Pandora FMS v1.2

Userguide

***Pandora FMS* v1.2Userguide**
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Chapter 1. Introduction to Pandora FMS

1.1. Pandora. The Free Monitoring System

Pandora FMS is a monitoring application to watch systems and applications. Pandora allows to know the status of any element of your bussiness systems. Pandora watch for your hardware, your software, your multilayer system and of course your Operating System. Pandora could detect a network interface down and the movement of any value of the NASDAQ new technology market. If you want, Pandora could sent a SMS message when your systems fails... or when Google value low below US$ 330.

Pandora FMS will adjust, like an octopus, to your systems and requirements, because it has been designed to be open, modular, multiplattform and easy to customize.

1.2. Introducing Pandora FMS.

Pandora FMS is a monitoring tool that allows a system administrator to visually analise the status and efficiency of Operating Systems, Servers, Applications and Hardware Systems - such as firewalls, proxies, databases, Web servers, tunnelling servers, routers, switches, processes, services, remote access servers, etc. - all integrated into an open and distributed architecture. Pandora can be implemented over any operating system, with specific agents for each platform. Pandora can also monitor any TCP/IP hardware system, as load balancers, routers, switches, printers, etc.
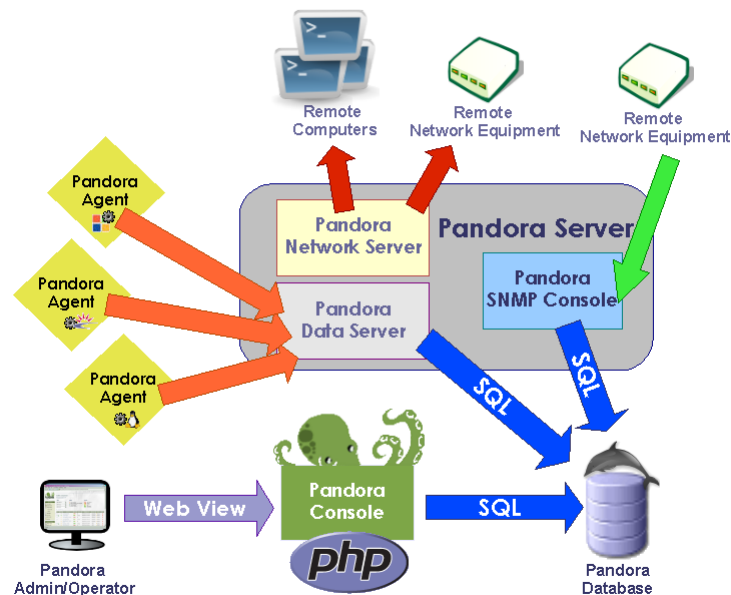
Pandora architecture is formed of four main components:

- *Web Console*: Pandora's user interface. The user controls and operates the system with it. Several Web consoles can be implemented in a single system. The Web console is written in PHP, and it is over a database and a Web server. It is compatible with any platform - GNU/Linux, Solaris, Win2000, AIX, etc.T official supported platform is GNU/Linux, though

  The console permits the user to control the status of the agents, view statistical information, generate graphs and data tables, keep a system incident control,moreover it is able to generate reports and change the alerts, agents, and user profile settings.

- *Server*: In Pandora 1.2 there are three different servers:

  The core server is the receptor of the data packages and generates the alerts - it is the brain of the system. Several servers can work alongside for larger systems. The core server accesses Pandora database, which is shared with the Web server, and stores the processed data packages. Server executes as daemon, and processes the packages stored in its file system. Data is generated by the system agents. Despite the server's low system resources comsumption and simple installation and operation, the core server is the most critical element of the system. The core server receives and processes the produced data, and fires the alerts and the events.

  The Network Servers monitorize remote systems using network resources like ICMP, TCP, UDP or SNMP Queries. Network Servers are acting itself like "Network Agents". This server fires the alerts and the events for this modules.

  The SNMP Server receives and processes the snmp traps, and fires the alerts associated to it.

- *Central Database*: At the moment the system only supports MySQL. The central database keeps all the information Pandora needs to work - agent data, settings, user information, incidents, system settings, etc. The system can use a MySQL cluster to store the information, or a High Availability (HA) solution for larger sytems.

  This database can work with any of the platform officially supported by MySQL. Pandora can be implemented with MySQL versions from 3.0 to 5.0, although the latest is recommended.

- *Pandora Agents*: They collect all the system's data. They are executed in each local system, although they can also collect remote information by intalling monitoring sytems for the agent in several different machines - called satellite agents.

  They have been developed to work under a specific platform, making use of the specific tools of the used language: ShellScripting for Unix - which includes GNU/Linux, Solaris, AIX, HP-UX and BSD, as well as the Nokia's IPSO. Pandora agents can be developed in virtually any language, given its

simple API and being open source. Windows agent are developed in a free development environment for C++ and uses the same interface and modularity than Unix agents.

The old agent for Windows plattforms was developed on VBS Scripting language, and is deprecated with the new Pandora 1.2 windows agent.
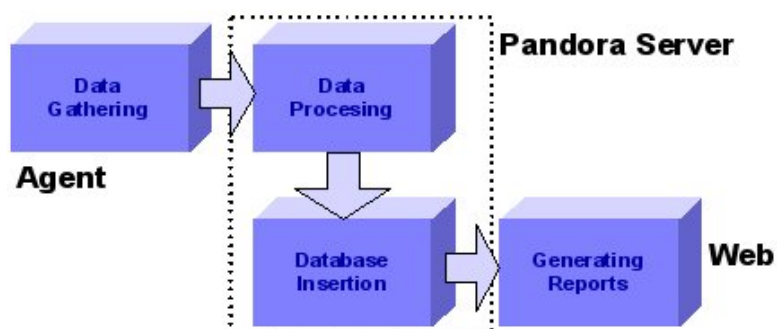
## 1.3. What kind of systems/ services can be monitored?

At present, with Pandora any process or system that through a command returns a value can be monitored, as well as any value in any Operating System log file or similar. Some examples of already existing implementations below:

```
Number of connections (sessions) of Checkpoint FW-1
Number of NAT sessions of Checkpoint FW-1
Number of connections of Linux NetFilter / IPTables firewall
Number of FW-1 logged packets
Number of FW-1 dropped packets
Number of FW-1 accepted packets
State of High Availability in FW1 NG
Last policy installed in a Firewall-1 module
Synchronization state of the modules in FW1 NG
CPU of the system: idle, user and system
Number of processes of the system
Temperature of the CPU of a system
Value of a MS Windows registry entry
Queued jobs in a generic dispatcher
Memory of the system: free, swap, kernel Fw-1, cache
Percentage of free space on disc (for different partitions)
Messages processed by a mail gateway
Existence of a string in a text file
IP traffic (filtering based on the connections of the firewall)
Hits of pages in HTTP Servers (Apache, iPlanet, IIS, Netscape)
```

```
Percentage of erroneous packets in a Gateway
Connections established in a Remote Access Server (RAS)
Size of a file
Open sessions by a VPN server
MySQL Performance: Threads, queries, sessions...
Snort system state
Reported events by IDS (Snort) up to six levels of priority
Network load
Number of local Connections (TCP, UDP, Unix sockets)
Detected viruses by a Web Antivirus Gateway
ICMP latency time towards a host
Rate of average transference in a file transfer tool
Number of DNS requests attended by a server (including types)
Number of FTP sessions attended by a FTP server
(Generic) State of any active process / service in the system
(Generic) State of any countable parameter of the system
```

1.3.1. Global architecture

Pandora 1.2 has changed many things from 1.1 version, but this graph representing Pandora architecture is very useful to understand in a single graph, all components.
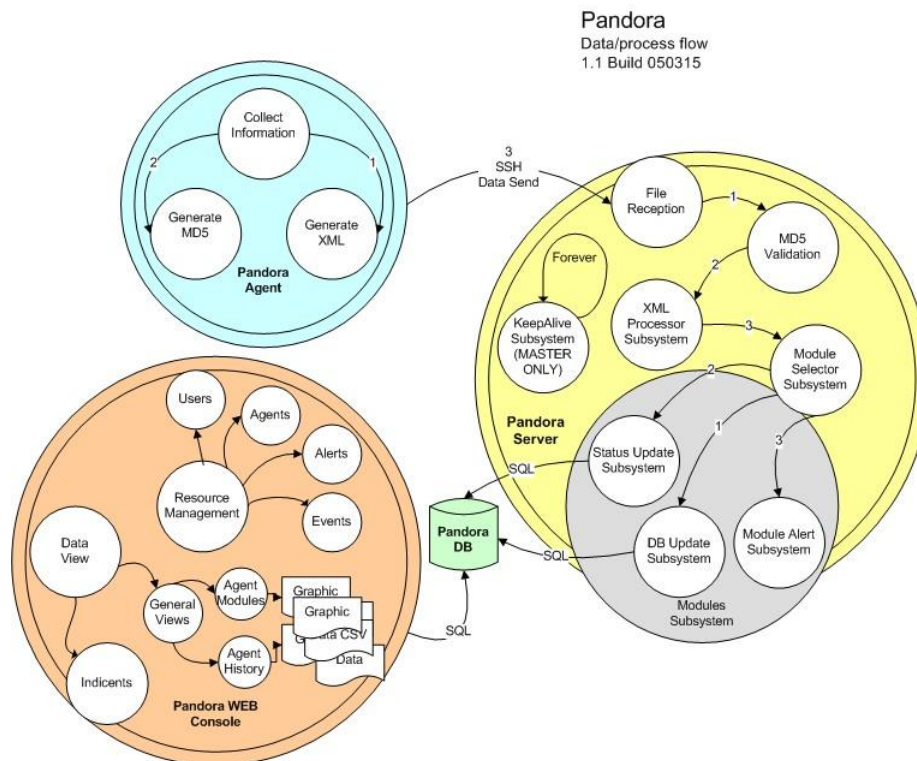
1.4. Information gathering with Pandora agents

Pandora agents are based on native languages in every platform: scripts that can be written in any language. It's possible to reproduce any agent in any programming language and can be extended without difficulty the existing ones in order to cover aspects not taken into account up to the moment.

These scripts are formed by modules that each one gathers a "chunk" of information. Thus, every agent gathers several "chunks" of information; this one is organized in a data set and stored in a single file, called data file.

The process of transferring the data file from the agent to the server is made regularly at a defined time interval in the agent configuration file, pandora_agent.conf. It's possible to modify that parameter in order to do not fill the database with non-relevant information, either load the network or affect the system performance. The default interval is 300 (seconds), which is equivalent to five minutes. Minor values of 100 (seconds) are not recommended since host performance could be affected, besides loading excessively Database and the Operating System of Pandora Server. Pandora is not a real time system; it's an applications and systems general monitoring system in environments that are not critical at real time.

