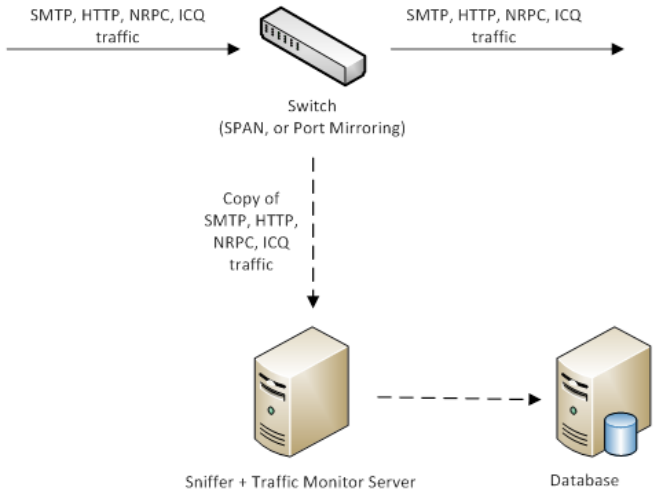
Method 1:

Traffic is intercepted from a managed switch by using SPAN Port, or Port Mirroring technology.

A large number of managed network switches allow duplicating traffic from one or several ports or VLAN to a single port.

In this case customized switch port is connected to Traffic Monitor Server network interface. Server interface is switched to promiscuous mode, which allows accepting all incoming packages. This interface does not require an IP-address.

The most effective is to mirror internal switch port or internal proxy-server interface.



For more information on functionality see "SPAN, or Port Mirroring"

Advantages:

Allows analyzing traffic safely even in an isolated network segment. System cannot influence the traffic being analyzed regardless of the Server state.

Shortcomings:

Under heavy load on the switch, some packages can be lost, especially, when the traffic is mirrored from two ports to a single port. To prevent the loss of packages, you should use:

- a switch with corresponding functionality;
- an additional network adapter on the monitoring server.

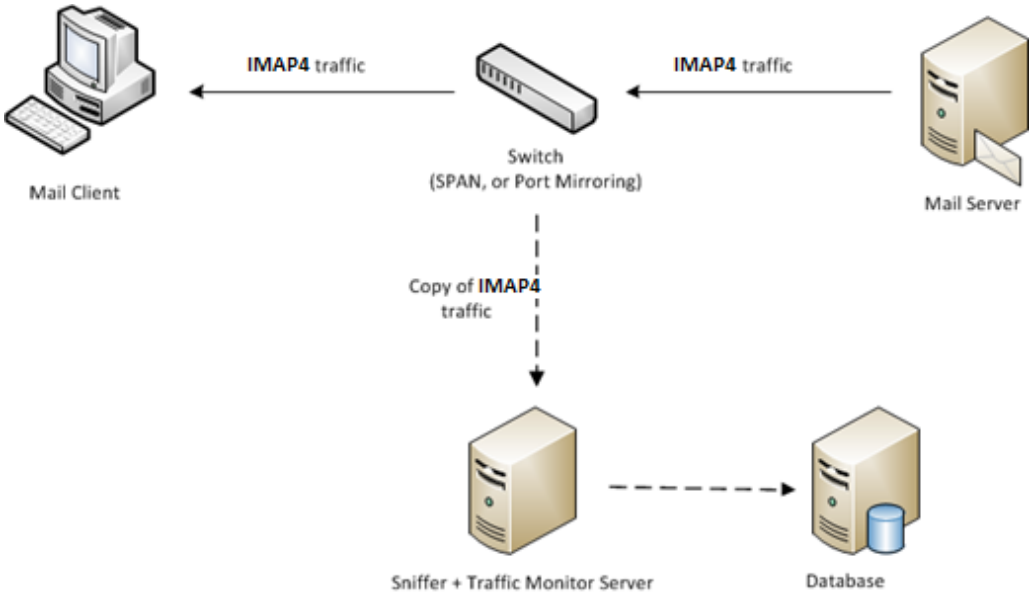
IMAP4 Traffic Interception Scheme

Traffic is intercepted from a managed switch by using SPAN Port, or Port Mirroring technology.

A large number of managed network switches allow duplicating traffic from one or several ports or VLAN to a single port.

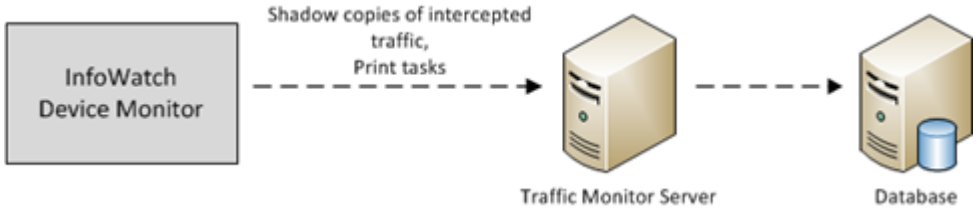
In this case customized switch port is connected to Traffic Monitor Server network interface. Server interface is switched to promiscuous mode, which allows accepting all incoming packages. This interface does not require an IP-address.

It is most effective to mirror the internal switch port or internal proxy-server interface.



For more information on functionality see *"SPAN, or Port Mirroring"*.

2.1.2 Other Interception Channels



Device Monitor Agents can be installed on Microsoft Windows client OS. Features of Device Monitor Agents:

- control of sending and receiving emails via SMTP, IMAP, POP3 protocols and using MAPI, including S/MIME standard encrypted messages (see "Configuring Mail monitor Rule (DM)");
- control of traffic transferred via HTTP and HTTPS (see "Configuring HTTPS Monitor Rule (DM)");
- control of employee access to computer peripheral devices;
- monitoring print operations on controlled computers;
- control of instant messengers: Skype (including voice traffic analysis), Telegram (desktop version), Facebook, VK, Jabber (XMPP protocol), Mmp protocol;
- control of traffic transferred via FTP and FTPS;
- control of data transferred via network connections outside the corporate network;
- Microsoft RDP and Citrix ICA client control;

- control of files copied to network resources and external storages;
- cloud storage control;
- screenshot control;
- application control.

For more information on these features, see the document "InfoWatch Traffic Monitor. User Guide", "Rules" section.

All intercepted data can be sent to Traffic Monitor server for analysis.

2.1.3 Revision of Files from the Corporate Network

File server and network resources content analysis is possible after installing special module on MS Windows Server.

For more information on functionality see "Configuring Crawler Interceptor".

2.1.4 Processing Traffic, Received from Third-party Systems

Traffic Monitor supports number of adapters, which work under the scheme of data transfer from integrable source and storing it in a database:

- **InfoWatch Lotus Domino Adapter**. Find the recommendations for installation and administration in the document "InfoWatch Lotus Domino Adapter. Installation and administration guide";
- **InfoWatch MS Lync Adapter**. Find the recommendations for installation and administration in the document "InfoWatch MS Lync Adapter. Installation and administration guide";
- **InfoWatch TMG Adapter**. Find the recommendations for installation and administration in the document "InfoWatch TMG Adapter. Installation and administration guide";
- **InfoWatch Device Control Adapter**. Find the recommendations for installation and administration in the document "InfoWatch Device Control Adapter. Installation and administration guide";
- **InfoWatch Cisco UCM Adapter**. Find the recommendations for installation and administration in the document "InfoWatch Cisco UCM Adapter. Installation and administration guide";
- **InfoWatch Smart Logger II**. Find the recommendations for installation and administration in the document "InfoWatch Smart Logger II. Installation and administration guide";
- **InfoWatch HEML Adapter**. Find the recommendations for installation and administration in the document "InfoWatch HEML Adapter. Installation and administration guide";
- **InfoWatch Sample Documents Autoupdate Adapter**. Find the recommendations for installation and administration in the document "InfoWatch Sample Documents Autoupdate Adapter. Installation and administration guide".

2.2 InfoWatch Traffic Monitor Subsystems (Red Hat Enterprise Linux)

InfoWatch Traffic Monitor subsystem	**Purpose**
Traffic Intercepting subsystem	Intercepts traffic (objects or their copies) and transfers it for processing. Consisting of the following modules: • Sniffer module; • ICAP module; • Device Monitor module.
Processing subsystem	Extracts significant information and attachments from intercepted objects, determines attachment formats, and transfers extracted texts to the Analysis subsystem. **Note:** together with an object, its XML context is created - a text file including object content and information about the object.
Analysis subsystem	Analysis of text data extracted from intercepted objects (texts of emails, messages, queries as well as text, extracted from attachments). Includes the following technologies: • Categories and terms; • Text objects; • Sample documents; • Vector images; • Blanks; • Stamps; • DB unloadings; • Graphical objects.
Policy Application subsystem	Based on results of Analysis and Processing subsystems operations, the Policy Application subsystem makes a decision whether the intercepted object violates the security policy or not. It also associates the sender/recipient data with records on employees and workstations. Consists of the following modules: • Active Directory and Domino Directory Integration module • Decision-Making module

Storage subsystem	A database which stores data on intercepted objects, results of analysis and applying policies. It also enables viewing this data by means of queries in the Management Console. Includes the following modules: • Remote Database Management module • Uploading Objects to Database module • System Settings Storage module • Object Storage module **Note:** before objects are saved to the database, they are converted from one internal format (XML) to another internal one.
Monitoring subsystem	Allows you to remotely monitor the state of the servers where InfoWatch Traffic Monitor components and their services are installed. Also, performs general management operations. The administration works with the subsystem via the web interface.
Audit subsystem	Makes it possible to customize search filters (by persons, actions, objects, dates), view brief information on events and violations based on selected filters, and define the period of storing events in the System. The administration works with the subsystem via the web interface.
Management Console subsystem	Enables GUI operation. The user interface is needed to administrate, configure, and operate Traffic Monitor. Includes the following modules: • Monitoring module • Control module • Configuration module

2.3 Licensing

After the System has been installed, the license should be installed accordingly. For this purpose request for license key file (see the document "InfoWatch Traffic Monitor. User Guide", topic "Requesting license").

The license is intended to specify the duration, number of users, number of interception modules and analysis modules, as well as the ability to integrate with external systems.

A commercial license key is a file in LIC format.

When you install and use the license key, consider the following:

- If the license expires, interceptors stop working. To resume the System operation the new license should be installed.
- If you want to change settings of traffic interception according to a new deployment scheme, replace the license key considering new interceptors.

If you completely reinstall the operating system or InfoWatch Traffic Monitor, you will need to install the license anew. Therefore, we recommend saving the license key file to some data storage.

Warning!

About license validity check and license management you may find in the document "InfoWatch Traffic Monitor. User Guide", section "Managing Licenses".

Modules used in the product are listed below.

Interception modules, designed by InfoWatch		
Subsystem	**Event type**	**Protocol**
TM	E-mail	POP3 IMAP SMTP NRPC
	Web-message	HTTP HTTPS
	Web-mail	HTTP HTTPS
	ICQ	OSCAR
	Crawler	-
DM	E-mail	POP3 IMAP Outlook SMTP
	Web-message	HTTP HTTPS
	Web-mail	HTTP HTTPS
	Print	-
	Skype	SKYPE
	XMPP	XMPP
	Mail.Ru Agent	MMP
	FTP	FTP
	Clipboard	-

	Screenshots	-
	Removable devices	-
	Network resources	-
	Terminal session	-
	Cloud storage	HTTPS
	Telegram	-
	Vkontakte	HTTPS
	Facebook	HTTPS
Adapters	MS Lync	SIP
	Email (Lotus)	NRPC
	Removable devices (Lumension Device Control)	-
	Print (Lumension Device Control)	-
	Web-message (ICAP)	ICAP
	Web-mail (ICAP)	ICAP

External interception modules	
Event type	**Protocol**
E-mail	POP3 MAPI SMTP/ESMTP IMAP NRPC
Web-mail	HTTP HTTPS ICAP
ICQ	OSCAR
Mail.ru agent	MMP
Skype	Skype
XMPP	XMPP
MS Lync	SIP

Web message	HTTP HTTPS ICAP
FTP	FTP
Removable devices	-
Print	-
Crawler	-
SmartLogger	XMPP
Cisco UCM	XMPP

Analysis modules:

1. Linguistic analysis
2. Sample documents detector
3. Vector images detector
4. Text objects detector
5. DB unloadings detector
6. Form detector
7. Graphical analysis
8. Stamps detector

Additional possibilities:

1. Modules of sample unloadings update;
2. Export to external analysis systems.

> **Note:**
>
> The technology of blocking leakage channels on workstations based on analysis results is not licensed.

3 System Installation Types

The deployment scheme is chosen based on estimated hardware workload and implementation goals (for details, see the document "*InfoWatch Traffic Monitor. Installation Guide*", "System Deployment Schemes and Installation Types" article). The following installation modes are supported:

- *All-in-one Standard* - all System components are installed on the same computer together with PostgreSQL DBMS. For details, see the document "*InfoWatch Traffic Monitor. Installation Guide*", "All-in-one Installation Mode of TM Enterprise and TM Standard" article;
- *All-in-one Enterprise* - System installation type with advanced features including PostgreSQL and Oracle DBMS, scalability, fine control of workstations. For details, see the document "*InfoWatch Traffic Monitor. Installation Guide*", "All-in-one Installation Mode of TM Enterprise and TM Standard" article;
- *Distributed Installation of TM Enterprise (Traffic Monitor Server + Database)* - System installation type for operation under heavy workload and with a large amount of data. For details, see the document "*InfoWatch Traffic Monitor. Installation Guide*", "Distributed Installation of TM Enterprise" article.

Important!

If the System is installed on different servers (and when building a server cluster), pay attention to the following:

- you should configure network parameters of Sphinx searching engine (see "Configuring Sphinx in case of distributed installation")
- some server processes (**iw_adlibitum, iw_licensed, iw_deliver, iw_indexer**) and user console processes (**iw_kicker, iw_configerator**) should run on the cluster in a single copy (see "List of Traffic Monitor Server End Processes")

Depending on the purchased license, each installation type may include installation of the following interceptors:

- Crawler which is intended to detect and prevent unauthorized use of confidential data as well as control corporate file resources (see the document "*InfoWatch Traffic Monitor. Installation Guide*", "Installing the Crawler subsystem" article).
- InfoWatch Device Monitor which is intended to configure security schemes, computer monitoring system, access to the company computers, etc. (see the document "*InfoWatch Traffic Monitor. Installation Guide*", "Installing InfoWatch Device Monitor" article).
- Adapters - interception modules intended for integration with third-party systems.

4 Configuring System After Installation

After installing the System, configure the following settings for proper System operation:

- Configuring Time Synchronization - enables automatic time synchronization on servers;
- Configuring Sphinx in case of distributed installation - settings required for distributed installation;
- Configuring traffic interception - specific settings for different types of intercepted traffic;
- General settings - the settings order to get traffic from the managed switch using SPAN Port technology, traffic interception, sent via ICAP protocol and system settings to switch the interceptors to "in-line" mode capably for traffic block;
- Process Autorun - the list of system processes and a description when and how to enable/disable autorun for these processes;
- Configuring OCR Libraries - the order of installing packages required for text recognition in intercepted events;
- Configuring Email Notifications for Users and Employees - mandatory settings to support mail notifications, sent as a result of triggering policy rules (for details, see the document "*InfoWatch Traffic Monitor. User Guide*");
- Limiting the Number of Found Events - changing maximum number of events displayed in the Management Console;
- Configuring InfoWatch Device Monitor - configuring separate modules of Device Monitor Server and editing the logging settings;
- Setting data collection in affiliate network - the settings of configuration files services, responsible for collecting data in a branch network.
- Service-to-service cooperation setup (Consul service) - the settings of configuration files services, managing The System processes.

It is recommended to change passwords pre-configured in the System, as information security rules require (for details, see Changing standard passwords in the System).

4.1 Changing the Preset Password

Accounts in the System have a preset password: xxXX1234 (for details, see Pre-installed Server Parameters). When you start using the System, you should change the password to meet the information security requirements. To ensure stable and safe operation of the System, store passwords in a safe, inaccessible place.

You can change the preset password in the System configuration files. To change the preset password:

1. Stop Traffic Monitor processes:
   ```
   iwtm stop
   ```
2. Run the command:
   ```
   egrep -lir --include=\*.{cfg,conf} 'xxXX1234' | xargs -l sed -i -e 's/xxXX1234/<new_pass>/g'
   ```
   where `<new_pass>` is a new password.
3. Start Traffic Monitor processes:
   ```
   iwtm start
   ```

When specifying a new password, follow recommendations in the "Username and Password Creation Recommendations" article. To change preset passwords of the DBMS, see "Database Administration".

4.2 Preliminary Settings

Upon System installation the following settings must be performed:

- Configuring Time Synchronization
- Configuring Sphinx in case of distributed installation.

4.2.1 Configuring Time Synchronization

1. Set the system time using `date` command. For example, to set 12 August 2013 13:30 run the command with following parameters:
   `date 12081330`
2. Copy the system time to configure hardware clock with the command:
   `hwclock --systohc`
3. Check if the system and hardware clock are configured properly:
   `hwclock ; date`
4. The time should be almost the same.
   Stop `ntpd` service:
   `systemctl stop ntpd`
5. Define the time synchronization server. You can use any exact time service which uses ntp protocol and is available from your network. It can be both network equipment and Windows domain controllers (Active Directory server).
   To check if the server supports NTP, use ntpdate -q <IP> command (where IP is the address of server to be checked), for example:
   ```
   root@atl-iw:~# ntpdate -q 10.10.0.98
   server 10.10.0.98, stratum 3, offset 9.196765, delay 0.04437
   11 Sep 13:09:02 ntpdate[13819]: step time server 10.10.0.98 offset 9.196765
   sec
   root@atl-iw:~#
   ```
6. Configure the synchronization specifying NTP synchronization server in **/etc/ntp.conf** file. Add entry (specify IP address of your NTP server):
   `server 10.10.0.98`
7. Run `ntpd` service:
   `systemctl start ntpd`
8. Check the current state of ntpd service with the command:
   `systemctl status ntpd`
9. Enable automatic time synchronization:
   `chkconfig --level 345 ntpd on`

4.2.2 Configuring Sphinx for Distributed Installation

Full-text query search in Traffic Monitor is implemented by means of Sphinx search engine. **Sphinx** service is installed in **All-in-one** or **TME DB server** installation mode (for information on installation modes, see the document "*InfoWatch Traffic Monitor. Installation Guide*", "Installation from TME distribution" article).

A distributed installation is an installation scheme when Traffic Monitor and the database are installed on different servers with keys **TME Node server** and **TME DB server** respectively.

Note:

If you use several servers, specify the server IP address where **sphinx** service is running (a server with the database) on **TME Node server**, in **web.conf** configuration file, in `hostname` parameter within `search` section.

4.3 General Settings

The chapter contains information on configuring the System and its components for different installation types:

- Configuring Server to Work with SPAN, or Port Mirroring Technology
- Intercepting Traffic, Transmitted via ICAP Protocol
- Configuring Inline Operation for Multiple Interceptors

4.3.1 Configuring Server to Work with SPAN, or Port Mirroring Technology

Traffic is being intercepted from managed switch via SPAN Port technology, or Port Mirroring.

There are different possible deployment schemas:

Variant 1. Traffic copy interception and analysis are being performed on one computer (**All-in-one kickstart** key). Cluster is not created:

1. Configure Server to work as Sniffer (see "Configuring Traffic Monitor Server as Sniffer", variant 2)
2. Configure traffic reception parameters from Sniffer (see "Configuring Traffic Monitor Server to receive Copy of Traffic from Sniffer").

Variant 2. Traffic copy interception and analysis are being performed on different computers, clusterization is not used:

1. On one computer (**Node server kickstart** key):
    a. Configure Server to work as Sniffer (see "Configuring Traffic Monitor Server as Sniffer", variant 1).
2. On the other computer (**All-in-one kickstart** key):
    a. Configure traffic reception parameters from Sniffer (see "Configuring Traffic Monitor Server to receive Copy of Traffic from Sniffer").

Variant 3. Traffic copy interception and analysis are being performed on different computers. To improve the performance, create a cluster of two Traffic Monitor server instances:

1. Install and configure DBMS server (**DB server kickstart** key).
2. On the computer, where Sniffer will be running (**Node server kickstart** key):
    a. Configure it to work as Sniffer (see "Configuring Traffic Monitor Server as Sniffer", variant 1).
3. On the computer, where Traffic Monitor cluster example will be running (**All-in-one** key):
    a. Configure traffic reception parameters from Sniffer (see "Configuring Traffic Monitor Server to receive Copy of Traffic from Sniffer").
    b. Specify clusterization parameters (see "Creating Traffic Monitor cluster").
    c. Configure licensing server (see "Configuring Licensing Server (in case of Cluster)

Repeat i.3 to add one more Traffic Monitor Server duplicate copy to cluster.

Configuring Traffic Monitor Server as Sniffer

For Traffic Monitor Server to function as Sniffer, one needs to perform configuration file setup.

In **sniffer.conf** configuration file specify required parameters in sections for each interceptor (sections `Http`, `Icq` and `Smtp`):

Parameter	Description
`Interface`	The network interface used to transfer data from the switch
`OpenInSec` (subsection `Timeouts`)	Time to keep the connection alive (in seconds) if no packages are transmitted. The recommended value – `600`.
`LiveInSec` (subsection `Timeouts`)	Timeout (in seconds) when the status of the connection must change to *ESTABLISHED*. If the status is not changed, the connection will be automatically terminated. Recommended value – `86400`.
`CloseInSec` (subsection `Timeouts`)	Time to keep the connection alive (in seconds) when the status is changed to *TIME_WAIT*. The recommended value – `300`
`TailInSec` (subsection `Timeouts`)	Wait time for sent packages (in seconds) after the connection has been terminated
`QueueMemorySizeInBytes`	The size of memory (in bytes), which is used to receive packages. When the channel utilization is high, you can increase this value. The range of values: from 1 to 500 Mb The recommended value – `16777216`

1. Stop server processes of Traffic Monitor:
   `iwtm stop`
2. Configure process autostart:
   - Variant 1. Traffic copy interception and analysis are performed on different computers. Configured Traffic Monitor Server example will be configured only as Sniffer (traffic interception):
     a. Enable **iw_sniffer** process autostart.
     b. Disable other processes autostart.

> **Note:**
>
> For more information on enabling and disabling autostart see "Enabling and disabling autorun processes".

- Variant 2. Traffic copy interception and analysis are performed on the same computer. Traffic Monitor Server will receive traffic copy from a switch (Sniffer function), analyze received data and upload it to the database (Traffic Monitor Server function):
    a. Enable **iw_sniffer**, **iw_x2db**, **iw_updater, iw_warpd** and **iw_adlibitum** processes autostart.
    b. Disable other processes autostart.

> **Note:**
>
> For more information on enabling and disabling autostart, see "Enabling and disabling autorun processes"

3. In **/opt/iw/tm5/etc/sniffer.conf** file, section `Iscp`, configure traffic interception parameters:
    - `ListenHost`. IP-address for incoming connections.
    - `ListenPort`. Port for incoming connections.
4. Start Traffic Monitor processes:
   `iwtm start`

Configuring Traffic Monitor Server to Receive Copy of Traffic from Sniffer

Configuration is performed on the computer where Traffic Monitor Server is installed. Configuring these settings is required if Sniffer and Traffic Monitor Server are installed on the same computer.

Go to `/opt/iw/tm5/etc` directory and configure the following settings:

1. Enable autostart for required traffic interceptors (setup for SMTP, HTTP(S), ICQ traffic:
   `iwtm enable iw_proxy_http iw_proxy_smtp iw_proxy_icq`
   For NRPC traffic interceptor autostart configuration description, see "SPAN, или Port Mirroring".
2. Make sure **proxy.conf** configuration file has `false` meaning for `SkipNegotiate` parameter.
3. In case you need to intercept ICQ traffic, which is being transmitted via proxy-server (over HTTP), set `true` value for `IcqFilter` parameter in **proxy.conf** configuration file.
4. In **proxy.conf** configuration file, in `Iscp` part of sections `Smtp, Icq, Http` create values of `Host` and `Port` parameters.

> **Note:**
>
> To configure interaction with computer, which has 10.20.30.40 IP address and port **1234**, `Iscp` section for ICQ interceptor will look as follows:

```
"iscp": {
"ListenArea": "icq",
"Host": 10.20.30.40,
"Port": 1234
}
```

Creating Traffic Monitor Cluster

If the traffic copy is intercepted by Sniffer, then you can create clusters of Traffic Monitor servers in order to increase the System performance.

> **Warning!**
>
> If a cluster is used, then the speed of a network connection between Sniffer and Traffic Monitor server should be twice as large as the speed at which traffic arrives at Sniffer.

To create a cluster of Traffic Monitor servers, in the **/opt/iw/tm5/etc/sniffer.conf** configuration file on each TM server instance, specify clusterization parameters:

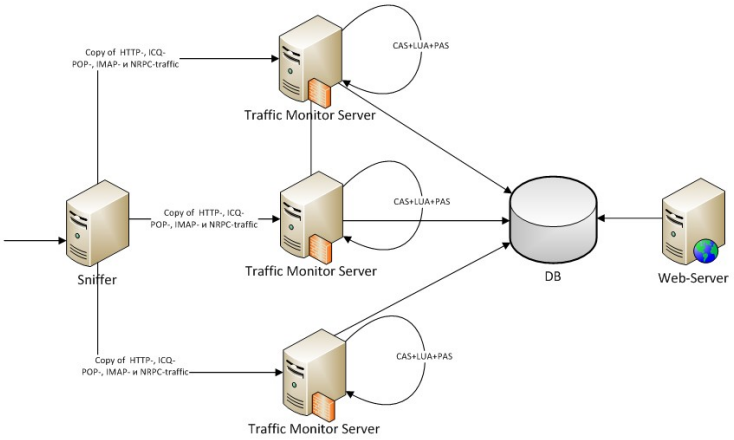
1. Make sure that `Usedareas` section looks like this:
   ```
   "UsedAreas": [
   "capstack",
   "http",
   "icq",
   "smtp"
   ]
   ```
   By default, this parameter is specified.
2. In the **proxy.conf** configuration file, in `Iscp` part of `Smtp`, `Icq`, and `Http` sections, specify values of `Host` and `Port` parameters.
   For example,
   To set up interaction with a computer which has an IP address of 10.20.30.40 and port **4301** (by default), the `Iscp` part for ICQ interceptor will look like this:
   ```
   "iscp": {
   "ListenArea": "icq",
   "Host": 10.20.30.40,
   "Port": 4301
   }
   ```
3. In the **sniffer.conf** configuration file, specify the value of the `Balancer` parameter for `Smtp`, `Icq`, and `Http` sections. Possible values:

- `Easy`. For each new TCP connection, an instance of Traffic Monitor Server with **iw_proxy** is chosen. Thus, all Traffic Monitor Server instances are used one in a turn.
- `IpPref`. The traffic is distributed between several instance of Traffic Monitor server with **iw_proxy** based on an IP address of the client. This means, that all data with the same IP address of the client is transmitted to the same instance of Traffic Monitor server.

By default, the `IpPref` parameter is used.

Example. Creating a cluster of several (up to three) Traffic Monitor server instances

The System intercepts a copy of SMTP, ICQ and HTTP traffic via Sniffer. To increase the performance, you can create a cluster of several (three in this case) Traffic Monitor Server instances. With the `Balancer` parameter, you can choose the optimal type of load on Traffic Monitor servers. This option allows you to avoid delays in processing data and losing data packages. The servers analyze traffic, then the data is saved to the database for further usage.



Configuring Licensing Server (in case of Cluster)

To receive correct data from interceptors in full, you need to configure the licensing server. It should run on the main Traffic Monitor server and be disabled on all other cluster nodes.

For this, take the following steps (on the node):

1. Stop **iw_licensed** service:
   `iwtm stop licensed`
2. Disable autostart of **iw_licensed** service:
   `iwtm disable iw_licensed`

And on the main Traffic Monitor server:

1. Enable autostart of **iw_licensed** service:
   `iwtm enable iw_licensed`
2. Run **iw_licensed** service:
   `iwtm start licensed`

To install, delete, request a license, or check its validity, please see the "License management" section in "*I*nfoWatch Traffic Monitor. User Guide".

4.3.2 Intercepting Traffic, Transmitted via ICAP Protocol

A proxy server, supporting ICAP, intercepts HTTP traffic and delivers it to Traffic Monitor server for analysis and uploading to the database.

> **Note:**
>
> If you use Blue Coat as proxy server, HTTPS traffic can also be intercepted. In this case, the Blue Coat proxy must be configured to process HTTPS traffic and send it to Traffic Monitor server as HTTP traffic.

A proxy supporting ICAP intercepts HTTP traffic and delivers it to Traffic Monitor server for analysis and uploading to the database. The scheme supports user data processing with the following methods of authentication: NTLM, LDAP, Basic, Digest.

In this scheme, Traffic Monitor server IW ICAP module is being automatically installed.

Warning!

Traffic Monitor Server and proxy with ICAP client must be located in the same subnetwork.

The web-browser of each workstation must be configured to use the required proxy server (SQUID, Blue Coat, Cisco IronPort, UserGate) for HTTP(S) traffic. For more information on configuring the settings, see the documentation for your web-browser.

Depending on transmission type (Copy or Block), the following variants of HTTP traffic are possible:

- Copy mode – copy of HTTP traffic is transmitted to TM Server for analysis; traffic is transmitted via proxy-server to the next chain link, depending on corporate infrastructure.
- Block mode – HTTP traffic is analyzed by Traffic Monitor system. Depending on the fact if there is violation or not, the following routes of traffic are possible:
  - In case there is no violation, a message which allows traffic transmission is returned to a proxy server. From the proxy-server, traffic is forwarded to the next link in a chain, depending on corporate infrastructure;
  - In case there is a violation, a message which prohibits traffic transmission is returned to a proxy-server. Traffic is blocked and the user, who sent the traffic, gets a warning message.

Note:

The text of the error message is contained in the **error.html** file which is located in the `/opt/iw/tm5/etc` directory.

In this chapter:

- Configuring ICAP;
- Configuring Blue Coat SG Series as an ICAP-client;
- Configuring SQUID as an ICAP-client;
- Configuring Cisco Iron Port as an ICAP-client;
- Configuring McAfee Web Gateway as an ICAP-client
- UserGate setting recommendations;
- Disabling ICAP.

Configuring ICAP

The IW ICAP module is automatically installed with Traffic Monitor server (**TME Node server**, **TME All-in-one** or **TMS All-in-one** options). Autorun of **iw_icap** process on TM Server is also enabled by default.

HTTP and HTTPS traffic is intercepted with the same System resources, but the configuration of external mechanisms configuration differs (see below). To enable interception of HTTP(S) traffic transferred via ICAP, you need to configure parameters of intercepting HTTP and HTTPS requests on a proxy server.

Warning

On each workstation, the web browser should be configured to use the required proxy server (SQUID, Blue Coat) for HTTP(S) traffic. For more information on how to configure this, see the documentation for your web browser.

The following ICAP configuration options are possible:

1. For the traffic to be transmitted in "Copy" mode:
    a. In **iwssid.lua** configuration file located in `/opt/iw/tm5/etc/scripts` directory, edit the code the following way:
    `iwssid_icap_servers['tm.server.name'] = 'Copy';`
    b. Save changes in **iwssid.lua** file.
2. For the traffic to be transmitted in spite of a verdict given:
    a. Set `Transparent` value for `TransportMode` parameter within the code above.
    b. Save the changes implemented in **iwssid.lua** file.
3. For the traffic to be transmitted in "Block" mode:
    a. Set `Normal` value for `TransportMode` parameter within the code above.
    b. Save the changes implemented in **iwssid.lua** file
4. Restart the service **iw_luaengined**:
    `iwtm restart luaengined`
5. In **icap.conf** configuration file located in `/opt/iw/tm5/etc/scripts` directory, set the value for `AsyncCheck` parameter of `Icap` sectionedit the code the following way:
    - `true` - "Copy" mode
    - `false` - "Block" mode
6. Save the configuration file.
7. Restart the service **iw_icap**:
    `iwtm restart icap`

> **Warning!**
>
> The transport mode, configured within **iwssid.lua** will be applied to SMTP- and HTTP(S) -interceptors. For a more flexible configuration, see "Configuring Inline Operation for Multiple Interceptors".

Configure the parameters for intercepting HTTP and HTTPS on a proxy server.

> **Note:**
>
> This setting depends on modification of the proxy server. You can find actual information in the documentation for your proxy server.
>
> If necessary, use recommendations on configuring Blue Coat SG Series (see "Configuring Blue Coat SG Series as an ICAP-client") and SQUID (see "Configuring SQUID as an ICAP-client").

Configuring Blue Coat SG Series as an ICAP-client

The proxy-server should have using ICAP in Request Mode allowed and parameters of interaction with Traffic Monitor configured. These settings are performed via Web-interface, under administrator user account.

> **Note:**
>
> The configuration procedure described below may vary depending on the proxy server's version and model.

To intercept the HTTPS traffic, it is necessary to implement ssl-inspection (ssl-bump) on the proxy server. For more information, see documentation for your proxy server.

1. Go to the **Configuration** tab.
2. Go to the **External Services ► ICAP** section. Create the **tm** service. Configure the settings of the service:

- **Service URL**: `icap://<TM_server_IP>/reqmod`
  Example: `icap://10.60.0.20/reqmod`.
- **Maximum number of connections:**`10`
- **Connection timeout:**`70`
- Check **This service supports plain ICAP connection**. In Plain ICAP port field, specify **1344**.

> **Warning!**
>
> The value of **Plain ICAP port** field must match the value of `ListenPort` setting in `/opt/iw/tm5/etc/icap.conf` file, Icap section. If another value was set for `ListenPort` setting, you need to adjust it.

- On **ICAP v1.0 Options** panel, configure the following settings:
- **Method supported:** select request modification
- **Send:** Check Authenticated User, Client address and Server address boxes.

1. Go to the **Health Checks ► General** section. Make sure that verification of server status is enabled — **Health Checks** tab displays the addresses:
   `icap.tm`
2. To check availability of all servers listed click **Perform health check** button.

Recommendations on SQUID Configuration

Documentation contains information on configuring SQUID proxy server for MS AD user authentication, SSL interception (ssl-bump) and traffic verification via ICAP.

In this chapter:

- SQUID Installation;
- Configuring ICAP;
- Configuring SSL Interception and Disclosure;
- Configuring User Authentication.

SQUID Installation

Before installing SQUID proxy server, download an RMP package or an archive (that should be then unpacked) from a repository or from CD/DVD.

To install an RMP package of SQUID proxy server, log into the System under `root` and enter the following command:

```
rpm -i squid-3.4.0.2-2.el6.x86_64.rpm
```

If the package is installed successfully, the following information will be displayed:

```
Preparing...     ################  [100%]
1:squid          ################  [100%]
```

To access the configuration file, enter:

```
cd /etc/squid/
mcedit squid.conf
```

Configuring ICAP

To configure ICAP, do the following:

1. To configure ICAP, in the **squid.conf** configuration file, add lines for processing ICAP:
   ```
   icap_enable on
   icap_service service_req reqmod_precache bypass=1 icap://10.60.7.7:1344/
   request
   adaptation_access service_req allow all
   icap_send_client_ip on
   icap_send_client_username on
   ```

2. To configure working on ICAP **UserGate Web Filter** server, in the **squid.conf** configuration file, add the following:
   ```
   icap_enable on
   icap_preview_enable on
   icap_preview_size 4096
   icap_send_client_ip on
   icap_service service_req reqmod_precache bypass=0 icap://10.0.3.10:1344/
   request
   adaptation_access service_req allow all
   icap_service service_resp respmod_precache bypass=0 icap://10.0.3.10:1344/
   response
   adaptation_access service_resp allow all http_port 8080 transparent
   ```

   where `10.0.3.10` - is the **UserGate Web Filter** server address.

   > **Warning!**
   >
   > **UserGate Web Filter** server does not support `icap_preview_enable off` mode. Working with https traffic is not supported at the moment.

