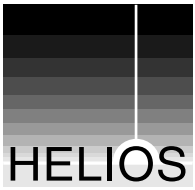


IT Monitor Server G8

(Version 2.0.0)

User manual

September 10, 2020

Contents

1 About the chapters of this manual

In the following, we give a brief summary of each chapter in this manual. These summaries will help you find the information you are looking for.

Chapter 2 “An introduction to IT Monitor Server” gives background information about the product and describes the installation on the HELIOS server.

Chapter 3 “The IT Monitor server” explains the IT Monitor server principle of operation.

Chapter 4 “The IT Monitor app” describes the usage of the IT Monitor app on an iPhone and how it works together with the IT Monitor server.

Chapter 5 “Internet remote access” describes how to remotely access IT Monitor servers in a local network from outside via a proxy server, and what you have to bear in mind when it comes to security aspects.

Chapter 6 “Develop own scripts” provides information on what scripts can be used as action scripts and what you have to do to make them available for IT Monitor server.

Chapter 7 “Statistics database” briefly introduces the SQLite statistics database, which contains all performance data.

Chapter 8 “Preferences” lists all IT Monitor server preferences, and it explains what they effect when set.

2 An introduction to IT Monitor Server

HELIOS IT Monitor Server continuously observes the network, CPU, disk, memory, and swapping utilization on the server. It monitors system messages, and local and remote services, such as file servers, printers, and web servers, within a specified interval. All this information goes into an integrated database. Upon request, it reports this information to a remote admin who can view these easy to use charts, system messages, and services status on an iPhone[1]. Failing services, server overload and messages with alarm conditions are sent via push notification to one or more admins, on their iPhone as well as by regular email. This means admins get proactively notified in case of problems or when reaching server utilization limits. The entire user interface works on the iPhone, to ensure that status reports can easily be viewed. Server utilization is presented via intelligible charts within a specified time range. The iPhone should always be on standby to inform admins when needed.

Note: HELIOS IT Monitor Server runs on top of the foundation provided by HELIOS Base. Please read the HELIOS Base manual for installation instructions and other important details.

For HELIOS Base, the foundation used by all HELIOS products, see the HELIOS Base product web page:
www.helios.de Go to *Products* > *Base*

[1] If not specified otherwise, this is also valid for the *iPad*

2.1 Product description

Unique advantages of IT Monitor Server

Basically, the server monitors the entire IT infrastructure and reports it to the iPhone. The entire user interface is available on the iPhone which makes it very easy to use. It monitors server utilization and available services on multiple servers (Windows, OS X, Linux, and Solaris) as well as all major network services. Via the iOS exclusive push notification, IT Monitor Server alerts one or more admins on their iPhone when alarms are triggered, and the details can be viewed immediately. It offers an unlimited number of services to monitor and it is licensed for one or multiple server environments.

IT Monitor Server benefits for customers in a nutshell

- Admin notification via the iPhone and by e-mail on an impending problem or failing services on the server
- Services on the network are also covered, e.g. a network printer or remote web server. Automatic notifications help address problems upfront before users or customers complain about failing IT services.
- A failing IT infrastructure costs a considerable amount of money. IT Monitor Server allows taking measures instantly, to make the infrastructure available again.
- IT Monitor Server is easy to use
- Charts within a specified time range (*now*, *today*, *week*, *month*, *quarter*, *year*) reveal upfront e.g. disk memory swapping and network bottlenecks, to avoid performance losses before they occur

2.2 Installation

2.2.1 System requirements

Host system:

- Oracle Solaris
- Linux
- Apple OS X
- Windows

Note: A detailed list of supported platforms and operating systems can be found on the HELIOS website (**www.helios.de/platforms**).

- 16 MB RAM + 4 MB per active client
- At least one network adapter

iOS client:

- iPhone (iOS 9.0 or higher)
- Internet connection for notifications required

E-Mail:

- Any e-mail client

3 The IT Monitor server

The IT Monitor server (“monitorsrv”) is controlled via preferences (see 8 “Preferences”), which allow setting conditions when alarms will be sent off to specified e-mail addresses.

If a single condition for setting off the alarm is met, a so-called “Push Notification” is sent to all iPhones that monitor this server. In addition, “monitorsrv” administers a list of e-mail addresses to which the alarm notification is sent. This list can be edited from the iPhone. By default this list is empty.

Note: “monitorsrv” needs not be installed on the server running the services that are subject to observation (see 4.3 “IT Monitor observed services”).

3.1 IT Monitor Server service port

The IT Monitor Server service port is 2029.