Packets transfers are made via SSH, with DSA authentication (although also RSA can be used). The process is completely safe since neither any password nor unencrypted confidential information is sent. Confidentiality, integrity and authentication of the connections between the agent and the server are ensured. In the Agents and Server Installation and Configuration guides, the process of generation of keys to do the automatic SCP transfer is detailed.

Also the transfer via FTP or any other file transfer system could be made, although SSH has been chosen for security and compatibility with most of the systems in the market.

Pandora Agents are thought to be executed from the agent from which they gather information, although the agents can gather information of accessible machines from the host where they are installed. In this case those agents are called "Satellite Agents". These Satellite Agents can use Telnet, SNMP or any other commands to get the information.

We can also have a host with several agents: Some that gather information from the accessible machines (acting as "satellite agents") and the Standard Agent that monitors the host where it's running.

1.4.1. XML Data files

The data file has the following syntax:

```
hostname.serialnumber.data
```

This is an XML file, and its name is the combination of the hostname where the agent runs, a different serial number for every data package and the extension .data that indicates that it's a data file.

We also have a control file for every data file:

```
hostname.serialnumber.checksum
```

This file has .checksum extension and contains a MD5 hash of the data file. This allows checking that the information has not been changed before being processed.

The XML data file generated by every agent is the core of Pandora. This file has the information gathered by the Agent. Its easy structure allows that any user could create its own developments to be processed in Pandora, or use the included ones. An example of the information included into the data file below:

```
<agent data os_name="SunOS" os_version="5.8" timestamp="300"
agent_name="pdges01" version="1.0">
  <module>
    <name>SSH Daemon</name>
    <type>generic_proc</type>
    <data>1</data>
  </module>
  <module>
    <name>FTP Daemon</name>
    <type>generic_proc</type>
    <data>0</data>
  </module>
  <module>
    <name>DiskFree</name>
    <type>generic_data</type>
    <data>5200000</data>
  </module>
  <module>
    <name>UsersConnected</name>
    <type>generic_data_inc</type>
    <data>119</data>
    <min>1</min>
    <max>250</max>
    <description>Users currently connected</description>
  </module>
  <module>
    <name>LastLogin</name>
    <type>generic_data_string</type>
```

```
        <data>slerena</data>
    </module>
</agent_data>
```

1.4.2. Pandora servers

With Pandora 1.2 version, you have three different types of servers:

- *Pandora Data Server*. This is a PERL application that that processes the information sent by the agents. The agents send the XML data file via SSH and the server periodically verifies if it has new data files waiting to be processed. You can setup different data servers in different systems or in the same host (that will be different virtual servers).

- *Pandora Network Server*. This is a PERL application that execute network tasks like sending pings, TCP requests, SNMP requests and UDP request. When you assign an agent to a server, you are assigning to a network server, not a data server, so, this is very important that machines running network servers have "network visibility" to hosts assigned in network modules.

  For example, if you create a module to make a ping check to 192.168.1.1 and assign this agent/module to a server in a 192.168.2.0/24 network without access to 192.168.1.0/24 module will always report DOWN.

- *Pandora SNMP Server*. This is a PERL application that parse output from standard snmptradp (we provide one binary for snmptrapd, but it is possible that you need to replace it with a binary that runs better in your system). This daemon receives SNMP traps, and Pandora SNMP Server stores in database and fire alerts assigned in Pandora SNMP Console.

Data are extracted from the data file, identifying origin, type and category. Once it's classified, the data are inserted into the Database by the same Perl script.

Pandora Server can work in High Availability and/or Load Balancing. In a very big architecture, several Pandora Servers can be arranged simultaneously in order to be able to manage big volumes of information distributed by geographical or functional zones.

Pandora Server is always running (as a daemon) and permanently verifies if some element causes to fire an alarm. If so, it executes the action defined in the alarm, as to send a SMS, an email, even activates the execution of a SCRIPT or to send an HTTP form.

We could have several simultaneous servers, one of them is the Main Server or "Master Server " and the rest of servers are "Slave Servers". The Master Server is the only one that verifies the alarms if any agent goes down. The server which receives the data file from the agent always fires the rest of alarms, defined in the agents' modules. This is also important if this server changes (due to configurations of high availability, load balancing or clustering).

1.4.3. Pandora console

The Web Console is a web application that allows to see graphical reports, state of every agent, also to access to the information sent by the agent, to see every monitored parameter and to see its evolution throughout the time, to form the different nodes, groups and users of the system. It is the part that interacts with the final user, and that will allows you to administer the system.

The Web Console is written in PHP and no plug-in, Flash, Java or ActiveX is needed to access the console, only a browser that supports HTML and CSS (IE5+ or Mozilla 4+). Pandora Web Console can run in several servers, the only thing you need is to be allow to access Pandora Database, where Pandora stores all the information.

1.4.4. Pandora database

Pandora uses a SQL Database to store all the information. Pandora maintains an asynchronous database with all the received data, making a temporary cohesion of everything it is receives and normalizing all the information from the different sources. Every Agent data module generates an entry of information for every data bundle, which implies that a real production system can have of the order of ten million of data, or information atoms.

This information is managed automatically from Pandora, carrying out a periodic and automatic maintenance of the database. This means that there is no operator either manager required to run tasks as database administration ones. This is possible thanks to a periodic purge of the past information over a date (by default 90 days), as well as a data which is older, by default, 30 days.

1.4.4.1. Compacting data

Data stored by Pandora are useful to see evolutions through the time, in order to: make statistics, generate reports and to do capacity planning, as well as other statisticals tasks. To do that it isn't necessary to have all the data, but it's enough to have a representative sample, of smaller resolution, enough to carry out the task that is needed.

With that philosophy the compaction system has been constructed. For instance, If we have a sample of 9.000 elements, distributed during 90 days, Pandora will take the data of last month, which would be 3.000 elements and will compress it in 300. In the graphs they will practically be equal, and it will be

usfel for the reports, statistics and other tasks. This is made thanks to a interpolation in temporary strips, in a totally automatic and periodic way, there is not user or the administrator needed to do this.

1.5. Pandora 1.2 new features

Alert system. Now it is possible to define a "minimun" and "maximum" limit to fire an alert, just to delete "noisy" data that fires false positives.

Network Subsystem. Now it is possible to monitor and analyze data using remote network tools, without using agents, from the new Pandora Network Server component. All management are made from Pandora Console, and now you will be able to make ICMP checks (Ping), size network latency, get all types of SNMP values (including scanning MIB), and makes TCP/UDP connections to check ports, and test text applications, sending texts and waiting for a specific response.

*Module groups.*Modules now could be grouped using a new "module groups".

Network data refresh on demand. Could be for each module or using a "global group refresh", forcing Pandora Network Servers to refresh all network modules inside a group.

Online contextual help, for Pandora WEB Console.

New Pandora server infraestructure.

New SNMP trap console to receive SNMP traps and assigning alerts.

Internal messaging system, to notify events to Pandora users.

Agent detail view autorefresh

New main agent group view

Improved database management system, that allows to manage much more data.

1.6. About Pandora

Pandora is a project initiated and mainly developed by Sancho Lerena, at present other people is working on it: Raul Mateos, David Villanueva, Esteban Sanchez, Jose Navarro and Jonathan Barajas. We want to

thank many other people who help us with translation, graphic design, bugs reporting and interesting ideas.

Pandora is Free Software, and is published under GPL Licence. In order to know the last features, go to the official web site of the project in http://pandora.sourceforge.net.

Chapter 2. Users

A user is based on the user's daily activity. Each user have his/her profile, with a list of actions that can or cannot perform, to access to Pandora. One or more profiles can be assigned to a single user.

Each user is given a number of groups of agents he/she has permission to access, as well as the administrative profile he/she will have in each group. Each user can belong to one or more groups, with an assigned profile for each of them.

Agent belongs to a group and only one, sharing the group with agents of similar characteristics. Groups also contain incidents.

Summarizing: User profiles in Pandora define which users can access Pandora as well as what each user can do. Groups define elements in common among various users. Each user could be in one or more groups at any one time. Each group has user profiles which are defined and attached to it. A profile is a list of things a user can do, such as view incidents, manage database or other tasks.

2.1. Profile manager

Pandora's profile manager is used to assign specific profiles to each user. A hierarchy of users is created, structured by the user's profile within the company. With this system different security levels can be implemented: read-only users, agent group coordinators or system administrators.

A profile is created from the Profile Manager tool in the Administration menu. There are five predefined profiles:

- Operator (Read)
- Operator (Write)
- Chief Operator
- Group coordinator
- Pandora Administrator

To create a new profile click on "Manage Profiles" > "Create Profile" in the Administration Menu

Profile management

Profiles defined in Pandora

Profiles	IR ★	IW ★	IM ★	AR ★	AW ★	LW ★	UM ★	DM ★	LM ★	PM ★	Delete
Operator (Read)	✓			✓							✖
Operator (Write)	✓	✓		✓							✖
Chief Operator	✓	✓	✓	✓							✖
Group coordinator	✓	✓	✓	✓	✓	✓	✓				✖
Pandora Administrator	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✖
Database Administrator								✓			✖
Alert manager									✓		✖
User manager							✓				✖
Pandora Manager							✓			✓	✖
Agent Editor				✓	✓						✖
Module Alert editor				✓	✓	✓					✖

Create profile

Any of the following roles can be assigned to a new profile:

- View incidents (IR)

- Edit incidents (IW)

- Manage incidents (IM)

- View agents (AR). To view agents as well as the events generated by them

- Edit agents (AW). To modify then agent's modules

- Edit alerts (LW). To modify the alerts assigned to an agent

- Manage users (UM). To modify users and their roles

- Manage DB (DM). To modify the configuration and data of the database (Global)

- Manage alerts (LM). To define new alerts (Global)

- Manage Pandora (PM). To modify general system settings

2.2. Adding a user

An user is added clicking on "Manage Users" > "Create user" in the Administration Menu

To create a new user it is necessary to, at least, fill in the user ID, the password (twice) and Pandora's global profile.

2.3. Deleting a user

An user is deleted by clicking on the delete icon on the right hand side of the user. The list of users is

accessed through the "Manage Users" option in the Administration menu.

2.4. Statistics

The user activity statistics shows a graph with the activity of the user, being the number of events the audit has generated for each user. The number of events of a user usually reflects the user's activity.