3. Restart **Squid**:
   ```
   sudo service squid3 restart
   ```

Configuring SSL Interception and Disclosure

SSL-Bump mode is being used for HTTPS sessions encrypted content interception. SQUID performs SSL-connection with server and receives its certificate as first intercepted HTTP request is transmitted. After that SQUID uses host name from real, received from server certificate and creates fictitious certificate whereby simulates requested server in interaction with client, wherein proceeding on using SSL connection. Except for HTTPS connections, specified scheme can be used to intercept major HTTP requests.

1. Create catalogue to store SQUID certificates and change its rights so that user **squid** is an owner of its content:
   ```
   cd /etc/squid
   mkdir ssl_cert
   chown -R squid:squid /etc/squid/ssl_cert/
   ```
2. Generate root certificate for browser of workstations traffic from which will be intercepted.
3. Move file with extention **.der** to Windows machine and install it as trusted certificate to computer storage:
   ```
   openssl req -new -newkey rsa:1024 -days 720 -nodes -x509 -keyout /etc/squid/
   ssl_cert/IW.pem -out
   /etc/squid/ssl_cert/IW.pem
   openssl x509 -in /etc/squid/ssl_cert/IW.pem -outform DER -out /etc/squid/
   ssl_cert/IW.der
   ```
4. Create database for substitute certificates and create user **squid** its owner:
   ```
   /usr/lib64/squid/ssl_crtd -c -s /var/lib/ssl_db/
   chown -R squid:squid /etc/squid/ssl_cert/
   squid -k reconfigure
   ```
5. In configuration file **squid.conf** Comment out the setting `http_port` and add the following lines:
   ```
   #http_port 3128
   http_port 3128 ssl-bump generate-host-certificates=on
   dynamic_cert_mem_cache_size=4MB cert=/etc/squid/ssl_cert/IW.pem
   sslproxy_flags DONT_VERIFY_PEER
   sslproxy_cert_error allow all
   sslproxy_cert_error allow all
   ssl_bump client-first all
   ssl_bump client-first all
   ssl_bump none all
   sslcrtd_program /usr/lib64/squid/ssl_crtd -s /var/lib/ssl_db -M 4MB
   ```
6. Check configuration and restart server **squid**:
   ```
   squid -k reconfigure
   service squid restart
   ```
7. Configure browser to use new proxy server.

Configuring User Authentication

SQUID authentication service is intended to decode HTTP `Authorization` header and transmit decoded information to a third-party module. User access is being provided in case information is correct. When information is incorrect or missing, SQUID returns 407 error to the client. Thus, all the work on user authentication is being performed by third-party modules. Location of these modules depends on SQUID distribution. For example, in Debian+SQUID3 they are located in catalogue: `/usr/lib/squid3`, in Red Hat they are likely to be located in `/usr/lib/squid`. To see what authentication methods, third-part modules placement and other parameters are supported by SQUID, use command `squid3 -v`:

```
squid -v
Squid Cache: Version 3.4.0.2
configure options: '--host=x86_64-redhat-linux-gnu' '--build=x86_64-redhat-linux-gnu' '--
program-prefix='
'--prefix=/usr' '--exec-prefix=/usr' '--bindir=/usr/bin' '--sbindir=/usr/sbin' '--
sysconfdir=/etc' '--datadir=/usr/share'
'--includedir=/usr/include' '--libdir=/usr/lib64' '--libexecdir=/usr/libexec' '--
sharedstatedir=/var/lib'
'--mandir=/usr/share/man' '--infodir=/usr/share/info' '--exec_prefix=/usr' '--
libexecdir=/usr/lib64/squid'
```

```
'--localstatedir=/var' '--datadir=/usr/share/squid' '--sysconfdir=/etc/squid'
'--with-logdir= of $ (localstatedir)/log/squid' '--with-pidfile= of $ (localstatedir)/
run/squid.pid'
'--disable-dependency-tracking' '--enable-eui' '--enable-follow-x-forwarded-for' '--
enable-auth'
'--The enable-auth-basic=DB, the LDAP, MSNT, MSNT-multi-domain, NCSA, NIS, PAM, the POP3,
the RADIUS, SASL, SMB, getp
wnam '--enable-auth-ntlm=smb_lm,fake' enable-auth-digest=file, LDAP, eDirectory
'--enable-auth-negotiate=kerberos,wrapper'
'--enable-external-acl-helpers=wbinfo_group,kerberos_ldap_group,AD_group' '--enable-
cache-digests'
'--enable-cachemgr-hostname=localhost' '--enable-delay-pools' '--enable-epoll' '--enable-
icap-client'
'--enable-ident-lookups' '--enable-linux-netfilter' '--enable-removal-policies=heap,lru'
'--enable-snmp'
'--enable-ssl' '--enable-ssl-crtd' '--enable-storeio=aufs,diskd,ufs,rock' '--enable-
wccpv2' '--enable-esi'
'--with-aio' '--with-default-user=squid' '--with-filedescriptors=16384' '--with-dl' '--
with-openssl' '--with-pthreads'
'--disable-arch-native' 'build_alias=x86_64-redhat-linux-gnu' 'host_alias=x86_64-redhat-
linux-gnu'
'CFLAGS= is O2 -g' 'CXXFLAGS= is O2 -g -fPIC'
'PKG_CONFIG_PATH=/usr/lib64/pkgconfig:/usr/share/pkgconfig'
```

Third-party modules interaction and settings description is being performed with the help of `auth_param` parameter. Client will alternately attempt to use authentication schemes in the order they have been set in **squid.conf**. Newly configured authentication scheme enters into force after squid service restart. To change existing schemes without service restart, use `squid3 -k reconfigure` or `/etc/init.d/squid3 reload` commands.

To control internet access, create acl, which will use configured authentication module. To do this, acl in `selection_type` field must have `proxy_auth`, `proxy_auth_regex` or `external` value using `%LOGIN` variable. Set access permission in`http_access` parameter for specified acl. Below the format is listed, which specifies the type of used authentication (format of using `auth_param` parameter):

```
auth_param authentication_scheme schem_parameters [parameters_value]
```

Recommendations on Cisco IronPort Configuration

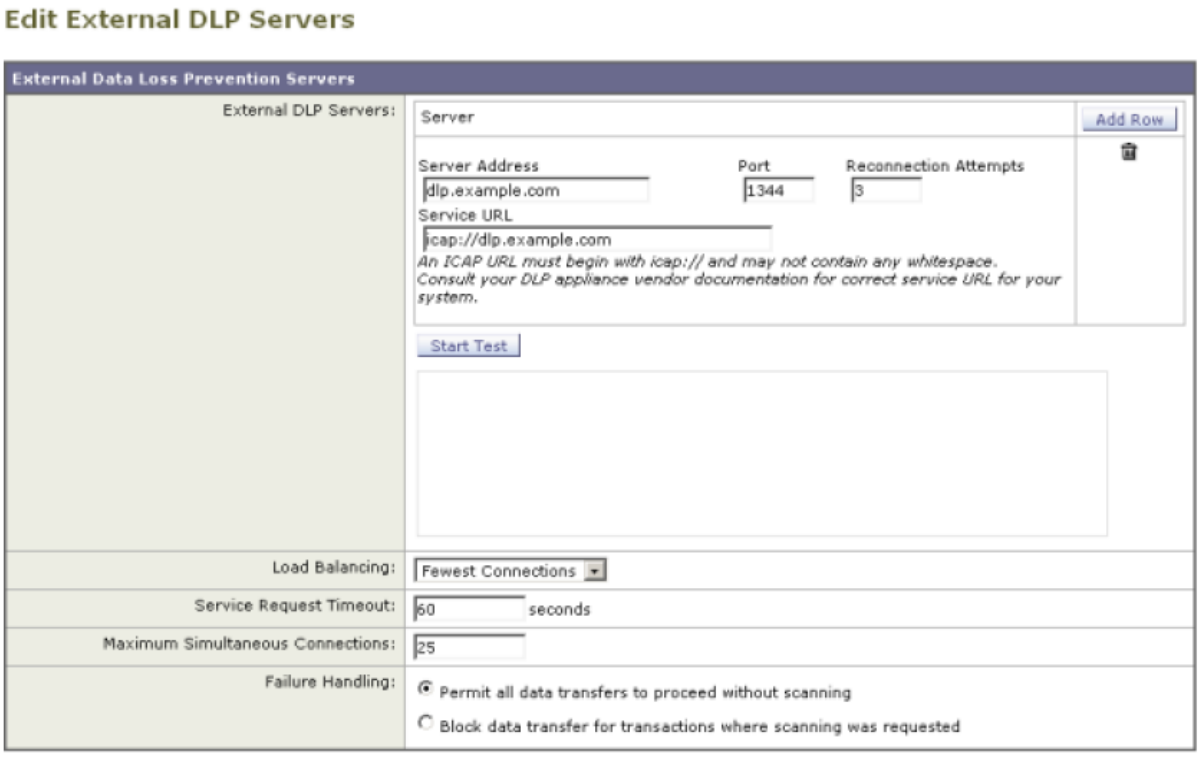
To configure Cisco IronPort as an ICAP-client:

- Add Traffic Monitor as an external DLP server
- Create and configure external DLP policy

To add external DLP server:

1. In browser open Cisco IronPort management console:
   `https://<Cisco IronPort hostname or IP-address>:8443`
2. Go to **Network > External DLP Servers** tab.

3. In the opened windows press **Edit Settings** button.



4. Fill in the fields in accordance with the table:

Parameter	**Value**
External DLP Servers	The following fields concerning external server of outgoing traffic filtering should be filled in: • **Server address and port**. Domain machine name and port used by Traffic Monitor ICAP-server • **Reconnection attempts**. Number of reconnection attempts with Traffic Monitor ICAP-server. Recommended value is `5`. • **DLP Service URL.** Traffic Monitor ICAP-server URL. URL should start with `icap://`. Example: `icap://FQDN:1344/reqmod`
Load Balancing	Load balancing. In case one Traffic Monitor ICAP-server is used for traffic filtering, `Fewest Connections` value should be specified.
Service Request Timeout	Timeout used for Cisco IronPort to wait for reply from Traffic Monitor ICAP-server. Default value is `60 seconds`.
Maximum Simultaneous Connections	Maximum number of simultaneous connections. Do not change default `25` value.

Parameter	Value
Failure Handling	Parameter, which allows to set Cisco IronPort behavior in case Traffic Monitor ICAP-server is unavailable. Recommended value is Permit all data transfers to proceed without scanning.

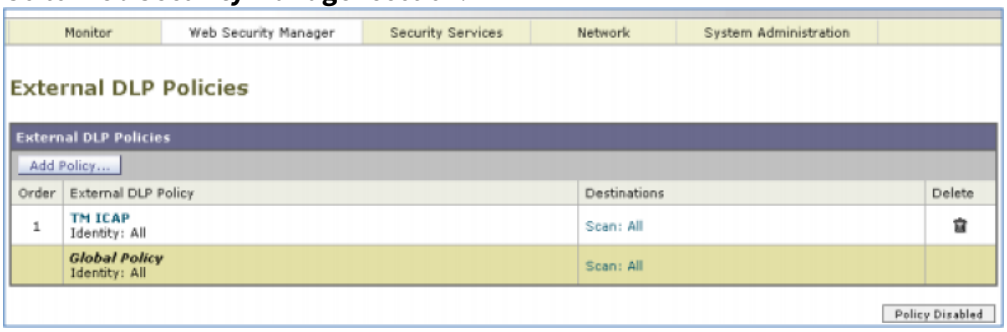
5. Press **Add Row** to create additional ICAP-server.
6. Press **Submit** to save changes.
7. Press **Start Test** to check connection with ICAP-server.

To create external DLP policy:

1. Go to **Web Security Manager** section.
2. Press **Add Policy** button.
3. Type in the name of the policy in **Policy Name** field (for example, TM ICAP)
4. In **Identities and Users** section choose users or user group, controlled by this policy.
5. Press **Advanced** and choose HTTP in **Protocols** field.
6. Save changes.

To configure external DLP policy:

1. Go to **Web Security Manager** section:



2. Choose policy in **Destinations** column.
3. In **Edit Destination Settings** drop-down list choose **Define Destinations Scanning Custom Settings** value.
4. In **Destinations to scan** choose **Scan All Uploads**.
5. Press **Submit** to save the changes.

Note:

Cisco IronPort can as well analyse HTTPS-traffic. In this case certificate replacement takes place. HTTPS-traffic is being decrypted and processed as HTTP. Interaction between Cisco IronPort and Traffic Monitor does not change. Find additional information on HTTPS decryption in Cisco IronPort documentation (see chapter «Decryption Policies»).

Recommendation on configuring McAfee Web Gateway

To configure the integration of McAfee Web Gateway with Infowatch Traffic Monitor for monitoring HTTP traffic using ICAP:

1. Make sure that **iw_icap** service is running on the Traffic Monitor server:
   ```
   iwtm status
   ```

2. In the status list, find the line:
```
Service iw_icap.service is active (running); enabled state: loaded (enabled)
```
3. Log into the McAfee Web Gateway web console.
4. Go to the **Settings** tab of the **Policy** section.
5. Take the following steps to create an ICAP REQMOD client:
    a. Right-click **ICAP Client** and click **Add**.
    b. Enter the name, for example, *ICAP-REQMOD-Client.*
    c. On the **Settings for** panel, select **ICAP Client**.
    d. On the **ICAP Service** panel, click **Add**.
    e. Enter the name and click **OK & Edit**.
    f. Click **+Add ICAP Server**, then enter an IP address and a port of the McAfee DLP Prevent device.
    g. Click **OK** three times.
6. Add a set of rules:
    a. Go to the **Rule Sets** tab.
    b. Select **Add** -> **Rule Set from Library**.
    c. Select the **ICAP Client** set and click **OK**.
7. Configure REQMOD parameters:
    a. On the **Rule Sets** tab, expand the **ICAP Client** rule set and select **ReqMod**.
    b. Select **Call ReqMOd Server** and click **Edit**.
    c. Select the **Rule Criteria** stage.
    d. Select **If the following criteria is matched.**
    e. Select a criterion and click **Edit**.
    f. From the **Settings** drop-down list, select the ICAP REQMOD client you have created.
    g. Click **OK**, then click **Finish**.
8. Enable the rule:
    a. On the **Rule Sets** tab, select the **ICAP Client** rule.
    b. Select **Enable**.
9. Click **Save settings**.

UserGate Setting

UserGate is an ICAP-client, so it allows to transmit HTTP/HTTPS traffic, SMTP mail traffic and POP3 traffic to Traffic Monitor ICAP server. To set up work between UserGate and ICAP server do the following:

1. Create an ICAP-server:
    i. Go to **Security policies->ICAP servers**
    ii. Click **Add** and create one or many ICAP servers by filling in the fields:

Field	Description
Name	ICAP server name
Description	ICAP server description
Address	ICAP server IP address
Port	ICAP server TCP port, default value 1344

Field	Description
Message maximum size	Defines maximum size of a message (in KB) to be transmitted to ICAP server. Set a value greater than 0. **Example** `35840`
ICAP server accessibility checking period	It sets up time slot (in seconds) for UserGate. When the time is up, UserGate should send an OPTIONS request to ICAP server to check if it is available.
Skip if error occurs	If the option is enabled, UserGate will not send data to ICAP server when it is unavailable (does not respond to OPTIONS request).
Reqmod path	If **Enable** flag is on, Reqmod mode is active. Then set up **path on ICAP server to work in Reqmod mode** in accordance with your ICAP server documentation's requirements. The following formats are possible: • `/path` - a path on ICAP server; • `icap://icap-server:port/path` - specifying a full URL for reqmod mode. **Example** `icap://FQDN:1344/reqmod`
Respmod path	If **Enable** flag is on, Respmod mode is active. Then set up **path on ICAP server to work in Respmod mode.** Set up path in accordance with your ICAP-server documentation's requirements. The following formats are possible: • `/path` - a path on ICAP server. **Example** `/response` • `icap://icap-server:port/path` - specifying a full URL for respmod mode.
Respond with username	If **Enable** flag is on, user name transmission to ICAP server is active. Then set up: • **Encode in base64** - encode user name in base64. This can be required if user names contain national alphabets' symbols. • **Headline** that will be used to send user name to ICAP-server. Default headline: `X-Authenticated-User`
Respond with IP address	If **Enable** flag is on, user's IP address transmission to ICAP server is active. Then set up **Heading** that will be used to send user's IP address to ICAP server. Default headline: `X-Client-Ip`

Field	Description
Respond with MAC address	If **Enable** flag is on, user's MAC address transmission to ICAP-server is active. Then set up **Heading** that will be used to send user's MAC address to ICAP-server. Default headline: `X-Client-Mac`

2. Create ICAP servers balancing rule (optional):
    a. Go to **Network policy->Load balancing**
    b. Select **Add->ICAP Balancer** and fill in the fields:

Field	Description
Enable/Disable	Enables or disables the rule
Name	Rule name
Description	Rule description
ICAP servers	List of ICAP servers created at the previous step that take the load on.

3. Create ICAP rule:
    a. Go to **Security policies-> ICAP Rules.**
    b. Click **Add** and fill in the fields:

Field	Description
Enable/ Disable	Enables or disables the rule
Name	Rule name
Description	Rule description
Operation	Possible options: • **Skip** - do not transmit data to ICAP server. By creating this rule, administrator can clearly exclude certain kind of traffic from transmission to ICAP server; • **Transmit** - transmit data to ICAP server and wait for response. This is a standard operating mode of the majority of ICAP servers; • **Transmit and ignore** - transmit data to ICAP server and ignore its response. In this case, no matter what the ICAP server responce would be, data sent to user will not be modified, but ICAP server will receive the full copy of user's traffic.
ICAP servers	The list of ICAP servers created at the previous step to take on the distributed load.
Source	Traffic source zone and/or traffic source IP addresses lists.

Field	Description
Users	The list of users, groups, the rule is applied to. The following types of users can be taken: **Any, Unknown, Known**. To apply the rules to the particular users or to **Known** type you should set users' identification.
Destination	Traffic destination zone and/or traffic destination IP addresses.
MIME-type content	MIME-type lists. There is a possibility to manage video-content, audio-content, images, executables, and other types. Administrator can also create group of MIME-types themselves.
Categories	UserGate URL filtering categories list
URL	URL lists
HTTP-method	The method is used for HTTP requests. As a rule, it is POST or GET.
Service	Possible options: • **HTTP** - web-traffic; • **SMTP** - mail traffic. Emails will be transmitted to ICAP server as a corresponding MIME type; • **POP3** - mail traffic. Emails will be transmitted to ICAP server as a corresponding MIME type.

Warning!

ICAP rules are applied from top downward in the same order that is defined at the console. Only the first rule for which the conditions defined in the rule are matched, is applied. This means specific rules should be placed above the general ones. Use **Up/Down** arrow buttons to change rules applying order.

Disabling ICAP

In case HTTP/HTTPS requests interception over ICAP is no longer required, you can disable the **iw_icap** module
To disable iw_icap module:

1. Stop Traffic Monitor processes:
   `iwtm stop`
2. Disable autostart for **iw_icap** process:
   `iwtm disable iw_icap`
3. Start Traffic Monitor processes:
   `iwtm start`
4. Check the state of Traffic Monitor processes:
   `iwtm status`

After you have disabled the module, restore original settings of the proxy server.

4.3.3 Configuring Inline Operation for Multiple Interceptors

If the System processes both SMTP and HTTP(S) traffic using the inline scheme, then you should modify the **iwssid.lua** configuration file as described below.

1. Log into the System as the **root** user:
   `su - root`
2. In the `/opt/iw/tm5/etc/scripts` directory, open the **iwssid.lua** file for editing.
3. Default mode for HTTP (S) interceptor is `Copy` ("Copy" mode). Uncomment the following section by filling in the valid name of TM server (for example, `tm.server.name`) and mode value `Normal` ("Block" mode):
   `iwssid_icap_servers['tm.server.name'] = 'Normal';`

   > **Important!**
   >
   > When configuring the HTTP interceptor, you should also edit the **icap.conf** configuration file according to the selected scheme (see "Configuring ICAP").

4. Default mode for SMTP interceptor is `Copy` ("Copy" mode). Uncomment the following section by filling in the valid name of TM server (for example, `tm.server.name`) and mode value `Normal` ("Block" mode):
   `iwssid_smtp_servers['tm1.server.name'] = 'Normal';`
5. Save the file.
6. Restart the System:
   `iwtm restart`

4.4 Configuring Traffic Interception

The System can intercept data transferred via the following protocols:

Protocol	Description
SMTP (Simple Mail Transfer Protocol)	Mail protocol, which is used by mail clients for sending email messages to the server. It works in tandem with the POP3 protocol.
POP3 (Post Office Protocol, version 3)	Mail protocol, which is used by a mail client to receive incoming email messages from the server. For sending emails, the SMTP protocol is used.

HTTP (Hyper Text Transfer Protocol)	Data transfer protocol based on «client-server» technology, which is used to receive text information, stream video and sound from the website. You can realize interception of all transmitted data on the Internet (visited pages, portals, received and sent emails and messages).
HTTP(S)	HTTP protocol extension, which supports encryption. Data, transmitted over HTTP, are packed into cryptographic protocol, thereby providing data protection.
OSCAR	Instant and offline text messaging protocol, used by ICQ, AIM, Miranda, QIP programs. You can perform text messages interception, transmitted via these instant messaging programs. **Note:** ICQ traffic will be intercepted if a specific server that supports OSCAR protocol is used for ICQ.
NRPC	Mail Transfer Protocol in IBM Notes.
IMAP4 (Internet Mail Access Protocol)	Protocol of access to email. In accordance with POP3 protocol, it is used for work with emails but provides more broad work capabilities to work with a mailbox. For example, access to processing events, located on the server, as if they were located on local receiver computer, without the necessity of permanent file transfer with content from server and back. SMTP protocol is used to send messages. You can perform incoming emails interception, transmitted by email clients.

Depending on intercepted traffic type and the interception method, the System can be configured as follows:

- Configuring SMTP Traffic Interception
- Configuring POP3 Traffic Interception
- Configuring HTTP Traffic Interception
- Configuring HTTPS Traffic Interception
- Configuring NRPC Traffic Interception
- Configuring IMAP4 Traffic Interception
- Receiving Objects Intercepted by InfoWatch Device Monitor
- Revision of Files from the Corporate Network

Important!

It is assumed, that System is already installed before configuration starts.

For more information on installation for each deployment scheme, see the document "*InfoWatch Traffic Monitor. Installation Guide*".

Important!

After you configure traffic interception, you should configure object analysis parameters (see document "*InfoWatch Traffic Monitor. User Guide*").

Important!

On DM Agents installed on Astra Linux OS, the System only intercepts mail traffic sent via SMTP, POP3, and IMAP channels.

4.4.1 Configuring SMTP Traffic Interception

Chapter contains information on how to configure SMTP traffic interception using the following technologies:

- SPAN, or Port Mirroring;
- Receiving Copies from Mail Server;
- Inline Mode;
- Configuring Mail Servers for SMTP Traffic Interception.

Detailed information SMTP traffic interception scheme is available in article "SMTP Traffic Interception Scheme".

SPAN, or Port Mirroring

1. Configure server (servers) for working with SPAN, or Port Mirroring (see "Configuring Server to Work with SPAN, or Port Mirroring Technology").
2. Enable the autorun option for `iw_proxy_smtp` process which is responsible for intercepting SMTP traffic:
   `iwtm enable iw_proxy_smtp`
3. Make sure, that autostart of all processes, which participate in mail interception and analysis, is enabled:
   iw_sniffer, **iw_proxy_smtp**, **iw_messed**, **iw_warpd**, **iw_cas**, **iw_x2db** (see "Enabling and disabling autorun processes").
4. To avoid duplication of intercepted data, disable **iw_smtpd** process (see "Enabling and disabling autorun processes").

Receiving Copies from Mail Server

A rule for sending a shadow copy (BCC) of each sent message should be configured on a corporate mail server. The copy is sent to a nonexistent mail address with a domain whose IP-address corresponds to Traffic Monitor Server. This functionality is supported by most mail servers.

Integration of Traffic Monitor Server with Postfix mail server is performed the following way. Postfix mail server which is embedded in the Traffic Monitor system receives copies of messages sent via SMTP. Copies are delivered to the port **25** and transmitted to the **iw_smtpd** process on port **2025**. An event for each message is created in the System. Information about those events is then placed to a database. To configure receiving copies from a mail server:

1. Make sure, that **iw_smtpd** process autostart is enabled (see "Process Autorun")
2. On a mail server, configure SMTP-messages shadow copy forwarding (BCC - Blind Carbon Copy) to Traffic Monitor Server. Find setup example for Microsoft Exchange Server 2007 and 2010 in "Forwarding Blind Carbon Copies with Microsoft Exchange Server 2007 and 2010".

3. Configure embedded Postfix server (see "Configuring Postfix Server embedded in Traffic Monitor system").
4. Make sure, that autostart of all processes, which participate in traffic interception and analysis, is enabled:
   postfix, iw_smtpd, iw_messed, iw_warpd,iw_luaengined, iw_cas, iw_pas, iw_x2x, iw_x2db, iw_tech-tools (see "Process Autorun").
5. Make sure that in the **system.lua** configuration file which is located in `/opt/iw/tm5/etc/scripts` directory, the code fragment is uncommented:

```
function try_set_transport_mode(processing, mode, warning)
if not get_child(processing, 'transport_mode') then
processing:add_child('transport_mode'):set_text(mode);
return true;
elseif warning then
Log(LogSeverityLevel.warning, 'transport_mode is already set ');
end;
```

Warning!

The chosen mode will apply to SMTP and HTTP(S) interceptors. For more flexible configuration, see "Configuring Inline Operation for Multiple Interceptors".

Important!

If MS Exchange uses a journal rule, then, for the correct processing of such emails, enable the corresponding option in Traffic Monitor. For this, in the `messed.conf` configuration file, specify:

```
"ExchangeJournalReports": true,
```

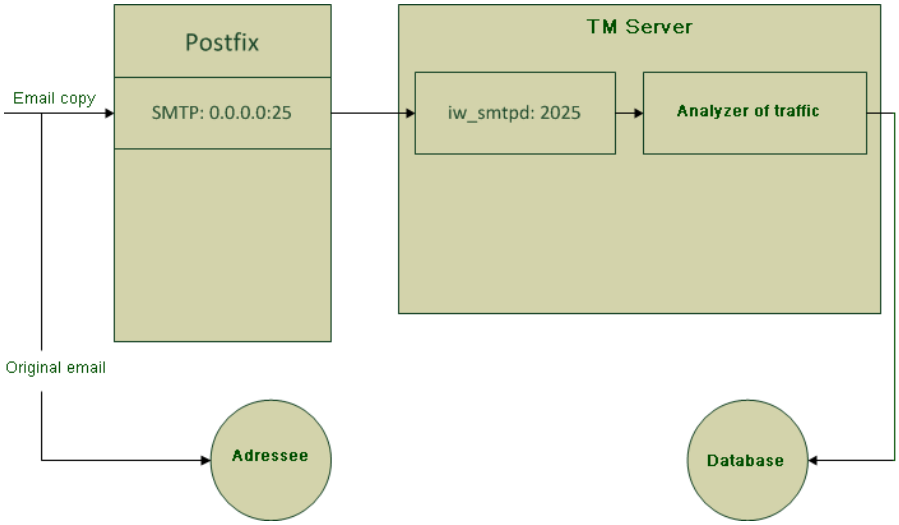
To make the option active, reload the configuration, or restart the service.

Inline Mode

Traffic Monitor Server is used as an intermediate mail server. It includes Postfix mail server.

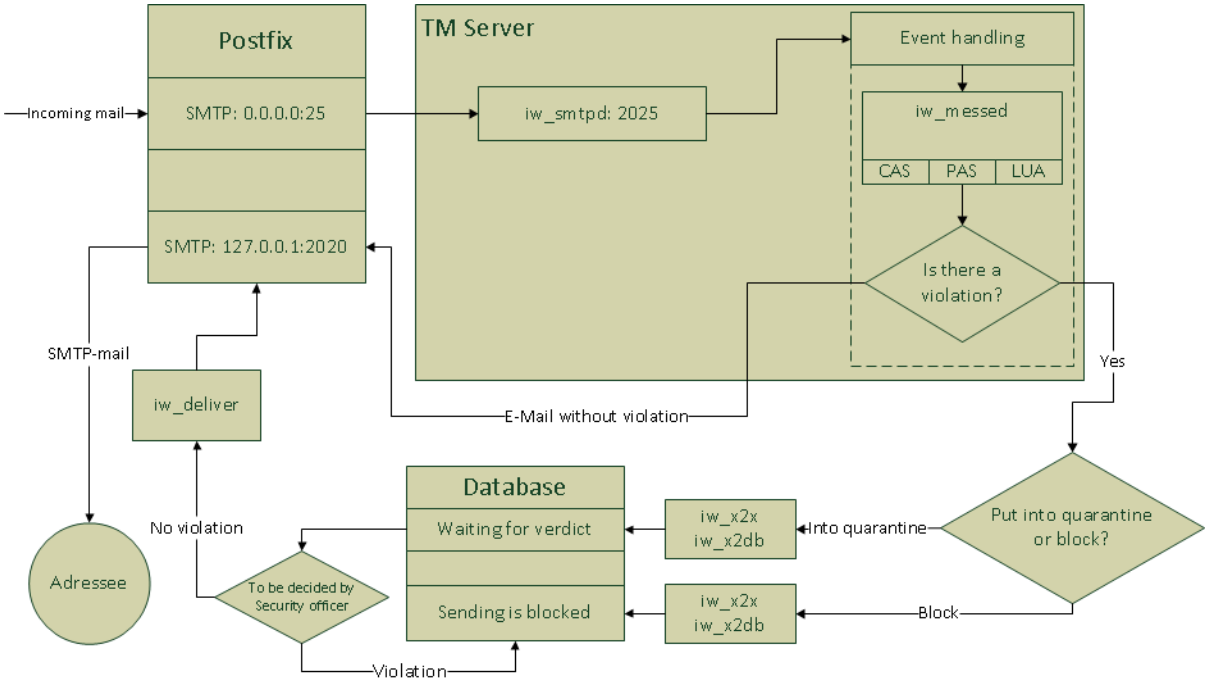
Integration of Traffic Monitor mail server with a mail server in implemented the following way. Postfix mail server which is embedded in the Traffic Monitor system receives incoming SMTP messages via port **25**. SMTP messages are then transmitted to the **iw_smtpd** process via port **2025**. For each message, the System creates an event. Depending on the selected scheme (*Copy* or *Block*), SMTP traffic can be transmitted in the following ways:

- Copy mode considers that SMTP traffic is transmitted to the recipient and also to InfoWatch Traffic Monitor via Postfix



Block mode considers that Traffic Monitor System analyzes SMTP traffic and,

- if there is no violation, SMTP traffic is transmitted to the recipient or to the next relay server in the corporate mailing System via the embedded Postfix server. Delivery is performed as follows: **iw_messed** process transmits messages to 2020 port of Postfix mail server. Postfix mail server delivers messages to recipients directly or transmits them to the next relay server
- if there is a violation and according to policies this should be a *Quarantine* verdict, the System gives *Quarantine* verdict to the message. It will be delivered only if the Security Officer changes the verdict to *No violation* in Management Console (see the document «*InfoWatch Traffic Monitor. User guide*»). The delivery is performed as follows: **iw_messed** process transmits messages to **2020** port of the embedded Postfix mail server. Postfix mail server delivers messages to recipients directly or transmits them to the next relay server
- if there is a violation and according to policies this should be a *Block* verdict, the System gives *Blocked* verdict to the message. Sending will be blocked and the event will be put into DB



To configure the inline mode:

1. Configure Traffic Monitor as a relay server on a corporate mail server.

   > **Note:**
   >
   > If the company uses more than one mail server each server should be configured to send messages to the embedded Postfix server.
   > The configuration process may differ depending on the mail server which is used in the company.

   As a result, all mail traffic sent from a corporate mail server is transmitted to Traffic Monitor Server.
2. Make sure that autostart for the **iw_smtpd** and **iw_deliver** processes is enabled (see "Process Autorun").
3. Configure Postfix server embedded in the System (see "Configuring Postfix Server in Traffic Monitor system").
4. Open the file **iwssid.lua** `/opt/iw/tm5/etc/scripts` to edit;
5. Uncomment the following code section by filling in the valid name of TM server (for example `tm.server.name`) and mode value `Normal` (Block mode):
   `iwssid_smtp_servers['tm.server.name'] = 'Normal';`

   > **Note:**
   >
   > In case of distributed installation, the mode is defined on local Traffic Monitor server with embedded Postfix/Exim post server. In `/opt/iw/tm5/etc/scripts/iwssid.lua` file specify the valid name of TM server on each node (for example `tm1.org.ru`) and required mode (for example, `Copy`): `iwssid_smtp_servers['tm1.org.ru'] = 'Copy';`

6. Save the file.
7. Restart the System:
   `iwtm restart`

> **Warning!**
>
> Chosen mode will be applied to SMTP interceptor only. For more flexible configuration, see "Configuring Inline Mode for Server Interceptors".

Delivering SMTP emails with processing errors, sent in "inline mode"

SMTP emails processing of which caused errors, are to be put into the error queues: **queue/x2x-errors** и **queue/errors**. Delivering SMTP emails (including the ones with "Quarantine verdict" assigned) is performed by **iw_rammer** daemon from error queues. After that the queues are to be refined. Sender and addressee addresses (if sufficient) to be taken from .xml file. Otherwise, the email cannot be delivered. When sending e-mail to Security officer, adressee and recipient adresses are specified within the configuration file **opt/iw/tm5/etc/rammer.conf**. The enclosed mail contains object .xml and .dat files.E-mail sending to the addressee as well as notification for Security officer is performed via Postfix mail server (port **2020**). Notification is to be delivered to security officer via event email and the sender is specified from initial message. Connection data (address and port), as well as the addressee and sender addresses, are set within the **rammer.conf** configuration file (for details, see the document "*Configuration Files Guide*", the "rammer.conf" file).

SMTP email is to be delivered when meeting the following terms:

1. if it wasn't delivered in a regular mode (by daemon **iw_messed**);
2. If "Block" mode is installed when processing the e-mail and when the e-mail got into error queue;
3. if the email wasn't qualified as the "Blocked" one.

Mandatory delivery measure is **opt/iw/tm5/rammer-tool** utility. To view the list of available settings, enter in the command line:

```
/opt/iw/tm5/bin/rammer_tool --help
```

Configuring Mail Servers for SMTP Traffic Interception

Chapter contains information on configuring mail servers to intercept SMTP traffic with Traffic Monitor:

- Forwarding Blind Carbon Copies with Microsoft Exchange Server 2007 and 2010;
- Configuring Blind Carbon Copies with ZCS Zimbra;
- Forwarding BCC with MDaemon;
- Configuring Postfix server in Traffic Monitor System.

Forwarding Blind Carbon Copies with Microsoft Exchange Server 2007 and 2010

To enable sending shadow copies of SMTP messages, a connector for sending messages to Traffic Monitor Server should be created and configured in the Exchange Management Console. For this, perform the steps below.

Creating SMTP connector that will send message copies to Traffic Monitor Server

1. Choose **Organization Configuration –> Hub Transport** node and press **New Send Connector**.
2. In the window of Connector creation wizard, type in connector name and choose the **Custom** type from the drop-down list. Click **Next**.
3. At the **Address space** step, create a new address space to transmit traffic. To do this, press **Add**. In the dialog box that opens, specify address space parameters and press **OK**. Then click **Next**.
4. At the **Network Settings** step, choose **Route mail through the following smart hosts** and press **Add**. In the opened dialog box, specify the IP address of the Traffic Monitor server, to which mail will be transmitted and press **OK**. Then click **Next**.
5. At the **Configure smart host authentication settings** step, choose **None**: by default Postfix does not require authorization on the Traffic Monitor Server. Click **Next**.
6. At the **Source Server** step, choose a server, the connector will be located on. Click **Next**.
7. At the **New Connector** step make sure, that connector parameters have been specified correctly, and click **New**. Wait for the creation process to be completed and click **Finish**.

The window of the Connector creation wizard will be closed.

Creating contact to which message copies will be sent

1. Choose **Recipient Configuration –> Mail Contact** node and press **New Mail Contact**.
2. In the window of Contact creation wizard, choose **Mail Contact** and click **Next**.
3. At the **Configure smart host authentication settings** step, type in information about the contact.