➢ Issue the command `socket localhost 2029`, type `help` for the command overview and `quit` to leave.

help

List available commands.

help <command>

Print help on a command.

quit

Close the connection to IT Monitor Server.

login

Log in to the IT Monitor Server (required e.g. for **stat**).

Usage: `login <user> <password>`

Example:

```
login hendrik secret
ready.
```

remote

Connect to a different IT Monitor Server.

Example:

```
remote turtle.helios.de
IT Monitor Server 1.0.0 (2.0/macosx86) running on "turtle"
ready.
```

name

Show server name.

Example:

```
name
ankh.helios.de
ready.
```

clients

Show list of connected client.

Example:

```
clients
The following machines are connected:
172.16.2.89
172.16.2.93
ready.
```

range

Show time range of recorded statistics.

Example:

```
range
time range:
05.05.2014 09:53:20
11.09.2014 13:21:54
ready.
```

format

Set the output format for the statistics records:

1 Plain text
2 XML
3 Internal format used by IT Monitor app

Example:

```
format 2
ready.
```

stat

Get accumulated statistics (authorization via **login** required).

Usage: `stat <start (UNIX "time_t")> <end (UNIX "time_t")> <numSamples>`

Example (for selected "format 3":)

```
stat 1399248000 1409875200 8
"record time cpu-usage cpu-alert memory-usage memory-paging
network-packets disk-alert user-system user-helios
jobs-print jobs-opi jobs-script jobs-tool jobs-index"
{1 1399248000 8.7 1 60.6 20 13 0 3 3 4 0 0 0 0}
{2 1400766171 9.4 1 59.7 23 18 0 3 3 3 0 0 0 0}
{3 1402284342 9.0 1 63.3 24 14 0 3 3 3 0 0 0 1}
{4 1403802514 9.5 1 62.7 29 16 0 4 5 4 0 0 0 704}
{5 1405320685 6.1 0 56.3 19 16 0 4 6 4 1 0 0 0}
{6 1406838857 7.4 1 63.7 30 32 0 4 5 4 33 0 0 246}
{7 1408357028 0.0 0 0.0 0 0 0 0 0 0 0 0 0 0}
{8 1409875200 0.0 0 0.0 0 0 0 0 0 0 0 0 0 0}
ready.
```

3.1.1 Filter system messages

The number of system messages on a host can rapidly increase, depending on the server traffic. In order to filter all messages for the desired information, IT Monitor Server allows setting up filter scripts which can reduce the amount of system messages significantly. IT Monitor Server allows two approaches to filter messages on the IT Monitor server:

prefilter.pl

The "prefilter.pl" script allows filtering system messages for specified messages, e.g. info, errors, *before* they are written to the database.

postfilter.pl

The "postfilter.pl" script allows filtering system messages for specified messages *after* they have been requested from the database. In this case, the filtered messages are not displayed on the iOS device.

Both filter scripts must be created and set up by the customer, and stored in "var/monitorsrv".

Note: It is necessary to create the "monitorsrv" subdirectory.

The "prefilter.pl" script:

```
#!/usr/bin/perl

use strict;

while (<>) {

        # postfix stuff
        next if /postfix\/smtp/;
        next if /postfix\/smtpd/;
        next if /postfix\/qmgr/;
        next if /postfix\/cleanup/;
        next if /postfix\/anvil/;
        next if /postfix\/bounce/;
```

```
        next if /postfix\/scache/;

        # login/logout users
        next if /pam_unix/ and /session opened for user/;
        next if /pam_unix/ and /session closed for user/;

        # Test for skipping lines
        next if /skip/;

        print;
}
```

Note: Make sure that the first line does really point to an existing Perl binary. On Windows, you may just use “Perl” because it should be in the environment `PATH`.

You may remove the unneeded “next if ...” lines which are just shown as an example here.

After the Perl script has been saved (or modified later) “monitorsrv” needs to be restarted.

You can verify this script using “psyslog”, e.g.:

```
psyslog -t "testing" "bing"
psyslog -t "testing" "bing skip me"
psyslog -t "testing" "bum"
```

If the script works properly the line (... `bing skip me`) should not be listed in the IT Monitor app.

4 The IT Monitor app

4.1 Set up the IT Monitor app

➢ Load the free IT Monitor app from **Apple's App Store** to your iPhone.

➢ Open the IT Monitor app.

4.1.1 Add server

Initially, the "Server List" window is empty (Fig. 4.1).