Click on "View Users" > "Statistics" in the Operation menu to show this graph:
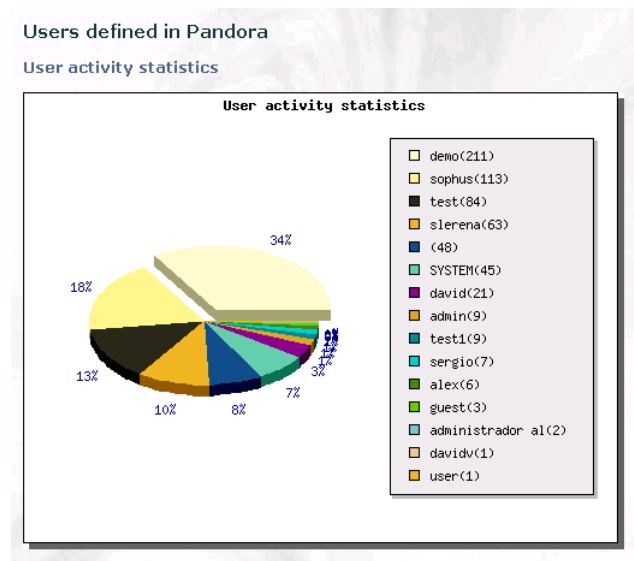
2.5. Messages to users

In pandora 1.2 the possibility of send messages to other users has been added.To create a new message to another user, go to "Messages"section in the Operation menu. You can also read the received messages, but the sent messages are not stored.

2.5.1. Messages to groups

From "Messages" > "Messages to groups" section in the Operation menu you can send messages to groups of users. The sent messages will not be stores.

Chapter 3. Agents

The agents collect information. There are agents based on a software agent and installed in the System to monitor, and network agents - a non-physical agent, without need of installing any software, that executes network tasks in Pandora Network servers and shows information on console.

For agents who need to install software into remote systems, public key of the machine to be monitored needs to be copied into Pandora Data server in order to be able to collect data, as it is specified in detail in Pandora Install documentation.

Data collected from the agents are stored in small pieces of information called "modules". Each module stores only a kind of data. The value of each module is the value of one monitored variable. The agent must be activated in Pandora Server and a group assigned to the agent. The data then begin to be consolidated in the database and can be accessed.

A network agent NEEDs to be assigned to a Network Server to execute network tasks. If you cannot see any Network Servers it's because you don't have any Network Server running. Please configure and run a Network Server before trying to assign a network module to an Agent.

With Pandora Console, user is capable to:

- View the agent status
- Access to the collected information
- Access the monitored values and its evolution in time
- View graphic reports
- Configure Alerts
- Configure modules. Define max and minumun valid values for each module, set a comprehensive description or even change module name (remember that module name must be the same in console and in software agent configuration).
- Export tabular data in CSV format.

3.1. Group Manager

Pandora groups are common to agents, incidents and profiles. Groups are added in "Manage Profiles" > "Manage Groups" in the Administration menu.

There are several default groups defined in Pandora. You also can create your own group (please use given icons or edit and add your own icons). You can also modify default ones.

A group is added by clicking "Create group" and assigning a name to it.

A group is deleted by clicking the delete icon ✖ in the right hand side of each group.

3.2. Adding an agent

You can define new agents. Once defined in Pandora console, it is ready to receive data from a Software agent (old agents, based on software installed in a remote machine), or from Network Agents (assined to a Network Server who runs network tasks to monitor remote systems). You can also mix both types of module in the same agent.

Please remember that a network agent NEEDs to be assigned to a Network Server to execute network tasks. If you can't see any Network Servers it's because you don't have any Network Server running. Please configure and run a Network Server before trying to assign a network module to an Agent.

An agent is added in "Manage Agents" > "Create agent" in the Administration menu.

To add a new agent the following parameters must be configured:

- *Agent Name:* Name of the agent. This and the "agent name" parameter in Pandora's agent.conf file *must have the same value*. By default agent takes hostname of the machine where it's running.

- *IP Address:* IP address of an agent. An agent can share its IP address with other agents. It's only used for informational purposes. In network agents it's useful, because the Server uses this IP address for all new network module definition by default.

- *Group:* Pandora's group the agent belongs to. In this version of Pandora, an agent only can belong to a group.

- *Interval:* Execution interval of an agent. It is the time elapsed in seconds between two consecutive agent executions. An agent could have a defined interval, but could have modules with different (bigger or smaller) intervals. An agent is considered "down" (not responding) when Pandora servers (any of them) has no contact with agent in Interval x 2 seconds.

- *OS:* The Operating System to be monitored. The supported Operating Systems are: AIX, BeOS, BSD, Cisco, HP-UX, Linux, MacOS, Other, Solaris, Windows.

- *Description:* Brief description of an agent.

- *Module definition:* There are two state for a module:

- *Learning mode:* All the modules sent by the agent are accepted. If modules are not defined, they will be automatically defined by the system. It is recommended to activate the agents in this mode and change it once the user is familiar with Pandora FMS.

- *Normal mode:* The modules in this mode must be configured manually. The self definition of the modules is not allowed in this mode.

- *Disabled:* This parameter shows if the agent is activated and ready to send data or deactivated. The deactivated agents don't appear in the user views.

3.2.1. Assigning modules

Pandora's agents use the operating system own commands to monitor a device. Pandora's server will store and process the output generated by those commands. The commands are called "modules".

If the agent had been added in "normal mode", the modules to be monitored should have been assigned. Those modules must be configured in the agent configuration file.

The modules to be processed by Pandora Server are assigned in the "Manage Agents" option, Administration menu. A list with all the agents in Pandora will be shown here.

You'll get a form with all the agent's settings when the agent name is clicked. In the same screen there is a section to assign modules.

Module type	--	Module group	General
Module name		Module Interval	300
Target IP	192.168.50.2	TCP port	
SNMP OID		Get Value	SNMP Community	public
SNMP OID			
TCP send		TCP receive	
Minimum Data		Maximum Data	
Comments			

To add a module is necessary to fill some of the following fields:

Module type: type of module, there are the following types of modules:

- *generic_data*: numeric data type.

- *generic_data_inc*: incremental numerical data type. It stores data resulting from difference between last agent data and actual data.

- *generic_data_proc*: Boolean data type: 0 means False or "bad values", and 1 means True or "good" value. Generic Proc types are also called "monitors" because could say if something is "ok" or is

"wrong". They Are displayed in agent view as little lamps. Red if 0, Green if 1.

- *generic_data_string*: Alphanumeric data type (text string, max. 255 characters).
- *generic_icmp*: get network latency in miliseconds for remote system.
- *generic_icmp_proc*: makes a "ping" to remote system. Report 0 if system is not reachable or not responding.
- *generic_tcp_proc*: makes a "tcp" ping to remote systems and reports "1" if a listing port is responding. Optionally, you may pass parameters in "TCP SEND" (you can use the macro ^M to send carriage returns) and wait to receive string defined in "TCP RECEIVE". If Pandora Network Server received TCP RECEIVE string, it returns 1 (ok), else returns 0 (wrong).
- *generic_tcp_data: generic_tcp_string, generic_tcp_inc*, gets numerical data, string data or incremental data from TCP open port. If it cannot connect, no value returned.
- *generic_snmp types:*: they get information using SNMP interface. If you enter SNMP community and IP address, you can walk SNMP MIB from target using SNMP v1 protocol, and all MIB variables will be listed to allow you choose one. You can also enter MIB using numerical OID or human - understandable format.
- *generic_ucp_proc*: makes a "udp" ping to remote systems and reports "1" if a listing port is responding and 0 if are not responding.

Module Group: It is possible to group modules in the following groups: General, Networking, Application, System and Misscellaneous:

Module Name: Name of the module.

Module Interval: Interval of time in seconds that the agent waits between two consecutive executions.

Target IP: IP of the agent.

TCP port: TCP port to monitor, it is possible to configure UDP port if the module type generic_udp_proc is chosen.

SNMP OID: SNMP OID to monitor. If you configure the MIBs in pandora is possible to get the value.

SNMP Community: Community necessary to monitor a SNMP OID.

TCP send: Parameters to send to TCP port.

TCP receive: Field to configure the parameters which we expect to receive in a TCP connection.

Maximum:: Upper threshold for the value in the module. Any value above this threshold will be taken as invalid and the whole module will be discarded.

Minimum:: Lower threshold for the value in the module. Any value below this threshold will be taken as invalid and the whole module will be discarded.

Comments:: Comments added to the module.

All the modules to be monitored by an agent can be reviewed by accessing the agent in the "Manage Agents" option, Administration menu.

In this screen the modules can be:

• Deleted by clicking ![x]

• Edited by clicking ![edit]

However, the type of data of the module can't be modified.

3.2.2. Alerts

An alert is Pandora's reaction to an "out of range" module value. The Alert can consist of sending an e-mail or SMS to the administrator, sending a SNMP trap, write the incident into the system syslog or Pandora log file, etc. Basically, anything that can be triggered by a script configured in the Operating System where Pandora Servers run.

3.2.2.1. Adding an Alert

The existing Alerts are accessed by clicking on the "Manage Alerts" option, Administration menu.

There are 6 default types of Alerts:

• *eMail*. Sends an e-mail from Pandora's Server

• *Internal audit*. Writes the incident in Pandora's internal audit system

• *LogFile*.Â Writes the incident in the log file

- *SMS Text*. Sends an SMS to a given mobile phone

- *SNMP Trap*.Â Sends a SNMP Trap

- *Syslog*. Sends an alert to the Syslog

An Alert is deleted by clicking on the delete icon placed on the right hand side of the Alert. A new customised Alert can be created clicking in "Create Alert".

The values "_field1_", "_field2_" and "_field3_" in the customised Alerts are used to build the command line that the machine where Pandora resides will execute - if there were several servers, the one in Master mode.

When a new Alert is created the following field must be filled in:

- *Alert name:* The name of the Alert

- *Command:* Command the Alert will trigger
- *Description:* Description of the Alert

In 'Command' data field these variables are used to build the command line that the machine where Pandora resides will execute - if there were several servers, the one in Master mode, replacing at runtime:

- *_field1_*: Field #1, usually assigned as username, e-mail destination or single identification for this event
- *_field2_*: Field #2, usually assigned as short description of events, as subject line in e-mail
- *_field3_*: Field #3, a full text explanation for the event
- *>_agent_*: Agent name
- *_timestamp_*: A standard representation of date and time. Replaced automatically when the event has been fired
- *_data_*: The data value that triggered the alert

3.2.2.2. Assigning Alerts

The next step after an agent has been added, its modules have been configured and the alerts have been defined, is assign those alerts to the agent.

This is done by clicking on the agent to be configured in the "Manage Agents" option, Administration menu. The Alert Assignation form is placed at the bottom of that page.

To assign an alert the next fields must be filled in:

- *Alert type:* This can be selected from the list of alerts that have been previously generated.
- *Maximum Value:* Defines the maximum value for a module. Any value above that threshold will trigger the Alert.
- *Minimum Value:* Defines the minimum value for a module. Any value below that will trigger the Alert.
- *Description:* Describes the function of the Alert, and it is useful to identify the Alert amongst the others in the Alert General View.
- *Field #1 (Alias, name):* Define the used value for the "_field1_" variable.
- *Field #2 (Single Line):* Define the used value for the "_field2_" variable.
- *Field #3 (Full Text):* Define the used value for the "_field3_" variable.
- *Time threshold:* Minimum duration between the firing of two consecutive alerts, in seconds. You can choose between the interval configured or to define other interval.
- *Min number of alerts:* Minimun number of alerts that can be sent consecutively.
- *Max number of alerts:* Maximun number of alerts that can be sent consecutively.
- *Assigned module:* Module to be motitorized by the alert.