   In the **External e-mail address** line, press **Edit**. In the opened **SMTP Address** dialog box, type in mail address, which will receive message copies.

> **Warning!**
>
> The mail contact domain should match the connector domain.

4. At the **New Mail Contact** step, make sure that connector parameters are specified correctly, and click **New**. Wait for process completion and click **Finish**.

The window of Contact creation wizard will be closed.

> **Warning!**
>
> For the System to function properly, it is necessary to have a Linux user with the same domain name as a new contact.
>
> For example, if *user@company.com* contact is created, it is necessary that *user* should be among Linux clients.
>
> To add a user on OS Linux, issue the following command under root:
>
> `useradd <username>`
>
> where <username> is a required user name. In the example above, issue the following command:
>
> `useradd user`

Creating a transport rule for copying messages

1. Choose **Organization Configuration -> Hub Transport** node and press **New Transport Rule**.
2. In the Transport rule creation wizard, type in a name of the rule being created and set a flag in the **Enable Rule** field. Click **Next**.
3. At the **Conditions**, select the **from users inside or outside the organization** checkbox. As a condition parameter, choose **Inside**. Click **Next**.
4. At the **Actions** step, select the **Blind carbon copy (Bcc) the message to address** checkbox. In the dialog box that opens, click the link with the **address** parameter and in the **Select Recipient** window, choose created contact. Click **OK**. In the wizard window, click **Next**.
5. You can configure exceptions at the **Exceptions** step if necessary. For example, for the messages from particular users not to be copied, select the **except when the message is from people** checkbox and choose desired users in the exception parameters. Click **Next**.
6. At the **Create Rule** step, make sure, that parameters have been specified correctly, and press **New**. Wait for the creation process to be completed and click **Finish**.

Blocking mail delivery when Traffic Monitor Server is not available

1. Choose **Organization Configuration -> Hub Transport** node and press  **New remote Domain**.
2. Specify the same name as the domain name used in item 3 step 2 of this chapter (creating contact, to which message copies will be sent).
3. Right-click on the new domain and choose **Properties** from the context menu.
4. In the window that opens, go to the **Message Format** tab.
5. Deselect the **Allow non-delivery reports** checkbox.
6. Click **OK**.

Important!

If MS Exchange uses a journal rule, then, for the correct processing of such emails, enable the corresponding option in Traffic Monitor. For this, in the `messed.conf` configuration file, specify:

```
"ExchangeJournalReports": true,
```

To make the option active, reload the configuration, or restart the service.

Configuring Blind Carbon Copies with ZCS Zimbra

Warning!

All commands should be executed under **zimbra** user.

Configuring transport table

Use configuration block for Zimbra 5.0.9 or higher with the following string:

```
zmlocalconfig -e postfix_transport_maps="hash:/opt/zimbra/postfix/conf/transportfile
proxy:ldap:/opt/zimbra/conf/ldap-transport.cf"
```

Warning!

This command should be executed using **zmlocalconfig**. Editing **main.cf** will not be sufficient in the situation.

1. Check the existing transport table:
   `zmlocalconfig grep -i postfix_transport_maps`
   Get the command output of the following form:
   `postfix_transport_maps = proxy:ldap:/opt/zimbra/conf/ldap-transport.cf`
2. Create transport file:
   `mcedit /opt/zimbra/postfix/conf/infowatch`
3. Add the following line to file:
   `dlp.iw :[192.168.0.144]`
4. Check rights (**zimbra** should be owner of the group):
   `ll /opt/zimbra/postfix/conf/infowatch`
   `chown zimbra:zimbra /opt/zimbra/postfix/conf/infowatch`
5. Convert transport file to DB:
   `postmap /opt/zimbra/postfix/conf/infowatch`
6. Add transport file before the default file:
   `zmlocalconfig -e postfix_transport_maps="hash:/opt/zimbra/postfix/conf/ infowatch proxy:ldap:/opt/zimbra/conf/ldap-transport.cf"`
7. Make sure, that relay_domains parameter of **main.cf** file contains all domains processed by server:
   `mcedit /opt/zimbra/postfix/conf/main.cf`
   Find or create line:
   `relay_domains = mydomain.com, mydomain.org, dlp.iw`

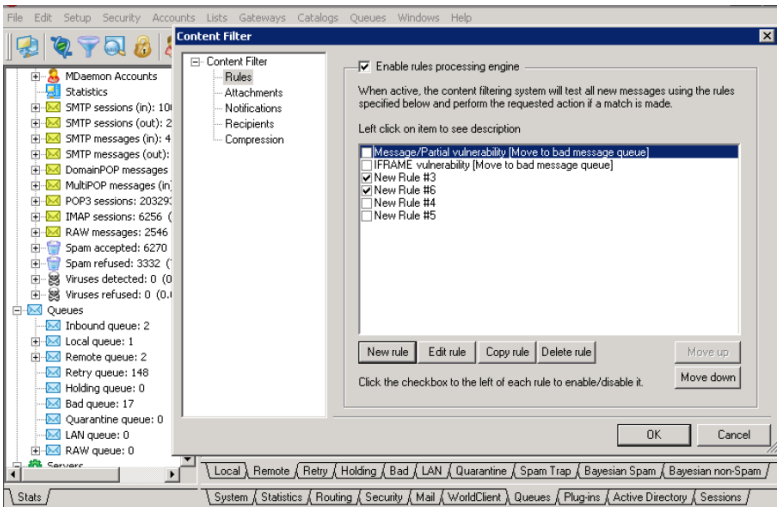
Configuring BCC

1. Add the following line to **/opt/zimbra/postfix/conf/main.cf** file:
   `/opt/zimbra/postfix/conf/main.cf`
2. Reboot Zimbra:
   `zmcontrol restart`

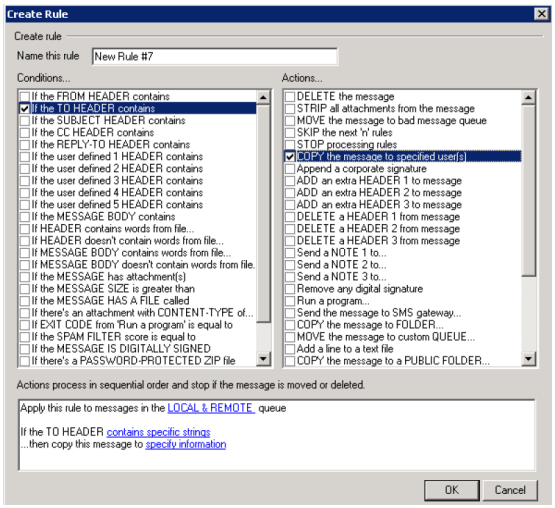
Forwarding BCC with MDaemon

In MDaemon mail client there is **Content Filter** option, which can be used to configure incoming/outgoing mail filtering.

1. Open MDaemon and go to **Security > Content Filter** tab.
2. Go to **Rules** tab. Press **New rule** button:



3. In the left column choose action condition. In the right column choose corresponding action:



4. Use blue sections to add values to rules.
5. Click **Add** and **OK**.

Configuring Postfix Server in Traffic Monitor

Depending on the System deployment scheme and on how TM server is installed (on the same computer with the database or on different computers), you may need to configure the built-in Postfix server:

System deployment method		Configuring Postfix
SMTP traffic is delivered by the corporate mail server. Traffic Monitor receives only a copy of SMTP traffic. We recommend configuring Postfix for the traffic copy to be received properly	TM server is installed separately from database (kickstart key **IWTMX**)	Mandatory
	All components are installed on the same server (kickstart key **IWALLX** or **IWTMSX**)	Performed by default
Traffic Monitor intercepts and delivers SMTP traffic by means of integration with Postfix	TM server is installed separately from database (kickstart key **IWTMX**)	Mandatory
	All components are installed on the same server (kickstart key **IWALLX** or **IWTMSX**)	Performed by default
System receives a copy of SMTP traffic via Sniffer		It is not required
Interception of SMTP traffic is not required (for example, Traffic Monitor is used only as Sniffer)		It is not required

For proper interaction between InfoWatch Traffic Monitor and built-in Postfix mail server, make the following changes to **/etc/postfix/main.cf** and **/etc/postfix/master.cf** configuration files:

1. Enter the system under **root** user:
   `su - root`
2. In the **main.cf** file, set the value for the `inet_interfaces` parameter as recommended on Postfix web page: http://www.postfix.org/postconf.5.html.

   > **Note:**
   >
   > In most cases, it is sufficient to set the value:
   > `inet_interfaces = all`

3. In the **main.cf** file, set the value for the `message_size_limit` parameter as recommended on Postfix web page: http://www.postfix.org/postconf.5.html.

   > **Note:**
   >
   > The default parameter value is
   > `message_size_limit = 50000000`

4. If InfoWatch Traffic Monitor participates in delivering SMTP traffic (see "Inline"):

- in the **main.cf** file, configure `relayhost` parameter. As a value, enter the IP address of the corporate mail server to which SMTP letters will be sent after analysis in Traffic Monitor.
- edit the **master.cf** file by writing the following lines to the end of the file:

> **Warning!**
>
> Lines which specify the service option must begin with space. For example: " `-o <option specification>`"

```
127.0.0.1:2020   inet  n   -   n  -   21   smtpd
     -o content_filter=
     -o local_recipient_maps=
     -o relay_recipient_maps=
     -o smtpd_restriction_classes=
     -o smtpd_client_restrictions=
     -o smtpd_helo_restrictions=
     -o smtpd_sender_restrictions=
     -o mynetworks=127.0.0.0/8
     -o strict_rfc821_envelopes=yes
     -o smtpd_error_sleep_time=0
     -o smtpd_soft_error_limit=1001
     -o smtpd_hard_error_limit=1000
     -o myhostname=<$hostname>
```

- In the **main.cf** file, check, that the `mynetworks` parameter contains a correct name of the subnetwork, where mail servers are located.
- In the **master.cf** file, add the following line to enable sending mail to TM for check:
  `The n inet SMTP   -   n   -   -   smtpd  -o content_filter=smtp:127.0.0.1:2025`

> **Note:**
>
> When the System is installed with **kickstart** installation program, this setting is installed automatically.

- Check that the syntax in configuration files is correct:
  `service postfix check`
- Restart Postfix:
  `service postfix restart`
- Check availability of Postfix via port **25** with the following command in the command line:
  `telnet <TM_ip> 25`
  where `<TM_ip>` - IP address of Traffic Monitor server on which Postfix has been configured.
  In response to this command, the command line should display the following message:
  `Connected to mail.server.com`

> **Note:**
>
> If Telnet client is not installed, you can install it as MS Windows 2008-2012 component or use Putty application instead.

If you cannot establish the connection, then, depending on the System configuration, check settings of subnets and ports.

4.4.2 Configuring POP3 Traffic Interception

1. Configure server (servers) for working with SPAN, or Port Mirroring (see "Configuring Server to Work with SPAN, or Port Mirroring Technology").
2. Make sure, that `Hi Port` parameter of `capstack` section in **/opt/iw/tm5/etc/sniffer.conf** configuration file has value `110`:
```
"ListenAreas": {
"capstack": {
"Balancer": "IpPref",
"Interface": "eth1",
"MaxClient": 16,
"QueueMemorySizeInBytes": 67108864,
"Rules": [
{
"HiPort": 110,
"IP": "0.0.0.0",
"LoPort": 110,
"Mask": "0.0.0.0",
"Policy": "ACCEPT"
```
3. Specify value `true` for `pop3` parameter of **/opt/iw/tm5/etc/capstack.conf** configuration file.

4.4.3 Configuring HTTP Traffic Interception

For this traffic interception method, see "HTTP Traffic Interception Scheme".

SPAN, or Port Mirroring

1. Configure server (servers) to work with SPAN technology, or Port Mirroring (see "Configuring Server to Work with SPAN, or Port Mirroring Technology").
2. Enable autostart of HTTP traffic interceptor:
```
iwtm enable iw_proxy_http
```
3. Make sure, that autostart of all processes, which participate in traffic interception and analysis, is enabled:
iw_sniffer, iw_warpd, iw_cas, iw_x2db (see "Enabling and disabling autorun processes").

Inline Mode

> **Note:**
>
> In this item, «inline» mode of interception is described, which is being transmitted by ICAP protocol – do not confuse with «inline» mode for SMTP traffic.

To configure inline transfer mode, issue the following actions:

1. Learn this working schema (see "Intercepting traffic, transmitted via ICAP protocol").
2. Configure HTTP requests interception parameters on proxy server (see "Configuring ICAP").

4.4.4 Configuring HTTPS Traffic Interception

For this traffic interception method, see in "HTTPS Traffic".

Inline Mode

> **Note:**
>
> In this item, «inline» mode of interception is described, which is being transmitted by ICAP protocol – do not confuse with «inline» mode for SMTP traffic.

To configure inline transfer mode, issue the following actions:

1. Learn this working schema (see "Intercepting traffic, transmitted via ICAP protocol").
2. Configure HTTP requests interception parameters on proxy server (see "Configuring ICAP").
3. Enable HTTPS traffic parsing on proxy-server.

   > **Note:**
   >
   > This setting depends on proxy-server modification. You can get actual information on configuring proxy-server from its manual.

4. Add certificate to the list of trusted root browser certificates of each Workstation, where outgoing HTTPS traffic is supposed to be controlled.

   > **Note:**
   >
   > Get configuration information from browser documentation.

4.4.5 Configuring SMTP Traffic Interception

For this traffic interception method see "ICQ Traffic Interception Scheme".

SPAN, or Port Mirroring

1. Configure server (servers) to work with SPAN technology, or Port Mirroring (see "Configuring Server to Work with SPAN, or Port Mirroring Technology").
2. Enable autorun of ICQ traffic interceptor:
   ```
   iwtm enable iw_proxy_icq
   ```

4.4.6 Configuring NRPC Traffic Interception

This type of traffic interception is described in the article "NRPC Traffic Interception Scheme"

SPAN, or Port Mirroring

1. Configure server (servers) to work with SPAN technology, or Port Mirroring (see "Configuring Server to Work with SPAN, or Port Mirroring Technology").
2. Open **capstack.conf** configuration file, which is located in `/ort/iw/tm5/etc` directory.
3. Make sure, that `Usedprocessors` section has NRPC traffic interceptor enabled:
   ```
   "UsedProcessors": {
   "nrpc": true,
   ```
4. Make sure, that `Processors` section has NRPC traffic transmission enabled:
   ```
   "processors": {
   "nrpc": {
   "TrackExternal": true,
   "TrackInternal": true
    },
   ```
5. Save changes in the **capstack.conf** file.
6. Enable autostart for **iw_capstack** process:
   ```
   iwtm enable iw_capstack
   ```
7. Restart **iw_capstack** process:
   ```
   iwtm restart capstack
   ```

4.4.7 Configuring IMAP4 Traffic Interception

1. Configure server (servers) for working with SPAN, or Port Mirroring (see "SPAN, or Port Mirroring").
2. Make sure, that `Hi Port` parameter of `capstack` section in **/opt/iw/tm5/etc/sniffer.conf** configuration file has value `143`:
   ```
   "ListenAreas": {
   "capstack": {
   "Balancer": "IpPref",
   "Interface": "eth1",
   "MaxClient": 16,
   "QueueMemorySizeInBytes": 67108864,
   "Rules": [
   {
   "HiPort": 143,
   "IP": "0.0.0.0",
   "LoPort": 110,
   "Mask": "0.0.0.0",
   "Policy": "ACCEPT"
   ```
3. Specify value `true` for `imap4` parameter of **/opt/iw/tm5/etc/capstack.conf** configuration file.

4.4.8 Receiving Objects Intercepted by InfoWatch Device Monitor

1. Install and configure Traffic Monitor Server part (see document "InfoWatch Traffic Monitor. Installation guide ", article "Installing Traffic Monitor Server (TME Node Server)").

2. Setup event transmission from Device Monitor to Traffic Monitor server (see KB article "Integration with Traffic Monitor Versions").
3. Setup object analysis parameters (see document «InfoWatch Traffic Monitor. User guide», article "Technologies Section").

4.4.9 Revision of Files from the Corporate Network

For this traffic interception method see "Revision of Files from the Corporate Network".

File server contents and network resources analysis is only possible after installing special module under MS Windows Server OS.

1. Install and configure Traffic Monitor Server (see document "InfoWatch Traffic Monitor. Installation guide", article "Installing Traffic Monitor Server (TME Node Server)").
2. Install and configure Crawler (see document "InfoWatch Traffic Monitor. Installation guide", article "Installing the Crawler Subsystem").
3. Configure main Crawler scanner parameters (see document "InfoWatch Traffic Monitor. Administration guide", article "Configuring Crawler Interceptor").
4. Configure object analysis parameters (see document "InfoWatch Traffic Monitor. Administration guide ").

4.5 Process autorun

This section contains fratures of System's processes autostart:

- Checking process autorun;
- Enabling and disabling autorun processes.

General information on working with processes is available in chapter "Traffic Monitor Server Processes".

4.5.1 Check of Process Autostart

> **Warning!**
>
> Disable autostart of unlicensed processes responsible for traffic interception. This allows you to reduce the number of messages in the log.

When you divide servers into the main server, interception server and web console server, make sure, that autostart is configured according to notes in the table.

Autostart must be enabled only for processes, which this copy of Traffic Monitor server needs for proper operation:

Process	By default autostart is enabled
iw_adlibitum	Yes **Note:** The process should operate only on the major server
iw_agent	Yes
iw_analysis	Yes

iw_kicker	Yes The process combines the following services: • `selection` • `iw_blackboard` • `iw_systemcheck` • `iw_agent` • `xapisamplecompiler` • `export` • `iw_sample_compiler` • `report` • `import` • `notifier` • `crawler` To enable service, set `1` value in `kikers` section **web.conf** configuration file. To enable service, set `0` value in `kikers` section **web.conf** configuration file. **Note:** The process should operate only on a server with the web console
iw_blackboard	Yes
iw_bookworm	Yes
iw_capstack	No
iw_cas	Yes
iw_configerator	Yes **Note:** The process should operate only on a server with the web console
iw_deliver	Yes
iw_icap	Yes
iw_is	Yes
iw_indexer	Yes **Note:** The process should operate only on the major server
iw_image_autoling	Yes
iw_text_autoling	Yes
iw_licensed	Yes **Note:** The process should operate only on the major server

iw_luaengined	Yes **Note:** The process should operate only on the major server of the cluster
iw_messed	Yes
iw_proxy_http iw_proxy_icq iw_proxy_smtp	No
iw_qmover_client	No
iw_qmover_server	No
iw_sample_compiler	Yes
consul	Yes
iw_smtpd	Yes
iw_sniffer	No
iw_system_check	Yes
iw_updater	Yes
iw_warpd	Yes
iw_x2x	Yes
iw_x2db	Yes
iw_xapi_xapi iw_xapi_puppy	Yes

Note:

To delete all **iw_kicker** processes from the server, delete **iwtm-web-meta** package:

```
rpm -e iwtm-web-meta
```

For more information on enabling autostart for processes, see "Enabling and disabling autostart of processes".

4.5.2 Enabling and Disabling Process Autorun

To enable/disable process autorun (the example below is for iw_proxy service):

The **iw_proxy** service includes the following three components: **iw_proxy_http**, **iw_proxy_icq**, **iw_proxy_smtp**. For this reason:

1. To enable autorun for a process (e.g., for **iw_proxy_http**) set the `enable` status for the process with the following command:
   `iwtm enable iw_proxy_http`
   To disable autorun, set the `disable` status for the process:
   `iwtm disable iw_proxy_http`
2. Restart **iw_proxy** service:
   `iwtm restart iw_proxy`

All Traffic Monitor processes with the `enable` status can run automatically, while processes with the `disable` status can only be started manually.

To configure the process autorun:

1. Unit files are stored in the /**usr/lib/systemd/system** directory. Edit the process unit file (for details, see "Traffic Monitor configuration files") and save the file.
2. Reboot the configuration:
   `systemctl daemon-reload`
3. Add the configured process to autorun:
   `iwtm enable <process_name>`
4. Start the process:
   `iwtm start <process_name>`
5. Check if the process is started with one of the following commands:
   `systemctl status <process_name>`
   `iwtm status`

To enable autorun of few processes, enter as follows**:**

```
iwtm enable <daemon1_name> <daemon2_name> ... <daemonN_name>
```

To disable autorun of few processes in the System, enter the following command**:**

```
iwtm disable <daemon1_name> <daemon2_name> ... <daemonN_name>
```

To enable autorun of all the processes in the System, enter the following command**:**

```
iwtm enable all
```

To disable autorun of all the processes in the System, enter the following command**:**

```
iwtm disable all
```

4.6 Remote database interaction module

In case the System deployment scheme is chosen in a way, that database, receiving intercepted objects is located on a remote server, you need to install a remote database interaction module.

The remote database is a database installed on a remote server with **TME DB Server** or **TME All-in-one** installation key (for details on installation keys, see "InfoWathc Traffic Monitor. Installation Guide", article "Installation from TME distribution").

The standard process of data transmission to a database is **iw_x2db** (see "Traffic Monitor Server modules list"). Using a remote database integration module with a remote database provides an additional opportunity to configure:

- the speed of files transmission to file queue;
- schedule of the width of the file transmission channel.

Configuration remote database integration module includes the following steps:

- Configuring the Client of the Remote Database Management Module
- Configuring the Server of the Remote Database Management Module

4.6.1 Configuring Data Collection in a Branch Network

If the System is deployed in an extensive branch network, then the following services are responsible for sending data on intercepted events and receiving this data on Traffic Monitor server:

- **iw_qmover_client** - sends data from branches;
- **iw_qmover_server** - receives data in the head office.

By default, both services are disabled and can be enabled manually by the Security Officer from Traffic Monitor Management Console:

- **iw_qmover_server** service - the first one;
- **iw_qmover_client** service - the second one.

These services can be configured in the directory `/opt/iw/tm5/etc`: **qmover_client.conf** and **qmover_server.conf** configuration files (for details, see the document "*Configuration Files Guide*", "qmover_client.conf" and "qmover_server.conf" articles).

4.6.2 Configuring the Client of the Remote Database Management Module

Configuring general settings

1. Configure the following client settings in **qmover_client.conf** configuration file, located in `/opt/iw/tm5/etc` directory:

Parameter	Description
`ListenerIP`	Server IP address (**qmover_server** service)
`Port`	Server port (central office)
`NookDir`	**qmover_server** service working catalogue
`ChannelWidth`	Channel bandwidth, speed of data downloading to Traffic Monitor (kbps). Can be implicitly limited with `WindowSize` parameter

2. Restart Traffic Monitor:
   `iwtm restart`

Configuring processes autorun

- Enable autorun for **iw_qmover_client** process.
- Disable autorun for **iw_x2db**, **iw_x2x**, **iw_deliverd** and **iw_adlibitum** processes.

For more information on disabling and enabling processes autorun see "Enabling and disabling autostart of processes".

Changing the bandwidth of the data transmission channel

By default, the bandwidth is 256 kbps. You can configure the bandwidth to be changed automatically at different time periods. To do this, use **iw_qmover_channel_width_setter** utility.
Bandwidth change is allowed. The bandwidth can be varied from 10 kbps through 2 Mbps.

To set bandwidth limitations,
Run the utility with the mandatory parameters:
`iw_qmover_channel_width_setter <unix_socket_name> <bandwidth>`
where

- `unix_socket_name` socket name (is being created automatically on service start; is being automatically deleted on service stop); default value - `/opt/iw/tm5/run/.channel_socket`;
- `bandwidth` the bandwidth (kbps) to be set.

Example
There is a channel whose bandwidth is 256 kbps. It is required that only 50% of the channel can be used from 9 AM to 6 PM. And from 6 PM to 9 AM – 100%.
Calculate the bandwidth for the required bandwidth usage. In this example, the bandwidth for different time intervals is following:

Interval	**Percent of the channel width**	
	Per cent of the channel width	Equivalent in kbps
9 AM to 6 PM	50%	128
6 PM to 9AM	100%	256

Add to **etc/crontab** these commands:
```
00 9 * * * iwtm /opt/iw/tm5/bin/iw_qmover_channel_width_setter /opt/iw/tm5/
run/.channel_socket 128
 00 18 * * * iwtm /opt/iw/tm5/bin/iw_qmover_channel_width_setter /opt/iw/tm5/
run/.channel_socket 256
```

4.6.3 Configuring the Server of the Remote Database Management Module

Configuration setting

Configure the following client settings in qmover_server.conf configuration file located in `/opt/iw/tm5/etc` directory:

Parameter	**Description**
IP (section `Clients`)	Client IP-address (branch office)
Queue (section `Clients`)	Directory where the objects queue is stored, default is `queue/db`
Port	Port where the server listens for objects coming from clients

Warning!

When branch offices parameters are changed (offices quantity or IP addresses), manually edit **qmover_server.conf** file.

Configuring autorun

Enable autorun for **iw_qmover_server** process. For more information on enabling and disabling processes autorun see "Enabling and disabling autostart of processes".

4.7 Configuring OCR Extractors

OCR for different interceptors is configured in the following configuration files:

- **warpd.conf** – to enable OCR for analysis of intercepted images, in the `Warp` section, set the value of the `EnableOCR` parameter to `true`;
- **sample_compiler.conf** – to enable OCR for analysis of images loaded as sample documents, set the value of the `EnableOCR` parameter to `true`.

In the file **/opt/iw/tm5/etc/config-perm/bookworm/ocr_custom.xml**, you can configure OCR for different interception channels:

- at the level of service. In this case, OCR configuration applies to the content of events received via protocols of this event types that belong to this service, if there were no specific OCR settings for these types of events or protocols;
- at the level of the event type for a particular service. In this case, OCR settings apply to the content of events received via protocols of this event type, provided that different OCR settings are not specified for these protocols;
- at the level of a protocol for a particular event type. In this case, OCR settings apply to the content of events received via the selected protocol for the specified event type.

For details, see "Configuring OCR Extractors".

Note:

For distributed installation when you install Traffic Monitor on several servers, you should specify individual OCR settings for each server.

Warning!

Settings specified at the protocol level have a higher priority than settings specified at the event type level. Settings specified at the event type level have a higher priority than settings specified at the service level.

Note:

If a new event type is registered by means of SDK, it will be processed with settings specified for the service the event type belongs to. If a new protocol is registered, it is processed with settings specified for the event type this protocol belongs to.

After you have changed the files, run the following command:

```
iwtm restart
```

The table below lists interception channels for which OCR can apply.

Service	Event type	Protocol
Email	Email	POP3 SMTP IMAP MAPI NRPC
	Webmail	HTTP HTTPS
Messenger	ICQ	OSCAR
	Skype	SKYPE
	XMPP	XMPP
Internet activity	Web message	HTTP HTTPS
File exchange	FTP	FTP
	External devices	-
	Cloud storages	HTTPS
Printer and MFD	Print	-
Storage	Crawler	-
Recording media	Photo	-

If the System is installed with the **kickstart** installer, both extractors are installed to the server end of the System. By default, ABBYY FineReader Engine 11 is used. Text extracted from images can be recognized with either ABBYY FineReader Engine 11 or Tesseract 3.0.
Functional limitations of extractors are listed in the table below:

Functionality	ABBYY FineReader Engine 11	Tesseract 3.0
Recognition of image rotation angles	0(+/-20) , 90(+/-20), 180(+/-20) and 270(+/-20) degrees	-
Recognition of colour images	+	-

Image correction	+	-
Recommended image resolution	300dpi for text with a font size from 10pt 400-600dpi for text with a font size of 9pt and less	300dpi for text with a font size from 10pt 400-600dpi for text with a font size of 9pt and less

Note:

To avoid deviation from recommended image resolution when using ABBYY FineReader Engine 11 the parameter `AutoOverwriteResolution` (`true` by default) is used, able to specify the image resolution automatically.

To start using ABBYY FineReader Engine 11:

1. Delete **/opt/iw/tm5/bin/iw_image2text** symlink.
2. Create a symlink:
   ```
   ln -s /opt/iw/tm5/bin/iw_image2text_fre /opt/iw/tm5/bin/iw_image2text
   ```

To replace ABBYY FineReader Engine 11 with Tesseract 3.0:

1. Delete **/opt/iw/tm5/bin/iw_image2text** symlink.
2. Create a symlink:
   ```
   ln -s /opt/iw/tm5/bin/iw_image2text_ts /opt/iw/tm5/bin/iw_image2text
   ```

To change size limit for images that can be sent:

1. Go to **/opt/iw/tm5/etc/image2text_fre.conf** directory (for FineReader Engine 11) or /**opt/iw/tm5/etc/image2text_ts.conf** directory (for Tesseract).
2. Edit the `MaxSizeInKb` (maximum size) and `MinSizeInKb` (minimum size) parameters. By default, their values are 1536 KB and 200 KB respectively.

To enable OCR only for cloud storage events:

1. Open the `/opt/iw/tm5/etc/config/bookworm/services.xml` directory and find `mnemo` and `key` suitable for cloud storage.
   For example,
   ```
   object_type mnemo="cloud_storage"
   key="AA9DFB259F0DFEE040BADC95815E13A200000000"
   ```
2. Copy these key and `mnemo` and paste them to `/opt/iw/tm5/etc/config-perm/bookworm/ocr_custom.xml` directory.

If ABBYY FineReader Engine 11 is used as OCR extractor, you need to set up the ABBYY license. For this:

1. In the **/opt/iw/tm5/etc/image2text_fre.conf** configuration file, edit values of the fields as follows:
   - enter serial number in the **SerNum** field;
   - enter serial number in the **Pwd** field.

2. Copy the license file (.LocalLicense format) to the ***/var/lib/ABBYY/SDK/11/Licenses /*** directory.
3. Make sure that **iwtm** user can access the downloaded file.
4. Restart the **iw_warpd** service.

4.8 Configuring Notifications for Users and Employees

Users of the Management Console can configure sending notifications from the System to users or employees. To enable notifications:

- specify the email address from which notifications will be sent to users or employees;
- configure sending emails via Postfix mail server

Notifications are sent when policy rules are triggered (for details, see the document "*InfoWatch Traffic Monitor. User Guide*").

To check if emails are sent via the mail server:

Run the following command:

```
sendmail -v <employee@company.com> < <sample.log>
```

where:

- `<employee@company.com>` - email address of the notification recipient;
- `<sample.log>` - a text file that will be used as the email text (we recommend using a simple text file up to 1 MB).

If emails are not sent, configure the delivery via Postfix.

To configure the mail delivery via Postfix:

1. Open the **/etc/postfix/main.cf** file.
2. Specify the required mail server as the `relayhost` value:
   `relayhost = <mail.company.ru>`
   `where <mail.company.ru> - the required mail server`

   > **Note:**
   >
   > If the **/etc/postfix/main.cf** file does not have a line containing the `relayhost` attribute, add this line.

3. Reboot Postfix using the following command:
   `service postfix restart`
4. Check the mail delivery using the following command:
   `sendmail -v <employee@company.com> < <sample.log>`
   where:

- `<employee@company.com>` - email address of the notification recipient;
- `<sample.log>` - a text file that will be used as the text of the email (we recommend using a simple text file up to 1 MB).

4.9 Limiting the number of events that can be found

You can specify a limitation for the maximum number of events that will be displayed in the Management Console as a result of applying filter. For this, in the *SETTING* table of a database, specify a desired value for the *query_stop_count* attribute. The default value is 10.000.

4.10 Configuring InfoWatch Device Monitor Server

This section contains InfoWatch Device Monitor server low level configuration described. You are highly recommended to perform the actions described with the support of InfoWatch experts.

To ensure the correct work of InfoWatch Device Monitor on the computers, where its components have been installed the following ports should be available:

Default port	Supported protocols	InfoWatch Device Monitor computers		Description
		Source	Receiver	
15003	TCP	Management console	Server	Connecting InfoWatch Device Monitor console to server
15004	TCP	Agent	Server	Encrypted connections to InfoWatch Device Monitor agents
15100	UDP	Server	Agent	InfoWatch Device Monitor agents notification (for example, if security scheme or server configuration has been changed)
15101	TCP	Agent	Server	Notifying InfoWatch Device Monitor agents about server capability
15505	TCP	Server	Agent	InfoWatch Device Monitor agents distribution, update and removal
15506	TCP	Server	Agent	Collecting logs, debugging mode enabling and disabling
local port, dynamically generated	TCP	Agent		Agent's module in user session, `DM.Client.exe` process

Server is configured with `InfoWatch.DeviceMonitor.Server.exe.config` XML configuration file. Configuration file is stored in the same directory as Server executable file `InfoWatch.DeviceMonitor.Server.exe`.

By default, after its installation the Server is located in

```
C:\Program Files\InfoWatch\Device Monitor\Server.
```

You can view and edit configuration file with any text or XML Editor. UTF-8 File Encoding.

`<configuration>` is the root element of configuration file. Root element includes child elements (configuration sections). The following table contains configuration file structure and its partitions description. Section links provide detailed information on their configuration.

> **Important!**
>
> It is extremely not recommended to edit the configuration file without InfoWatch engineer assistance.
>
> When editing of file is finished, please restart Device Monitor Server.

Configuration section	Description
<configSections>	Service section. Describes all remaining sections. You should not edit this section.
<runtime>	Contains Microsoft .NET framework environment settings. These settings are required for correct Server operation. In `<runtime>` section the `gcServer` element is specified for garbage collector configuration. Element features `enabled` attribute with `true` (parallel garbage collection is enabled) or `false` value (parallel garbage collection is disabled). It is not recommended to edit this section.
<applicationSettings>	Contains individual Server modules settings, such as ports, buffer size, time-out, etc.
<system diagnostics>	Contains logging settings. Logging can be useful for Server components diagnostics.

If you need to delete temporary files generated by Device Monitor, you can do it by the special utility: see details in "Deleting Device Monitor Temporary Files".

4.10.1 <applicationSettings> Section

You can use `<applicationSettings>` section to configure individual Server modules. There are six modules. All sections have the same structure: Each section includes a set of elements for module configuration. Each `<setting>` element has the following attributes:

- `name` - setting name.
- `serializeAs` - data serialization method. Data is always serialized as a string (string data type).

Module parameters are defined by <value> child element. For example:

```
<setting name="RemotingPort" serializeAs="String">
   <value>15003</value>
</setting>
```

Each module parameters are described in the following table.