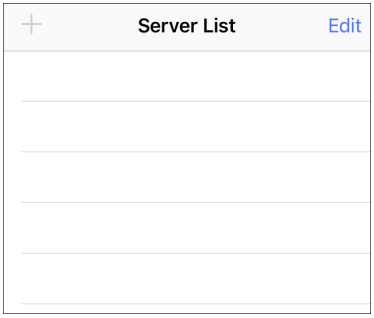


Fig. 4.1: Initially empty server list

➢ Tap on Edit and then on the + icon.

➢ In the "Server Info" window (Fig. 4.2), fill in all required server settings.

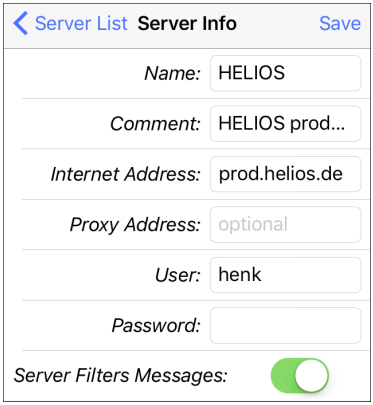


Fig. 4.2: Filling in server data

The `Server Filters Messages` slider allows the user to define whether the server ("monitorsrv") should filter the messages before they are transferred to the IT Monitor app. See 3.1.1 "Filter system messages" for more information.

Important: If you wish to connect to the specified IT Monitor server via a proxy server, `Internet Address` must be defined from the proxy server's view, e.g. a network internal host name or IP address may be necessary. If the server host name is used, make sure that the proxy server can resolve this host name. Otherwise an error (**Error while resolving "<proxy name>: Unknown host"**) is issued upon verification! In this case, specify the host's IP address.

➢ In the "SEND NOTIFICATIONS" section select in which manner "monitorsrv" should issue notifications (Fig. 4.3). The default behavior is `Always`.

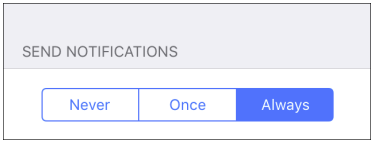


Fig. 4.3: Select notification behavior

Never	No notification is issued upon alarm messages
Once	A notification is issued after the first alarm message. Subsequent alarms will not issue further notifications (until the IT Monitor app is started)
Always	A notification is issued upon each alarm message

➢ Tap on Save to accept all settings you entered in the "Server Info" window, and back in the "Server List" window tap on Done.

Now the new server entry is scheduled in the server list. The icon to the right indicates the server platform (see Fig. 4.8).

Send configuration data to other iPhones

The complete list of iPhone server configuration settings can easily be transferred to other iPhones. This could be advantageous if e.g. the manager wants to distribute monitoring tasks to their employees, without the need for the employees to set up and configure the server list again on each of their iPhones.

➢ In the "Server List" window, change into the edit mode and tap on Edit in the bottom menu.

➢ Tap on `Copy` (Fig. 4.4).

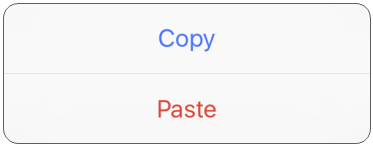


Fig. 4.4: Copy server settings to the clipboard

➢ Paste the copied information into your iPhone e-mail program (e.g. “Mail”) and send it to the desired iPhone clients.

The recipients only need to copy the mail body from their iPhone, navigate to the “Server List” window, change into the edit mode, tap on Edit in the bottom menu, and then on `Paste`.

The server list has now successfully been transferred from one iPhone to others.

Important: For security reasons, the password for each server still needs to be entered in the `Password` field before using the posted configuration!

4.1.2 Remove server from the list

➢ In the “Server List” window, change into the edit mode and tap on Edit.

➢ Then tap on the ⛔ icon adjacent to the server that you want to delete from the list, and confirm the deletion by tapping on Delete.

4.1.3 Specify limits

➢ Tap on Edit and then on the desired server entry.

The “SERVER SETTINGS” section allows defining general and file system (volume) limits that build the base for alarms and messages.

General Limits

`Free Disk Space (MB)`
Allows defining the minimum *free disk space* limit below which an alarm is issued after the time span specified in the `Time until alarm (seconds)` entry. This defines the default value for all mounted file systems. Different values can be specified for individual file systems, by scrolling down to the “File System Limits” screen.

The corresponding “monitorsrv” preference is ***MinDiskFreeSpace*** *(default is* `8 MB`*). The time until alarm is controlled by the* ***MinDiskFreeSpaceDur*** *preference (default is* `1 minute`*).*

`CPU Utilization (%)`
Allows defining the maximum *CPU utilization* limit above which an alarm is issued after the time span specified in the `Time until alarm (seconds)` entry. This value specifies the percentage (1-99 %) of the total amount of available CPU.