All the alerts of an agent can be seen through "Manage Agents" in the Adminitration menu and selecting the agent.

3.2.3. Agent module and agent's alert management

It might happen that the user finds that modules and alerts configured for an agent would be repeated in a new agent.

In order to simplify the administrator's work Pandora offers the option of copying modules and alerts defined in an agent to be assigned to another.

The screen is accessed through "Manage Agents" > "Manage Config.", in the Administration menu:

Source Agent menu permits the selection of the agent where the needed modules and/or alerts reside. The "Get Info" button shows the modules for that agent in the Modules list box.

Copy process is performed to copy the module and/or alert configuration from the selected source agents to the selected destination agents. Several agents can be selected, pressing CTRL and the mouse right button simultaneously. The two tick boxes at the top of the form will be used to specify if the configuration to copy is from modules and/or from alerts.

Deletion process is performed to delete the configuration of the destination agents, in the multiple selection list box. Several agents can be selected at a time, and the tick boxes at the top of the form indicate whether it is the modules or the alerts configuration what is to be deleted. The application will prompt to confirm the deletion, as once deletion is performed, the data associated to them will also be deleted.

3.2.4. Agents group detail

Once you have configured your groups and agents, you can see the status of the groups of agents through "View Agents", in the Operation Menu.

If you pass the mouse over any group image, you'll see the number of agents of that group as well the number of monitors, organized by status.

By pressing the icon at the right of any group image, you will update the info of that group.

3.3. Agent monitoring

When the agents begin to send data to the server, and it is added in the Web console, Pandora processes and inserts the data in the Database. The data are consolidated and can be accessed from the Web console, either as row data or as graphs.

3.3.1. Agent view

All the Agents can be accessed from the Operation menu.

You can view the agents in group you must click in "View agent" From here the status of the agents can be quickly reviewed thanks to a simple system coloured circles and windows that appear when the user pass the mouse on a group.

To view all the Agents the user must click in "View aggent"

Pandora Agents

Summary

All ⊙ - Alert fired ● - Alert not fired

Agent	OS	Interval	Group	Modules	Status	Alerts	Last contact
Endor	🐧	300	SERV (Servers)	19 / 7	💡	●	7%
Ortega	AIX L	300	SERV (Servers)	3 / 1	💡	●	9%
Pacheco	☀	300	SERV (Servers)	1 / 1	💡	●	9%
Popeye	🐧	300	SERV (Servers)	4 / 4	💡	●	7%
Artica_AP	🖥	300	COMS (Networking)	1 / 1	💡	●	11%
RouterEf	🖥	300	COMS (Networking)	6 / 1	💡	●	1%
RouterJazztel	🖥	300	COMS (Networking)	6 / 2	💡	●	4%
tato	🐧	300	WRKS (Workstations)	1 / 1	💡	●	4%
ulises	🐧	300	WRKS (Workstations)	2 / 2 / 2	💡	●	18%
winbox01	⊞	300	WRKS (Workstations)	1 / 1 / 1	💡	●	11%

💡 - All Monitors OK   💡 - At least one monitor fails   💡 - Change between Green/Red state

💡 - Agent without monitors   💡 - Agent without data   ? - Agent down

The list of agents shows all the relevant the information in the following columns:

Agent: Shows the agent's name.

SO: Displays an icon that represents the Operating System.

Interval: Shows the time interval (seconds) in which the agent sends data to the server.

Group: This is the group the agent belongs to.

Modules: Under normal circumstances this field shows the values representing the number of modules and the number of monitors, both in black. If the status of a monitor changes to "incorrect", one additional number is shown: the number of modules, the number of monitors and the number of monitors with "incorrect" status, all in black save the last one.

Status: Shows the "general" status of the agent through the following icons:

💡 All the monitors are OK. It's the ideal status.

No defined monitors. Sometimes nothing is monitored that could be right or wrong, and only numeric or text data is reported.

At least one of the monitors is failing. Usually we want to avoid this, and keep our systems in a healthy green colour.

The agent doesn't have any data. New agents with an empty data package can have this status.

Colour shifting from green to red. This icon indicates that the agent has just changed its status, from 'All OK' to 'we have a problem'.

When an agent is down or there is no news from it for 2 times the Interval value in seconds. Usually it is due to a communication issue or a crashed remote system.

Alerts: Shows if any alerts have been sent through the following icons:

No alerts have been sent.

Shown when at least one alert has been sent within the time threshold of the alert.

Last contact: Shows date and time of the last data package sent by the agent, using a progress bar, according to value of the interval. If you see the image Out of limits, the agent has not send data during the interval. Passing the mouse over the image will show you the last contact in date and time format.

Note: The icon is only visible if you're and administrator and it's a link to the "Manage Agents" > "Update Agent" option in the Administration menu.

3.3.2. Accessing the data of an agent

When an agent is accessed, by clicking on its name, all the information related to that agent is displayed.

3.3.2.1. Agent general info

This shows the data introduced when the agent was created and the total number a data packages the agent has sent.

3.3.2.2. Last data received

This is the description of all the agent modules been monitored.

In this list the module information is showed in the following columns:

Module name: Name given to the module in the agent's config file.

Module type: Type of module as described in Asigning Modules section.

Description: Description given to the module in the agent's config file.

Data: Last data sent by the agent.

Graph: Monthly(M), Weekly(W), Daily(D) and Hourly(H) graphs are generated with the data sent by the agent against time.

On the left hand side of the graph the newst data is represent, and on the right had side the oldest.

The generated graphs are:

- *Hourly graph* (🖳ᴴ) covers a 60 minute interval
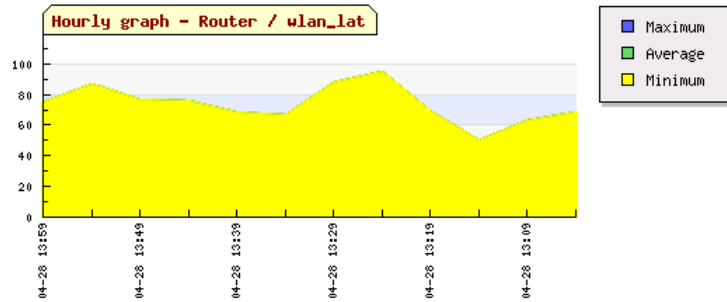
- *Daily graph* (🖳ᴰ) covers a 24 hour interval
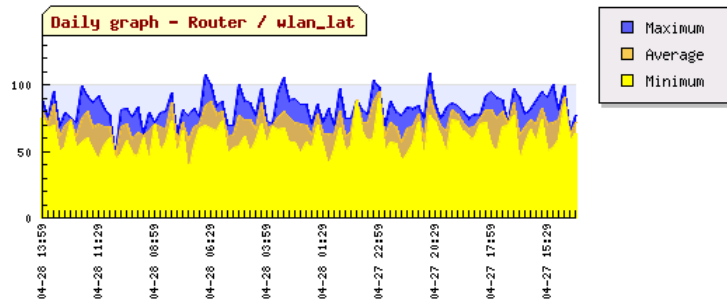
- *Weekly graph* (🖳ᵂ) covers a 7 day interval
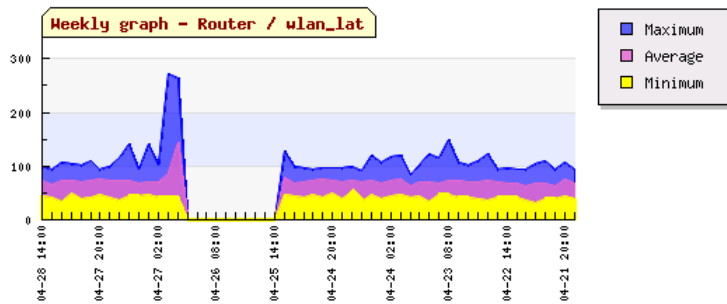
- *Mothly graph* (🖳ᴹ) covers a 30 day interval
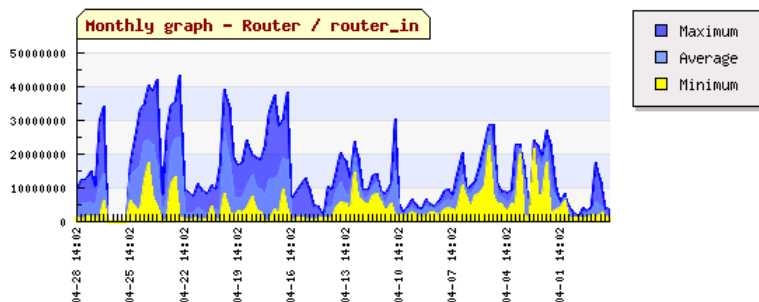
Raw Data: This is the raw data sent by the agent

- Last month

- Last week

- Last day

Timestamp: This is the hour when last contact was made.

3.3.2.3. Complete list of monitors

This is the description of all the monitors defined by the agent

The list shows the information about the monitors in the following columns:

Agent: Agent where the monitor is defined.

Type: Data type of the monitor. For a monitor this value is always of the generic_proc type.

Module name: Name given to the module when it was created.

Description: Description given to the modulein the agent's config file.

Status: The table shows the agent status through the following icons:

The monitor is OK

The monitor is failing

Last contact: Shows the time and date of the last data packaged received from the agent

3.3.2.4. Complete list of alerts

This is the description of all the alerts defined in the agent

Full list of Alerts ❷

Type	Name	Description	Min/Max	Time threshold	Last fired	Times Fired	Status
eMail	DNS_CHECK	DNS for octopus.genterara.com doesn't correspond	1/1	3600	0000-00-00 00:00:00	0	●
eMail	www.artica.es_CONTENTHASH	WEB Content changed	1/1	7200	0000-00-00 00:00:00	0	●

The arlert information is shown in the list divided in the following fields:

Type: Type of alert.

Name: Name given to the alert when it was created.

Description: Description given to the alert when it was created.

Min/Max: The values Mininimun and Maximum configured in the alert.

Time threshold: The time threshold configured in the alert.

Last fired: The last time the alert was executed.

Times Fired: Number of times the alert was launched.

Status: Shows if the alert has been sent through the following icon:

🟢 No alerts have been sent

🔴 At least one alert has been sent

3.3.3. Alert details

The description of all the alerts defined in the server can be viewed from the "View Agents" > "Alert Details" option in Operation menu.

In this list all the alerts appear in a similar way as in the individual view, but now they are shown all together. This allows a deeper analisys of each alert.

3.3.4. Monitor details

The description of all the monitors defined in the server can be viewed from the "View Agents" > "Monitor detail" option in the Operation menu.