Section of configuration file	Description
<InfoWatch.DeviceMonitor.Server.Core.Properties.Settings> Server kernel configuration	
RemotingPort	TCP port processing Management Console service connections. Default value 15003 (it is not recommended to change this value)
CultureName	Language of module diagnostic and other messages. Possible values: • ru-RU • en-US
MachineName	IP address of network interface used by the Server to accept Management Console connections. The default value is 127.0.0.1. You can only change this value if the Server has 2 or more network interfaces. In this case, you should explicitly specify interface address used by the Server to accept incoming connections from different instances of the Management Console
CheckServerSettingsInterval	If clustering is enabled - a period of synchronization with the database (in seconds). When the specified period expires, the Server queries the database for changes in the security scheme made by the main Server that uses the same database. The default value is 10
<InfoWatch.DeviceMonitor.Server.Database.Properties.Settings> Settings of the module that interacts with the database	
DatabaseType	Database types. Possible values: • Oracle • Microsoft • PostgreSql
ConnectionString	Database connection string. It must comply with ADO.NET connection string rules. For example: Data Source=isis\s2005;Initial Catalog=g1228_9;Integrated Security=True
CultureName	Language of module diagnostic messages and other messages. Possible values: • ru-RU • en-US
ConnectionPoolSize	The number of open connections to the database which will be used by the server. The default value is 20

CommunicationPort	The port number that is used when the server connects to the Deployment Agent if the Agent is installed through installation tasks. We recommend not changing this value during the System operation. The default value is 15505
UpdateStatusTimeOut	The interval of updating the job execution state on a remote computer. The server gets the installation state on the computers where the Agent is deployed and displays this state. The default value is 60
<InfoWatch DeviceMonitor.Server.Gui.Properties.Settings.> Management Console interface module settings	
CultureName	Language of module diagnostic messages and other messages. Possible values: • ru-RU • en-US
InitialLeaseTime	Time (in minutes) during which a connection session with the Management Console is valid
RenewOnCallTime	Time (in minutes) for which a connection session with the Management Console is prolonged
<InfoWatch.DeviceMonitor.Server.Client.Properties.Settings> Settings of the module that serves client connections (controlled computers)	
Backlog	Queue length of client connections waiting to be connected. The default value is 64
CultureName	Language of module diagnostic messages and other messages. Possible values: • ru-RU • en-US
ShadowCopyTempDir	A full path to the directory which stores temporary shadow copies waiting to be sent to InfoWatch Traffic Monitor. The default value: C:\Program Files\InfoWatch\DeviceMonitor\Server\ShadowCopyTempDir
DmpV1Adress	List of IP addresses (separated by ";") on which the server listens to ports. Possible values: • AllAny – ports on all IP addresses of the computer (the default value) • AllIp4 – ports on all IP addresses of version 4 • AllIp6 – ports on all IP addresses of version 6

Dmpv1TraceLevel	Trace level of interaction protocol between client and server. Possible values: ▪ disable tracing ▪ only trace information on packages (the default value) ▪ full tracing **Note:** Tracing is output to the receiver of diagnostic messages (Windows Application Log by default) only of the value is 3 and logging level for the module filter is Verbose (see " Section ").
Dmpv1TraceClients	List of Agent IP addresses (separated by ";") that require tracing. If the value is All, then all Agents are traced.
Dmpv1ConnectionsLimit	Number of simultaneously processed TCP/IP connections with Agents. The default value is 200
Dmpv1ConnectionsQueueLimit	The maximum number of connections waiting for processing. If the number is exceeded, connections are reduced to the value of Dmpv1ConnectionsQueueLengthAfterCut parameter. The default value is 500
Dmpv1ConnectionsQueueLengthAfterCut	The number of connections after reducing the queue which exceeded the maximum size. The default value is 250
TimeoutPeriodSeconds	Timeout after which a hanging connection between Agent and Server is terminated and partially created shadow copies are deleted (shadow copies will be re-sent when a new connection is established). The default value is 120
SSLPort	The port number for encrypted connections. The default value is 15004
<InfoWatch.DeviceMonitor.TrafficMonitor.Connector.Properties.Settings> Basic settings for Traffic Monitor Server connector	
DBPollTime	Database query period (in milliseconds) checking for database events
CultureName	Language of module diagnostic messages and other messages. Possible values: • ru-RU • en-US
NumberOfConnections	Number of connections to InfoWatch Traffic Monitor. The default value is 4. The maximum value is 32.

`QueueSendLimit`	The maximum number of events transferred from the database to InfoWatch Traffic Monitor in a single transaction. The default value is `200`
`ShadowCopyTrasferBlockSize`	The size of shadow copy data block sent to Traffic Monitor server, in MB. The default value is `16`
`<InfoWatch DeviceMonitor Database.Core.Properties.Settings>` Settings of database low-level driver	
`CultureName`	Language of module diagnostic messages and other messages. Possible values: • `ru-RU` • `en-US`
`MaxConnectionWaitingTime`	Waiting time for a free connection from the pool, in seconds. The default value `300`.
`CommandTimeoutSeconds`	Execution time of a long operation or a queue, in seconds. The default value is `30`.**Note:** this setting does not apply in Oracle DBMS.
`LongCommandTimeoutSeconds`	Execution time of a long operation or a queue, in seconds. Applies when the execution time is a significant interval. The default value is `0` (endless).**Note:** this setting does not apply in Oracle DBMS.

4.10.2 <system.diagnostics> Section

Server diagnostics section. It includes the following elements:

- `<trace>`. Diagnostics module general settings.
- `<sources>`. Individual Server components diagnostics settings.
- `<switches>`. Managing diagnostic system's overall level of detail. Includes detalizer definitions. Typically, there is a single detilizer. If different modules require different detalisation settings, you should use a filter. General detalizer's value must contain maximum detail.

***<trace>* element**

Used to describe global module diagnostics settings. In this element you can specify message margins and diagnostics data saving parameters.

***<sources>* element**

Used to configure individual application modules. Includes <source> child elements - one for each application module (see Server module list in " section ").

The list of modules also includes secondary ones which are needed for debugging output for main components:

- `InfoWatch.DeviceMonitor.Server.FileIdentification.Core` - module describing the signatures object model;
- `InfoWatch.DeploymentSubSystem` - module of the subsystem responsible for deployment on computers;

- `InfoWatch.DeviceMonitor.EventPostProcessorManager` - module for post-processing of print events;
- `InfoWatch.DeviceMonitor.ScreenShotStorage` - module for saving screenshots on the file system;
- `InfoWatch.DeviceMonitor.Server.Remote.Install` - module for launching the remote installation\update\uninstallation of the Agent on the computer.

`<source>` element has the following attributes:

- `name`. Server module name.
- `switchName`. Name of the module that defines diagnostics (detalizer's) level of detail.
- `switchType`. Type of the module that defines diagnosis level of detail. Is always set to `System.Diagnostics.SourceSwitch`.

Each `<source>` element also contains a definition for diagnostic messages receiver (`<listeners>`). Diagnostic messages can be received by:

- Windows application log (Application log);
- system debug output (can be viewed with special tools like DebugView);
- text file.

`<source>` element has child element `<listeners>`. This element contains parameters of diagnostic messages receiver. `<listeners>` element may contain the following child elements:

- <add>. Add a new diagnostic messages receiver
- <remove>. Deleting diagnostic messages receiver. You can only apply it to remove default message receiver (Windows application log). To this end, set element name to `Default`: `<remove name="Default" />`

***<add>* element**

This item adds diagnostic messages receiver to Server module. Element contains the following attributes:

- `name`. Diagnostic messages receiver name.
- `type`. Diagnostic messages receiver type.
- `initializeData`. Server module ID. Typically, this value is the same as Server module name. If Windows application log is the receiver, this information appears in the source column.

Receiver type is fully qualified receiver name from .NET framework library or proprietary type that implements the required diagnostic messages receiver interface.

.NET framework library contains the following diagnostic messages receiver types:

- `System.Diagnostics.EventLogTraceListener`. Windows application log
- `System.Diagnostics.ConsoleTraceListener`. Console application message output
- `System.Diagnostics.TextWriterTraceListener`. Text file output
- `System.Diagnostics.DefaultTraceListener`. Debug Windows output (enabled by default).

<add> element also contains diagnostic messages filter. This filter only displays the messages with level of detail exceeding the filter parameters. It features the following levels of detail (listed in descending priority order):

- `Verbose`. Debug level. All events are logged. This level can only be used for System debugging. This level does not allowed for a system running in normal mode, since it cuts the performance significantly.
- `Information`. Information level. Registers the events that are not related to errors, for example, information on server changes.
- `Warning`. Warning level. Registers non-critical System errors, such as an unexpected disconnection from the Server, connection timeout, etc.

- `Error`. Error level. Records errors that cause System malfunction (i.e., errors that require troubleshooting).
- `Critical`. Critical level. Registers serious malfunctions that can lead to System shutdown.

Example 1

Detalizer features *Verbose* logging level, while module filters feature *Warning* level. Then detalizer ignores *Warning*, *Error* and *Critical* events, but filters out *Information* and *Verbose* events.

Example 2

Detalizer features *Error* logging level, while module filters feature *Warning* level. In this case, detalizer ignores *Error* and *Critical* events, but filters out *Warning*, *Information* and *Verbose* events. This happens because overall System level of detail is *Error*, i.e. only *Error* events and higher are registered regardless the filter settings.

***<remove>* element**

Deleting message receiver. It is usually used to remove default receiver that displays diagnostic messages in Windows debug output:

```
<remove name="Default" />
```

***<switches>* element**

Defines Server detalizers. Typically, there is only one detalizer, which sets the global (for entire Server) level of detail the diagnostic system. If individual Server modules require lower level of detail, you can use filters.

`<switches>` element contains only one child element by default:

```
<add name="eventLog" value="Warning"/>
```

Level of detail is specified as `value` attribute.

4.10.3 Deleting Device Monitor temporary files

InfoWatch Device Monitor provides a means for deleting the files generated by the System, namely:

- all files from the temporary files directory of the operating system (%Temp%);
- data from file queue of Device Monitor events processing (`C:\Program Files\InfoWatch\DeviceMonitor\Server\ShadowCopyTempDir` by default; see information on the path configuring in "Раздел ").

The deleting is performed by `RemShadowCopyFiles` utility located in the Server installation folder (`C:\Program Files\InfoWatch\DeviceMonitor\Server` by default).

The launching of the utility should be performed by administrator account having rights for reading and writing in directories containing deleting files.

Important!

The System will stop the proceeding of incoming events for a time when deleting procedure runs.

The procedure will delete all the data on events which were not proceeded by the moment of deleting start.

To delete temporary files:

1. Log on at the InfoWatch Device Monitor Server where you need to delete temporary files.
2. Run `RemShadowCopyFiles` utility.

3. Confirm deletion by pressing **Y**.

The utility will stop all Device Monitor services, delete temporary files and start Device Monitor services again.

> **Important!**
>
> When deleting temporary files from %Temp% system folder the access denial can arise: there can be some files created and used by another processes irrelevant to the System.

4.11 Service-to-service cooperation setup (Consul service)

To register the services, monitor the accessibility and detect Traffic Monitor components the decentralized fault-tolerant discovery service Consul is used. The Consul agent:

- is installed on each host and is a significant part of cluster activity
- revealing the services, collecting the services state data, realizing DNS, API HTTP and RPC CLI interfaces
- can be started in one of two modes: client and server one.

Consul is installed in **All-in-one** mode, **TME DB server** and **TME Node server** (Information on System installation is available in Installation Guide, "System Installation" block).

When using **All-in-one (TME/TMS)** installation mode, the configuration parameters to connect to the Consul service are set automatically during the installation. The only exception is the distributed installation, when Traffic Monitor and the database are installed on different servers with **TME Node server** and **TME DB server** keys, when the System is installed on more than one node (has more than one network interface).

The service operation settings are to be done within the configuration file located by the following path: `/opt/iw/tm5/etc/consul/consul.json`. The full description of parameters is available at the page "Consul.json configuration file".

4.11.1 Starting and stopping the service

To start the Consul service, use one of the following commands:

```
service iwtm-consul start
systemctl start iwtm-consul.service
```

To stop the Consul service, you can use the following commands:

```
service iwtm-consul stop
systemctl stop iwtm-consul.service
```

If necessary, you can start the Consul agent **manually**:

```
consul agent -data-dir=<path> -bind=<bind_addr> -bootstrap -server -ui
```

where:

- `<path>` is a path to the directory with service data (e.g., `/opt/iw/tm5/var/consul`);
- `<bind>` is the network interface address.

If the System has more than one network interface, specify one of the following parameters:

- `-bind=<ip-address>`.

- `-config-file` or `-config-dir` - the path to the configuration file (e.g.: `/opt/iw/tm5/etc/consul`).

If several configuration files are loaded, their options are merged.

4.11.2 Registering services in Consul

You can register a service in Consul in 2 ways:

- using HTTP API or agent's configuration file, in the case, when service can communicate to Consul independently;
- registering service as an external component.

Services with obligatory registry in Consul	Services installed on nodes with Consul Server or Consul Client
iw_adlibitum	iw_adlibitum
iw_agent	iw_agent
Iw_analysis	Iw_analysis
iw_blackboard	iw_bookworm
iw_bookworm	iw_capstack
iw_capstack	iw_cas
iw_cas	iw_configerator
iw_icap	iw_icap
iw_deliver	iw_indexer
iw_indexer	iw_licensed
iw_licensed	iw_kicker
iw_luaengined	iw_luaengined
iw_messed	iw_messed
iw_pas	iw_pas
iw_proxy_http	iw_proxy_http
iw_proxy_icq	iw_proxy_icq
iw_proxy_smtp	iw_proxy_smtp
iw_qmover_server	iw_qmover_server
iw_sample_compiler	iw_sample_compiler
iw_system_check	iw_system_check
iw_smtpd	iw_smpd
iw_tech_tools	iw_tech_tools
iw_updater	iw_updater
iw_warpd	iw_warpd
iw_xapi_xapi	iw_xapi_xapi
iw_xapi_puppy	iw_xapi_puppy
iw_x2x	iw_x2x
iw_x2db	iw_x2db
Crawler	Web (backend)

After the registaration, Traffic Monitor services and Consul interact the following way:

- registration using Consul client;
- establishing TCP connection or returning HTTP code;
- deregisrtation.

4.11.3 Distributed installation

Important!

To use the Consul service, the full-mesh network topology ("each-to-each" connection) should be implemented for all the agents within the cluster and for servers, when combining them into WAN.

Important!

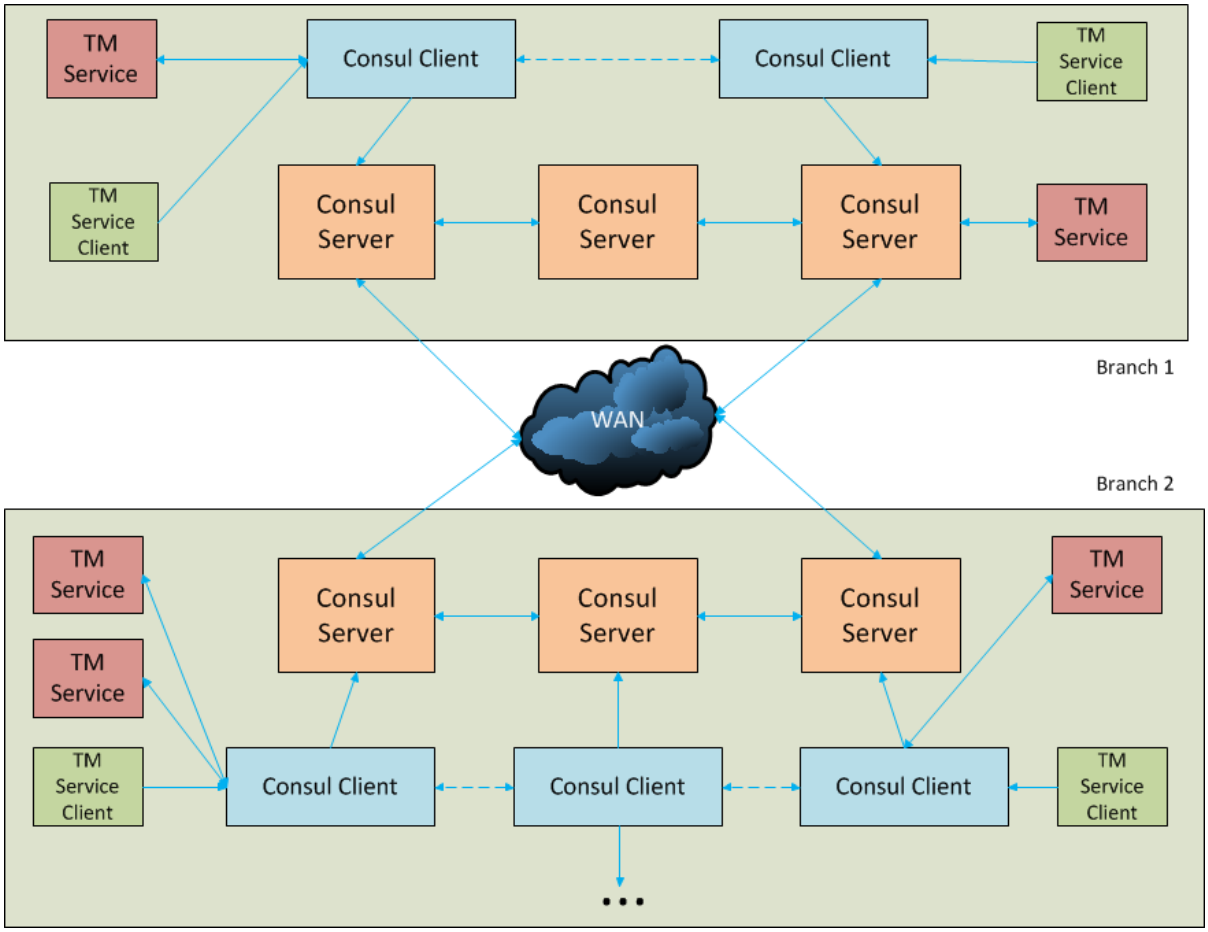
In case of distributed TM installation, using TCP and UDP between different network segments (including nodes) must be allowed in Windows firewall.

Clustering

The client collects the node- and service-related data and sends it to the server. System components searching for services send the request to the agent started on a local workstation, which resends the request to an available server. If the server is unable to respond to the request, it can send the request to a different data center (a branch) and retrieve the response.

Servers compose a cluster and define independently the leading server, responsible for elements coordination within the cluster. The first/the only one server is usually started in bootstrap mode (assigning the leader manually). When starting the agent, to connect to cluster it is enough specifying one server of this cluster. While configuring it in `retry_join` option, it is recommended specifying all the servers of the cluster. A quorum to hold the operations and to provide the consistency is required in each data center. If there are few data centers, a separate cluster to be created in each of them. Data centers are not isolated from each other due to service detection task. An agent within one data center can get information from a separate data center.

The Consul network can use one server, but to avoid data loss it is recommended using from three to seven servers within the data center.



Example:

A cluster consisting of three nodes (servers) continues operating when one server is out of operation.

Below are the examples of using the interface command line:

Command	Description
`consul members`	displays the list of cluster members
`consul catalog services -node <node_name>`	displays the list of cluster servers on a specific computer
`consul operator raft list-peers -stale=true`	displays the list of all the servers regardless of the cluster

Connecting to cluster

You may register extra nodes on the cluster using one of the following ways:

- Enter the command: `consul join <ip-адрес>`. Please make sure, all the servers and Consul clients have the same parameters `datacenter` and `encrypt` within the `consul.json` configuration file (see consul.json configuration file)

- Specify the list of servers, to be joined within the parameter `retry_join` of `consul.json` configuration file.

4.11.4 Network rules configuration to access Consul

To set up the network exchange the following ports between all Consul agents (servers and clients) should be accessible.

Port by default	Interface	Supported protocols	Description
8300	Server RPC	TCP	Used by servers to process incoming queries from other agents
8301	Serf LAN	TCP, UDP	Used by agents to process data flows within local network
8302	Serf WAN	TCP, UDP	Used by servers to exchange data with other servers via WAN
8400	CLI RPC	TCP	Used by all the agents to process RPC from CLI
8500	HTTP API	TCP	Used by clients to interact with HTTP API interface
8600	DNS	TCP, UDP	Used to allow DNS queries

4.11.5 consul.json configuration file and iwtm-consul.service unit-file

Content	Description
`{`	
`"bootstrap_expect": 1,`	Number of servers expected in cluster (for server mode only)
`"server": true,`	Start of agent on server mode (false – client)
`"datacenter": "iwtm",`	Title for datacenter
`"data_dir": "/opt/iw/tm5/var/consul",`	Directory to store the Consule service data
`"encrypt": "4RTZ5ttYY6RwIYX28XWNPw==",`	Secret key, shared between cluster agents

`"log_level": "WARN",`	Level of logging
`"enable_syslog": true,`	Let logging in syslog
`"disable_update_check": true,`	Prohibit to check the updates for Consul
`"leave_on_terminate": false,`	If it's true, then receiving SIGTERM, sends the farewell message and leaves the cluster in standard mode. Default values: for server - false, for client – true
`"skip_leave_on_interrupt": true,`	If it's false, then receiving the signal of interruptions (e.g, SIGINT) leaves the cluster in standard mode. Default values: for server - true, for client - false
`"rejoin_after_leave": true,`	If it's true, then joining to cluster once started
`"retry_join": "0.0.0.0",`	In case of distributed installation contains the list of servers, which should be connected to
`"ui": true,`	Access to web interface (prohibited by default)
`"client_addr": "0.0.0.0"`	Client IP with open web interface access
`}`	

Unit-файл **iwtm-consul.service**

Code	Description
`[Unit]`	Section defining demon metadata and its relationship settings with other demons
`Description=Consul Service discovery agent`	Demon name
`Requires=network-online.target`	Services cannot operate without network-online.target
`After=network-online.service`	Demons that will be run before the current demon is started
`[Service]`	Demon start setting section
`StandartOutput=syslog`	Redirecting standard output to syslog
`StandartError=syslog`	Redirecting standard error to syslog

Code	Description
`Type=simple`	Demon start type. `simple` - demon starts and switches to waiting mode on the console
`User=iwtm`	User name on behalf of which demon is started
`Group=iwtm`	User group name
`SyslogIdentifier=iwtm-consul`	Defines process name for log prefix rows, which are sent to logging system or to core log buffer.
`PermissionsStartOnly=true`	Starting commands from ExecStartPre on behalf of the **root** user
`ExecStartPre=/opt/iw/tm5/bin/consul validate /opt/iw/tm5/etc/consul`	Full path and command arguments which should be completed before starting the main process.
`ExecStart=/opt/iw/tm5/bin/consul agent $OPTIONS -config -dir= /opt/iw/tm5/etc/consul`	Full path and command arguments which should be completed to start demon. The command is to be run on behalf of the user defined in `User`.
`ExecReload=/bin/kill -s SIGHUP $MAINPID`	The command restarts demon configuration, if it is accessible. The command is to be run on behalf of the user defined in `User`.
`KillSignal=SIGINT`	The command stops demon's work forcefully
`TimeoutStopSec=5`	Period of time within which the system waits for demon to stop, before labeling it as inaccessible or stopped forcefully.
`[Install]`	Defining demon's behaviour, if it is enabled or disabled
`WantedBy=multi-user.target`	Start this demon, when the system is loading in a multi-user mode

5 Configuring Crawler Interceptor

Crawler subsystem of InfoWatch Traffic Monitor system allows you to check files in the corporative network for violations of the corporate security policy.

Crawler subsystem operates as one of Traffic Monitor interceptors.

The following InfoWatch Traffic Monitor components are involved to the Crawler operation:

- Crawler is a software package that provides basic functions. It is implemented as two Windows services:
  - `InfoWatch.Crawler.Scanner` – scans network folders and file storages according to user-defined settings;
  - `InfoWatch.Crawler.Server` – manages scanning services and communicates with Traffic Monitor Management Console.
- Database – Crawler uses InfoWatch Traffic Monitor DB schema to store objects that are considered violations and information on scanning jobs.
- InfoWatch Traffic Monitor Web Management Console: tools for managing Crawler subsystem can be found in the **Crawler** section.

Warning!

If Crawler scanner and server are located in different domains or working groups, you should disable the encrypted connection. For more information, see the article "Disabling Traffic Encryption between Components".

See detailed information on configuring Crawler in the following sections:

- Configuring Network Access
- Crawler Configuration Files
- Crawler Log Files
- Automatic deletion of Crawler events

5.1 Configuring Network Access

If network segments where InfoWatch Traffic Monitor with Crawler is deployed are divided by firewalls, then for correct Crawler operation, TCP ports **6556** (Crawler scanner connects to Crawler server through this port) and **1337** (IWTM Management Console connects to Crawler server through this port) should be opened.

Detailed information on network ports which should be available for efficient system operation, see in the following scheme and in the explanation table.

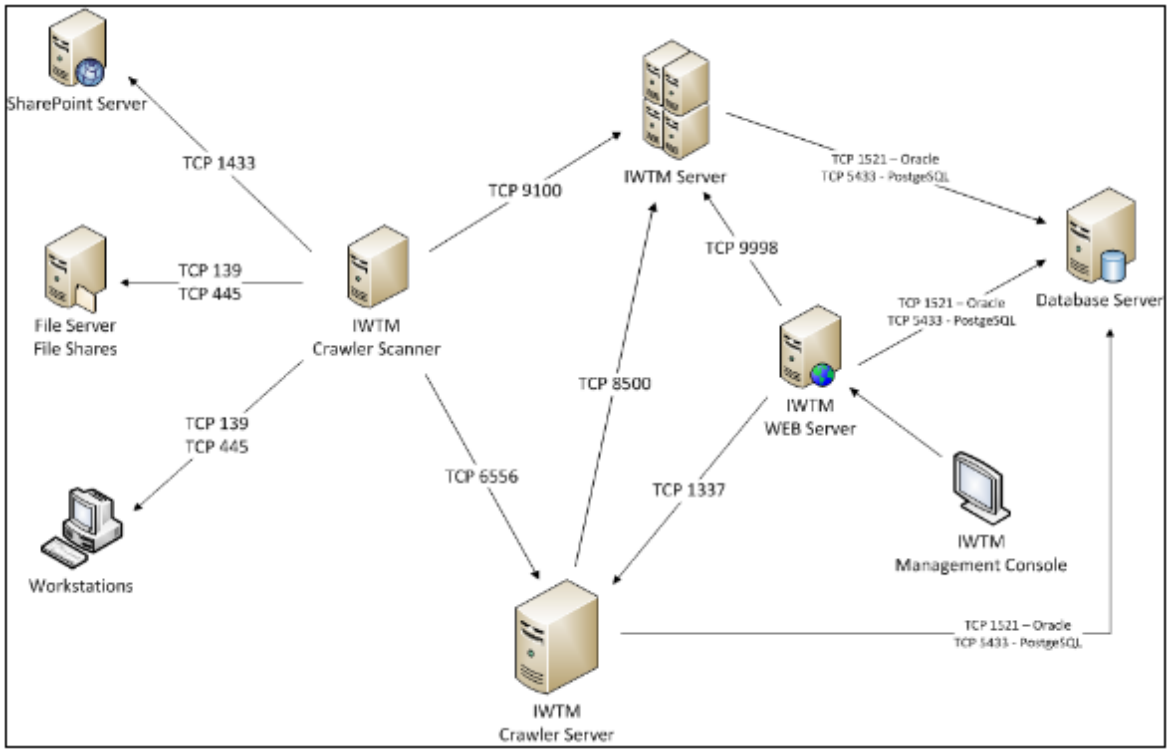
Note:

The scheme does not display ports through which:

- Management Web Console connects to IWTM web server;
- IWTM web server connects to IWTM server.

These ports are not specified, because, during kickstart installation, specified System components are installed on the same computer.

If some system components belong to different domain controllers, then for correct operation of Crawler, you should configure Domain Trust for these controllers. However, if Crawler scanner is located far from scanned objects, this may significantly increase the load on the network. Thus, we recommend installing Crawler scanner on a computer in the network segment that is closest to segments to be scanned.



Connection	**Port**
Crawler scanner – Crawler server	TCP 6556
Crawler server – IWTM DB	TCP 1521 - for OracleTCP 5433 - для PostgreSQL
Crawler server – IWTM	TCP 8500
Crawler scanner – IWTM server	TCP 9100
IWTM web server – Crawler server	TCP 1337
Crawler scanner – workstations and file servers	TCP 139 TCP 445
Crawler scanner – SharePoint file storage (MS SQL server)	TCP 1443

Warning!

If you configure a network inside the domain, the firewall should be disabled both for the domain and for the domain profile.

To disable the firewall in the domain profile:

1. Go to **Start -> Control Pane**l -> W**indows Firewall**.
2. In the left part of the window, choose **Advanced settings**.

   Note:

   If you are asked for the administrator password or the password confirmation, please, enter the password or confirm it.

3. In the central part of the **Windows Firewall with Advanced Security** window, choose **Windows Firewall Properties**.
4. In the State block, choose **Off** in the **Firewall state** drop-down list.
5. Click **OK**.

5.2 Crawler Configuration Files

Administrator maintaining the system can perform some low-level settings of Crawler components in configuration files:

- **Crawler server** – InfoWatch.Crawler.Server.exe.config. Located in the same directory as executed file InfoWatch.Crawler.Server.exe (default – C:\Program Files\InfoWatch\Crawler\Server for 32-bit systems and C:\Program Files (x86)\InfoWatch\Crawler\Server for 64-bit systems). See details in "Configuration File of Crawler Server".
- **Crawler scanner** – InfoWatch.Crawler.Scanner.exe.config. Located in the same directory as executed file InfoWatch.Crawler.Scanner.exe (default – C:\Program Files\InfoWatch\Crawler\Scanner for 32-bit systems and C:\Program Files (x86)\InfoWatch\Crawler\Scanner for 64-bit systems). See details in "Configuration File of Crawler Scanner".

Configuration files can be viewed and edited by any text or XML editor. File encoding is UTF-8.

5.2.1 Configuration File of Crawler Server

Administrator maintaining the system can perform some low-level settings of Crawler server Crawler in configuration file InfoWatch.Crawler.Server.exe.config. Configuration file is located in the same directory as executed file InfoWatch.Crawler.Server.exe (default - `C:\Program Files\InfoWatch\Crawler\Server` for 32-bit systems and `C:\Program Files (x86)\InfoWatch\Crawler\Server` for 64-bit systems).

The configuration file can be viewed and edited by any text or XML editor. File encoding is UTF-8.

Primary settings configuration is performed during Crawler installation (see “InfoWatch Traffic Monitor. Installation Guide” document).

Further the settings to change are described. Other settings are strongly recommended not to change.

- **Database connection string**. If settings of connection to the Oracle DB with used IWTM schema were changed, in `<connectionStrings>` section, `CrawlerEntities` setting, make corresponding changes in `connectionString` value.
- **Password of IWTM database schema owner's account**, used for connection to DB. If the password was changed, specify new password in `<appSettings>` section:

```
<add key="NewDbPassword" value="new_password" />
```

Then save modified file `InfoWatch.Crawler.Server.exe.config` and restart Crawler service. New password will be encoded and saved as a value of `DbPassword` setting. `NewDbPassword` setting will be reset.

> **Note:**
>
> If you need to change an account used for server start, then prior to first server service starting enter DB password to the `NewDbPassword` field as encoded password can be decoded only by user encoded it. See more details in "Changing Account Used for Crawler's Service Start ".

- **Numbers of ports used for scanner and TM Management Console to Crawler server**. Those parameters are specified in <userSettings> section, parameters ScannerPort and ConsolePort. Values are specified in the following manner:

```
<value>port_number</value>
```

Changing Account Used for Crawler Server's Service Start

To change account used for starting the Crawler server's service:

1. At the computer where Crawler server works, in the list of Windows services, find **iw_crawler_server** service and stop it.
2. In the server configuration file `InfoWatch.Crawler.Server.exe.config` (see details in "Configuration File of Crawler Server"), in `NewDbPassword` setting enter a password of IWTM schema owner account, used for database connection. Save modified configuration file.
3. Return to i**w_crawler_server** service and call it **Properties** (**Actions -> Properties** or select it in the context menu opening by right-click at the service string). At the **Log On** tab specify settings of account used for starting the Crawler server's service.
4. Run server's service.

SharePoint scanning scripts

Scanning SharePoint by network scanner is being performed through SQL-query to SharePoint database with preset parameters. In the new versions of scanner scripts can be changed.

By default scripts are located in folder `C:\Program Files (x86)\InfoWatch\Crawler\Server\SharePoint_scripts`.

To update scripts::

1. In folder `C:\Program Files (x86)\InfoWatch\Crawler\Server\SharePoint_scripts` replace the old scripts with new ones.
2. Restart **InfoWatch Crawler Server Service** service.

Note:

In case scanning scripts have been changed in-service and it is required to transfer changes to the new version:

1. Save changed scripts.
2. Perform System update.
3. In folder `C:\Program Files (x86)\InfoWatch\Crawler\Server\SharePoint_scripts` replace scripts with the those, which have been saved earlier.
4. Restart **InfoWatch Crawler Server Service** service.

5.2.2 Configuration File of Crawler Scanner

Crawler scanning service configuration file `InfoWatch.Crawler.Scanner.exe.config` is located in the same directory as `InfoWatch.Crawler.Scanner.exe` executable file (by default - `C:\Program Files \Infowatch\Crawler\Scanner\`).

Configuration file can be viewed and edited with the help of any text or XML-editor. UTF-8 encoding file.

If necessary, System admisintrator can change the following parameters:

Contents	Description

`<client>`
`<endpoint name="ScannerEndpoint"`
`binding="netTcpBinding"`
`bindingConfiguration="EncryptedBinding"`
`address="net.tcp://localhost:6556/Scanner"`
`contract="InfoWatch.Crawler.Contracts.Server.IScannerDispatcher"/>`
`</client>`
	Crawler server conection string. This parameter is specified in the following block. When changing Crawler server location, you can specify the neccessary **IP-address and server name** instead of specified localhost value.

`<setting name="SendEmptyFileToTm"`
`serializeAs="String">`
`<value>False</value>`
`</setting>`
	File transfer to database. This parameter is specified in the following block. If it is required for Crawler to synchronize hash with database, change `value` parameter to `True`. In this case zero-length files are to be transferred in Traffic Monitor.

`<setting name="SyncronizeHashes"`
`serializeAs="String">`
`<value>False</value>`
`</setting>`
	Synchronization of hash local base and database. This parameter is specified within the following block. If it is required for Crawler to synchronize hash with database, change `value` parameter to `True`.

`<setting name="ResolveSIDs"`
`serializeAs="String">`
`<value>True</value>`
`</setting>`
	SID Resolution. This parameter is specified in the following block. If it is required to disable SID resolution, change `value` parameter to `False`. In this regard the cap name occurs instead of sender and the recipient is unknown.

`<setting name="MaxRecipients" serializeAs="String"> <value>0</value> </setting>`	Limitation of maximum number of recipients. This parameter is specified in the following block. By default there's no limitation (`0` - is disabled).
`<setting name="UserLimitInExpandedGroup" serializeAs="String"> <value>0</value> </setting>`	Limitation of maximum number of recievers when disclosing the group. This parameter is specified in the following block. When the value is `0`, the groups cannot be disclosed.
`<setting name="LimitRunningTasksNumber" serializeAs="String"> <value>True</value> </setting>`	Flag, specifying if the number of Crawler tasks run at the same time should be limited. If the value is `True` - there's a limit, anf it's `False` - no limits.
`<setting name="MaxRunningTasksNumber" serializeAs="String"> <value>5</value> </setting`	Maximum permitted number of tasks run at the same time. It does function if the flag LimitRunningTasksNumber is set for True. In the case, when the number of the running tasks is equal to MaxRunningTasksNumber and the flag LimitRunningTasksNumber is set in True, the new tasks are not to be running.
`<setting name="ProcessSymLinkFolders" serializeAs="String"> <value>False</value> </setting>`	Processing the folders, that are the symbol links (symlinks). Once activated (true) the symlink paths are scanned, exceeding the maximum path length with no symlink.

To apply settings, restart scaner service in Control panel -> Administration -> Services.

It is highly not recommended to change other parameters.

5.2.3 Disabling Traffic Encryption between Components

If Crawler scanner and server are located in different domain or working groups, it is required disabling the **encrypted connection**.

1. Change the value of `bindingConfiguration` parameter within the configuration file of Crawler server part `InfoWatch.Crawler.Server.exe.config` with `EncryptedBinding` on `PlainBinding`:
   ```
   <system.serviceModel>
   <services>
   <service name="InfoWatch.Crawler.Server.ScannerDispatcher"
   behaviorConfiguration="CrawlerServerBehavior">
   <endpoint binding="netTcpBinding" address="net.tcp://0.0.0.0:6556/
   Scanner" bindingConfiguration="PlainBinding"
   contract="InfoWatch.Crawler.Contracts.Server.IScannerDispatchr"/>
   ```
2. Change the value of `bindingConfiguration` parameter within the configuration file of Crawler scanner `InfoWatch.Crawler.Scanner.exe.config` with `EncryptedBinding` on `PlainBinding`:
   ```
   <system.serviceModel>
   <client>
   ```

```
<endpoint name="ScannerEndpoint"
binding="netTcpBinding" bindingConfiguration="PlainBinding" address="net.tcp
://10.60.3.138:6556/Scanner"
contract="InfoWatch.Crawler.Contracts.Server.IScannerDispatcher"/>
```

3. Reset Crawler scanner and server services.

5.3 Crawler Log Files

The System administrator can receive information about operation of the scanner and the Crawler server from log files. Log files are located in the following directories: `C:\Program Files\Infowatch\Crawler\Scanner\Logs` and `C:\Program Files \Infowatch\Crawler\Server\Logs` for 32-bit systems, and `C:\Program Files (x86)\Infowatch\Crawler\Scanner\Logs` and `C:\Program Files (x86)\Infowatch\Crawler\Server\Logs` for 64-bit systems.