The corresponding “monitorsrv” preference is ***MaxProcessorUsage*** *(default is* `99 %`*). The time until alarm is controlled by the* ***MaxProcessorUsageDur*** *preference (default is* `5 minutes`*).*

`RAM Utilization (%)`
Allows defining the maximum *RAM utilization* limit above which an alarm is issued after the time span specified in the `Time until alarm (seconds)` entry.

The corresponding “monitorsrv” preference is ***MaxMemoryUsage*** *(default is* `95 %`*). The time until alarm is controlled by the* ***MaxProcessorUsageDur*** *preference (default is* `10 seconds`*).*

`Paging Activity (pages/s)`
Allows defining the maximum *number of pages* limit above which an alarm is issued after the time span specified in the `Time until alarm (seconds)` entry.

The corresponding "monitorsrv" preference is ***MaxMemoryPages*** *(default is* `2000/s`*). The time until alarm is controlled by the* ***MaxMemoryPagesDur*** *preference (default is* `10 seconds`*).*

`Network (packets/s)`
Allows defining the maximum *number of network packets* limit above which an alarm is issued after the time span specified in the `Time until alarm (seconds)` entry.

The corresponding "monitorsrv" preference is ***MaxNetworkPackets*** *(default is* `30000/s`*). The time until alarm is controlled by the* ***MaxNetworkPacketsDur*** *preference (default is* `1 minute`*).*

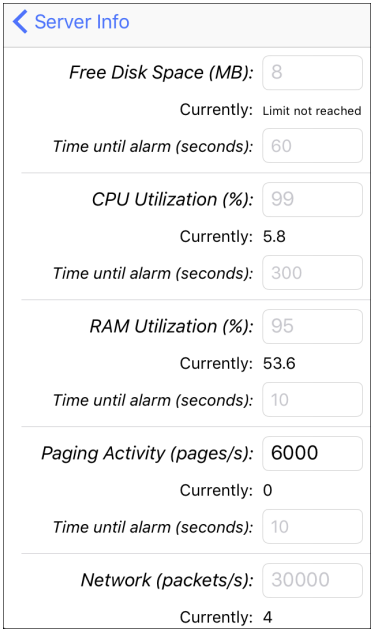


Fig. 4.5: General limits

File System Limits

Scrolling down, all file system and HELIOS volume limits are displayed (Fig. 4.6).

"File System Limits" shows, for each file system, the minimum free disk space limit defined, and the current free storage space.

➢ Tap on a list entry to change the `Min Free Space (MB)` setting for the corresponding file system.

In addition, this window lists all shared HELIOS volumes including their Mac and Windows export name.

In the example in Fig. 4.6, the free storage space for each file system on “HELIOS” should not fall short of 100 MB. The currently free disk storage space for the “/” directory is tinted in red because it has fallen below the limit.

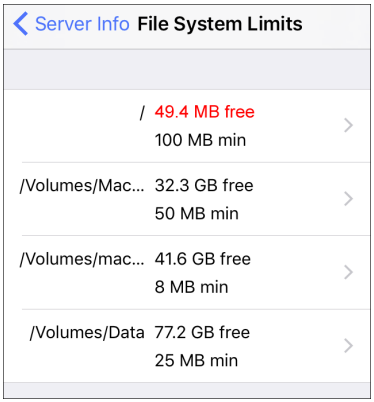


Fig. 4.6: File system limits

4.1.4 Add service

Available services are listed in the chapter 4.3 “IT Monitor observed services”.

➢ Tap on Edit and then on the desired server entry.

➢ Scroll down to the “Server Settings” section and tap on `Services`.

➢ Tap on + to create a new service, or tap on an existing service entry to edit an existing service (Fig. 4.7 *left*).

Note: If the service uses a non-default port it is necessary to specify the proper port number in the `Host` entry field, e.g. `helios.de:1234`

The `Options` field allows specifying options for a self-defined script, which are used by that script, e.g. *pages=5*. However, entries in this field are not used by sample scripts that were automatically installed.