In this list all the monitors appear in a similar way as in the individual view, but now they are shown all together. This allows a deeper analisys of each monitor.

3.3.5. Export Data

The Data Export tool can be found in the "View Agents" > "Export data" option in the Operation Menu.

Three parameters need to be configured for exporting data: the agent where data resides, the modules to be exported and the date interval of the data to be exported:
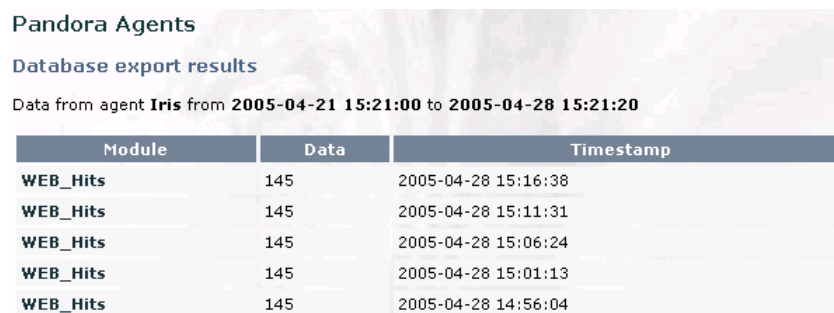
The fields in the results of Exporting data are:

Module: Module name.

Data: Data contained by the module.
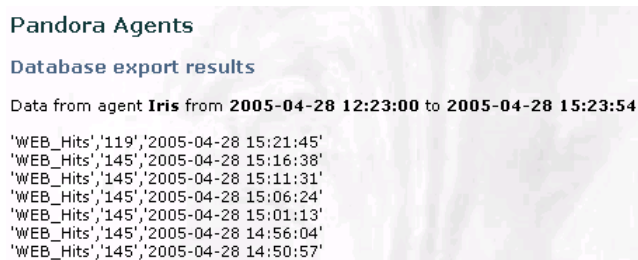
Timestamp: Date and time of the the package was sent by the agent.

Pandora Agents

Database export results

Data from agent **Iris** from **2005-04-21 15:21:00** to **2005-04-28 15:21:20**

Module	Data	Timestamp
WEB_Hits	145	2005-04-28 15:16:38
WEB_Hits	145	2005-04-28 15:11:31
WEB_Hits	145	2005-04-28 15:06:24
WEB_Hits	145	2005-04-28 15:01:13
WEB_Hits	145	2005-04-28 14:56:04

Selecting the CSV format for the output, a text file with extension *.csv* is be created. The data is qualified by single quotes and the fields separated by commas:

Pandora Agents

Database export results

Data from agent **Iris** from **2005-04-28 12:23:00** to **2005-04-28 15:23:54**

```
'WEB_Hits','119','2005-04-28 15:21:45'
'WEB_Hits','145','2005-04-28 15:16:38'
'WEB_Hits','145','2005-04-28 15:11:31'
'WEB_Hits','145','2005-04-28 15:06:24'
'WEB_Hits','145','2005-04-28 15:01:13'
'WEB_Hits','145','2005-04-28 14:56:04'
'WEB_Hits','145','2005-04-28 14:50:57'
```

3.3.6. Statistics

Two kinds of graphical statistics are displayed from the "View Agents" > "Statistics" option, in the Operation menu:

- A graph with the number of modules configured for each agent

- A graph with number of packages sent by each Agent. A package is the number of values from the modules the agent sends after each time interval

Pandora Agents

Database Stats per Agent
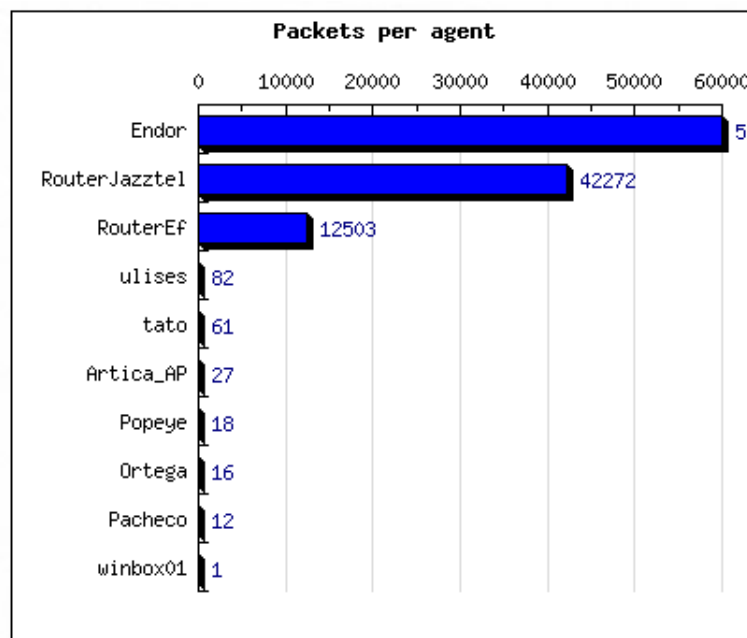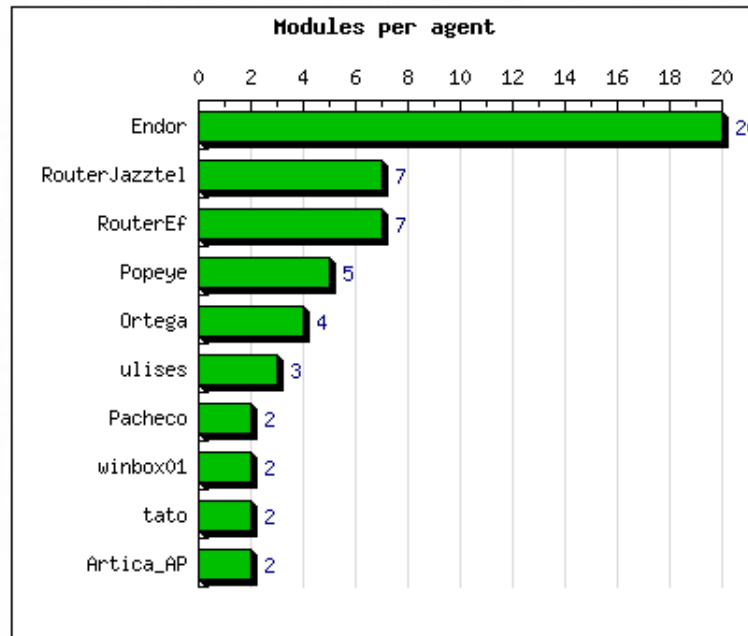
3.4. SNMP Console

Majority of devices can send SNMP traps when have any problem as reboot, lost interface, the temperature is very high, CPU crash, etc. With Traps is possible to know the problem when it happens.

In Pandora 1.2 there is a SNMP console to receive SNMP traps. It is possible configure any device to send SNMP traps to Pandora FMS, you only need the Pandora IP and Community.

From SNMP Console in the Operation menu the users can see the SNMP traps sent to Pandora Server.

3.4.1. SNMP Alerts

Just like is possible to generate an alert if there is an out of range module value. It is possible to generate an alert if an SNMP trap is received with a anorma value. The Alert can consist of sending and e-mail or SMS to the administrator, sending an SNMP trap, write the incident into the system syslog or Pandora log file, etc. Basically anything that can be triggered by a script configured in the Operating System when Pandora Servers run.

In "SNMP Console" > "SNMP Alerts" from Operation menu, the users can see the configured SNMP

Alerts.

- To create a new alert the administrator must click in [Create] . Then appears the following screen:

To assign an Alert the next fields must be filled in:

- *Alert:* This can be selected from the list of alerts that have been previously generated.
- *Alert type:* You can chose between "OID", "Custom OID/vaule" or "SNNMAgent".

- *Description:* Describes the function of the Alert, and it is useful to identify the Alert amongst the others in the Alert General View.

- *OID:* The OID to be motitorized by the alert.

- *Custom value:* Custom value to be motitorized by the alert.

- *SNMP Agent IP:* IP of the SNMP agent.

- *Field #1 (Alias, name):* Define the used value for the "_field1_" variable.

- *Field #2 (Single Line):* Define the used value for the "_field2_" variable.

- *Field #3 (Full Text):* Define the used value for the "_field3_" variable.

- *Min number of alerts:* Minimun number of alerts that can be sent consecutively.

- *Max number of alerts:* Maximun number of alerts that can be sent consecutively.

- *Time threshold:* Minimum duration between the firing of two consecutive alerts, in seconds.

Chapter 4. Incident management and messages

The system monitoring process needs to follow up the incidents arising in the system besides receiving and processing the data to be monitored in each time interval

Pandora uses a tool called Incident Manager for this task, where each user can open an incident, where a description of what happened in the network is shown. This can be completed with comments and files when necessary.

This system is designed for group work. Different roles and workflow systems permit to move incidents from one group to another. The system allows different groups and different users to work on the same incident, sharing information and files.

Clicking on "Manage Incidents", in the Operation menu, a list showing all the incidents is displayed, ordered by the date-time they were updated. Filters can be applied to display only those incidents the user is interested on.

The filters that can be applied are:

- *Incident status filter*. The user can display:

    - All incidents

    - Active incidents

    - Closed incidents

    - Rejected incidents

    - Expired incidents

- *Property filter*. The incidents are shown by:

    - All priorities

    - Informative priority

    - Low priority

    - Medium priority

    - High priority

    - Very high priority

    - Maintenance

- *Group filter*. It can be selected to display just the incidents of a given Pandora group.

The incident list is displayed showing information in the following columns:

ID: ID of the incident.

Status: The incident status is represented by the following icons:

 Active incident

 Active incident with comments

 Rejected incident

 Closed incident

⚪ Expired incident

Incident name: Name given to the incident

Priority: The incident assigned priority is represented by the following icons:

🔴🔴🔴 Very high priority

🟡🔴🔴 High priority

🟡🟡🔴 Medium priority

🟢🟡🟡 Low priority

🟢🟢🟡 Informative priority

🟢🟢🟢 Maintenance priority

Group: The name of the group the incident has been assigned to. One incident can only belong to a single group.

Updated at: This is the date/time the incident was updated for the last time.

Source: The source of the incident. The source is selected from a list stored in the data base. This list can only be modified by the database base administrator.

Owner: User to whom the incident has been assigned to. It doesn't coinced with the creator of the incident, as the incident may have been moved from one user to another. The incident can be assigned to another user by its owner, or by a user with management privileges over the group the incidents belong to.

4.1. Adding an incident

The creation of incidents is performed by clicking on "Manage Incidents" > "New incident", in the Operation menu

Incidents

Create incident

Incident name	Cpu at 75% on Iris

Opened at	2005/04/28 15:27:44	**Updated at**	2005/04/28 15:27:44
Owner	slerena - Sancho Lerena ▾	**Status**	Open and Active ▾
Source	Systems ▾	**Group**	All ▾
Priority	Medium ▾	**Creator**	slerena (*Sancho Lerena*)

Detected a large lapse of time (30min +) of CPU time at 75% on Iris. It could be a

Create

The "Create Incident" form will come up, containing the necessary fields to define the incident. The process is completed by clicking on the "Create" button.