Configuring the logging level for Crawler

The logging level is configured in configuration files (see "Crawler Configuration Files").

The default logging level is `Error`. To change the logging level:

1. In `<specialSources>` section, for three `listeners` parameters, comment out the upper line and uncomment the bottom line;
2. In `switchValue` parameter, specify the necessary logging level.
   For example, All:
   ```
   <allEvents switchValue="All" name="All Events">
          <listeners>
           <!--<add name="Rolling Flat File Trace Listener"/>->
           <add name="Flat File Trace Listener" />
          </listeners>
   ```
   Logging levels (listed in order of reducing details): `All, Verbose, Information, Warning, Error, Critical, Off`.
3. Restart crawler service with standard tools of the operational system.

5.4 Automatic deletion of Crawler events

By default, the System removes objects that have no applied TM policy or protection objects. To save such objects, disable the removal setting:

1. Connect to TM server.
2. In `/opt/iw/tm5/etc/scripts/` catalogue, open the **iwssid.lua** configuration file.
3. To disable automatic removal of objects, change the `set_text ('true')` value to `set_text('false')`. The code should be as follows:
   ```
   function IWSSID_HookCrawler(root)
                  if root:xFind('/root/processing[count(postanalysis/
   *|policies/policy)>0]').count == 0
               then
                    -- RM: Do not remove objects with analysis errors

                    if root:xFind('//object/processing/messages/
   message[@module="cas"][@severity="fatal" or
   @severity="error"]').count == 0 then

   processing(root):find_or_add_child('delete_content'):set_text('false
   ```

```
');
            end
        end
    end
```

4. Save changes.
5. Restart **iw_luaengined** service:
   `iwtm restart luaengined`

6 Monitoring

InfoWatch Traffic Monitor Monitoring subsystem is implemented based on Nagios app that enables remote hosts & network services state monitoring.

Monitoring subsystem exercises the following functions:

- Monitoring operations of all servers (both physical and virtual) included in InfoWatch Traffic Monitor solution;
- Monitoring of all software components (OS, DBMS, DB, processes etc.) included in InfoWatch Traffic Monitor solution;
- Control of indicator values for each server and component. Here by control we mean regular retrieval of indicator value and comparing this indicator value to a threshold value;
- Enabling and disabling monitoring of specific indicators and servers;
- Sending email notifications when indicator values exceed the normal range.

The Monitoring subsystem is autoinstalled during InfoWatch Traffic Monitor server installation by the **kickstart** program. For more details on the installation see *«InfoWatch Traffic Monitor. Installation and Configuration Guide»* document.

If InfoWatch Traffic Monitor system is deployed in such a way that all the server components (both database server and TM servers) are located at one computer (**All-in-one**) or DB server (**DB server**) is installed separately from Traffic Monitor (**Node server**), then monitoring subsystem will function without any additional settings.

In the case of more than one Traffic Monitor (**Node server**), it is required to perform additional settings (see "Configuring indicators manually").

6.1 Monitoring Subsystem for Distributed Architecture

> **Warning!**
>
> If InfoWatch Traffic Monitor system is deployed in such a way that all the server components (both database server and TM servers) are located at one computer (**All-in-one**) or DB server (**DB server**) is installed separately from Traffic Monitor (**Node server**), then monitoring subsystem will function without any additional settings.

To perform a diagnostic of all servers included to the solution, system administrator should make some additional settings:

- Configuring Connection to Device Monitor;
- Configuring Indicators Manually;
- Configuring Addresses of Time Synchronization Server for Monitoring Subsystem;
- Configuring Threshold Value for Load Indicator;
- Configuring Notifications.

6.1.1 Configuring Connection to Device Monitor

To configure connection to Device Monitor server:

1. Edit **/etc/nagios/iwmon/iwmon-hosts-dm.cfg** file:

- Uncomment `host` and `hostgroup` sections.
- In `address` parameter of `host` section define host name or IP-address of Device Monitor server.

- In `/etc/nagios/iwmon/iwmon-services-dm.cfg` file uncomment `service` section.

- In `/etc/nagios/iwmon/iwmon-commands.cfg` file uncomment `Check Dm server` section.
- Restart nagios process:
  `service nagios restart`

6.1.2 Configuring Indicators Manually

Enabling and disabling indicators is being performed in the following file of the `/etc/nagios/iwmon` directory:

- iwmon-services-db-psql.cfg – Postgre SQL indicators configuration;
- iwmon-services-db.cfg – Oracle indicators configuration;
- iwmon-services-dm.cfg – Device Monitor indicators configuration;
- iwmon-services-loadavg.cfg – Server load parameters configuration (System load indicator);
- iwmon-services.cfg – main indicator configuration;
- iwmon-services-queue.cfg – queues indicators configuration;
- iwmon-services-traffic.cfg – subnets traffic indicator configuration;

The service_description parameter displays each indicator purpose.

To enable indicator, change `register` parameter value to `1`.

To enable indicator, change `register` parameter value to `0`.

To apply changes, restart nagios:

```
nagios service restart
```

6.1.3 Configuring Addresses of Time Synchronization Server for Monitoring Subsystem

To provide correct time synchronization, IP address of NTP server should be specified at every system server. You may use any exact time service utilizing NTP protocol and available from your network: both network equipment and Windows domain controllers.

To configure time synchronization at the server:

1. Open **iwmon-services-ntp.cfg** file for editing.
2. In the check command parameter replace default IP-address with the actual IP-address of NTP server (time synchronization server).

6.1.4 Configuring Threshold Value for Load Indicator

Adjust activation threshold values based on number of cores on Traffic Monitor Server in **/etc/nagios/iwmon/ iwmon-services-loadavg.cfg** file for Current Load indicator (service) that checks up values for load average on Traffic Monitor server.

For instance, for 4-core processor the threshold values should be specified as follows:

iwmon_check_load!10.0,8.0,6.0!20.0,16.0,12.0

Threshold values for a different number of cores are calculated proportionally.

6.1.5 Configuring Notifications

Monitoring subsystem enables sending email notifications where the current indicator value exceeds the threshold value.

In this section:

- Configuring Notifications on Indicators Threshold Exceeding;
- Configuring Sending Notification Mails via Postfix.

Configuring Notifications on Indicator Threshold Exceeding

To configure sending email notifications:

1. In the **/etc/nagios/private/resource-notify-iw.cfg** configuration file, specify a value of the `$USER10$` parameter: a Postfix server embedded in Traffic Monitor and the port being used. For example: :
   `$USER10$=localhost:25`
2. In the **/etc/nagios/iwmon/iwmon-contacts.cfg** configuration file, add contacts to send notifications to. For this, add the following section for each contact:

```
define contact{
        contact_name                    <contact name>
        use                             generic-contact
        alias                           Recipient Notification
        service_notification_commands   iw-notify-service-by-email
        host_notification_commands      iw-notify-host-by-email
        email                           <address>
        register                        1
}
```

> **Note:**
>
> In this section, you can also specify additional options for sending notifications such as sending time or events for which notifications should be sent. For more information, please refer to Nagios documentation.

3. In the `members` field of the same file, specify names of contacts to which notifications will be sent. Contacts are separated by commas:

```
define contactgroup{
        contactgroup_name           admins
        alias                       IW Nagios Notification Recipient
        members                     <contact name>, <contact name1>
}
```

4. Restart Nagios with the following command:
   `service nagios restart`

Notifications will contain the following information:

- Indicator name
- Name of the server where controlled indicator exceeds the threshold value
- IP address of this server
- Current status of the indicator
- Date and time when the indicator threshold value was exceeded
- System message from the source

To set up e-mail notifications sending only for selected indicators:

1. Go to the Nagios subsystem directory:
   `cd /etc/nagios/iwmon`
2. Open **iwmon-services.cfg** configuration file:
   `mcedit /etc/nagios/iwmon/iwmon-services.cfg:`
3. To identify the needed indicator, view the `service_description` field.
4. In the indicator section, set the `notifications_enabled` parameter to:

- 1 – to enable notifications sending;
- 0 – to disable notifications sending.

- Save changes.

> **Note:**
>
> If the `notifications_enabled` parameter is absent in the configuration file, it should be added manually.

Configuring Sending Notification Mails via Postfix

If the System has the following configuration:

- SMTP-messages are sent via Postfix (see "*InfoWatch Traffic Monitor. Installation Guide*", "*System Deployment Schemas and choosing installation type*" chapter)

and

- Monitoring subsystem is located on the same server as Postfix,

then for correct sending of notification emails you should:

1. In `/etc/postfix/transport` file add the following strings:
   `example@example.com smtp:[mailserver]`
   where `example@example.com` is an address to send emails to and `mailserver` is the name of company's mail server.
   A separate string should be specified for each recipient.
2. Run the command:
   `postmap /etc/postfix/transport`
3. Add `transport_maps` setting in the **/etc/postfix/main.cf** file:
   `transport_maps = hash:/etc/postfix/transport`
4. Restart Postfix:
   `service postfix restart`

7 Database Administration

This chapter contains information on administrating:

- Oracle
- PostgreSQL

DB statistics information is available in " DB statistics gathering" KB article.

7.1 Oracle

This chapter contains instructions on Oracle administration:

- Changing Preset Passwords
- Database Routinely Maintenance
- Tablespaces in InfoWatch Traffic Monitor database
- Managing Daily Tablespaces
- Database Backup

7.1.1 Changing Preset Passwords

To change preset passwords of the DB users:

1. Stop Traffic Monitor processes:
   `iwtm stop`
2. Connect to Oracle database:
   sqlplus iwtm@iwtm
3. Enter the preset password.
4. Get the list of users:
   `select * from dba_users;`
5. Change user passwords:
   `ALTER USER user IDENTIFIED BY password;`
   where `user` is the selected DB user, `password` is a new password for this user.
6. Exit Oracle DB:
   `exit`
7. Start Traffic Monitor processes:
   `iwtm start`

On how to change the preset password in Traffic Monitor, see "Changing the Preset Password".

7.1.2 Tablespaces in InfoWatch Traffic Monitor database

There are two types of tablespaces (TS) in InfoWatch Traffic Monitor database:

The type of tablespace	Purpose
Main	Storing the settings that are needed for the analysis and processing of the objects (configuration, tags, colors, etc.). Managing the System using the Management Console (roles, user accounts, etc.)

Daily	Storing objects, intercepted within one day. Storing information on the results of the analysis and processing of the objects (analyzed object categories, terms, etc.) Consists of three tablespaces: for storing objects with states *Violation*, *No Violations, Other (tablespace to save screenprints)*. Therefore the possibility of divided archiving, restoring, and deleting is acquired.

All data about the objects intercepted on a particular day are in the same daily TS. Daily tablespaces are created every day in such a way that the database always has TS for the next six days. The following name is automatically assigned for all daily TS:

- *IWTM_YYYY_MM_DD_N* – tablespace for the day, which contains objects without violations.
- *IWTM_YYYY_MM_DD_V* – tablespace for the day, which contains objects with violations.

Settings to manage data segments are defined when configuring database schema; however, they can be changed after the schema is created "Managing Daily Tablespaces").
Using installation type **TM Standard**, events are being saved in one tablespace. Automatic calculation of free space for future events with old events deletion takes place every week.

7.1.3 Managing Daily Tablespaces

This section covers:

- Configuring Location of Files within File System;
- Configuring Storage Modes for Tablespace Files;
- Archiving Daily Tablespaces;
- Restoring Daily Tablespaces;
- Deleting Daily Tablespaces.

Configuring Location of Files within File System

The daily tablespaces can be stored in the same directory or distributed to various directories on various disks.

The kickstart installation program (see "*InfoWatch Traffic Monitor. Installation Guide*") sets the usage of one daily tablespace located in `/u02/oradata/`.

> **Note:**
>
> For tablespace archives, the `/u02/arch` directory is used.

However at high loads, it is recommended to place daily TS on different I/O devices (LUN, physical drives) for sequential usage. For example, when 3 file systems are defined, data is located as follows:

First day – the daily tablespace is created in File system 1.

Second day – the daily tablespace is created in File system 2.

Third day – the daily tablespace is created in File system 3.

Fourth day – the daily tablespace is created in File system 1.

…

Distribution of daily TS files (number and locations) of daily TS files can be managed using scripts.

An example of the script to change the number of dedicated daily TS storage locations:

```
BEGIN
```

```
pkg_part.set_df_path_cnt('4');
COMMIT;
END;
/
```

> **Warning!**
>
> After changing the number of daily TS storage locations make sure to adjust (add/delete) their location paths.

An example of the script to change the location paths for daily TS:

```
BEGIN
pkg_part.set_df_path('/test1/', 1);
pkg_part.set_df_path('/test2/', 2);
pkg_part.set_df_path('/test3/', 3);
pkg_part.set_df_path('/test4/', 4);
COMMIT;
END;
/
```

> **Note:**
>
> It is advisable to add “/” symbol in the end whenever specifying the path.

An example of viewing daily TS content:

```
select a.tbs_name, a.service_code, power(10, trunc(log(10, a.text_size))) || '-' ||
power(10, trunc(log(10, a.text_size)) + 1) size_range,
count(1) cnt, sum(a.text_size) text_size
from
(
select t.tbs_name, o.service_code,
case
when length(o.text) > 0 then length(o.text)
else 1
end text_size
from object o
inner join object_source os on os.object_id = o.object_id
inner join tbs_list t on o.tbs_id = t.tbs_id
) a
group by a.tbs_name, a.service_code, power(10, trunc(log(10, a.text_size))) || '-' ||
power(10, trunc(log(10, a.text_size)) + 1)
order by 1, 2, 3
```

Service code definition is specified in **services.xml** file, which is located in `/opt/iw/tm5/etc/compendiums/` catalogue.

Note:

To receive intercepted objects volume analysis along with DB service information, use SQLDeveloper

Configuring Storage Modes for Tablespace Files

If during the installation, the System was configured to move data in the **Normal** mode, you can change the storage mode later.

You can use the **Fast/slow** mode (fast and slow drives). In this mode, data is saved to the fast partition and then, after a specified number of days is moved to slow partitions. To configure this mode:

1. Edit the `/etc/fstab` file to automatically mount a new partition to `/u03`:
   `/dev/sdd1 /u03/ ext4 defaults 1 2`
2. Create the "oradata" folder:
   `mkdir /u03/oradata` (where `/u03/oradata` is a path to the fast drive)
3. Change user:
   `chown -R oracle:oinstall /u03`
4. Log into the database:
   `su -oracle`
   `sqlplus iwtm@iwtm`
5. Specify the storage period on fast drives:
   `exec pkg_part.set_fast_days(7);`
6. Specify the path to the fast drive:
   `exec pkg_part.set_fast_path('/u02/oradata/',1);`
7. Specify the path to the slow drive:
   `exec pkg_part.set_fast_path('/u03/oradata/',1);`
8. Specify another path to the slow drive:
   `exec pkg_part.set_fast_path('/u04/oradata/',2);`
9. Change the mode to fast-slow drives:
   `exec pkg_part.set_filesys_type('fast/slow');`
10. Apply changes:
    `commit;`
11. Run the process of moving files:
    `exec iwtm.pkg_part.move_fast_tablespaces_to_slow();`

Note:

Few slow drives can be used in the System.

Warning!

Make sure the partitions paths you use are in accordance with the ones specified in the article.

Or you can use the **Rotate** storage mode (everyday rotation). In this mode, the System switches to the next partition daily or in case of the partition overflow. To configure this mode:

1. Mount the partition and make sure that it can be mounted automatically on reboot
2. Create the "oradata" folder:
   `mkdir /u03/oradata`

3. Change user:
   `chown -R oracle:oinstall /u03`
4. Log into the database:
   `su -oracle`
   `sqlplus iwtm@iwtm`
5. Add a path to the second partition:
   `exec pkg_part.set_df_path('/u03/oradata/',2);`
6. Specify a new number of paths:
   `exec pkg_part.set_df_path_cnt(2);`
7. Apply changes:
   `commit;`
8. Switch to the `rotate` mode:
   `exec pkg_part.set_filesys_type('rotate');`

```
SQL>exec * from setting where setting like 'df_path%';
setting | value | editable
------------+--------------+----------
df_path1 | /u02/oradata1/ | 1
df_path2 | /u03/oradata/ | 1
df_path_cnt | 2 | 1
df_filesys_type | rotate | 1
```

> **Note:**
>
> Specifics of data storage modes (**normal**, **fast/slow**, and **rotate**) are described in the KB article "Tablespaces data storage settings. Data storage partition").

Archiving Daily Tablespaces

To free some space on hard drive, you can periodically archive outdated data. It is recommended to place data archive on external devices. Data can be recovered when necessary.

> **Warning!**
>
> If the months or years are used as the time interval, it is recommended to use the maximum value of the interval in calculations. For a month - 31 days. For a year - 366 days. For example, to remove the daily TS older than 4 years specify the interval 366 * 4 = 1464 days in the IWTM_DELETE_TABLESPACES job

You can regularly archive obsolete data to free some space on a hard drive. We recommend you to save an archive with data to external data carrier. If necessary, you can restore the data.

The archiving can be performed:

- Automatically after the specified period is expired (see "Automatically Archiving of Daily Tablespaces");
- Manually – for archiving the selected daily tablespaces (see "Manual Archiving of Daily Tablespaces").

Automatic Archiving of Daily Tablespaces

Before strating automatic archiving, check, that archiving catalogue has been set properly:

```
select value from setting where setting = 'archive_path';
```

`Orcale` user should be an owner of the catalogue.

In case the catalogue has been set improperly, reset it with the following command:

```
begin
sp_setting_set('archive_path', '/u02/arch/');
commit;
end;
/
```

To perform TS archiving automatically (by default the function is disabled) you can use the following scripts (run under the account of the database schema owner):

- For daily TS storing objects with *Violation* status:

```
begin
sp_setting_set('violation_archive_enabled', 1);
sp_setting_set('violation_archive_period', D);
commit;
end;
/
```

- For daily TS storing objects with *NoViolation* status:

```
begin
sp_setting_set('noviolation_archive_enabled', 1);
sp_setting_set('noviolation_archive_period', D);
commit;
end;
/
```

- For daily TS storing *screenshots*:

```
begin
sp_setting_set('other_archive_enabled', 1);
sp_setting_set('other_archive_period', D);
commit;
end;
/
```

where:
1 – indicates that automatical deletion is enabled (to disable specify 0 instead);
D – is a number of days at the end of which the daily TS will be archived by the System. This number should be larger than the set number of days before archiving the daily tablespace ("Automatic Archiving of Daily Tablespaces").

Manual Archiving of Daily Tablespaces

Manual archiving of daily tablespaces is performed in the following steps:

Selecting daily tablespaces and data files

To get a list of disconnected tablespaces, you must run the following query to the database under the account of the database schema owner. The queries are built according to the archiving policy of your company. For example, to select the daily TS storing the objects which were intercepted more than 100 days ago, run the following query:

```
SELECT t.tbs_id, t.tbs_name, t.part_date

FROM tbs_list t

WHERE t.part_date<trunc(SYSDATE) - 100 + 23 / 24 AND t.status IN (0, 3)
```

> **Warning!**
>
> It is strongly recommended to run the following sample query in this section in order to retrieve the list of files. This is due to the fact that the file list if generated by any other ways may be incomplete.

In this case, the following query is created to select data files:

```
SELECT f.file_name

FROM dba_data_files f

WHERE f.tablespace_name in

(

  SELECT t.tbs_name

  FROM tbs_list t

  WHERE t.part_date<trunc(SYSDATE) - 100 + 23 / 24 AND t.status IN (0, 3)

)
```

where `t.status IN (0, 3)` indicates that the tablespaces with the *ReadWrite* (status code `0`) and *ReadOnly* (status code `3`) statuses are selected for archiving.

Disconnecting Daily Tablespaces from the Database

> **Warning!**
>
> It is strongly recommended not to disable daily TS when the IWTM_ADD_PARTS, IWTM_DELETE_TABLESPACES and IWTM_ARCHIVE_TABLESPACES jobs are running as it may cause the data loss.

1. Call the procedure on behalf of the owner of the database schema, call the procedure:
   ```
   begin
   IWTM.pkg_part.archive_tablespace(N);
   end;
   /
   ```
   where `N` is a value of tbs_id attribute of the target TS from the `tbs_list` table.
   After running this script status of daily TS will change to *Offline*.
2. Repeat the procedure call for each daily TS you want to disable.

Moving Datafiles

Transfer the data files belonging to the disabled daily TS to the other data carrier.

To get a list of data files for all disconnected tablespaces, use the following script:

`select tbs_name from tbs_list` where `NOTE = 'Tablespace is offline'`

where `tbs_name` is a name of a tablespace.

`tbs_list` is a name of a table.

Data files are stored in the catalogue:

```
select value from setting where setting = 'archive_path'.
```

Restoring Daily Tablespaces

> **Warning!**
>
> A tablespace can only be restored in the database schema, from which it was disconnected (even if this schema was updated). The restoration of the tablespace after total database schema reinstallation is impossible.

Moving data files

To restore daily TS, you must move data files of this tablespace from a data carrier to the folder which path you can obtain using the following command:

```
select value from setting where setting = 'archive_path';
```

> **Warning!**
>
> Make sure that the *oracle* user has reading and writing privileges for the directory to move the data files to.

Connecting the daily tablespace

> **Warning!**
>
> Do not connect daily TS during IWADDPARTS, IWTM_DELETE_TABLESPACES jobs. This may cause the data loss.

1. On behalf of the owner of the database schema, call the procedure:
   ```
   begin
   pkg_part.restore_tablespace(N);
   end;
   /
   ```
   where `N` is ID of the tablespace (specified in tbs_list).
   After procedure ending the status of TS will change to *Restored*.
2. Repeat the procedure call for each daily TS you want to enable.

Deleting Daily Tablespaces

If you do not need to further store the data, you can use the procedure for deleting daily TS (**IWTM_DELETE_TABLESPACES**). The procedure automatically deletes all the data in a tablespace, segments, and also the tablespace and data files.

Warning!

1. Deleting tablespaces cannot be undone. If you complete the operation, you will not be able to restore the deleted data.
2. After removal of the tablespaces disconnected from the database (with *Offline* status), the data files will be kept. To free space on your hard drive, delete these files manually.
3. IWTM_DELETE_TABLESPACES job cannot operate tablespaces which were disconnected/ connected manually

As a result, this procedure will remove all the daily tablespaces (including information about the archived daily tablespaces), which satisfy the following condition:

The date of creating a tablespace is less or equal to the difference between the current date and the specified time interval for deleting the tablespace.

Note:

If the archived daily tablespace cannot be restored (because the information in it was removed from the database), then you can delete data files of this tablespace from the archive.

Important!

While deleting tablespaces, access to the corresponding tables is closed. For this reason, log files of the **iw_deliver**, **iw_x2db**, **iw_updater** processes may contain database access errors. Once tablespaces are deleted, these processes automatically restore access to the database.

We recommend running a job to delete data daily. Otherwise, the amount of deleted data increases, which increases the time for running the procedure and consequently increases the idle time of the Traffic Monitor Server.

Warning!

If months or years are used as a time interval, then we recommend you to apply the maximal interval value in the counting: 31 days for a month and 366 days for a year. For example, to delete daily TS older than 4 years, specify 366*4=1464 days interval in the IWTM_DELETE_TABLESPACES job.

Setting the interval of daily TS deletion

To perform TS deletion automatically (by default the function is disabled) you can use the following scripts (run under the account of the database schema owner):

- For daily TS storing objects with *Violation* status:

```
begin
    sp_setting_set('violation_delete_enabled', 1);
    sp_setting_set('violation_delete_period', D);
  commit;
end;
/
```

- For daily TS storing objects with *No Violation* status:

```
begin
      sp_setting_set('noviolation_delete_enabled', 1);
      sp_setting_set('noviolation_delete_period', D);
  commit;
end;
/
```

- For daily TS storing *screenshots*:

```
begin
      sp_setting_set('other_delete_enabled', 1);
      sp_setting_set('other_delete_period', D);
  commit;
end;
/
```

where:

1 indicates that automatical deletion is enabled (to disable specify 0 instead);

D is a number of days at the end of which the daily TS will be deleted by the System. This number should be larger than the set number of days before archiving the daily tablespace (see "Automatic Archiving of Daily Tablespaces").

Scheduled deletion of daily tablespaces

By default, the automatic deletion of daily TS is disabled. To enable the deletion of daily TS according to schedule (every day at 00 h 30 min 00 s), run the following script under the account of the database schema owner:

```
BEGIN
      dbms_scheduler.enable('IWTM_DELETE_TABLESPACES ');
  COMMIT;
  END;
/
```

To disable procedure autorun, run the following script:

```
BEGIN
      dbms_scheduler.disable('IWTM_DELETE_TABLESPACES');
  COMMIT;
  END;
/
```

Deleting daily tablespaces manually

If you need an immediate launch of procedure for deletion of daily TS (e.g., due to file system space shortage the interval of deletion was changed, but the next launch of the job will not happen soon), run the script:

```
BEGIN
dbms_scheduler.run_job('IWTM_DELETE_TABLESPACES');
END;
/
```

Deleting daily tablespaces with a script

If you want to configure automatic deletion of daily tablespaces, use the **/opt/iw/tm5/bin/dbtools/dbconf-iwdrop-oracle.sh** script. You can use the following commands:

Purpose	Command
Set up deletion period	`/opt/iw/tm5/bin/dbconf-iwdrop-oracle.sh set violation|noviolation|other <days> [-v]`
Enable automatic deletion	`/opt/iw/tm5/bin/dbconf-iwdrop-oracle.sh enable violation|noviolation|other [-v]`
Disable automatic deletion	`/opt/iw/tm5/bin/dbconf-iwdrop-oracle.sh disable violation|noviolation|other [-v]`
View the state of settings	`/opt/iw/tm5/bin/dbconf-iwdrop-oracle.sh show [-v]`

Example:

To delete all objects with *"No violation"* status, which are older than 15 days, run the following commands:

```
/opt/iw/tm5/bin/dbconf-iwdrop-oracle.sh set noviolation 15 [-v]
/opt/iw/tm5/bin/dbconf-iwdrop-oracle.sh enable noviolation [-v]
```

Deleting archived tablespaces manually

When deleting archived daily tablespaces from the database, datafiles remain in the System (by default, they are stored in the `/u02/arch` directory). To free up hard disk space, you should manually add new scheduled jobs in the `/etc/cron.d/iwtm_error_queue` file.

Example:

To delete all archived daily tablespaces that are older than 150 days:

1. Open the `/etc/cron.d/iwtm_error_queue` file for editing.
2. Add lines:
   ```
   35 3 * * * root find /u02/arch/ -type f -mtime +150 -delete > /dev/null 2>&1 &
   40 3 * * * root find /u02/arch/ -type d -ctime +10 -empty -delete > /dev/null 2>&1 &
   ```
3. Save changes.
4. Apply new settings of the `cron` service: `service crond reload`

7.1.4 Database Backup

To minimize the risk of data loss we strongly recommend to backup the database on a monthly basis. We recommend you to use dedicated storage system for backups storage.

Experienced Oracle database administrators can perform a backup at the running database (“hot backup”) using Oracle-recommended RMAN program (see Oracle documentation), previously taken the Oracle database to ARCHIVELOG mode.

For non-database administrators who do not have standard backuping methods we recommend creating a “cold backup” at the stopped database. This procedure may also be used to migrate the database from one server to another.

This section further covers:

- Creating Database Backup;
- Restoring the Database from the Backup.

Creating Database Backup

Creating database backup (cold backup procedure) is performed in the following order:

- Defining the Size of Backup;
- Checking the Backup Storage;
- Creating Backup Directories;
- Creating Recovery Aid Files;
- Collecting a List of Files to Backup;
- Stopping IWTM System;
- Stopping Oracle Database;
- Copying database Files to the Backup Storage.

Defining the Size of Backup

To define the backup size:

1. Log the computer that hosts database, as **oracle** user.
2. Open Oracle SQL*Plus and log as **sysdba**:
   `OS> sqlplus / as sysdba`
3. If the system was installed using kickstart, you can use **wsqlplus** command.

   > **Note:**
   >
   > `wsqlplus` command is an alias of `sqlplus` command:
   > `alias wsqlplus='rlwrap -b "" -f ~/sql.dict sqlplus'`

   Wait until the connection is established - you will receive **Connected** message.
4. Copy (or enter) the following SQL query to the command prompt:
   ```
   SQL> SELECT ROUND(SUM(bytes)/1024/1024/1024,4) GB FROM ( SELECT SUM(bytes)
   bytes FROM dba_data_files union SELECT SUM(bytes) bytes FROM dba_temp_files
   union SELECT SUM(bytes) bytes FROM v$log);
   ```
5. Write down the received database size.
6. Exit Oracle SQL*Plus:
   `SQL> exit`

Checking the Backup Storage

Check your backup storage. It should confirm the following requirements:

- Located outside the computer where database is running.
- Available from the computer where backuping servers and database are located.
- Free space at the hard disk is bigger than backup size.

To define the hard disk free space

Run the command as **root**:

```
OS> df -h
```

Make sure this number is bigger than database size.

Creating Backup Directories

> **Warning!**
>
> Backup directories should be located at computer other than the database is located.

1. Log the system as **root** user.
2. Create the directory for backup files storage:
   ```
   OS> mkdir /opt/IWTM_Backup_Files
   ```
3. Create subdirectories:
   ```
   OS> mkdir /opt/IWTM_Backup_Files/Oradata
   OS> mkdir /opt/IWTM_Backup_Files/IWTM
   OS> mkdir /opt/IWTM_Backup_Files/Recovery_Aid
   ```
4. Grant permissions to these directories to the **oracle** user:
   ```
   OS> chmod 777 /opt/IWTM_Backup_Files/ -R
   ```

Creating Recovery Aid Files

To provide database restoring, besides data files, you need recovery aid files: a **trace** file of the control file and a copy of the **init.ora** file.

The **trace** file of the control file contains the names and locations of all of the data files and additional data files that have been added to the database. It also contains the redo logs and the commands that can be used to recreate the database structure.

The **init.ora** file contains Oracle initializing parameters, including the names and locations of the database control files.

To create trace file of the control file, spfile file and to backup them:

1. Log on to the computer that hosts the Oracle database as the **oracle** user.
2. Open Oracle SQL*Plus and log as **sysdba** user:
   ```
   OS> sqlplus / as sysdba
   ```
   If the system was installed using kickstart, you can use **wsqlplus** command.

> **Note:**
>
> `wsqlplus` command is an alias of `sqlplus`:
> `alias wsqlplus='rlwrap -b "" -f ~/sql.dict sqlplus'`

Wait for **Connected** message.

3. Copy (or enter) the following SQL queue to the command prompt:
   `SQL> alter database backup controlfile to trace;`
4. To find the directory in which the trace file was created, enter:
   `SQL> show parameter user_dump;`
   At that folder you can find **trc** file and **alert_iwtm.log** file (alert_INSTANCE_NAME). At log file you can find the name of the trace file which was created.
   Exit Oracle SQL*Plus:
   `SQL> exit`
5. If the system was installed using kickstart and default parameters were left, you can check last **alert_iwtm.log** records by the following command:
   `OS> tail -f /u01/app/oracle/diag/rdbms/iwtm/iwtm/trace/alert_iwtm.log`
   Press CTRL+C to exit view.
6. Create a copy of **spfile** (**pfile**):
   `OS> sqlplus / as sysdba`
   `SQL> CREATE PFILE from SPFILE;`
7. To find the directory in which the pfile file was created, enter:
   `SQL> show parameter PFILE`
   It returns a path to the directory where pfile was created (/u01/app/oracle/product/db_1/dbs/ by default).
   In this folder the **initiwtm.ora** file is located too. Please create a backup for **initiwtm.ora** file.
   Exit Oracle SQL*Plus:
   `SQL> exit`
8. Copy trace and spfile files to the backup storage, to previously created `/opt/IWTM_Backup_Files/Recovery_Aid` subdirectory.
9. Be sure to copy the file with the most recent date and timestamp. To check the date and the timestamps of the files in the directory, enter:
   `OS> ll`
10. Rename the file so that it can be easily identified, for example:
    `controlfilebackupMMDDYY.trc`

Collecting a List of Files to Backup

You can create a list of files that need to be backed up. These lists are used in a later step.

1. Log on to the computer that hosts the Oracle database as the **oracle** user.
2. Open Oracle SQL*Plus and log as **sysdba** user:
   OS> sqlplus / as sysdba
   Wait for **Connected** message.
3. Create the list of directories to backup using following SQL commands:
   `SQL> SELECT file_name FROM dba_data_files UNION SELECT file_name FROM dba_temp_files UNION SELECT name FROM v$controlfile union select member name from v$logfile;`
   The output is like:

```
/u01/app/oracle/fast_recovery_area/iwtm/control02.ctl
/u01/app/oracle/oradata/iwtm/control01.ctl
/u01/app/oracle/oradata/iwtm/redo01.log
/u01/app/oracle/oradata/iwtm/redo02.log
/u01/app/oracle/oradata/iwtm/redo03.log
/u01/app/oracle/oradata/iwtm/redo04.log
/u01/app/oracle/oradata/iwtm/redo05.log
/u01/app/oracle/oradata/iwtm/redo06.log
/u01/app/oracle/oradata/iwtm/redo07.log
/u01/app/oracle/oradata/iwtm/redo08.log
/u01/app/oracle/oradata/iwtm/redo09.log
/u01/app/oracle/oradata/iwtm/redo10.log
/u01/app/oracle/oradata/iwtm/redo11.log
/u01/app/oracle/oradata/iwtm/redo12.log
/u01/app/oracle/oradata/iwtm/redo13.log
/u01/app/oracle/oradata/iwtm/sysaux01.dbf
/u01/app/oracle/oradata/iwtm/system01.dbf
/u01/app/oracle/oradata/iwtm/temp01.dbf
/u01/app/oracle/oradata/iwtm/undotbs01.dbf
/u01/app/oracle/oradata/iwtm/users01.dbf
/u02/oradata/IWTM_2012_06_25_1.dbf
/u02/oradata/IWTM_2012_06_26_1.dbf
/u02/oradata/IWTM_2012_06_27_1.dbf
/u02/oradata/IWTM_2012_06_28_1.dbf
/u02/oradata/IWTM_2012_06_29_1.dbf
/u02/oradata/IWTM_2012_06_30_1.dbf
/u02/oradata/IWTM_2012_07_01_1.dbf
/u02/oradata/IWTM_2012_07_02_1.dbf
/u02/oradata/IWTM_2012_07_03_1.dbf
/u02/oradata/IWTM_2012_07_04_1.dbf
/u02/oradata/iwtm_1.dbf
```

4. Exit Oracle SQL*Plus:
   ```
   SQL> exit
   ```

Stopping IWTM System

Stopping IWTM system is not required but recommend doing this if there is little free space on IWTM server.

To stop IWTM system:

1. On the computer that hosts IWTM services, log in as **root**.
2. Stop all running Traffic Monitor Server services:
   ```
   iwtm stop
   ```
3. You can start services later (when backup is finished) using the following command:
   ```
   iwtm start
   ```

Stopping Oracle Database

> **Waning!**
>
> Please stop ORACLE database before backuping database files.

To stop Oracle database:

1. On the computer that hosts the database, log on as the ***oracle*** user.
2. In the command prompt, enter:
   `OS> dbshut $ORACLE_HOME`
3. You can start services later (when backuping finished) using the following command:
   `OS> dbstart $ORACLE_HOME`

Copying Database Files to Backup Storage

1. Stop all Oracle services (see "Stopping Oracle Database"). To make sure that all services are stopped, run the following command:
   `ps aux | grep ora`
   If Oracle services are not stopped, backup files can be damaged and unsuitable for recovery.
2. On the computer that hosts the database, copy directories (and their content) using previously created directories list (see "Collecting a List of Files to Backup").
   If the system was installed using kickstart and default parameters were left, the path should be as follows:
   a. copy contents of **/u01/app/oracle/oradata/iwtm/** directory to **/opt/IWTM_Backup_Files/IWTM** directory
   b. copy contents of **/u02/oradata/** directory to **/opt/IWTM_Backup_Files/Oradata** directory

   > **Note:**
   >
   > Only the following file storages can be used:
   > - an external drive with Ext4 or XFS file system
   > - a remote block device connected via iSCSI or NFS protocol
   > - a locally connected block device with Ext4 or XFS file system

3. From the computer that hosts database, copy **/u01/app/oracle/product/db_1/dbs/orapwiwtm** file to **/opt/IWTM_Backup_Files/Recovery_Aid** directory of the computer where backup files are located.