4.2. Incident follow up

All the open incidents can be followed up. The tool is reached by clicking on the "Manage Incidents" option, in the Operation menu.

The indicent is selected by clicking on its name in the "Incident name" column.

The screen coming up shows us the configuration variables of the incident, its comments and attached files.

The first part of the screen contains the Incident configuration

From this form the following values can be updated:

- *Incident name*

- *Incident owner*

- *Incident status*

- *Incident source*

- *Group the indicent will belong to*

- *Indicent priority*

The indicent is updated by clicking on the "Update incident" button.

4.2.1. Adding comments to an incident

Comments about the incident can added clicking on "Add note". This will open up a screen with a text box in it.

The comment is written in this box. The Comment will appear in the "Notes attached to incident" section after the button "Add" is pressed.

Only users with writing privilieges can add a comment, and only the owners of the incident or of the notes can delete them.

4.2.2. Attaching files to an incident

Sometimes it is necessary to link an incident with an image, a configuration file, or any kind of file.

The files are attached in the "Attach file" section. Here the file can be searched for in the local machine and attached when the "Upload" button is pressed.

Only a user with writing privileges can attach a file, and only the owner of the incident or of the file can delete it.
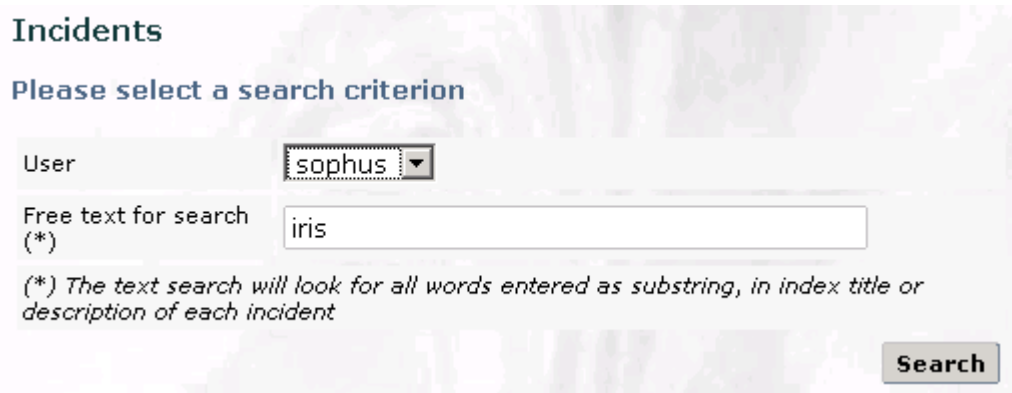
The incident follow up screen shows all the files attached to the incident in the "Attached files" section of the screen.

4.3. Searching for an incident

A specific incident can be found among the incidents created in Pandora by either using a filter, as explained in the first section of this chapter, or by making a query using the "Manage Incidents" > "Searh Incident" tool, in the Operation menu.

Any text string included as a sub-string in the incident can be searched for using this tool. This search engine looks for the string in the Incident title as well as in the text contained by the incident. The search engine will not search either the Comments added to the agent or the attached files. The search can be performed in addition to group, priority or status filters.

4.4. Statistics

The incident statisticts are shown in the "Manage Incidents" > "Statistics" option of the Operation menu. They can be of five different types:

• *Incident status*

• *Incident priority*

• *Users with the incident opened*

• *Incidents by group*

• *Incident source*

Incidents status

55%

- ☐ Open Incident
- ☐ Closed Incident
- ☐ Outdated
- ☐ Invalid

9%

9%

27%

Incidents priorities

59%

- ☐ Informative
- ☐ Low
- ☐ Medium
- ☐ Serious
- ☐ Very serious
- ☐ Maintance

9%

5%

9%

5%

14%

Incident sources

77%

- ☐ Application(17)
- ☐ Other(2)
- ☐ Logs(1)
- ☐ IDS(1)
- ☐ Pandora(1)

5%

5%

9%

5%
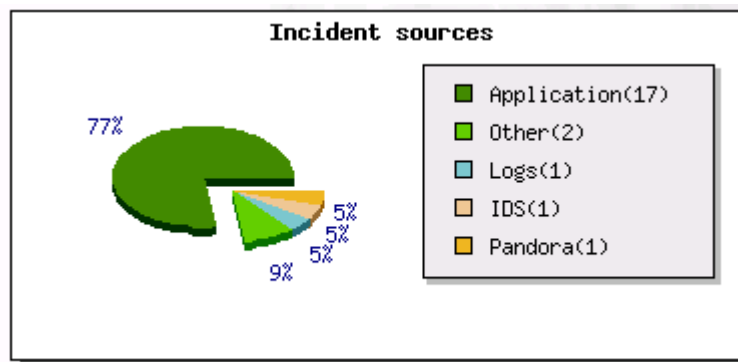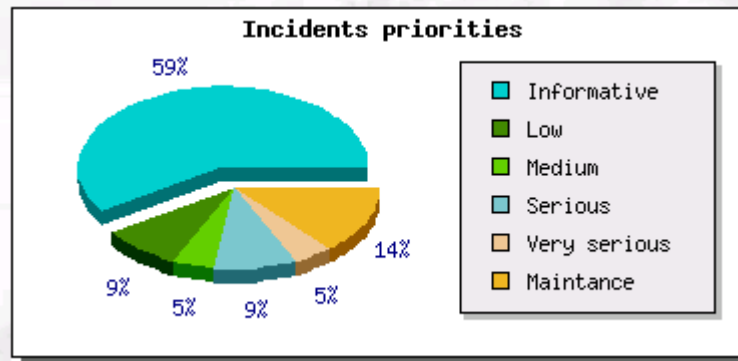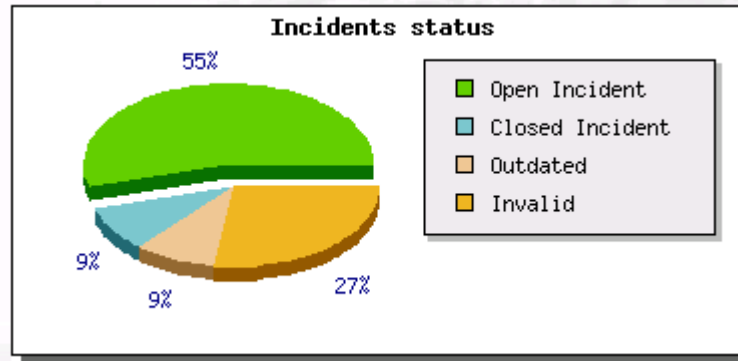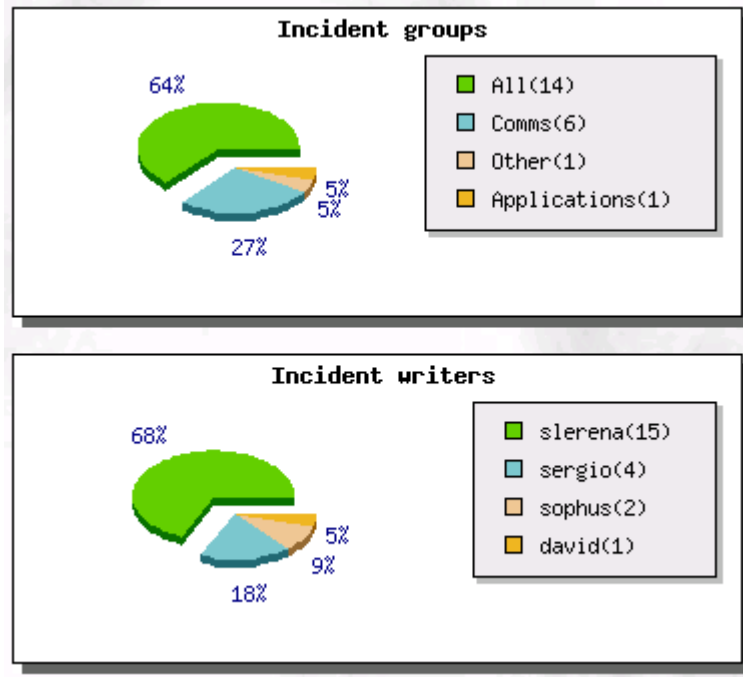
4.5. Messages

In Pandora 1.2 it is possible to send messages to others user. Each user can see his/her messages in "Messages" in the Operation menu.

To send a message to other user you must click in "Messages" > "New mesage" in the Operation menu.

Messages

New message ❓

From:	**ges_demo**
To:	pandora ▾
Subject:	Network problem in Mexico
Message:	

```
Hi,
There are a Network problem in Mexico.
Regards
```

Send message

It is possible to send a message to a group from "Messages to groups" > "New mesage" in the Operation menu.

Messages

New message to group ❓

From:	**ges_demo**
To:	All ▼
Subject:	
Message:	

Send message

Chapter 5. Events

An event in Pandora is any unusual change happend in an agent.

An event is registered when an agent is down or starts up, when a monitor fails or changes its status, or when an alarm is sent.

An event is usually preceded by an issue with the system being monitored. A validation and deletion system has been created to avoid leaving unanalised issues, so they can be easily validated or deleted if the problem can be ignored or it's been already solved.

The events appear ordered chronologically as they enter the system, and can be viewed by clicking the "View Events" option in the Operation menu. The newest events are placed at the top of the table.

The event information list shows the data in the following columns:

Status: The event status is represented by the icon below:

The event has been validated

The event hasn't been validated

Event name: Name assigned to the event by Pandora.

Agent name: Agent where the event happend.

Group name: Group of the agent where the event has happened.

User ID: User that validated the event.

Timestamp: Date and time when the event was raised or validated - if it has been validated.

Action: Action that can be executed over the event.

✔ This icon will validate the event, disappearing the icon

✖ This icon will delete the event

The events can be also validated or deleted in groups by selecting the tick boxes on the last column of the event, and pressing "Validate" or "Delete" at the bottom of the list.