Restoring the Database from the Backup

Considering the reason of your database fail, choose appropriate recovering database procedure:

- If the database was damaged due to system failure or user fault, restore old database. For example, if any essential file was occasionally deleted, you can restore the database to the state when this file existed: see "Restoring at the Same Database".

- If old database cannot be used any more, create a new one and recover data there: see "Restoring at the New Database".

Restoring at the Same Database

This is the procedure of restoring to the database that has the same directory structure as the one the backup was created at.

To restore the database by creating a new one:

1. Make sure the database environment is healthy. Check the existing database, the database server that hosts the existing database, and the computer that hosts the database server.
2. Stop database:
   ```
   OS> dbshut $ORACLE_HOME
   ```
3. Install Oracle database according to «*InfoWatch Traffic Monitor. Installation Guide*» document.
4. Perform the following tasks:
   a. Delete all content of **/u02/oradata/, /u02/oradata1/** and **/u01/app/oracle/oradata/iwtm/** directories
   b. Copy the content of **/opt/IWTM_Backup_Files/Oradata/** directory to **/u02/** directory
   c. Copy the content of **/opt/IWTM_Backup_Files/IWTM/** directory to **/u01/app/oracle/oradata/iwtm/** directory
   d. Rename **control01.ctl** file located in **/opt/IWTM_Backup_Files/IWTM/** directory to **control02.ctl** and copy it to **/u01/app/oracle/oradata/iwtm/** directory
   e. Check permissions.
5. Change them if necessary:
   ```
   OS> chown -R oracle:oinstall /u02/
   OS> chown -R oracle:oinstall /u01/app/oracle/oradata/iwtm/
   ```
6. Start database:
   ```
   OS> dbstart $ORACLE_HOME
   ```

Restoring at the New Database

If the drive structure of the new database differs from the drive structure of the old database, perform the following actions:

1. Edit the **initiwtm.ora** file in the **/opt/IWTM_Backup_Files/Recovery_Aid** directory to reflect the drive structure of the new database.
2. Copy the edited **initiwtm.ora** file to the **$ORACLE_HOME/dbs** directory on the computer that hosts the new database.
3. Log on to the computer that hosts the Oracle database as the **oracle** user.
4. Open Oracle SQL*Plus and connect as the **sysdba** user:
   ```
   OS> sqlplus / as sysdba
   ```
5. Generate spfile
   ```
   SQL> create spfile from pfile;
   ```
6. If you need to rename some files, you can use the following script:
   ```
   OS> sqlplus / as sysdba
   SQL> startup mount
   SQL> alter database rename file '/<path_to_proddb_files>/<filename1>' to '/
   <path_to_clonedb_files>/<filename1>';
   …
   SQL> alter database rename file '/<path_to_proddb_files>/<filenameN>' to '/
   <path_to_clonedb_files>/<filenameN>';
   ```

```
SQL> shutdown immediate
```
Here `path_to_proddb_files` is a path to the directory where new database files are located (to where backup is restoring), and `path_to_clonedb_files` is a path to the directory where backup files are located.

7.1.5 Database Routinely Maintenance

> **Warning!**
>
> Do not power DB server off with power button: in certain cases this may cause the DB corruption.

When doing routine database maintenance, you should follow the established order:

1. Close all instances of the Management Console. Make sure that all connections of other programs to DB Traffic Monitor schema are closed; if there're any active connections, disable them.
2. Stop all TM processes on Traffic Monitor server:
   ```
   iwtm stop
   service php-fpm stop
   service nginx stop
   ```
3. Retrieve list of scheduled jobs from database server. For thisб run the following query in sqlplus using schema owner account:
   ```
   select JOB_NAME, STATE
   from user_scheduler_jobs u
   where u.enabled = 'TRUE'
   ```
4. Disable jobs by running the following script:
   ```
   BEGIN
   dbms_scheduler.disable('JOB_1',true);
   …
   dbms_scheduler.disable('JOB_N',true);
   COMMIT;
   END;
   /
   ```
   where `JOB_1… JOB_N` are the names of tasks to disable.
5. To make sure that none of these jobs is running run the following query:
   ```
   SELECT job_name
   FROM user_scheduler_running_jobs
   A list of active jobs displays. If any of the jobs is running you may run
   the query to stop it:
   BEGIN
   dbms_scheduler.stop_job('job_name');
   COMMIT;
   END;
   /
   ```
6. To prevent hanging on, stop Device Monitor server:
   ```
   net stop iwdms
   ```
7. Make all the necessary operations with the database.
8. After all required operations are made check connection to database server from Traffic Monitor server:
   ```
   sqlplus db_login/db_password@tns_name
   ```
   Here `db_login` and `db_password` are the name and password of the database schema owner,

and `tns_name` is the name of TNS service.
If the test is successful, the following SQL *Plus prompt will be displayed in response to the command:
SQL>

9. Run Device Monitor server:
   ```
   net start iwdms
   ```
10. Run the processes of the Traffic Monitor server:
    ```
    iwtm stop
    service php-fpm stop
    service nginx stop
    ```
11. Check if the system log contains errors. The path to the system log:
    ```
    /var/log/messages
    ```
12. If the system log contains any error messages, consult technical support service.
13. Enable running previously disabled jobs:
    ```
    BEGIN
    dbms_scheduler.enable('JOB_1',true);
    …
    dbms_scheduler.enable('JOB_N',true);
    COMMIT;
    END;
    /
    ```
    where `JOB_1… JOB_N` are the names of previously stopped jobs.

7.2 PostgreSQL

To connect to DB server from Traffic Monitor server terminal, use the following commands:

```
su - iwtm
psql -p 5433 -h <DB_server_IP_address> postgres iwtm
psql -p 5433 -h 127.0.0.1 postgres iwtm
```
- to connect local database

To connect to DB from workstations running Windows, use pgAdmin program.

Connection information is located in **/opt/iw/tm5/csw/postgres/database.conf** configuration file.

This chapter contains instructions on aministration PostgreSQL:

- Database Server Routinely Maintenance
- Tablespaces in InfoWatch Traffic Monitor Database;
- Managing Daily Tablespaces;
- Database backup.

7.2.1 Changing Preset Passwords

To change preset passwords of the DB users:

1. Stop Traffic Monitor processes:
   `iwtm stop`
2. Connect to PostgreSQL database:
   `psql postgres iwtm`
3. Get the list of users:
   `\du`
4. Change user passwords:
   `alter user 'iw_user' with password 'new_password';`
   where `'iw_user'` is the selected DB user and `'new_password'` is a new password for this user.
5. Exit PostgreSQL DB:
   `\q`
6. Start Traffic Monitor processes:
   `iwtm start`

On how to change the preset password in Traffic Monitor, see "Changing the Preset Password".

7.2.2 Tablespaces in InfoWatch Traffic Monitor database

There are two types of tablespaces (TS) in InfoWatch Traffic Monitor database:

The type of tablespace	Purpose
Main	Storing the settings that are needed for the analysis and processing of the objects (configuration, tags, colors, etc.). Managing the System using the Management Console (roles, user accounts, etc.)
Daily	Storing objects, intercepted within one day. Storing information on the results of the analysis and processing of the objects (analyzed object categories, terms, etc.) Consists of three tablespaces: for storing objects with states *Violation*, *No Violations, Other (tablespace to save screenprints)*. Therefore the possibility of divided archiving, restoring, and deleting is acquired.

All data about the objects intercepted on a particular day are in the same daily TS. Daily tablespaces are created every day in such a way that the database always has TS for the next six days. The following name is automatically assigned to all daily tablespaces: *IWTM_X*, where *X* table)

Settings to manage data segments are defined when configuring database schema; however, they can be changed after the schema is created (see "Managing Daily Tablespaces").

Using installation **TM Standard** type, events are being saved in one tablespace. Automatic calculation of free space for future events with old events deletion takes place every week.

7.2.3 Managing Daily Tablespaces

In this chapter:

- Archiving Daily Tablespaces;
- Configuring Storage Modes for Tablespace Files;
- Restoring Daily Tablespaces;
- Configuring Location of Files in File System;
- Deleting Daily Tablespaces.

Archiving Daily Tablespaces

To free some space on a hard drive, you can periodically archive outdated data. We recommend placing data archive on external devices. Data can be recovered when necessary.

> **Warning!**
>
> If the months or years are used as the time interval, it is recommended to use the maximum value of the interval in calculations. For a month - 31 days. For a year - 366 days. For example, to remove the daily TS older than 4 years specify the interval 366 * 4 = 1464 days in the iwtm_iwtm_archive_tablespaces job.

You can regularly archive obsolete data to free some space on a hard drive. We recommend you to save an archive with data to an external data carrier. If necessary, you can restore the data.

The archiving can be performed:

- Automatically after the specified period is expired (see "Automatic Archiving of Daily Tablespaces");
- Manually – for archiving the selected daily tablespaces (see "Manual Archiving of Daily Tablespaces ").

Automatic Archiving of Daily Tablespaces

Before you enable automatic archiving, check that the archive directory is specified correctly:

```
select value
from setting
where setting = 'archive_path';
```

A `postgre` user must be the owner of the directory.

If the directory is specified incorrectly, then set it properly with the following command:

```
begin;
select sp_setting_set('archive_path', '/test/archive/');
commit;
```

If enable automatic archiving of tablespaces (by default, the option is disabled), you can use the following scripts (you should run scripts on behalf of the owner of the database schema):

- For the daily tablespace that stores objects with *Violation* status:
  ```
  begin;
  select sp_setting_set('violation_archive_enabled', '1');
  select sp_setting_set('violation_archive_period', 'D');
  commit;
  ```
- For the daily tablespace that stores objects with *No Violation* status:
  ```
  begin;
  ```

```
select sp_setting_set('noviolation_archive_enabled', '1');
select sp_setting_set('noviolation_archive_period', 'D');
commit;
```

- For the daily tablespace that stores *screenshots*:
```
begin;
select sp_setting_set('other_archive_enabled', '1');
select sp_setting_set('other_archive_period', 'D');
commit;
```

where:
1 indicates that automatical deletion is enabled (to disable it, specify 0 instead);
D is a number of days after which the daily tablespace is archived by the System. This number should be larger than the set number of days before archiving the daily tablespace (see "Automatic Archiving of Daily Tablespaces").

Manual Archiving of Daily Tablespaces

You can archive daily tablespaces manually. The order is described below.

Selecting daily tablespaces and data files

You can get a list of tablespaces that can be disconnected by running queries to the database on behalf of the database schema owner. The queries are made according to the archiving policy of your company.

Example. To select daily tablespaces with basic attributes (name, identifier, path, types, creation date, size), you can use the following query:

```
SELECT t.tbs_name, t.tbs_id, t.tbs_type, t.part_date, pg_tablespace_location(oid),
pg_size_pretty(pg_tablespace_size(spcname)), t.status, t.note
FROM  pg_tablespace, iwtm.tbs_list t
WHERE t.tbs_name = pg_tablespace.spcname AND t.status IN (0, 3);
```

```
tbs_name | tbs_id | tbs_type | part_date  | pg_tablespace_location |
pg_size_pretty | status |        note
----------+--------+----------+------------+-----------------------
+----------------+--------+--------------------
 iwtm_2   |      2 |        1 | 2017-03-30 | /u02/pgdata/iwtm_2     | 692
kB          |      0 | Partitions created
 iwtm_3   |      3 |        2 | 2017-03-30 | /u02/pgdata/iwtm_3     | 692
kB          |      0 | Partitions created
 iwtm_4   |      4 |        0 | 2017-03-31 | /u02/pgdata/iwtm_4     | 25
MB          |      0 | Partitions created
 iwtm_5   |      5 |        1 | 2017-03-31 | /u02/pgdata/iwtm_5     | 692
kB          |      0 | Partitions created
 iwtm_6   |      6 |        2 | 2017-03-31 | /u02/pgdata/iwtm_6     | 692
kB          |      0 | Partitions created
 iwtm_7   |      7 |        0 | 2017-04-01 | /u02/pgdata/iwtm_7     | 692
kB          |      0 | Partitions created
 iwtm_8   |      8 |        1 | 2017-04-01 | /u02/pgdata/iwtm_8     | 692
kB          |      0 | Partitions created
 iwtm_9   |      9 |        2 | 2017-04-01 | /u02/pgdata/iwtm_9     | 692
kB          |      0 | Partitions created
```

> **Warning!**
>
> To get the list of files, we highly recommend using the sample query described in the article. If you use a different query, the list of files may be incomplete.

Disconnecting Daily Tablespaces from the Database

> **Warning!**
>
> You should not disconnect daily tablespaces when the iwtm_iwtm_add_parts, iwtm_iwtm_delete_tablespaces, iwtm_iwtm_archive_tablespaces jobs are running as it may cause data corruption.

1. Call the procedure on behalf of the owner of the database schema:
   `select pkg_part_archive_tablespace(N);`
   where `N` is a value of `tbs_id` attribute of the required tablespace from the `tbs_list` table.
   After running this script, the daily tablespace status will change to *`Offline`*.
2. Repeat the procedure call for each daily tablespace you want to disconnect.

Moving Data Files

Move catalogs with archived tablespaces which belong disconnected daily tablespaces to a different storage.

To get the list of disconnected tablespaces, use the following command:
`select * from tbs_list where status = 10;`
Data files are located in the directory:
`select value from setting where setting = 'archive_path';`

Restoring Daily Tablespaces

> **Warning!**
>
> A tablespace can only be restored in the database schema, from which it was disconnected (even if this schema was updated). The restoration of the tablespace after total database schema reinstallation is impossible.

Moving data files

To restore daily TS, you must move data files of this tablespace from a data carrier to the folder which path you can obtain using the following command:

```
select value from setting where setting = 'archive_path'
```

> **Warning!**
>
> Make sure that the *postgres* user has read and write privileges for the directory to move the data files to.

Connecting the daily tablespace

Warning!

Do not connect daily TS during iwtm_iwtm_add_parts, iwtm_iwtm_delete_tablespaces and iwtm_iwtm_archive_tablespaces jobs. This may cause data loss.

1. On behalf of the owner of the database schema, call the procedure:
   `select pkg_part_restore_tablespace(N);`
   where `N` is ID of the tablespace (specified in tbs_list).
   After completing the procedure, the status of TS will change to *Restored*.
2. Repeat the procedure call for each daily TS you want to enable.

Configuring Location of Files in File System

Daily tablespaces can be stored either in the same directory or in various directories on various disks.

The kickstart installation program (see "*InfoWatch Traffic Monitor. Installation Guide*" document) sets the usage of one daily tablespaces directory located in `/u02/pgdata1`.

Note:

For tablespace archives, the `/u02/arch` directory is used.

However, at high loads, we recommend storing daily tablespaces distributedly in different files systems (LUN, physical drives) for sequential usage. For example, if three file systems are defined, data is located as follows:

The first day – a daily tablespace is created in File system 1.

The second day – a daily tablespace is created in File system 2.

The third day – a daily tablespace is created in File system 3.

The fourth day – a daily tablespace is created in File system 1.

…

You can change the distribution of daily tablespace files (number and location) using scripts.

A sample script to change the number of separate storages for daily tablespaces:

```
begin;
select pkg_part_set_df_path_cnt('4');
commit;
```

Warning!

If you change the number of storages for daily tablespaces, you should also edit (add/delete) their paths.

A sample script to change paths for daily tablespaces:

```
begin;
select pkg_part_set_df_path('/test1/', 1);
select pkg_part_set_df_path('/test2/', 2);
select pkg_part_set_df_path('/test3/', 3);
```

```
select pkg_part_set_df_path('/test4/', 4);
commit;
```

> **Note:**
> We recommend adding “/” character at the end of the path.

A sample script to view contents of daily tablespaces:

```
select a.d, a.code, power(10, trunc(log(10, a.binary_size + a.text_size))) || '-' ||
power(10, trunc(log(10, a.binary_size + a.text_size)) + 1) size_range,
count(1) cnt, sum(a.binary_size) binary_size, sum(a.text_size) text_size
from
(
select date_trunc('day', o.capture_date) d, s.display_name code, o.object_id,
coalesce(length(os.source),0)+coalesce(length(os.context),0)+
coalesce(length(o.gui_xml),0)+coalesce(length(o.preview_data),0) binary_size,
coalesce(length(o.text), 0) text_size
from object o
inner join service s on o.service_code = s.service_id and s.language = 'eng'
inner join object_source os on os.object_id = o.object_id
where o.capture_date between to_date('05.05.2014', 'dd.mm.yyyy') and
to_date('14.05.2014', 'dd.mm.yyyy')
) a
group by a.d, a.code, power(10, trunc(log(10, a.binary_size + a.text_size))) || '-' ||
  power(10, trunc(log(10, a.binary_size + a.text_size)) + 1)
order by 1, 2, 3;
```

> **Note:**
> If, along with the service information of the database, you need to retrieve the result of analyzing the size of intercepted objects in daily tablespaces, we recommend using pgAdmin.

Configuring Storage Modes for Tablespace Files

If during the installation, the System was configured to move data in the **Normal** mode, you can change the storage mode later.

You can use the **Fast/slow** mode (fast and slow drives). In this mode, data is saved to the fast partition and then, after a specified number of days is moved to slow partitions. To configure this mode:

1. Edit the `/etc/fstab` file to automatically mount a new partition to `/u03`
   `/dev/sdd1 /u03/ ext4 defaults 1 2`

2. Create the "pgdata" folder:
   `mkdir /u03/pgdata`
3. Change user:
   `chown -R postgres:postgres /u03`
4. Log into the database:
   `su - iwtm`
   `psql -p 5433 -h <DB_server_IP_address> postgres iwtm`
   `psql -p 5433 -h 127.0.0.1 postgres iwtm` - to connect local database
5. Specify the storage period on fast drives:
   select pkg_part_set_fast_days(7);
6. Specify the path to the fast drive:
   `select pkg_part_set_fast_path('/u02/pgdata/',1);`
7. Specify the path to the slow drive:
   `select pkg_part_set_df_path('/u03/pgdata/',1);`
8. Specify the second path to the slow drive:
   `select pkg_part_set_df_path('/u04/pgdata/',2);`
9. Change the mode to fast-slow drives:
   `select pkg_part_set_filesys_type('fast/slow');`
10. Run the process of moving files:
    `select iwtm.pkg_part_move_fast_tablespaces_to_slow();`

Or you can use the **Rotate** storage mode (everyday rotation). In this mode, the System switches to the next partition daily or in case of the partition overflow. To configure this mode:

1. Mount the partition and make sure that it can be mounted automatically on reboot
2. Create the "pgdata" folder:
   `mkdir /u03/pgdata`
3. Change user:
   `chown -R postgres:postgres /u03`
4. Log into the database:
   `su - iwtm`
   `psql -p 5433 -h <DB_server_IP_address> postgres iwtm`
   `psql -p 5433 -h 127.0.0.1 postgres iwtm` - to connect local database
5. Add a path to the second partition:
   `select pkg_part_set_df_path('/u03/pgdata/',2);`
6. Specify a new number of paths:
   `select pkg_part_set_df_path_cnt(2);`
7. Switch to the `rotate` mode:
   `select pkg_part_set_filesys_type('rotate');`

```
postgres=# select * from setting where setting like 'df_%';
setting | value | editable
-------------+---------------+----------
df_path1 | /u02/pgdata1/ | 1
df_path2 | /u03/pgdata/ | 1
df_path_cnt | 2 | 1
df_filesys_type | rotate | 1
```

Note:

Specifics of data storage modes (**normal**, **fast/slow**, and **rotate**) are described in the KB article "Tablespaces data storage settings. Data storage partition".

Deleting Daily Tablespaces

If you do not need to further store the data, you can use the procedure for deleting daily tablespaces (iwtm_iwtm_delete_tablespaces). The procedure automatically deletes all the data in a tablespace, segments, and also the tablespace and data files.

Warning!

1. Deleting tablespaces cannot be undone. If you complete the operation, you will not be able to restore the deleted data.
2. After removal of the tablespaces disconnected from the database (with *Offline* status), the data files will be kept. To free space on your hard drive, delete these files manually.
3. iwtm_iwtm_delete_tablespaces job cannot operate tablespaces which were disconnected/connected manually

As a result, this procedure will remove all the daily tablespaces (including information about the archived daily tablespaces), which satisfy the following condition:

The date of creating a tablespace is less or equal to the difference between the current date and the specified time interval for deleting the tablespace.

Note:

If the archived daily tablespace cannot be restored (because the information in it was removed from the database), then you can delete data files of this tablespace from the archive.

Important!

While deleting tablespaces, access to the corresponding tables is closed. For this reason, log files of the **iw_deliver**, **iw_x2db**, **iw_updater** processes may contain database access errors. Once tablespaces are deleted, these processes automatically restore access to the database.

We recommend running a job to delete data daily. Otherwise, the amount of deleted data increases, which increases the time for running the procedure and consequently increases the idle time of the Traffic Monitor Server.

Warning!

If months or years are used as a time interval, then we recommend you to apply the maximal interval value in the counting: 31 days for a month and 366 days for a year. For example, to delete daily TS older than 4 years, specify 366*4=1464 days interval in the iwtm_iwtm_delete_tablespaces job.

Setting the interval of daily TS deletion

To perform TS deletion automatically (by default the function is disabled) you can use the following scripts (run under the account of the database schema owner):

- For daily TS storing objects with *Violation* status:
```
begin;
select sp_setting_set('violation_delete_enabled', '1');
select sp_setting_set('violation_delete_period', 'D');
commit;
```
- For daily TS storing objects with *No Violation* status:
```
begin;
select sp_setting_set('noviolation_delete_enabled', '1');
select sp_setting_set('noviolation_delete_period', 'D');
commit;
```
- For daily TS storing *screenshots*:
```
begin;
select sp_setting_set('other_delete_enabled', '1');
select sp_setting_set('other_delete_period', 'D');
commit;
```

  where:

  1 indicates that automatical deletion is enabled (to disable it, specify 0 instead);

  D is a number of days after which the daily TS will be deleted by the System. This number should be larger than the set number of days before archiving the daily tablespace (see "Automatic Archiving of Daily Tablespaces").

Deleting daily tablespaces manually

If you need to delete daily tablespaces immediately (e.g., due to file system space shortage the interval of deletion was changed, but the next launch of the job will not happen soon), then run the following script on the behalf of the database scheme owner:

```
select pkg_part_delete_tablespaces();
```

Deleting daily tablespaces with a script

If you want to configure automatic deletion of daily tablespaces, use the **/opt/iw/tm5/bin/dbtools/dbconf-iwdrop-postgres.sh** script. You can use the following commands:

Purpose	Command
Set up deletion period	`/opt/iw/tm5/bin/dbtools/dbconf-iwdrop-postgres.sh set violation|noviolation|other <days> [-v]`
Enable automatic deletion	`/opt/iw/tm5/bin/dbtools/dbconf-iwdrop-postgres.sh enable violation|noviolation|other [-v]`
Disable automatic deletion	`/opt/iw/tm5/bin/dbtools/dbconf-iwdrop-postgres.sh disable violation|noviolation|other [-v]`
View the state of settings	`/opt/iw/tm5/bin/dbtools/dbconf-iwdrop-postgres.sh show [-v]`

Example:

To delete all objects with *"No violation"* status, which are older than 15 days, run the following commands:

```
/opt/iw/tm5/bin/dbtools/dbconf-iwdrop-postgres.sh set noviolation 15 [-v]
```

```
/opt/iw/tm5/bin/dbtools/dbconf-iwdrop-postgres.sh enable noviolation [-v]
```

Deleting archived tablespaces manually

When deleting archived daily tablespaces from the database, datafiles remain in the System (by default, they are stored in the `/u02/arch` directory). To free up hard disk space, you should manually add new scheduled jobs in the `/etc/cron.d/iwtm_error_queue` file.

Example:

To delete all archived daily tablespaces that are older than 150 days:

1. Open the `/etc/cron.d/iwtm_error_queue` file for editing.
2. Add lines:
   ```
   35 3 * * * root find /u02/arch/ -type f -mtime +150 -delete > /
   dev/null 2>&1 &
   40 3 * * * root find /u02/arch/ -type d -ctime +10 -empty -
   delete > /dev/null 2>&1 &
   ```
3. Save changes.
4. Apply new settings of the `cron` service: `service crond reload`

7.2.4 Database Backup

To minimize the risk of data loss we strongly recommend to backup the database on a monthly basis. We recommend you to use dedicated storage system for backups storage.

For non-database administrators who do not have standard backuping methods we recommend creating a “cold backup” at the stopped database. This procedure may also be used to migrate the database from one server to another.

This section further covers:

- Creating Database Backup;
- Database Backup.

Creating Database Backup

Creating database backup (cold backup procedure) is performed in the following order:

- Defining the Size of Backup;
- Checking Backup Storage;
- Creating Backup Directories;
- Stopping IWTM System;
- Copying Database Files to Backup Storage;
- Stopping Postgre SQL.

Defining the Size of Backup

To define size of the future archive, it is necessary to find out summary size of catalogue of Postgres DB, main tablespace size and daily tablespaces catalogues:

1. Enter the system using **root**;
2. Get summary catalogue size:
   ```
   du -sx -BM /u01/postgres/ /u02/pgdata /u02/arch
   ```

Checking Backup Storage

To check if the selected backup storage is suitable, take the following steps:

1. Mount the external storage to the DB server. Make sure that the following requirements are met:
   - The external storage and the database are located on different computers.
   - Computer with servers and databases to be backed up can access the external storage.
   - The external storage has more free space on the hard disk than the backup size.
2. Check the amount of free space on the hard disk:
   a. Run the following command as **root**:
      ```
      OS>df -h
      ```
   b. Make sure that the mounted section has more free space than the backup size.

Creating Backup Directories

> **Warning!**
>
> Backup directories should be located at computer other than the database is located.

1. Log the system as **root** user.
2. Create the directory for backup files storage:
   ```
   mkdir /mnt/IWTM_Backup_Files
   ```
3. Create subdirectories:
   ```
   mkdir /mnt/IWTM_Backup_Files/Pgdata
   mkdir /mnt/IWTM_Backup_Files/IWTM_main
   mkdir /mnt/IWTM_Backup_Files/IWTM_data
   ```

Stopping IWTM System

Stopping IWTM system is not required but we recommend doing it if there is little free space on IWTM server.

To stop IWTM system:

1. On the computer that hosts IWTM services, log in as **root**.
2. Stop all running Traffic Monitor Server services:
   ```
   iwtm stop
   ```
   You can start services later (when backup is finished) using the following command:
   ```
   iwtm start
   ```

Stopping Postgre SQL

> **Important!**
>
> Before processing the database files backup, you should obligatory stop the Postgre SQL database.

To stop Postgre SQL database:

1. On the computer that hosts the database, log on as the **root** user.
2. In the command prompt, enter:
   ```
   service pgagent-9.6 stop
   service postgresql-9.6 stop
   ```
   You can start services later (when backuping finished), using the following command:
   ```
   service pgagent-9.6 start
   service postgresql-9.6 start
   ```

Copying Database Files to Backup Storage

1. Stop all Postgre SQL services ("Stopping Postgre SQL"). To make sure that all services are stopped, run the following command:
   ```
   ps aux | grep postgre
   ```
   If Postgre SQL services are not stopped, backup files can be damaged and unsuitable for recovery.
2. On the computer that hosts the database, copy directories (and all their contents) using a previously created list of directories.
   If the system has been installed using kickstart and default settings are not modified, then:
   - copy contents of **/u01/postgres/** directory to **/opt/IWTM_Backup_Files/postgres** directory
   - copy contents of **/u02/pgdata/** directory to **/opt/IWTM_Backup_Files/pgdata** directory
   - copy contents of **/u02/pgdata1/** directory to **/opt/IWTM_Backup_Files/pgdata1** directory
   - copy contents of **/u02/arch/** directory to **/opt/IWTM_Backup_Files/arch** directory

   > **Note:**
   >
   > Only the following file storages can be used:
   > - an external drive with Ext4 or XFS file system
   > - a remote block device connected via iSCSI or NFS protocol
   > - a locally connected block device with Ext4 or XFS file system

Restoring the Database from the Backup

Considering the reason of your database fail, choose appropriate recovering database procedure:

- If the database was damaged due to system failure or user fault, restore old database. For example, if any essential file was occasionally deleted, you can restore the database to the state when this file existed: see "Restoring at the Same Database".
- If old database cannot be used any more, create a new one and recover data there: see "Restoring at the New Database".

Restoring at the Same Database

This is the database restoring procedure, where the directory structure is the same, as the one, where the backup was created on.

To restore the database by creating a new one:

1. Make sure the database environment is healthy. Check the existing database, the database server that hosts the existing database, and the computer that hosts the database server.

2. Stop Postgre SQL services:
   ```
   service pgagent-9.6 stop
   service postrgesql-9.6 stop
   ```

3. Install Postgre SQL database according to «InfoWatch Traffic Monitor. Installation Guide» document.

4. Perform the following actions:
   a. Delete all the content of **/u01/postgres/**, **/u02/pgdata/**, **/u02/pgdata1/**, **/u02/arch/** directories;
   b. Copy the content of **/opt/IWTM_Backup_Files/postgres** directory to **/u01/postgres/** directory;
   c. Copy the content of **/opt/IWTM_Backup_Files/pgdata/** directory to **/u02/pgdata/** directory;
   d. Copy the content of **/opt/IWTM_Backup_Files/pgdata1/** directory to **/u02/pgdata1/** directory;
   e. Copy the content of **/opt/IWTM_Backup_Files/arch/** directory to **/u02/arch/** directory.

5. Check the permissions. If necessary, change them:
   ```
   chown postgres /u01/postgres/ –R
   chown postgres /u01/pgdata/ –R
   chown postgres /u01/pgdata1/ –R
   chown postgres /u01/arch/ –R
   ```

6. Start the database:
   ```
   service postrgesql-9.6 start
   service pgagent-9.6 start
   ```

Restoring at the New Database

Restoring to PostgreSQL, it is important to copy DB files to the same catalogues, in which they were initially located.

To restore DB, copy catalogues, check permissions and start DB services (see "Restoring at the Same Database")

7.2.5 Database Server Routinely Maintenance

> **Warning!**
>
> We highly recommend not shutting down the DB server with the power button: in certain cases, this may cause the DB corruption.

If you need to carry out routine maintenance on the database server, take the following steps:

1. Close all instances of the Management Console. Make sure that all connections of other programs to DB Traffic Monitor schema are closed; if there are any active connections, disable them.
2. Stop all TM processes on Traffic Monitor server:
   ```
   iwtm stop
   service iwtm-php-fpm stop
   service nginx stop
   ```
3. On the database server, retrieve the list of scheduled jobs. For this, in psql, under the account of the database schema owner, run the following query:
   ```
   select jobname, case when jobagentid is null then 'scheduled' else 'running'
   end state
   from pgagent.pga_job
   where jobenabled= true;
   ```
4. Disable jobs by running the following script:
   ```
   select iwtm.pkg_utility_disable_job('JOB_1);
   ...
   select iwtm.pkg.utility_disable_job('JOB_N');
   commit;
   ```
   where `JOB_1... JOB_N` are the names of jobs to be disabled.
5. To make sure that there are no running jobs, run the following query:
   ```
   select pga_job.jobname
   from pgagent.pga_job
   where pga_job.jobagentid is not null;
   ```
   A current task cannot be stopped in PostgreSQL, this should be done by stopping the agent from Linux using thy following command:
   `service pgagent-9.6 stop` (stopping all tasks with one command)
6. Make all the necessary operations with the database.
7. After all operations are complete, check the connection to the database server from Traffic Monitor server:
   ```
   psql -p 5433 -h server_name postgres postgres
   ```
   where `server_name` - database name or IP address
   If the test is successful, the following psql invitation will appear:
   `postgre=#`
8. Run the Traffic Monitor server processes:
   ```
   iwtm start
   service iwtm-php-fpm start
   service nginx start
   ```
9. Check if the system log contains errors. The path to the system log:
   `/var/log/messages`
10. If the system log contains any error messages, consult the technical support service.

11. Enable running previously disabled jobs:
    ```
    BEGIN
    select iwtm.pkg_utility_enable_job('JOB_1');
    …
    select iwtm.pkg_utility_enable_job('JOB_N');
    commit;
    end;
    /
    ```
    where `JOB_1…  JOB_N` are the names of the previously stopped jobs.

8 Administrating the Server End of InfoWatch Traffic Monitor

This chapter contains description of Traffic Monitor server part components and methods of their use:

- Traffic Monitor Server Modules and Processes;
- Setting Traffic Monitor Server End Configuration Files;
- Configuring Settings for HTTP-Requests Transferred through ICAP Protocol (icap.conf file);
- Configuring Settings of Enclosures Archives Processing (extractors.conf file);
- Archiving a Mail Queue Directory;
- Logging of System Work;
- Loading an Object Queue;
- Recovering the System after Failures;
- Configuring forwarding data to SIEM;
- Deleting temporary files.

8.1 Traffic Monitor Server Processes

This section covers:

- List of Traffic Monitor Server End Processes;
- Using Traffic Monitor Server End Processes.

8.1.1 List of Traffic Monitor Server End Processes

The System works by means of running processes: the same process can run simultaneously in several instances.