5.1. Statistics

Three different sort of graphical statistic representation can be choosen from the "View Events" > "Statistics" option in the Operation menu:

• Total number of events divided by revised and not revised
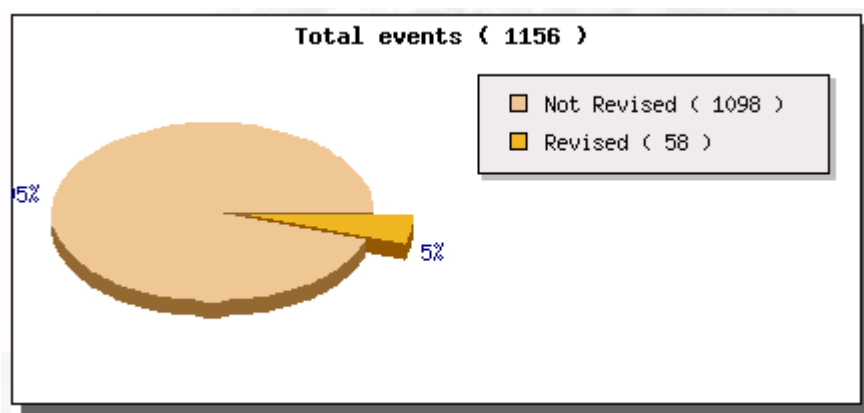
• Total events divided by the users who validated the events
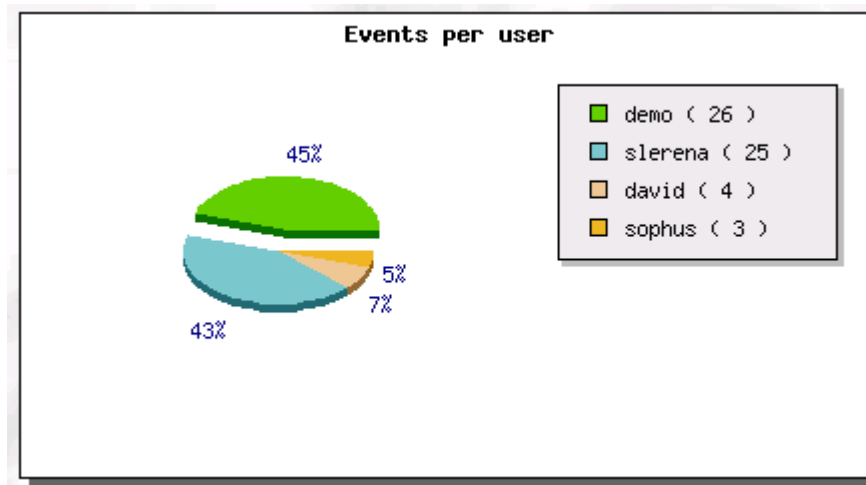
• Total events divided by the group the agent that launched the event belongs to
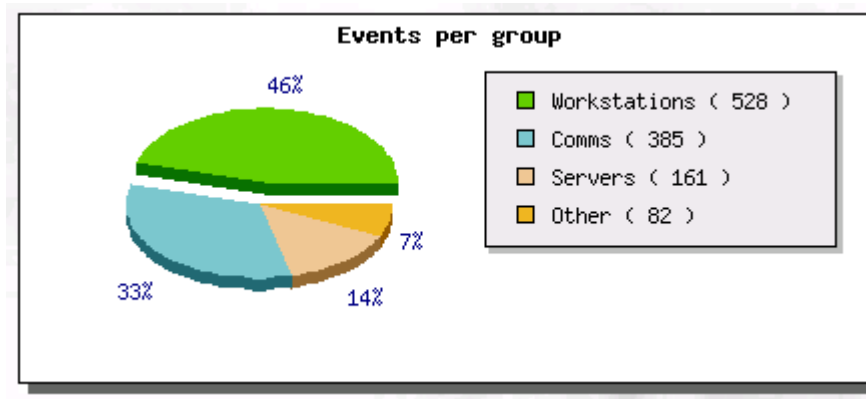
Chapter 6. System audit

The Pandora's system audit shows all the actions performed by each user, as well as the failed logins.

The system audit includes actions that somehow try to by pass the security system: attempts to delete an incident by an unauthorized user, attempts to change user profiles by unauthorized users, etc. Its main function is, however, to trace the user connections (login/logout).

The audit Logs can be found in the "System Audit Log" option of the Administration menu, ordered chronologicly.

Filters can be applied to the Logs displayed to show only those of interest for the user, selected by the action the Log produces.

The selectable actions are those actions stored in the Data Base at that time.

Review of Pandora audit logs

Filter

All ▼

[1-15] [16-30] [31-45] [46-60] [61-75] [76-90] [91-105] [106-120] [121-135] [136-150] >

User	Action	Date	Source IP	Comments
demo	Logoff	2005-04-28 15:25:33	206.113.192.12	Logged out
demo	Logon	2005-04-28 15:24:11	206.113.192.12	Logged in
slerena	Logon	2005-04-28 13:01:53	194.179.83.87	Logged in
sophus	Logon	2005-04-28 12:41:37	194.158.69.201	Logged in
demo	Logon	2005-04-28 12:40:57	194.30.38.2	Logged in
sophus	Logon	2005-04-28 09:36:15	194.158.69.201	Logged in
demo	Logon	2005-04-28 09:28:09	62.23.219.97	Logged in
SYSTEM	System	2005-04-28 07:27:15	SYSTEM	Pandora Daemon starting
demo	Logon	2005-04-28 03:42:46	24.188.54.67	Logged in
demo	Logon	2005-04-28 01:51:01	61.95.45.230	Logged in
sophus	Logon	2005-04-28 00:40:36	85.94.161.74	Logged in
demo	Logon	2005-04-27 23:50:24	208.234.1.225	Logged in
admin	Logon Failed	2005-04-27 23:50:16	208.234.1.225	Invalid username: admin / a****n
admin	Logon Failed	2005-04-27 23:50:05	208.234.1.225	Invalid username: admin / d****o
demo	Logon	2005-04-27 23:10:32	206.195.193.254	Logged in

The following fields display the Audit Logs information:

User: User that triggerd the event (SYSTEM is special user of the system).

- *Action:* Action generated by the entry in the log.
- *Date:* Date of the entry in the log.

- *Source IP:* IP of the machine or the agent that provoked the entry.

- *Comment:* Comment describing the entry

6.1. Statistics

There isn't a special section to view system audit statistics. However, we could use a graph generated in the Users section to evaluate the actions of each user, as this graph would represent the total number of entries in the audit log for each one: the more active the user is the higher the number of entries.

The graph will also show entries of invalid users, i.e., those entries generated by failed attemps to log in.
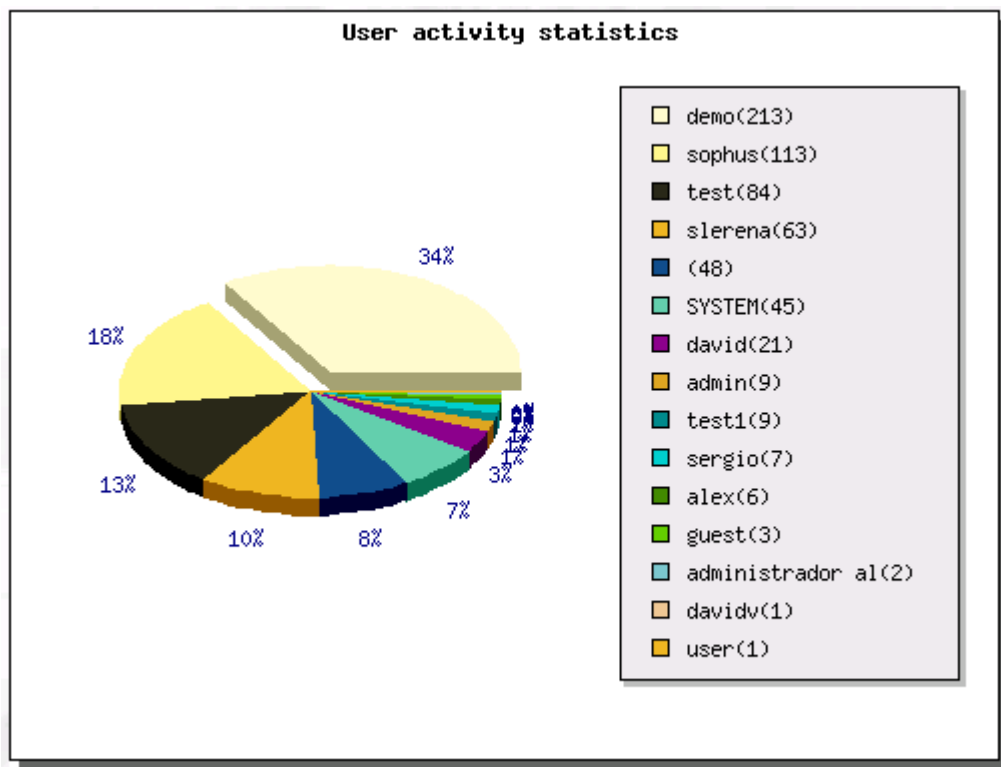
Chapter 7. Pandora Servers

In Pandora 1.2 there are different type of servers, Network Server, Data Server or SNMP Server.

It is possible to manage the Pandora Servers from the "Manage Servers" option of the Administration menu.

The following fields are displayed in the Managed Servers page:

- *Name:* Name of the server.
- *Status:* Status of the server. Green ok and Red fail.
- *IP address:* IP of the Server.
- *Description:* Server´s description.
- *Network:* Mark for Network Server..
- *Data:* Mark for Data Server.
- *SNMP:* Mark for SNMP Server.
- *Master:* Mark when the server is Master and not mark when the master is backup.
- *Check:*
- *Started at:* Date when the Server started.
- *Updated at:* The date of the last update.
- *Action:* Icons to modify a server's properties or to delete a server.

It is possible delete a server using the icon

It is posible to change the server's properties using the icon

In a Server is posiible modify: Name, IP Address and Description.

Chapter 8. Database Maintenance

The core of Pandora's system is its Database. All the data collected by the monitored machines is stored in this data base, from the administrator's data, to the events, incidents and audit data generated in the system at any time.

It is obvious that the efficiency and reliability of this module is vital for the correct functioning of Pandora. A regular data base maintenance is needed. To do so the data base managers can use standard MySQL commands. Maintaining Pandora database in good condition is critital for Pandora to work properly.

As the database size will increase linearly, the data will be compacted to reduce the amount of stored data without loosing important information, specially the different graphs that are generated with the processed data.

Going to "DB Maintenance" from the Administration menu we will find the Database configuration defined in the "Pandora Setup" option of the Administration menu to compact and delete data.
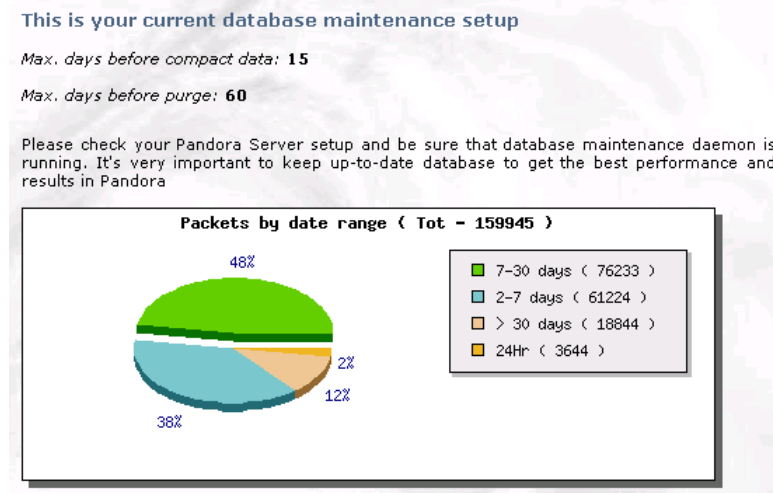
8.1. DB Information

The DB statistics are generated by Agent, on the "DB Maintenance" > "DB Information" in the Administration menu, and are represented in two kinds of graphs:

- Number of modules configured for each of the agents.