Purpose	Process name	Process description	Configuration file
Data collection	iw_icap	Processes HTTP traffic. Receives HTTP requests from the ICAP client. Extracts data from HTTP requests. Then, the extracted data is added to the XML context. The XML context is sent to the analysis subsystem for the check. After analysis, the response is sent to the ICAP-client to allow/deny the delivery of the HTTP request. It also transfers HTTP request to **iw_x2db** process that saves it to the database	/opt/iw/tm5/etc/icap.conf
	iw_sniffer	Process that intercepts traffic transferred by SMTP, HTTP, ICQ, POP3, IMAP, and NRPC protocols	/opt/iw/tm5/etc/sniffer.conf

iw_proxy	Receives a copy of the traffic, divides it to HTTP, ICQ, and SMTP-traffic and sends it to iw_messed module. Includes the following processes: • iw_proxy_http – receives a copy of HTTP traffic Receives an HTTP request, generates XML context from the received object. Then XML context is transferred to the analysis and decision making subsystem **iw_analysis**. • iw_proxy_icq - receives a copy of ICQ traffic Receives an ICQ message, generates XML context from the received object. Then XML context is transferred to the analysis and decision making subsystem **iw_analysis**. • iw_proxy_smtp - receives a copy of SMTP traffic Receives an SMTP message, generates XML context from the received object. Then XML context is transferred to the analysis and decision-making subsystem. After the analysis, the object copy is sent to the **iw_x2db** process that saves is to the database.	/opt/iw/tm5/etc/proxy.conf
iw_smtpd	Receives SMTP messages. When integrated with the Postfix mail server, it receives incoming messages from Postfix. If there is no integration with Postfix, it receives incoming messages from the corporate mail server or mail client (depending on the settings of your mail system). Receives incoming messages in SMTP format, converts SMTP envelope data to the XML context. Then it transfers SMTP-message and XML context to the **iw_messed** process.	/opt/iw/tm5/etc/smtpd.conf
iw_capstack	Processes traffic transferred by POP3, IMAP, and NRPC protocols	/opt/iw/tm5/etc/capstack.conf
iw_messed	Processes SMTP messages. Extracts data from SMTP, POP3, and IMAP objects. The extracted data is then added to the received XML context. The ready XML context (containing the data extracted from the envelope and the e-mail) is transferred to the analysis subsystem. After the analysis, **iw_messed** transfers the allowed SMTP messages to the mail system component that delivers mail (only in the normal and transparent transport modes). If integration with the Postfix mail server is configured, then this component is Postfix. If there is no integration with Postfix, then the component depends on the settings configured in your mail system: it can be a corporate mail server or a mail client. Besides, a copy of the checked SMTP message is sent to the **iw_x2db** process that saves is to the database.	/opt/iw/tm5/etc/messed.conf
iw_xapi	Includes 2 services: **iw_xapi_xapi** and **iw_xapi_puppy**. Receives objects from Device Monitor, Crawler and external systems via thrift-interface and places them in a file queue. Then it sends objects to **iw_analysis** process. When receiving EML objects, transmits them to **iw_messed** process.	/opt/iw/tm5/etc/xapi.conf

	iw_analysis	Takes objects from the file queue, previously placed there by **iw_xapi_xapi/ iw_xapi_puppy, iw_proxy_icq, iw_proxy_http**. By means of file queue, it transmits objects to **iw_warpd**, **iw_cas**, **iw_pas**, **iw_luaengined** for processing. Then the objects are placed into the file queue to be sent to the database by **iw_x2db** process.	/opt/iw/tm5/etc/analysis.conf
Data processing	iw_warpd	Manages processes of extracting data from containers enclosed in intercepted objects	/opt/iw/tm5/etc/warpd.conf
	iw_image2text_fre	Manages text recognizing in images with the help of OCR ABBYY FineReader.	/opt/iw/tm5/etc/image2text_fre.conf
	iw_image2text_ts	Manages text recognizing in images with the help of OCR Tesseract.	/opt/iw/tm5/etc/image2text_ts.conf
	iw_cas	Takes the role of the content analysis server. Interception subsystems send text queries in plain text format to the **iw_cas** process for content analysis. When the analysis is complete, the query result is sent to the analysis and decision-making subsystem.	/opt/iw/tm5/etc/cas.conf
	iw_image_autoling	Automatically classifies graphic objects	/opt/iw/tm5/etc/iw_image_autoling.conf

	iw_text_autoling	Automatically classifies text objects	/opt/iw/tm5/etc/iw_text_autoling.conf
	iw_pas	Receives analysis results from **iw_cas**. Defines the presence of protected objects and adds corresponding attributes to the object.	/opt/iw/tm5/etc/pas.conf
	iw_luaengined	Enables running of an LUA-script according to the actual policy.	/opt/iw/tm5/etc/luaengined.conf
	iw_x2x	The process gets data with xml+dat-files via file queue. The files provided are to be modified and sent to **iw_x2db** process.	/opt/iw/tm5/etc/x2x.conf
	iw_tech_tools	Verifies regular expressions and conditions for DB unloadings, makes it possible to normalize text according to regular expressions.	/opt/iw/tm5/etc/tech_tools.conf
Loading to DB	iw_qmover_client	Works on the Traffic Monitor Server installed at a branch office. Sends intercepted objects to the headquarters' database.	/opt/iw/tm5/etc/qmover_client.conf

	iw_qmover_server	Works on the Traffic Monitor Server, installed in the central office. Receives objects from the agent installed in a branch office. Through **iw_x2x**, it sends objects to the **iw_x2db** process that saves them to the database.	/opt/iw/tm5/etc/qmover_server.conf
	iw_x2db	Load objects verified by analysis and decision making systems from output file queue of **iw_x2x** process to the database.	/opt/iw/tm5/etc/x2db.conf
Infrastructure	iw_adlibitum	Manages processes of receiving actual data from Active Directory server	/opt/iw/tm5/etc/adlibitum.conf
	iw_agent	Is required for managing the System configuration	/opt/iw/tm5/etc/agent.conf
	iw_blackboard	Enables interaction of active policies and the database	/opt/iw/tm5/etc/blackboard.conf
	iw_bookworm	Acts a reference book in the System	/opt/iw/tm5/etc/bookworm.conf

iw_cas_config_compiler	Converts the configuration file of Content analysis server to a normal binary file for using the configuration in the content analysis	/opt/iw/tm5/etc/cas_config_compiler.conf
iw_configerator	Generates configuration that is sent to Device Monitor	/opt/iw/tm5/etc/configerator.conf
iw_crawler	A process for Crawler subsystem (Crawler operates on a server different from Traffic Monitor Server)	//opt/iw/tm5/etc/web.conf
iw_deliver	Delivers emails. Sends SMTP messages to recipients if the delivery is allowed in the Management Console (only in Normal and Transparent transport modes). Besides, it delivers SMTP messages if, for some reason, they have not been delivered by **iw_messed** process (for example, if there is no connection with the mail relay server or a mail client).	/opt/iw/tm5/etc/deliver.conf
iw_indexer	Indexes the text of database objects. Gets access to the database for indexing it and adds indexes to file storage. When a **sphinx** search query is running, receives object IDs from the file storage.	/opt/iw/tm5/etc/indexer.conf
iw_metainfo_fetcher	Selects data for indexing from the DB. Transfers data for indexing to **iw_is** process**.**	-

iw_is	Receives data for indexing from **iw_metainfo_fetcher** using the file queue. Indexes the received data. Sends indexed data to **sphinx** storage.	/opt/iw/tm5/etc/is.conf
iw_kicker	Enables operation of WebGUI and starts the following services: agent, blackboard, crawler, export, import, report, notifier, selection, systemcheck, xapisamplecompiler, samplecompiler, querytracker, reporttracker	/opt/iw/tm5/etc/kicker.conf
iw_licensed	Licensing subsystem. Monitors and processes licenses installed in the System	/opt/iw/tm5/etc/licensed.conf
iw_rammer	Dispatches the processing errors e-mails when operating inline	/opt/iw/tm5/etc/rammer.conf
iw_sample_compiler	A process for creating fingerprints from uploaded sample files	/opt/iw/tm5/etc/sample_compiler.conf
consul	Detects, registers and monitors availability of servers which interact with the user interface	/opt/iw/tm5/etc/consul/consul.json

iw_system_check	Collects data from Nagios service and provides received data to be displayed in Management Console	/opt/iw/tm5/etc/system_check.conf
iw_updater	Loads the configuration from the database to Traffic Monitor Server	/opt/iw/tm5/etc/updater.conf

8.1.2 Using Traffic Monitor Server End Processes

You can find the list of Traffic Monitor processes in "List of Traffic Monitor Server End Processes"

All Traffic Monitor Server processes are launched under **iwtm** user, which is created automatically during Traffic Monitor Server installation (for more information on user accounts, see "InfoWatch Traffic Monitor. Installation Guide ").

> **Note:**
>
> The user name is registered in unit files of processes in `User` parameter. For correct operation of the System, we recommend leaving the value of this parameter unchanged.

During Traffic Monitor Server operation, the state of processes is checked by **pguard** script which is created in `/opt/iw/tm5/bin` directory during the installation. If for some reason, one or more Traffic Monitor Server processes are stopped, **pguard** script restarts them.
Traffic Monitor Server processes are managed with bash script **/opt/iw/tm5/bin/iwtm** which is an autorun script for run levels 2, 3, 4, 5.

> **Note:**
>
> 1. To intercept a copy of traffic using Sniffer (ICQ- HTTP-, SMTP-traffic), separate **iw_proxy** processes are launched.
> 2. The **iw_qmover_server, iw_qmover_client** processes are available, however, autorun is disabled for them by default. Each process is launched on its end (**iw_qmover_client** in branches and **iw_qmover_server** in the central office.
> 3. The **iw_rammer** process is not installed by default. After manual installation, the process is available in the process list.

Start keys for **iwtm** script:

Start key	Purpose
`start`	starting processes
`stop`	safe stop of processes
`status`	displaying process state (running/not started/available/unavailable)
`restart`	restarting processes (sequential execution of start+stop commands)
`reload`	reloading process configuration
`kill`	transmitting a signal to immediately end the process (SIGKILL)
`test`	displaying all available iwtm daemons
`enable`	setting the "available" status to a daemon - the daemon autostart is allowed
`disable`	setting the "unavailable" status to a daemon - the daemon autostart is forbidden
`services_state`	displaying all available iwtm daemons with bit masks

Sample commands

Command	Action
`iwtm status`	Check the state of Traffic Monitor Server processes

One of the following commands:
`service iw_cas start` (if you need to view logs)
`iwtm start cas`
`iwtm start iw_cas`
`iwtm start iw_cas.service`
`systemctl start iw_cas` (viewing logs is unavailable)
`systemctl start iw_cas.service`
	Start the content analysis server (CAS)

Warning!

PID files are stored in `/opt/iw/tm5/run` directory. In case of an emergency shutdown, you should delete all PID files before starting processes.

Changing process autorun parameters

You can find information on enabling/disabling autorun for processes in "Check of process autostart".

For each process managed by **iwtm** bash script, autorun parameters can be specified in a command line. Enabling/disabling autorun for processes (with iw_sniffer service as an example) is described in "Enabling and disabling autorun processes". For details about systemd commands see article "Commands to work with systemd".

8.2 Setting Traffic Monitor Server End Configuration Files

You can find the list of System configuration files and their settings that can be changed to configure the System for operation in your organization in the "*Configuration Files Guide*" document. We recommend not editing files that are not described in this document.

Configuration files are located in `/opt/iw/tm5/etc`.

The System configuration files are in JSON format. Configuration file names match the names of corresponding System components to be configured. For example, for configuring **iw_x2x** component, **x2x.conf** configuration file is used**.**

There are common configurable settings (see the document "*Configuration Files Guide*", articles: "*General section Bookworm*"*, "Common section Discovery", "General section Logging", "General section Statistics", "General section Statistic", "General section ThriftServers"*) and parameters specific for each configuration file (see a description of separate files in the "*Configuration Files Guide*" document).

8.3 Configuring OCR

The OCR technology allows you to convert hand-written, typed or printed text to text data. By default, the technology is disabled for all services, event types, and related protocols. OCR is used for:

- analyzing intercepted images,
- analyzing images loaded as sample documents.

For the first case, **iw_warpd** is extracting data from containers, included into intercepted objects. As per analyzing images, **iw_sample_compiler** is creating digital traces from downloaded sample documents. OCR enabling and configuring is performed within its configuration files. For details, see "Configuring OCR Extractors".

If necessary, you can configure OCR to analyze intercepted images. The following methods of configuring OCR are available:

Configuring interception at the level of:	**Settings apply to the content of events**	**Priority of the setting**
Service	Received by protocols of event types which belong to this service (if OCR settings are not specified for these event types or protocols)	Low
Event type for a particular service	Received by protocol of this event type (if OCR settings are not specified for these protocols)	Medium
Protocol for a particular event type	Received by the selected protocol for the specified event type	High

OCR settings are specified in the directory of **iw_bookworm** daemon, in `/opt/iw/tm5/etc/config-perm/bookworm` catalogue:

- `ocr.xml` - preset settings;
- `ocr_custom.xml` - custom settings for a specific type of implementation.

You can enable using OCR technology when you implement the System. For this, modify the `ocr_custom.xml` file (for details see "Configuration File ocr_custom.xml") the following way:

1. Select required objects: services, protocols, and event types.

   > **Note:**
   >
   > New event types registered via plugins are added to `/opt/iw/tm5/etc/config/bookworm/services.xml`. They can be processed or moved to the `ocr_custom.xml` file.

2. Set identifiers for service directory objects and event types (files with a description are located in the `/opt/iw/tm5/etc/config/bookworm/` catalogue).
3. Enable OCR (`ocr_enabled="true"`).

If you need to enable OCR on several server instances (for a distributed installation), you should set rules for each instance. For this:

1. In catalogue `/opt/iw/tm5/etc/config-perm/bookworm`, create a new XML file that will describe the node.
2. Specify created xml-file in `CustomNodeXMLPath` section of configuration file `/opt/iw/tm5/etc/bookworm.conf`
3. Specify instance name from file `/opt/iw/tm5/node_name` in `<ocr_option node>` parameter.
4. Define overridable rules for the instance as described above.

> **Note:**
>
> In this case, settings have the following priority (in descending order): a directory with settings for the server instance -> a directory with custom settings -> a directory with preset settings.

> **Important!**
>
> When you update the System to current version, OCR parameters are reset to preset ones. In case you add or change OCR functional capacity, the new settings to be available within the `ocr.xml` file. User settings remain within the `ocr_custom.xml` file.

8.3.1 Configuration File ocr_custom.xml

Below you may find disabled OCR rules, where:

- `object_type` – object type;
- `service` – services;
- `protocol` – protocols;
- `key` - keys;
- `mnemo` – catalogues objects IDs of object types, services and protocols.

When enabling the rules, it is recommended specifying only the required ones:

```
<ocr_options node="*" ocr_enabled="false">
  <service key="CE6D8E0E27DA11E2962FC1DB6088709B00000000" mnemo="email" ocr_enabled="false">
    <object_type key="D2B5132E27DA11E28444C2DB6088709B00000000" mnemo="email" ocr_enabled="false">
      <protocol key="501A9868F3460E2E5AAF0C6AB21F8D6F63C09109" mnemo="pop3" ocr_enabled="false"/>
      <protocol key="2ECB2A264E31677895BC5D8845D33BC26F637CDF" mnemo="imap" ocr_enabled="false"/>
      <protocol key="A324CCB227DA11E2A8D99FDB6088709B00000000" mnemo="smtp" ocr_enabled="false"/>
      <protocol key="5F7E60DB3E86EFF90FDA87E72209EA1B0E017F16" mnemo="mapi" ocr_enabled="false"/>
      <protocol key="93B79EB44EE1A45522C08319EC47B499294776D7" mnemo="nrpc" ocr_enabled="false"/>
    </object_type>
    <object_type key="D8333C9027DA11E29E34CADB6088709B00000000" mnemo="email_web" ocr_enabled="false">
      <protocol key="A779DB3627DA11E2ADDCA0DB6088709B00000000" mnemo="http" ocr_enabled="false"/>
      <protocol key="7ED97C84BDBDD99C1C21AC0A6D6191F6A891C440" mnemo="https" ocr_enabled="false"/>
    </object_type>
  </service>
  <service key="DD6ECB5227DA11E2B507CBDB6088709B00000000" mnemo="im" ocr_enabled="false">
    <object_type key="E266719627DA11E2A83ECCDB6088709B00000000" mnemo="im_icq" ocr_enabled="false">
      <protocol key="ABA5D02027DA11E2B78FA1DB6088709B00000000" mnemo="oscar" ocr_enabled="false"/>
    </object_type>
    <object_type key="EEC2D87627DA11E29EA6D2DB6088709B00000000" mnemo="im_mail_ru" ocr_enabled="false">
      <protocol key="B8C7FC6A27DA11E2A080B7DB6088709B00000000" mnemo="mmp" ocr_enabled="false"/>
    </object_type>
    <object_type key="F249A80827DA11E29BA2D3DB6088709B00000000" mnemo="im_skype" ocr_enabled="false">
      <protocol key="DD3D593857521DE2E9618C26FD3E1B914F8A16F9" mnemo="skype" ocr_enabled="false"/>
    </object_type>
    <object_type key="E7C3A26C27DA11E296D3CDDB6088709B00000000" mnemo="im_xmpp" ocr_enabled="false">
      <protocol key="AF69EA3427DA11E2BE09A2DB6088709B00000000" mnemo="xmpp" ocr_enabled="false"/>
    </object_type>
  </service>
  <service key="62E7C68AD1354D118282FAFF07DA59ED00000000" mnemo="multimedia" ocr_enabled="false">
    <object_type key="55E10E81F5C94B3FB742CB61CA9476F800000000" mnemo="multimedia_photo"
 ocr_enabled="false"/>
  </service>
  <service key="0794BBB227DB11E2BD81E9DB6088709B00000000" mnemo="web" ocr_enabled="false">
    <object_type key="0CAFCC9027DB11E2AD27EDDB6088709B00000000" mnemo="web_common" ocr_enabled="false">
      <protocol key="A779DB3627DA11E2ADDCA0DB6088709B00000000" mnemo="http" ocr_enabled="false"/>
      <protocol key="7ED97C84BDBDD99C1C21AC0A6D6191F6A891C440" mnemo="https" ocr_enabled="false"/>
    </object_type>
  </service>
  <service key="111CBA0427DB11E2AB82EEDB6088709B00000000" mnemo="file" ocr_enabled="false">
    <object_type key="1515A7B027DB11E2BBB2EFDB6088709B00000000" mnemo="file_exchange" ocr_enabled="false">
      <protocol key="BEFB1A7C27DA11E2AB10B8DB6088709B00000000" mnemo="ftp" ocr_enabled="false"/>
    </object_type>
    <object_type key="190D004827DB11E287B1F0DB6088709B00000000" mnemo="file_copy_out" ocr_enabled="false"/>
  </service>
  <service key="1DA8A90427DB11E289E8F5DB6088709B00000000" mnemo="print" ocr_enabled="false">
    <object_type key="225BD8F427DB11E2926DF9DB6088709B00000000" mnemo="print_common" ocr_enabled="false"/>
  </service>
  <service key="7843FC5BEA024E9B274E26DB43B7E680D8BC9356" mnemo="placement" ocr_enabled="false">
    <object_type key="602A224D9335579214E3188D1D2745DB9F85D500" mnemo="crawler" ocr_enabled="false"/>
  </service>
</ocr_options>

<ocr_options node="*" ocr_enabled="false">
</ocr_options>
```

Note:

To enable OCR on all the levels at one time (service level, event type and protocol level) it is required replacing `<ocr_options node="*" ocr_enabled="false">` with `<ocr_options node="*" ocr_enabled="true">` in the lower row of `ocr_custom.xml` file.

8.4 Configuring Settings for HTTP-Requests Transferred through ICAP Protocol

The **/opt/iw/tm5/etc/icap.conf** file defines settings of interaction with ICAP server.

Note:

The **icap.conf** file is created only after installation of ICAP integration module.

8.5 Configuring Settings of Enclosures Archives Processing

Attachment processing is configured in the following configuration files:

- `/opt/iw/tm5/etc/config-perm/bookworm/extractors.xml` file (see "The extractors.xml Configuration File")
- `/opt/iw/tm5/etc/extractors.conf` (see the document "*Configuration Files Guide*", "extractors.conf" article)

Important!

If MS Exchange uses a journal rule, then, for the correct processing of such emails, enable the corresponding option in Traffic Monitor. For this, in the `messed.conf` configuration file, specify:

```
"ExchangeJournalReports": true,
```

To make the option active, reload the configuration, or restart the service.

8.5.1 The extractors.xml Configuration File

The **/opt/iw/tm5/etc/config-perm/bookworm/extractors.xml** file contains directory settings and signatures base which define file types when unpacking archives and enclosures.

Parameter	Description
`FilenameCharsets`	If file name encoding differs from the standard one (ANSI, UTF) then the filename processes as corresponding to encodings listed in this setting. Several values are listed comma separated; the System sequentially tries process the filename in listed encodings while it finds a matched one. Default value is `UTF-8,cp1251,cp866`

`MinFileSizeInBytes`	Minimum file size (in bytes) subjected to unpacking. This limit lets increase the System performance due to refusing of small files unpacking. Default value is `10`
`MaxTextPlainSizeInKb`	Maximum size of file, which signature is not defined. Exceeding the threshold value file is automatically considered to be binary and is not sent to **iw_cas**. Default value is `25600`
`SpeedInKBs`	Proposed extractor's operation speed, in Kb/s, per 1 GHz of the processor. Default value is `100`
`TimeoutInSec`	Awaiting time (in seconds) till file processing ends. Default value is `1800`
`UseLog`	Logging extractor. Default value is `false`

If the general values of `TimeoutInSec` and `MinFileSizeInBytes` settings are not appropriated for some file types then enable these parameters in sections of needed file types with other values.

Other sections define signatures used for detection of types of files from archives and enclosures. Each section contains the same set of parameters:

Parameter	**Description**
`Extension`	Extension of archive files. Optional parameter which is needed for correct operation of some archiving utilities requiring correct extensions of incoming files **Example**: `Ext = arj`

`Name`	Format name. Used for exact detection of format name when file unpacking.
	To define detection/detailing of format the setting can include a list of names:
	`"defaultname, name1(code1), name2(code2)"`
	In this case the format can be defined basing on the code (`codeN`) assigned to the file when unpacking. For example if the unpacking is ended with code1 code that the file is considered as having name1 format. The list of names can include default name (`defaultname`) which will be assigned when the code is not assigned:
	Example 1 (one format name)
	`text/xml`
	Example 2 (list of format names)
	`"application/arj, UNKNOWN(9), text/encrypted(4)"`
	the file format is defined as application/arj. Two others for specific cases are: unknown format (UNKNOWN), encrypted format (`text/encrypted`)

Parameter	Description

`Signature`	Format signature which is «standard» sequence of values (bytes) with initial displacement and masks. This sequence is needed for unambiguous definition of files format by the content of those files.
	The signature can include up to 16 triades of the following view:
	`[OFFSET]:BYTE_VALUE/[MASK]`
	There can be string signature like "BZh" for BZIP2. This signature means specified bytes sequence from 0 displacement. The search of string signatures is performed except for upper/lowercase distinction.
	The OFFSET setting is optional. By default it equals 0 for the first byte and increases by 1 for each later one. The displacement can be specified using «?» symbol – searching of the pattern in first N bytes of a file. For example to search pattern in first 500 bytes you should specify '500?' displacement.
	The MASK setting is optional and equals to 0xFF by default.
	Example (signature of a heading of WAV format):
	`Sign = "'RIFF', 0x8: 'WAVEfmt'"`
	Starting from 0 displacement there is a sequence 'R', 'I', 'F', 'F', then from 8 displacement there should be 'W', 'A', 'V', 'E', 'f', 'm', 't'

`Comment`	The explanation commentary, for example, indicating the version of archiving utility: `Comment = "bzip2 v. 1.0.x"`
`Command`	Command string for file extracting, for example, `Extract = "/usr/bin/bzip2 -f -dc ${SRC} > ${OUTDIR}/${SRC}"` where `${OUTDIR}` is a catalogue where to the archive will be extracted and `${SRC}` is a name of file to unpack
`ExcludeFromContext`	If the parameter is enabled (`On`) then the file is unpacked but information on archiving utility is not added to object's XML-context. This lets to let out the fictional containers like MS-TNEF from object's context. By default the parameter is disabled (`Off`)
`CaseInsensitive`	Indicates whether the symbol register will be taken into account in file processing or not. Default value is `false`
`CreateTags`	Indicates if there is an extracting of the metadata from the file when proceeding by TM extractors.
`Archive`	Regulates the kind of retrieved information. When `true` - files. When `false` - data.

Parameter	Description
PIRegexp	Contains a description of PIRE signature for file format detection. Can be specified several times withing the same Extractor. Includes the following attributes: • assurance - the accuracy of detecting file format with this signature • offset - offset where to start searching for the signature • max_length - the length of the section to be checked • case_sensitive - enables case sensitivity in the signature description
DetectableByRegexp	Allows you to disable format detection by means of PIRE (instead, signatures from Signature will be used).
OpenFifoRetryTimeout	Timeout during few attempts to open fifo queue
OpenFifoRetryCount	Number of attempts to open fifo queue
ResultCharset	Specifies the code of extracted text
NeedProcess	If the files with mime type specified should be sent for analysis

8.6 Archiving a Mail Queue Directory

If errors occur in the incoming SMTP mail queue, you must archive the SMTP mail queue folder and save it for further analysis. Then delete the folder. The location of the mail queue folder is specified in **/opt/iw/tm5/etc/filequeues.conf** configuration file in the `Smtppath` section.

8.7 Logging System Work

For the convenience of monitoring processes, the logging subsystem has 6 levels:

Level	Description
`fatal`	Writes errors that are critical for the process operation
`error`	Writes messages about errors that are not critical for the process operation
`warning`	Writes information about potentially dangerous cases
`Information`	General information about the process that can be useful (process start/stop, applying configurations, etc.)
`debug`	Writes information which is mostly used to diagnose the service operation (IT, system administrators and so on)
`trace`	Mostly used by programmers to track the code

Configuring logging levels

> **Warning!**
>
> Please, note that choosing a more detailed logging level may significantly reduce the System performance.

Configuration files are located in the `/opt/iw/tm5/etc` directory. By default, the `warning` level is used for all processes.

To change the logging level for Traffic Monitor Server processes:

1. In the configuration file of the required process, find the `Logging` section and set the needed value for `GlobalLevel` parameter.
2. Save changes.
3. After you have changed the system log, restart the process:
   `iwtm restart <service_name>`

By default, all process logs are stored in the `/var/log/infowatch` directory.

For extractors which do not have a separate configuration file, the logging level can be set in the **/opt/iw/tm5/etc/config-perm/bookworm/extractors.xml** configuration file:

1. Open the configuration file.
2. For `text-extractor` parameter, add the value `-l <level>`, where `<level>` is the logging level. For example:
   `<Command> bin/text-extractor -l error -t ooxml -i ${OUTDIR}"<Command>`
3. After you have made changes, restart processes:
   `iwtm restart bookworm`
   `iwtm restart warpd`

> **Note:**
>
> This type of configuring the logging level is only available for extractors of the following formats: docx, html, msoffice_xml, msole, odp, odt, pptx, xlsx, xml.

8.8 File queues

To enable loading the existing object queues:

1. Stop the following services: iw_icap, iw_deliver, iw_luaengined, iw_is, iw_smtpd, iw_sniffer, iw_xapi_xapi, iw_xapi_puppy, iw_analysis, iw_messed, iw_proxy_http, iw_proxy_icq, iw_proxy_smtp, iw_capstack.
2. Place objects from the error queue to the required queue.
3. Wait until all objects in the file queue are processed.
4. Run the following services: iw_icap, iw_deliver, iw_luaengined, iw_is, iw_smtpd, iw_sniffer, iw_xapi_xapi, iw_xapi_puppy, iw_analysis, iw_messed, iw_proxy_http, iw_proxy_icq, iw_proxy_smtp, iw_capstack.

To start all the services, run the command: **iwtm start**. To check if the processes are started, use the following command: `iwtm status.`

Commands for starting/stopping separate services:

Starting	Stopping
`iwtm start icap`	`iwtm stop icap`
`iwtm start deliver`	`iwtm stop deliver`
`iwtm start luaengined`	`iwtm stop luaengined`
`iwtm start is`	`iwtm stop is`
`iwtm start smtpd`	`iwtm stop smtpd`
`iwtm start sniffer`	`iwtm stop sniffer`
`iwtm start xapi_xapi`	`iwtm stop xapi_xapi`
`iwtm start xapi_puppy`	`iwtm stop xapi_puppy`
`iwtm start analysis`	`iwtm stop analysis`
`iwtm start messed`	`iwtm stop messed`
`iwtm start proxy_http`	`iwtm stop proxy_http`
`iwtm start proxy_icq`	`iwtm stop proxy_icq`
`service iwtm start proxy_smtp`	`service iwtm stop proxy_smtp`
`service iwtm start capstack`	`service iwtm stop capstack`

Objects in the System are moved by means of file queues:

Path to the directory of the queue	Format of files in the queue
`queue/analysis`	`.xml & .dat`
`queue/smtp`	`.xml & .dat`
`queue/db`	`.xml & .dat`

queue/blackboard	.dat
queue/blackboard_errors	.dat
queue/is	.xml & .dat
queue/x2x	.xml & .dat
queue/errors	.xml & .dat
queue/x2x-errors	.xml & .dat
queue/x2db-errors	.xml & .dat
queue/final-errors	.xml & .dat

Each queue contains additional technical queues which allow you to monitor for processing objects: `.db, .in, .out.`

Note:

For the `queue/smtp` process, the processing can be divided into the following steps:

1. `queue/smtp/.in` – as the **iw_smtpd** service receives objects from Postfix, a file is generated in this queue. If for some reason, the object processing in this queue is delayed, please, check **iw_smtpd** or **iw_proxy_smtp** service.
2. `queue/smtp/.db` – when the processing is complete, the file is moved from the `.in` queue to the `.db` queue. EML mail objects from **iw_xapi** are placed in this queue.
3. `queue/smtp/.out`– the object is placed in this queue by the following service - **iw_messed**.

Note that:

Queues of the **iw_is** service are additionally divided into:

- `queue/is/cmd/` – a file queue of **iw_is** commands;
- `queue/is/fetching/` – a queue of commands for loading;
- `queue/is/indexing/` – a queue of commands for indexing;
- `queue/is/errors/` – an error queue.

Queue name	Services that place an event in the queue	Services that remove an event from the queue
queue/analysis	iw_xapi_xapi, iw_xapi_puppy	iw_analysis
queue/smtp	iw_xapi_xapi, iw_xapi_puppy, iw_smtpd, iw_proxy_smtp, iw_capstack	iw_messed

queue/db	iw_messed, iw_analysis, iw_icap, iw_proxy_icq, iw_proxy_http	iw_x2x
queue/blackboard	iw_luaengined, iw_deliver	iw_blackboard
queue/blackboard_errors	an error when processing iw_blackboard	-
queue/x2x	iw_x2x	iw_x2db
queue/is	iw_metainfo_fetcher	iw_is
queue/errors	all services in case of processing errors	iw_rammer
queue/x2x-errors	errors when processing iw_x2x	
queue/x2db-errors	errors when processing iw_x2db	
queue/final-errors	iw_rammer	-

You can enable collecting statistics on file queues in the service configuration file which is located in the `/opt/iw/tm5/etc` directory. For this, in the *Statistic* section, set the **Enabled** parameter value to `true`.

8.9 Recovering the System after Failures

You can recover the System when server failures occur or during a network outage by completing the steps described below:

1. Stop Traffic Monitor Server processes by running the command:
   `iwtm stop`
2. Move objects from error queues to general ones. For this, use `iw_qtool` utility (see KB article "Moving of Objects between Queues (iw_qtool Utility)").
3. If Traffic Monitor Server works with installed Postgre DBMS, then, to check the connection, run the following command:
   `su - iwtm`
   `psql -p 5433 -h <DB_server_IP_address> postgres iwtm`
   `psql -p 5433 -h 127.0.0.1 postgres iwtm` - to connect local database
   If the check is successful, then, in response to the execution of the command, PSQL invitation will be displayed:
   `postgres=#`
   If Traffic Monitor Server works with installed Oracle DBMS, then, to check the connection, run the following command:
   `sqlplus db_login/db_password@tns_name`

where `db_login` and `db_password` are the name and the password of the DB schema owner respectively and `tns_name` is the name of TNS service.
If the check is successful, then, in response to the execution of the command, SQL *Plus invitation will be displayed:
`SQL>`

4. Run the Traffic Monitor Server processes by executing the command:
   `iwtm start`

After the Traffic Monitor Server is started, check the system log for errors. The path to the system log: `/var/log/messages`

If the system log contains any error messages, consult our technical support service.

8.10 Managing Languages Including Morphological Support

Managing languages including morphological support in Traffic Monitor is being performed through configuration file change and installation of package with language dictionary.

English morphology dictionary is being installed in the System by default.

To add Russian morphology dictionary to preinstalled dictionaries, select `Russian` value in **CFDb** parameter on step of localization parameters selection in the process of System installation (Find information on installation in document "InfoWatch Traffic Monitor. Installation guide").

Upon installation, user also can:

- Add new language including morphological support ;
- Update installed language including morphological support;
- Delete language including morphological support.

8.10.1 Adding New Language for Events Search. Morphology and Adding Terms.

To add a new language to the System for event search:

1. Stop thy **iw_indexer** and **iw_is** processes:
   `iwtm stop indexer`
   `iwtm stop is`
2. Go to the local repository that keeps packages downloaded during the installation:
   `cd /opt/iw/distr`
3. Go to directory that matches current Traffic Monitor version.
4. Select the required package and install it using the command:
   `rpm -i <package name>`
   For example, to install French dictionary package, enter the command:
   `rpm -i iwtm-sphinx-dict-fra-7.0.0-792.x86-64.rpm`
5. Run the processes:
   `iwtm start indexer`
   `iwtm start is`

> **Note:**
>
> Installing a new dictionary causes full database re-indexing, which may take some time.

To enable morphology for events search:

1. Stop the **iw_indexer** and **iw_is** processes:
   `iwtm stop indexer`
   `iwtm stop is`
2. Open the **sphinx_options.ini** file using the command:
   `mcedit /opt/iw/tm5/etc/sphinx_options.ini` and add the required language key to `sphinx_language` parameter.
   For example, to activate the morphology for Russian and Turkish languages, specify the following parameter values:
   ```
   sphinx_languages = 'rus tur'
   ```

   > **Note:**
   >
   > To set the language priority, put the language parameter to be the last in the list of `sphinx_languages` parameters of **sphinx_options.ini** file.

3. When using PostgreSQL DBMS, open the **database.conf** file to add terms:
   `mcedit opt/iw/tm5/csw/postgresql/database.conf` When using Oracle DBMS, open the **database.conf** file to add terms:
   `mcedit opt/iw/tm5/csw/oracle/database.conf`
4. Add the language key with morphology support from `cfdb_language` parameter, for example,
   ```
   \set cfdb_language 'rus'
   ```

   > **Note:**
   >
   > The full list of language keys with morphology support can be found in "List of languages including morphological support".

5. Run the **iw_indexer** and **iw_is** processes:
   `iwtm start indexer`
   `iwtm start is`

8.10.2 Updating Installed Language Including Morphological Support

To update existing dictionary:

1. Go to directory with dictionary packages:
   `cd /opt/iw/disrt/7.0.0/`
2. Run package installation:
   `rpm -i <package name>`
   For example:
   `rpm -i iwtm-sphinx_dict-deu-7.0.0.792.x86_64.rpm`

Note:

Updating dictionary, database reindexing will not take place. Language support will be performed only for new events.

8.10.3 Deleting Search Language and Terms

To delete a dictionary from the System:

1. Stop the **iw_indexer** and **iw_is** processes:
   `iwtm stop indexer`
   `iwtm stop is`
2. Open **database.conf** file if you use PostgreSQL DBMS:
   `mcedit /opt/iw/tm5/csw/postgresql/database.conf`If you use Oracle DBMS, open file **database.conf** to add terms:
   `mcedit opt/iw/tm5/csw/oracle/database.conf`
3. Delete code of language with morphology support from `define cfdb_language` parameter.
4. Delete indexing files from `/var/lib/sphinx/` directory.
5. Start processes:
   `iwtm start indexer`
   `iwtm stop is`

Note:

After you delete a dictionary, the database is completely reindexed.

If you delete a language with morphology support, this language is also deleted from Categories and Terms during the System update.

Note:

If you want to save the language in Categories and Terms, then add the code of the language with morphology support to the `cfdb_language` parameter of the **database.conf** configuration file just before updating the System. This will also restore the language with morphology support. If you want to delete the language with morphology support after the System update, repeat the steps described above.

8.11 Configuring Forwarding Data to SIEM

Traffic Monitor can be integrated with SIEM systems (ArcSight, Tivoli). Integration means forwarding consolidated information from all installed TM components to SIEM.

Configuring this functionality is possible using the script **/opt/iw/tm5/bin/config/iwtm-siem.conf.py**, which is available on Traffic Monitor server.

Information from TM is available for SIEM system:

1. By means of a table view:

- Events, registered in TM;
- TM console user session audit;

- By means of rsyslog:
  - Logging in and out TM Linux server;
  - Events, registered in TM Linux server system log, including information on logging in and out Oracle or PostgreSQL DB users;
  - State of services on TM Linux server or group of servers.

  In this chapter:

  - Configuring SIEM side
  - Configuring TM side
  - Type of logs, transmitted to SIEM

8.11.1 Configuring SIEM Side

To prepare SIEM to recieving data from TM:

1. In SIEM tables to extract information from:

   - `IWTM.ARC_VIEW_OBJECTS`
     TM events
   - `IWTM.ARC_VIEW_AUDIT_LOG`
     TM user audit

- Create SIEM account to access DB tables.
- Configure processing data, which has been extracted from TM DB.
  To analyse table views of TM events and user audit see articles "TM events table view" and "User audit table view".

> **Warning!**
>
> While configuring integration, additional modules from SIEM system vendor, which allow SIEM system to work with table views, can be required. For example, HP Flex Conector module is required for integration with HP ArcSight.

Table Representation of TM Events

Connect to TM database using the created **siem** user (see "Creating Siem User"). The `IWTM.ARC_VIEW_OBJECTS2` table contains the desired data.

> **Note:**
>
> If for importing data to SIEM, you need to filter the data, you can use `capture_date` or `insert_date` fields for filtering. We recommend filtering data by the `insert_date` field. Filtering data by the `object_id` field is not supported.