- Number of packages sent by each agent. A package is the group of data linked to the module the agent sends in each interval of time.

Database Maintenance

Database Information
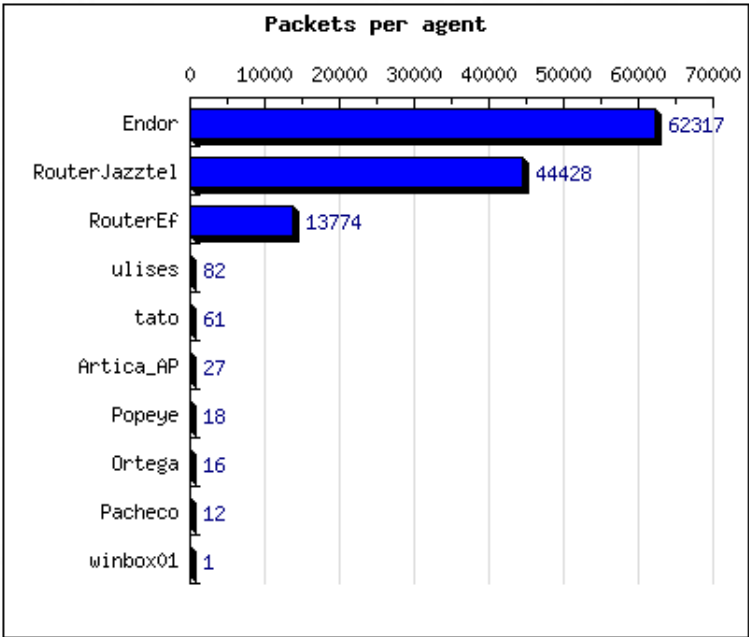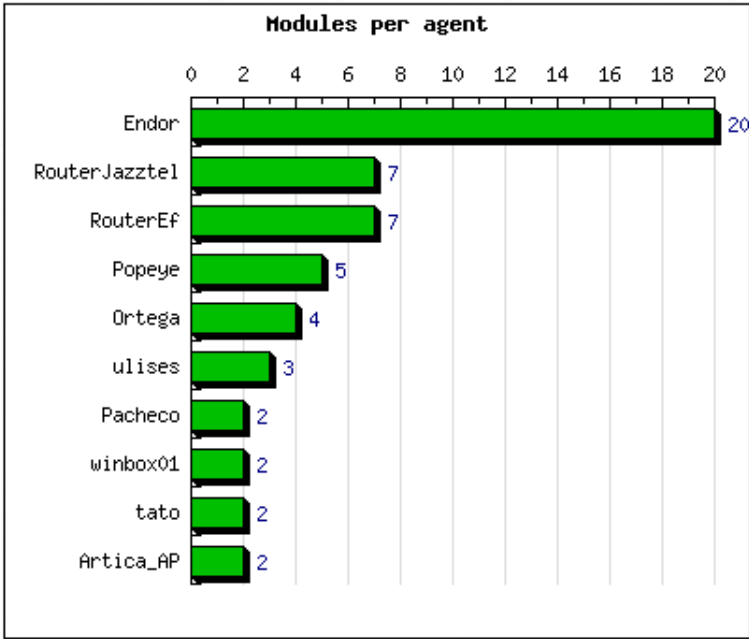
These graphs can be also viewed from "View Agents" > "Statistics" in the Operation menu.

It is possible to view the Data Base information in text mode pressing "Press here to get DB Info as text"

8.2. Manual purge of the Datadase

Pandora counts with powerful tools for the Administrator to manually purge the majority of data stored in the Database. This includes data generated by both the agents and the server by its own.

8.2.1. Agent's data purge

8.2.1.1. Debuging selected data from a module

The option of purging selected data from a module is used to eliminate those out of range entries, whatever the reason - agent failure, out of range values, testing, DB errors, etc. Eliminating erroneous, incorrect or unnecessary data makes the graphical representation more acuarate and shows the data without peaks or unreal scales.

From "DB Maintenance" > "Database Debug" in the Administration menu any of the out of range data received from a agent's module can be deleted.

The purge settings are: agent, module, minimum and maximum data range. Any parameter out of this minimum/maximum range will be deleted.

For example, in a module registering the number of processes, if we are only interested in values between 0 and 100, any values above that number will be usually produced by errors, noise or abnormal circumstances. If we set to range between 0 and 100 all those values below and above - such as -1, 100 or 100000 - will be permanently deleted from the database.

8.2.1.2. Purging all the agent's data

All the out of range data received by an agent can be deleted from the "DB Maintenance" > "Database Purge" option in the Administration menu.

The data is deleted by the following parameters from the "Delete data" screen:

- Purge all data
- Purge data over 90 days
- Purge data over 30 days
- Purge data over 14 days
- Purge data over 7 days
- Purge data over 3 days
- Purge data over 1 day

8.2.2. Purging system data

8.2.2.1. Audit data purge

All the audit data generated by the system can be deleted from "DB Maintenance" > "Database Audit", in the Administration menu

The data to be deleted is selected by setting the following parameters in the "Delete Data" screen

- Purge audit data over 90 days

- Purge audit data over 30 days

- Purge audit data over 14 days

- Purge audit data over 7 days

- Purge audit data over 3 days

- Purge audit data over 1 day

- Purge all audit data

8.2.2.2. Event data purge

All the event data generated by the system can be deleted from "DB Maintenance" > "Database Event", in the Administration menu
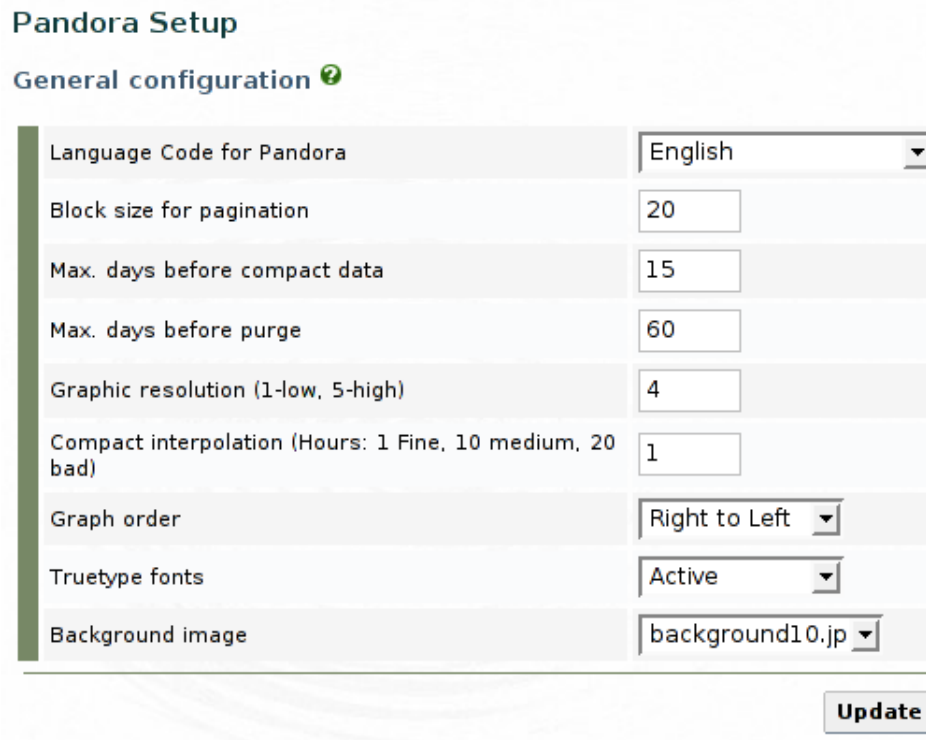
The data to be deleted is selected by setting the following parameters in the "Delete Data" screen

- Purge event data over 90 days
- Purge event data over 30 days
- Purge event data over 14 days
- Purge event data over 7 days
- Purge event data over 3 days
- Purge event data over 1 day
- Purge all event data
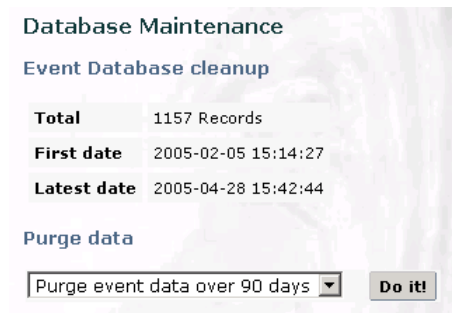
Chapter 9. Pandora Configuration

All the configurable parameters in Pandora can be set in the "Pandora Setup" section, in the Administration menu.

These parameters are:

Language: In following versions or revisions of the actual Pandora version will support more languages. At the moment version 1.2 supports English, Spanish, Spanish Latin-America, Bable, Italian, French, Catalan and Portuguese of Brazil.

Block size for pagination: Maximum size of the lists in the event, incident and audit log sections.

Max. days before compact data: This parameter controls data compacting. From the number of days in this parameter the data starts getting compacted. For large amounts of data it is recommended to set this parameter to a number between 14 and 28; for systems with less data load or very powerful systems, a number between 30 and 50 will be enough.

Max. days before purge: This parameter controls how long the data is kept before it is permanently deleted. The recommended value is 60. For systems with little resources or large work load the

recommended value is between 40 and 50.

Graphic resolution (1 low, 5 high): This value represents the precision of the interpolation logarithm to generate the graphics.

Compact interpolation (Hours: 1 fine, 10 medium, 20 bad): This is the grade of compression used to compact the Data Base, being 1 the lowest compression rate and 20 the highest. A value above 12 means a considerable data loss. It's not recommended to use value above 6 if the data needs to be represented graphically in large time intervals.

Graph order: This value represents the order to create the graphs. The possibility are right to left, or left to right.

Truetype fonts: This value represents the capacity to active the truetypefonts. The possible values are Active or Disable.

Background image: This value represents the image to background, it is possible to change it between several different images.

9.1. Links

Links to different Internet or private network links can be configured in Pandora. These could be search engines, applications or company Intranets.

The links configured in Pandora can be edited through the "Pandora Setup" > "Links" option in the Administration menu.

A new link is created by clicking on "Add". The link can be then edited:

Pandora Setup

Link management

Link name	Your favorite site
Link	www.favorite.now

Update

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