Attribute name	Data type	Description	Possible values	Example
`object_id`	number(20)	*Event ID* attribute of the event	Event ID in TM database. Is always present.	110

Attribute name	Data type	Description	Possible values	Example
`monitorcode`	varchar2(4000)	*Event type* attribute of the event	The event type determines how the data is transferred. Possible values: • External device • Printing • ICQ • Skype • XMPP • Telegram • MS Lync • FTP • Email • Webmail • Web message • Crawler • Clipboard • Cloud storage	Crawler
`protocol`		*Protocol* attribute of the event	Possible values: • OSCAR • Skype • XMPP • MMP • SIP • FTP • POP3 • IMAP • MAPI • SMTP • HTTP • HTTPS • NRPC • None	
`verdict`	varchar2(12)	*Verdict* attribute of the event	Possible values: • Quarantined • Forbidden • Allowed	Forbidden
`date_of_capture`	varchar2(50)	*Date of capture* attribute in ISO 8601 with specifying the timezone of the data capture		2014-06-19T18:56:26+04:00

Attribute name	Data type	Description	Possible values	Example
`capture_data`	timestamp	Event interception date (in UTC, without specifying the timezone) in `timestamp` format. Is used for fast data filtering.		timestamp
`insert_date`	timestamp	Event insertion date (in UTC, without specifying the timezone) in `timestamp` format		timestamp
`device`	varchar2(256)	*Device name* attribute of the event	Name of the device, to which or from which data has been copied. Or a name of the printer, to which a document from the intercepted event has been sent. Can be blank.	Kingston USB Drive 5.0
`Web-source`	varchar2(256)	*Resource* attribute of the event	Address of the visited web resource or address of cloud storage. Can be blank.	Yahoo.com
`recipientscontacts`	clob	*Recipients* attribute of the event	List of recipients separated by commas in `<contact type>:<contact value>` format. Can be blank.	email:ivanov@infowatch.ru, email:petr.petrov@infowatch.ru
`recipientsfullname`	clob	*Recipients* attribute of the event	List of recipients' full names separated by commas. The order is the same as for `recipients`. Names are specified only if recipients have been identified. Can be blank	Ivanov Ivan Ivanovich, Petrov Petr Petrovich
`recipientsdomainaccountname`	clob	*Recipients* attribute of the event	List of identification keys of the `auth` type for all recipients. Keys in the list are separated by commas. The order is the same as for `recipients`. Can be blank.	Ivanov@iw, Petrov@iw

Attribute name	Data type	Description	Possible values	Example
`senderdomainaccountname`	clob	*Senders* attribute of the event	Identification key of `authtype` for the sender. Can be blank.	Petrov@iw
`senderfullname`	clob	*Senders* attribute of the event	Sender's full name. Can be blank.	Petrov Petr Petrovich
`sendercontacts`	clob	*Senders* attribute of the event	Sender's contact in `<contact type>:<contact value>` format. Can be blank.	email:petr.petrov@infowatch.ru
`sendermachinedomainname`	clob	*Workstation* attribute of the event	Domain name `dnshostname` of the sender's workstation. Can be blank.	XP-PETROV
`sendermachineip`	clob	*Workstation* attribute of the event	IP address of the sender's workstation. Can be blank.	10.60.20.184
`perimetersin`	clob	Name of the perimeter the event has entered	List of names of the perimeters which the event has entered. Names in the list are separated by commas. Can be blank.	Company perimeter
`perimetersout`	clob	Name of the perimeter which the event has left	List of names of the perimeters which the event has left. Names in the list are separated by commas. Can be blank.	Company perimeter
`tags`	clob	*Tag* attribute of the event	List of tags, separated by commas. Can be blank.	New
`categories`	clob	*Category* attribute of the event	List of categories, separated by commas. Can be blank.	Confidentially
`text_objects`	clob	*Text object* attribute of the event	List of text objects detected in the intercepted event. Text objects in the list are separated by commas. Can be blank	special control

Attribute name	Data type	Description	Possible values	Example
`fingerprints`	clob	*Form*, S*ample document*, *Stamp*, *DB unloading* attributes of the event	List of forms, sample documents, stamps, and DB unloadings detected in the intercepted object. Elements in the list are separated by commas. Can be blank.	Application form.doc
`protectedddocuments`	clob	*Protected object* attribute of the event	List of protected objects detected in the intercepted object. Elements in the list are separated by commas. Can be blank.	Lease contract
`policies`	clob	*Policy* attribute of the event	List of policies triggered by the intercepted object. Policy names are separated by commas. Can be blank.	New employees monitoring policy
`violationtype`	varchar2(40)	*Rules group* attribute of the event	Possible values: • *Copy* (*Copying violation*) • *Placement* (*Placing violation*) • *Transfer* (*Transferring violation*) Can be blank.	Copy
`violation_level`	List	*Violation level* attribute of the event	Possible values: • *High* • *Medium* • *Low* • *No violation* Can be blank.	Medium
`userdecision`	varchar2(27)	User decision attribute of the event	Decision of the Console user. Possible values: • *Violation* • *NoViolation* • *NotProcessed* • *AdditionalProcessingNeeded* Can be blank	Violation
`filepath`	clob	*File path* attribute of the event	List of paths to files. Paths in the list are separated by commas. Can be blank.	\\xp-petrov\C$\666.txt

Attribute name	Data type	Description	Possible values	Example
`attachments`	clob	*Attachment name* attribute of the event	Names of attachments separated by commas	666.txt, Petrov.doc, 3.jpg
`url`	varchar2(4000)	*URL* attribute of the event	Full address from which data has been sent Can be blank.	10.60.21.34/3.jpg
`capture_server_ip`	varchar2(256)	*IP of interception server* attribute of the event	IP address of the server, on which data has been intercepted. Can be blank.	10.60.21.34
`capture_server_hostname`	varchar2(256)	*Name of interception server* attribute of the event	Name of the server, on which data has been intercepted. Can be blank.	iwtm.infowatch.ru

Warning!

The number of elements to display within one cell of one record is limited to 1000 (For example: 1000 recipients or extracted files in the event).

User Audit Table View

Connect to TM DB using created **siem** user (see "Creating siem user"). `IWTM.ARC_VIEW_AUDIT_LOG` contains desired data.

Attribute	Data type	Desctiption	Example
`audit_log_id`	Number(20)	TM user session audit entry ID.	12345
`change_date`	Varchar2(50)	Date and time of registered user action	2014-06-19T18:56:26+04:00
`user_login`	varchar2(256)	Login of user, who performed an action	Admin
`user_fullname`	varchar2(256)	Full name of user, who performed an action	Petrov Petr Petrovich
`user_email`	varchar2(256)	Email of user, who performed an action	petr.petrov@infowatch.ru

Attribute	Data type	Desctiption	Example
`operation`	varchar2(40)	Type of action, performed by user The following values are possible:[VK1] • Run (performing query) • Start (start) • Stop (stop) • view (view) • create (creation) • update (editing) • delete (delition) • login_failure (unsuccessful login attempt) • login (successful login) • logout (logout) • change_password (password change) • decision_update (changin user decision) • remove_tag (changing event tag) • delete_ref (deleting reference) • copy (copying) • move (move) • commit (applying changes in system configuration) • rollback (cancellation of changes in system configuration) • draft (saving changes in system configuration) • add (adding) • import (import) • export (export)	Edit

Attribute	Data type	Desctiption	Example
`entity_type`	varchar2(40)	Type of object on which the action was carried out. The following values are possible:[VK2] • Category (category) • Dashboard (dashboard) • DashboardWidget (widget) • EtForm (sample form) • EtStamp (sample stamp) • EtTable (sample table) • Fingerprint (sample documents) • LdapContact (LDAP contact) • LdapGroup (LDAP group) • LdapPerson (LDAP person) • LdapStatus (LDAP person status) • LdapWorkstation (LDAP workstation) • Perimeter (perimeter) • Policy (policy) • Report (report) • Role (role) • Selection (selection) • SystemList (list of resource topics) • SystemListItem (list of resources with definite topic) • Tag (tag) • Term (term) • TextObject (text pbject) • User (пользователь) • VisibilityArea (visibility scope) • Config (configuration) • License (license) • Object (object) • ProtectedCatalog (protected catalog)	Dashboard
`entity_display_name`	varchar2(4000)	Name of object, on which the action was carried out.	Statistics1
`property_changes`	clob	Description of actions in json format. Filled only in case of managing users, roles, areas and logging in and out of the management console. Three different formats are possible.	
	-	**Format №1.** Relevant for events of role and visibility scope management.	

Attribute	Data type	Desctiption	Example

		{
		“old”: {
		“<OBJECT TYPE>”:{
		{
		“<FIELD>”: “<VALUE>”,
		“<FIELD>”: “<VALUE>”
		}
		}
		}
		{
		“new”: {
		“<OBJECT TYPE>”:{
		{
		“<FIELD>”: “<VALUE>”,
		“<FIELD>”: “<VALUE>”
		}
		}
		}
		}
			{
			"old":{
			"visibilityareas":{
			}
			},
			"new":{
			"visibilityareas":[
			{
			"VISIBILITY_AREA_ID":"F00207A1E7E7743EE0433D003C0A5DD400000000",
			"DISPLAY_NAME":"<idclip>",
			"NOTE":"<idclip>",
			"VISIBILITY_AREA_CONDITION":"{"data":{"link_operator":"and","children":[]}}",
			"IS_SYSTEM":1
			}
			}
			}

	-	**Format №2.** Relevant for user management events.	

Attribute	Data type	Desctiption	Example

		{
		“old”:{
		“<FIELD>”: “<VALUE>”,
		“<FIELD>”: “<VALUE>”
		}
		“new”:{
		“<FIELD>”: “<VALUE>”,
		“<FIELD>”: “<VALUE>”
		}
		}
			{
			"old":{
			"EMAIL":"asdasd@asdasd.ru"
			,
			"CHANGE_DATE":"01-07-2014 09:46:29.000000"
			},
			"new":{
			"EMAIL":"asdasd11@asdasd.ru",
			"CHANGE_DATE":"01-07-2014 09:46:44.000000"
			}
			}

	-	**Format №3.** Relevant for log in and log out events. -	

		{
		"request":{
		"hostname": “<HOST NAME>”,
		"ip":"<IP-ADDRESS>",
		"login":"<USER LOGIN>"
		}
		}
			{
			"request":{
			"hostname":*null*,
			"ip":"127.0.0.1",
			"login":"officer"
			}
			}

8.11.2 Configuring TM Side

To configure forwarding consolidated information to TM:

1. To start script, run the command:
   `/opt/iw/tm5/bin/config/iwtm-siem.conf.py`
2. Create DB user account for SIEM (see "Creating Siem User").
3. Configure forwarding information from TM to SIEM (see "Forwarding Logs to SIEM");
4. Configure **Nagios** and TM components from menu;
5. Configure TM DB user session audit logging.

Forwarding Logs to SIEM

To configure forwarding entries from TM Linux-server log files to SIEM:

1. Ru the following script:
   `/opt/iw/tm5/bin/config/iwtm-siem.conf.py`
2. Choose the option **Log messages forwarding configuration**.
3. Set parameters for logs transfer:

Parameter	Description
`Enable forwarding`	Enabling/disabling forwarding logs to siem. (Possible value: `Yes/No`)
`Forwarding server`	SIEM server IP address or dns name
`Forwarding server port`	Port of SIEM server, where **syslog** is running
`Forwarding protocol`	Protocol of forwarding data to SIEM. (Possible value: `TCP/UDP`)
`Log messages severity`	Minimal level of log messages, sent to SIEM server. (Possible value: `Emergency, Alert, Critical, Error, Warning, Notice, Info, Debug`)
`Size (MB)`	Acceptable size of messages queue, which are to be sent to SIEM. (Default value: `500`)

4. Press **Ok**.

> **Warning!**
>
> Disconnecting users with administrative permissions is not being logged in DB, thereafter, this information will not be forwarded to SIEM.

Log Management for TM DB User Sessions

You can enable or disable logging for TM DB user sessions in the OS system log via **rsyslog** utility.

To enable logging for TM DB user sessions:

1. Run the script:
   `/opt/iw/tm5/bin/config/iwtm-siem.conf.py`
2. Select the option **DB audit logging management**.
3. Enter your login and password for Oracle/Postgre administrator:
   - **Enter login for DB administrative account** - a login for the administrator account;
   - **Enter password for DB administrative account** - a password for the administrator account.

4. Click **Check logging status**.
5. If:
    - **DB audit logging to OS journal: OFF** - click **Change logging status** to enable logging;
    - **DB audit logging to OS journal: ON** - click **Change logging status** to disable logging.

> **Note:**
>
> For Oracle database, IWTM services are restarted when you change the logging status. Restarting services may take some time.

Managing Siem User

This chapter describes creating, deleting and changing password for **siem** user, which is used by SIEM to interact with Traffic Monitor:

- Creating Siem User;
- Changing Siem User Password;
- Deleting Siem User.

Creating Siem User

To create siem user:

1. To start script, run the command: `/opt/iw/tm5/bin/config/iwtm-siem.conf.py`
2. Choose **DB siem user** option.
3. In the window that opens, select **Create DB siem user** option.
4. Set parameters:

Parameter	Description
`Enter login for DB administrative account`	Login of Oracle/PostgreSQL administrators account **Note:** the following logins are used: • `sys` - if you run Oracle • `postgres` - if you run PostgreSQL
`Enter password for DB administrative account`	Password for Oracle/PostgreSQL administrators account
`Enter password DB siem user`	Password for new siem user

5. Press **Create**.

Changing Siem User Password

To change siem user password:

1. To start script, run the command: `/opt/iw/tm5/bin/config/iwtm-siem.conf.py`
2. Choose the option **DB siem user**.
3. Choose the option **Change password for DB siem user**.
4. Set parameters:

Parameter	Description
`Enter login for DB administrative account`	Login of Oracle/PostgreSQL administrators account **Note:** the following logins are used: • if you run Oracle - `sys` • if you run PostgreSQL - `postgres`
`Enter password for DB administrative account`	Password of Oracle/PostgreSQL administrators account
`Enter new password user siem`	New password for siem user

5. Press **Change password**.

Deleting Siem User

To delete siem user:

1. To start script, run the command: `/opt/iw/tm5/bin/config/iwtm-siem.conf.py`
2. Choose the option **DB siem user**.
3. Choose the option **Delete DB siem user**.
4. Set parameters:

Parameter	Description
`Enter login for DB administrative account`	Login of Oracle/PostgreSQL administrators account
`Enter password for DB administrative account`	Password of Oracle/PostgreSQL administrators account

5. Press **Delete**.

8.11.3 Type of Logs, Transmitted to SIEM

Rsyslog forms common system journal. It is a protocol, which is used to transmit logs to SIEM.

There are five major log types, transmitted to SIEM:

1. **iw_*** processes logs. For example:
   ```
   Mar 11 14:32:30 iw-VMware-4224da3ab iw_expressd: 5
   (18485:0x00007f53001b97e0) [INFO   ] : <Root> Runtime environment
   initialized. Starting...
   ```
2. **pguard** script logs. Script monitors state of services and restarts them when necessary:
   ```
   Mar 11 14:32:26 iw-VMware-4224da3ab pguard: 148 (18256:0) [INFO] : expressd
   Terminating pid 18257 (signal 15)
   ```
3. Logs of login to **Oracle DB** and logout from it:
   ```
   Mar 11 14:28:20 iw-VMware-4224da3ab Oracle Audit[17786]: LENGTH : '153'
   ACTION :[7] 'STARTUP' DATABASE USER:[1] '/' PRIVILEGE :[4] 'NONE' CLIENT
   USER:[4] 'root' CLIENT TERMINAL:[13] 'Not Available' STATUS:[1] '0' DBID:[0]
   ```
4. **Linux users** login and logout:
   ```
   Mar 11 14:32:02 iw-VMware-4224da3ab runuser: pam_unix(runuser:session):
   session opened for user iwtm by root(uid=0)
   ```
5. **Nagios** logs:
   ```
   Feb 10 20:05:39 iw-VMware-4224289a4 nagios: SERVICE ALERT:
   IWTM;TM_DAEMONS_STATE;CRITICAL;SOFT;1;CRITICAL - updater(3)
   ```

8.12 Deleting Temporary Files

Ability to delete temporary files has been implemented in the product as **clean_temporary_files.sh** script.

Script deletes the following information:

1. Files from operation system's temporary directory (`/opt/iw/tm5/tmp/` directory).
2. Data from Traffic Monitor file queue directory (`/opt/iw/tm5/queue/` directory).

> **Note:**
>
> New events will not be processed by the system during temporary files deletion. Information about all unprocessed data will be deleted at the moment of script execution.

To delete temporary files:

1. Run **clean_temporary_files.sh** script:
   ```
   /opt/iw/tm5/bin/clean_temporary_files.sh
   ```
2. Accept temporary files deletion:
   ```
   yes
   ```

9 Appendix A. Username and Password Creation Recommendations

Rules for logins

- The username should be 1-20 characters long.
- The username may include English letters, digits and underscore "_". It should start with a letter.

Rules for passwords

- The user password should be 8-128 characters long.
- The user password may include English letters, digits, and also the following characters:

«#», «$», «!» or «%».

- The password is case-sensitive.

Recommendations for strong passwords

- Recommended password length is 10-30 characters.
- The password must contain the combination of letters, digits and characters.
- It is not advised to:
    - include whole words or phrases into a password.
    - use a series of the same character.
    - start and end the password with the same character.
    - create a new password by adding characters to your current password

General recommendations

Do not start usernames or passwords with these combinations: SYS_ and ORA_.

Do not use Oracle reserved words in usernames or passwords:

ACCESS	DELETE	INTERSECT	OPTION	SUCCESSFUL
ADD	DESC	INTO	OR	SYNONYM
ALL	DISTINCT	IS	ORDER	SYSDATE
ALTER	DROP	LEVEL	PCTFREE	TABLE
AND	ELSE	LIKE	PRIOR	THEN
ANY	EXCLUSIVE	LOCK	PRIVILEGES	TO
AS	EXISTS	LONG	PUBLIC	TRIGGER
ASC	FILE	MAXEXTENTS	RAW	UID
AUDITBETWEEN	FLOAT	MINUS	RENAME	UNION
BY	FOR	MLSLABEL	RESOURCE	UNIQUE

CHAR	FROM	MODE	REVOKE	UPDATE
CHECK	GRANT	MODIFY	ROW	USER
CLUSTER	GROUP	NOAUDIT	ROWID	VALIDATE
COLUMN	HAVING	NOCOMPRESS	ROWNUM	VALUES
COMMENT	IDENTIFIED	NOT	ROWS	VARCHAR
COMPRESS	IMMEDIATE	NOWAIT	SELECT	VARCHAR2
CONNECT	IN	NULL	SESSION	VIEW
CREATE	INCREMENT	NUMBER	SET	WHENEVER
CURRENT	INDEX	OF	SHARE	WHERE
DATE	INITIAL	OFFLINE	SIZE	WITH
DECIMAL	INSERT	ON	SMALLINT	
DEFAULT	INTEGER	ONLINE	START	

10 Appendix B. Monitoring Indicators

The table below is listing all indicators, used by monitoring subsystem to check the state of System components, installed and operating on servers in All-in-one mode. The check includes obtaining indicator values at regular intervals and comparing them with threshold values. Critical values of all indicators may mean that the server is physically inaccessible. In this case, please check if the server works properly.

> **Warning!**
>
> If configuration files have been changed, then the threshold values and check period may differ from the specified values.

> **Warning!**
>
> If recommendations from the table below do not help you to solve the problem, please contact InfoWatch technical support at support@infowatch.com.

Indicator name	What is checked, where it is checked	Poll interval	Values	Details and recommendations
General System load	Load of IW-Linux-servers, TMcap servers, DB servers over the last 15, 5, and 1 minute	30 minutes	– at least one figure exceeds the value of 20.0, 16.0 and 12.0 for 15, 5 and 1 minute respectively – at least one figure exceeds the value of 10.0, 8.0 and 6.0 for 15, 5, and 1 minute respectively – none of the figures exceed the value of 10.0, 8.0 and 6.0 for 15, 5 and 1 minute respectively	Check the load of interception and analysis servers, and DB servers: 1. Run `top` 2. Sort the results, using the commands: a. Shift+m to sort by RAM load; b. Shift+p to sort by CPU load.
System components statuses	System services statuses	30 minutes	– at least one service is not started – all services are started	In All-in-one installation mode, the list and number of System services are known and permanent. To display services status details, type `iwtm status`

Syslog service status	Whether the syslog service is started or not	30 minutes	🔴 – service not started 🟢 – service started	Check if rsyslog service is running: `systemctl status rsyslog` For additional information, see "Использование демона rsyslogd для логирования сообщений от служб iwtm"
Number of active users	Number of users (security ofiicers), registered in the System (Linux servers)	30 minutes	🔴 – > 50 users 🟡 – from 20 to 50 🟢 – < 20 users	It is necessary to decrease number of security officers to 50 persons
DB Alert Log Errors	Whether Alert Log contains errors (DB servers)	5 minutes	🔴 – errors found 🟢 – no errors	It is necessary to decrease the number of errors having SEVERITY=HIGH label. Search in Alert Log should be based on the following words: • ORA- • Failed to archive • ORACLE Instance .* - Archival Error • ARC[0-9]: I/O error • ARC[0-9]: RFS network connection lost at host • ARC[0-9]: Error 3113 creating • Media Recovery failed with error • Corrupt block • Fractured block • Bad header • Data in bad block • Reread of rdba • log corruption • RESETLOGS Search in pg_log should be based on the following words: • FATAL • PANIC • ERROR
Server availability	Response time for sent packages and number of lost packages (Linux servers)	5 minutes	🔴 – > 500 ms 🟡 – from 100 to 500 ms 🟢 – < 100 ms	Ping results with the following parameters `100.0,20%!` `500.0,60%` show that: response to sent packages exceeds 100 milliseconds and more than 20% of packages are lost; response to sent packages exceeds 500 milliseconds and 60% of packages are lost.

Availability of incorporated mail transfer agent	Postfix server availability	30 minutes	🔴 – not available 🟢 – available	1. Check Postfix server status, using the command `systemctl status postfix` 2. Start checking correctness of configuration file */etc/postfix/main.cf*, using the command `postfix check`
Server availability via SSH	Response time	10 minutes	🔴 – >= 10 seconds 🟢 – < 10 seconds	Check sshd daemon status, using the command `systemctl status sshd`
Device Monitor server availability	Response for request	30 minutes	🔴 – no connection 🟢 – connection established	If the System has an active Device Monitor license, it should be displayed. Check the license in **Administration->Licenses** in Traffic Monitor console.
Using swap file	Free space in swap (virtual memory). (Linux servers)	5 minutes	🔴 – < 10% free 🟡 – from 10 % to 20% free 🟢 – > 20% free	For details, see "Рекомендации по разбиению дискового пространства серверов при установке в разных режимах"
Free space in root partition	Free space in the root file system (Linux servers)	30 minutes	🔴 – < 10 000 MB 🟡 – from 10 000 MB to 20 000 MB 🟢 – > 20 000 MB	
Free space in /var partition	Free space in the `/var.` file system (Linux servers)	30 minutes	🔴 – < 10 000 MB 🟡 – from 10 000 MB to 20 000 MB 🟢 – > 20 000 MB	
Status of time synchronization service	ntpd. service status (NTPD)	30 minutes	🔴 – NTP server is unavailable 🟢 – NTP server is available	Check ntpd daemon status, using the command `systemctl status ntpd`
System time offset	Time lag on System servers and NTP server. (Linux servers)	360 minutes	🔴 – > 40 seconds 🟡 – from 20 to 40 seconds 🟢 – < 20 seconds	The error occurs, if the System cannot connect NTP servers, or System configuration has no NTP servers. In this case, the error message "*Can't create socket connection*" will appear. Make sure that *ntp.conf* and *iwmon-services-ntp.cfg* configuration files have the same correct NTP server specified.

Core dump	Number of files in /opt/iw/tm5 catalogue, starting with core_.... (Linux servers)	30 minutes	🔴 – core dump 🟢 – no core dumps	Contact InfoWatch technical support at support@infowatch.com

Queue of events processing errors	Number of objects in **queue/final-errors** queue (iw_rammer)	1 minute	🔴 – > 50 objects
			🟡 – from 1 to 50 objects
			🟢 = 0
				Option 1: Clear queues using the commands:
				`su - iwtm`
				`/opt/iw/tm5/bin/iw_qtool erase /opt/iw/tm5/queue/final-errors`
				`exit`
				Option 2:
				1. Open file `/etc/cron.d/iwtm_error_queue in` edit mode.
				2. Shorten queues cleaning period in standard cron job in all strings (Default value is 90 days).
				3. Save changes and close the file.
				For additional infromation, see "Каким образом можно дослать письма, если они попали в очереди ошибок?"

Database status	Database status (depending on the DBMS in use)	10 minutes	🔴 – <> ok 🟢 – ok	Check availability of the database: 1. Log in the database `sqlplus iwtm@iwtm` 2. Enter password xxXX1234 3. Watch `SQL>`
Database access service status	Oracle TNS listener's status	10 minutes	🔴 – TNS listener is not started 🟢 – TNS listener is started	Indicator is enabled and displayed in the list, only in case when Oracle SMDB is used in the System
The number of Oracle data files	If the number of files has reached 90% of the specified maximum value	60 minutes	🔴 – if the current number of data files reaches the maximum value 🟡 – if the number of files is 90% of the maximum value 🟢 – if the number of files is fewer than 90% of the maximum value	If the number of files reaches the maximum value, you should increase the value of the **db_files** Oracle paramerer

Free space on the database main partition	Free space on the partition that stores main information (By default: `/u01`)	30 minutes	– < 10 000 MB – from 10000 to 20 000 MB – > 20 000 MB	Dedicate more disk space for `/u01` (for details, see "Рекомендации по разбиению дискового пространства серверов при установке в разных режимах")
Free space in database events catalogue	Free space on the partitions that store events (By default: `/u02`)	30 minutes	– < 7% – from 7 to 15% (if daily table spaces are stored in several sections, then when the value is < 7% in one section, at least. – > 15%	If daily table spaces are stored in several sections, then the free space is calculated as a total sum of all sections, which during the installation were dedicated for storing daily table spaces. For details, see "Рекомендации по разбиению дискового пространства серверов при установке в разных режимах"
Free space on daily events partition on fast disk	Free space on fast disk on partition that stores daily table spaces.	30 minutes	– < 7% – from 7 to 15% – > 15%	The indicator is added, if during the installation *Fast and slow disks* storing mode was chosen. For details, see "Рекомендации по разбиению дискового пространства серверов при установке в разных режимах"
Database patch availability	Whether Oracle patches, required for correct operation of the System, are installed.	30 мин.	– not installed – installed	Indicator is on and displayed in the list, only if Oracle DBMS is used in the System. Download and install the required patch.
Size of database alert log	Size of PostgreSQL DBMS alert log: System LogSize of Oracle DBMS alert log: Alert Log	5 minutes	– > 100 MB – from 50 to 100 MB – < 50 MB	Contact InfoWatch technical support at support@infowatch.com
DB syslog errors	Database log contains errors	30 minutes	– errors found – no errors found	It is necessary to decrease the number of errors with SEVERITY=Error

Number of running processes	The number of running processes (Linux servers)	30 minutes	– > 600 processes
			– from 450 to 600 processes
			– < 450 processes
				It is necessary to increase maximum permitted number of processes. To do this, increase the below mentionned values in the file `/etc/security/limits.d/iwtm.conf`:
				`* - nproc 8192`
				`@iwtm - nproc 8192`
				Maximum permitted value - 100000.

Mail traffic processing queue	Number of objects in queue **queue/smtp** (iw_messed)	30 minutes	🔴 – > 10000 objects 🟡 – from 1000 to 10000 objects 🟢 – < 1000 objects	1. Check status of service `systemctl status iw_messed` 2. View service logs in `opt/iw/tm5/log/messed_app.log` 3. Check RAM and swap load: a. for a short response, run command `free -m` b. for a detailed response, run command `cat /proc/meminfo`
Queue for specific analysis for xAPI/pushAPI objects	Number of objects in queue **queue/analysis** (iw_analysis)	30 minutes	🔴 – > 10000 objects 🟡 – from 1000 to 10000 objects 🟢 – < 1000 objects	1. Check status of service `systemctl status iw_analysis` 2. View service logs in `opt/iw/tm5/log/analysis.log` 3. Check RAM and swap load: a. for a short response, run command `free -m` b. for a detailed response, run command `cat /proc/meminfo`
Queue of objects loading from interceptors to **iw_x2x** service	Number of objects from interceptors for **iw_x2x** queueing in **queue/db** (iw_x2x)	30 minutes	🔴 – > 10000 objects 🟡 – from 1000 to 10000 objects 🟢 – < 1000 objects	1. Check status of service `systemctl status iw_x2x` 2. View service logs in `opt/iw/tm5/log/x2x.log` 3. Check RAM and swap load: a. for a short response, run command `free -m` b. for a detailed response, run command `cat /proc/meminfo`
Loading to storage queue	Number of objects queueing in **queue/x2x, which** are to be loaded to storage by service **iw_x2db** (TMcap servers)	30 minutes	🔴 – > 10000 objects 🟡 – from 1000 to 10000 objects 🟢 – < 1000 objects	1. Check status of service `systemctl status iw_x2db` 2. View service logs in `opt/iw/tm5/log/x2db.log` 3. Check RAM and swap load: a. for a short response, run command `free -m` b. for a detailed response, run command `cat /proc/meminfo`

Queue of applied policies actions processing	Number of objects queueing in **queue/ blackboard** (Linux servers)	30 minutes	🔴 – > 1000 objects 🟡 – from 200 to 1000 objects 🟢 – < 200 objects	1. Check status of service `systemctl status iw_analysis` 2. View service logs in `opt/iw/tm5/log/analysis.log` 3. Check RAM and swap load: a. for a short response, run command `free -m` b. for a detailed response, run command `cat /proc/meminfo`
Queue of objects to be indexed in Sphinx for full-text search	Number of objects queueing to be indexed in Sphinx, for full-text search	30 minutes	🔴 – > 10000 objects 🟡 – from 1000 to 10000 objects 🟢 – < 1000 objects	1. Check status of service: `searchd --status -c /etc/infowatch/sphinx.conf` 2. View service logs in `opt/iw/tm5/log/sphinx/` 3. Check RAM and swap load: a. for a short response, run command `free -m` b. for a detailed response, run command `cat /proc/meminfo` 4. Calculate the number of running `searchd` instances: a. if `iw_is` is running on a node, then: 1 (`iw_is itself`)+ 4 (`grep max_children /opt/iw/tm5/etc/is.conf`)=5 b. if `iw_indexer` is running on a node, then: 1 (`iw_ndexer itself`)+ 8 (`grep max_children /opt/iw/tm5/etc/sphinx.conf`)=9 c. Total: a+b=14 `searchd` instances. The more processes, the less are the odds of slow user request processing.

Queue of objects to be indexed in Sphinx for meta-information search	Number of objects queueing to be indexed in Sphinx, for meta-information search	30 minutes	🔴 – > 10000 objects 🟡 – from 1000 to 10000 objects 🟢 – < 1000 objects	1. Check status of service: `searchd --status -c /etc/infowatch/sphinx.conf` 2. View service logs in `opt/iw/tm5/log/sphinx/` 3. Check RAM and swap load: a. for a short response, run command `free -m` b. for a detailed response, run command `cat /proc/meminfo`
Events indexation by **iw_indexer** service number of errors	Indexation errors number (iw_indexer)	30 minutes	🔴 – > 50 errors 🟡 – from 1 to 50 🟢 – no errors	1. Check status of service `systemctl status iw_indexer` 2. View service logs in `opt/iw/tm5/log/indexer.log` 3. Check RAM and swap load: a. for a short response, run command `free -m` b. for a detailed response, run command `cat /proc/meminfo`
Number of meta-information indexation by **iw_is** service errors	Number of errors occurred during indexation of meta-information by **iw_is** service	30 minutes	🔴 – > 50 errors 🟡 – from 1 to 50 errors 🟢 – no errors	1. Check status of `systemctl status iw_is` service 2. View service logs in `opt/iw/tm5/log/is.log` 3. Check RAM and swap load: a. for a short response, run command `free -m` b. for a detailed response, run command `cat /proc/meminfo`
iw_is commands queue	Number of commands in **iw_is** service queue	30 minutes	🔴 – > 100 commands 🟡 – from 50 to 100 commands 🟢 – < 50 commands	
Data selection queues	Number of objects in **iw_is** service queue	30 minutes	🔴 – > 100 objects 🟡 – from 50 to 100 objects 🟢 – < 50 objects	

iw_is indexation queue	Number of commands in **iw_is** service queue	30 minutes	🔴 – > 100 objects 🟡 – from 50 to 100 objects 🟢 – < 50 objects	
iw_is errors queue	**iw_is** service has errors	5 minutes	🔴 – errors found 🟢 – no errors	
Queue of commands for text tablespace	Number of commands in text tablespace queue	30 minutes	🔴 – > 50 commands 🟡 – from 20 to 50 commands 🟢 – < 20 commands	1. Enable logging of **iw_indexer** service work on `debug` (see "Logging System Work") 2. Check if log file **iw_indexer** in `opt/iw/tm5/log/indexer.log` has errors. 3. Contact InfoWatch technical support.
Queue of commands for meta-information tablespace	Number of commands in meta-information tablespace queue	30 minutes	🔴 – > 50 commands 🟡 – from 20 to 50 commands 🟢 – < 20 commands	

Events processing errors queue	Number of objects in errors queue **queue/errors** (Extractors Framework, TMcap servers: iw_luaengined, iw_warpd, iw_cas)	30 minutes	🔴 – > 1000 objects
			🟡 – from 200 to 1000 objects
			🟢 – < 200 objects
				Option 1: Clear queue by using the commands:
				`su - iwtm`
				`/opt/iw/tm5/bin/iw_qtool erase /opt/iw/tm5/queue/errors`
				`exit`
				Option 2:
				1. Open file `/etc/cron.d/iwtm_error_queue` in edit mode.
				2. Shorten queues cleaning period in standard cron job, in all strings (Default value is 90 days).
				3. Save changes and close the file.

Errors queue of processing events by **iw_x2x**	Number of objects in queue **queue/ x2x-errors** (iw_x2x)	30 minutes	🔴 – > 50 objects
			🟡 – from 1 to 50 objects
			🟢 = 0
				Option 1: Clear queue by using the commands:
				`su - iwtm`
				`/opt/iw/tm5/bin/iw_qtool erase /opt/iw/tm5/queue/x2x-errors`
				`exit`
				Option 2:
				1. Open file `/etc/cron.d/iwtm_error_queue` in edit mode.
				2. Shorten queues cleaning period in standard cron job, in all strings (Default value is 90 days).
				3. Save changes and close the file.

Errors queue of processing events by **iw_x2db** service	Number of objects in queue **queue/ x2db-errors** (iw_x2db)	30 minutes	🔴 – > 50 objects
			🟡 – from 1 to 50 objects
			🟢 = 0
				Option 1: Clear queue by using the commands:
				`su - iwtm`
				`/opt/iw/tm5/bin/iw_qtool erase /opt/iw/tm5/queue/x2db-errors`
				`exit`
				Option 2:
				1. Open file `/etc/cron.d/iwtm_error_queue` in edit mode.
				2. Shorten queues cleaning period in standard cron job, in all strings (Default value is 90 days).
				3. Save changes and close the file.

Errors queue of applied policies actions processing	Number of objects in queue **queue/ blackboard_errors** (Linux servers)	30 minutes	🔴 – > 50 objects
			🟡 – from 1 to 50 objects
			🟢 = 0
				Option 1: Clear queue by using the commands:
				`su - iwtm`
				`/opt/iw/tm5/bin/iw_qtool erase /opt/iw/tm5/queue/blackboard-errors`
				`exit`
				Option 2:
				1. Open file `/etc/cron.d/iwtm_error_queue` in edit mode.
				2. Shorten queues cleaning period in standard cron job, in all strings (Default value is 90 days).
				3. Save changes and close the file.