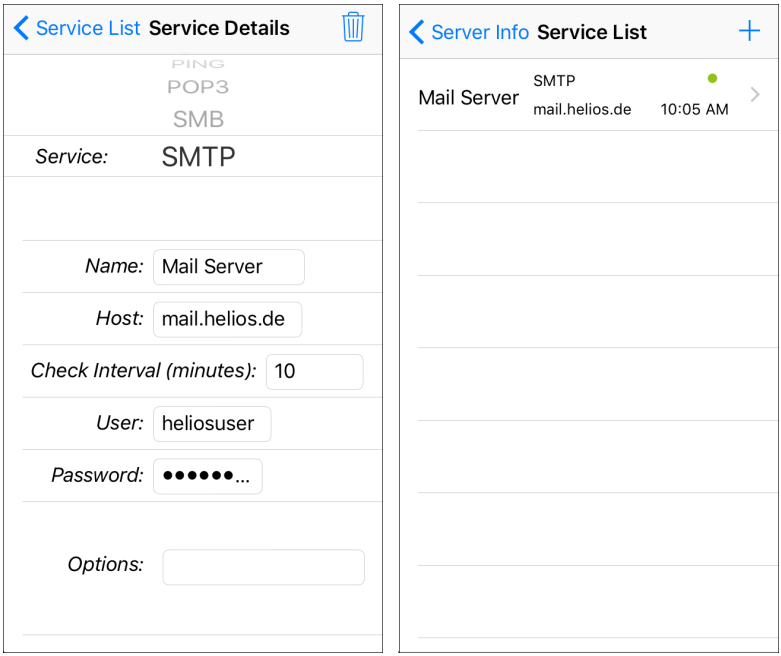


Fig. 4.7: Entering mail server data and displaying the new service

Now the new server entry is scheduled in the “Service List” (see Fig. 4.7 *right*).

Remove service from the list

➢ Tap on Edit and then on the desired server entry.

➢ Tap on the service that you wish to remove.

➢ In the “Service Details” window tap on the icon.

The service is immediately removed from the list and the “Service List” overview is displayed (now without the just deleted service).

4.1.5 Set up e-mail list

Each user that is on this list with their e-mail address will receive a notification in case an alarm message is issued by IT Monitor Server.

➢ Tap on Edit and then on the desired server entry.

➢ Scroll down to the “Server Settings” section and tap on `Email List` to specify one or more e-mail addresses that should be notified in case of an alarm message.

4.2 Using the IT Monitor app

4.2.1 Server status overview

The “Server List” window gives an overview of all servers that have been configured to be handled by the IT Monitor app (Fig. 4.8). The status icon adjacent to the server name can display three different colors:

- (Green) *OK (all services up; no alarms)*
- (Yellow) *Cannot connect to host* or *host is not answering*
- (Red) *Failure of the monitored service* or *other alarms pending*

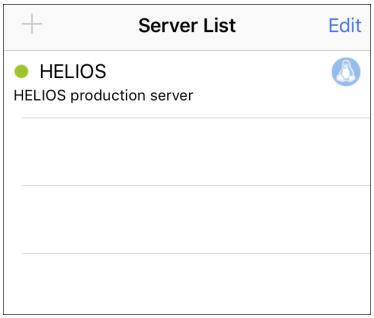


Fig. 4.8: Server overview

➢ Tap on to refresh the display information.

➢ Tap on a server entry to get a summary of all charts, services, scripts, and messages that are issued by this particular server (Fig. 4.9).

➢ Tap on Server List to return to the “Server List” window.

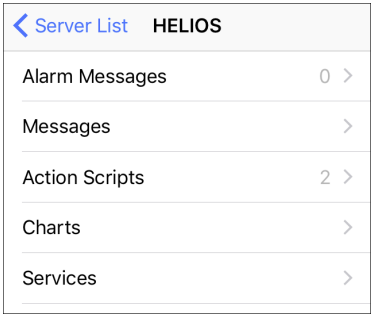


Fig. 4.9: Server system messages

Note: By default, all host users with server login credentials are permitted access. However, this might not always be desired. The **Users** preference (see 8 “Preferences”) allows creating a list of users who are permitted to monitor the server. All other users are not allowed even if they know the correct server password. There is an exception from this rule: “root” and members of the “SysAdm” and “ITMAdm” groups can always log in and can also do administration via their iPhones, i.e. change server settings that affect all users. For example, specifying the CPU load limit from which an alarm should be set.

4.2.2 Charts

Displays the load of *CPU*, *RAM*, *Paging*, *Network*, *Jobs* and *Users* usage on this server (see Fig. 4.10 *left*).

➢ Tap on ↻ to update the charts.

Zoom into a chart:

➢ Rotate the iPhone by 90 degrees to get into the landscape view. In this view, touch the screen with two fingers and slide them apart to "stretch" the chart.

Move a day/week/month/quarter/year forward or backward:

➢ Tap on Previous to move one day back, or Next to move one day forward.

See charts in detail:

➢ Tap on Info in the upper right to display the peak values in the monitored period (see "Max" column in Fig. 4.10 *right*).

A particular day may also be specified in the "Date" section.

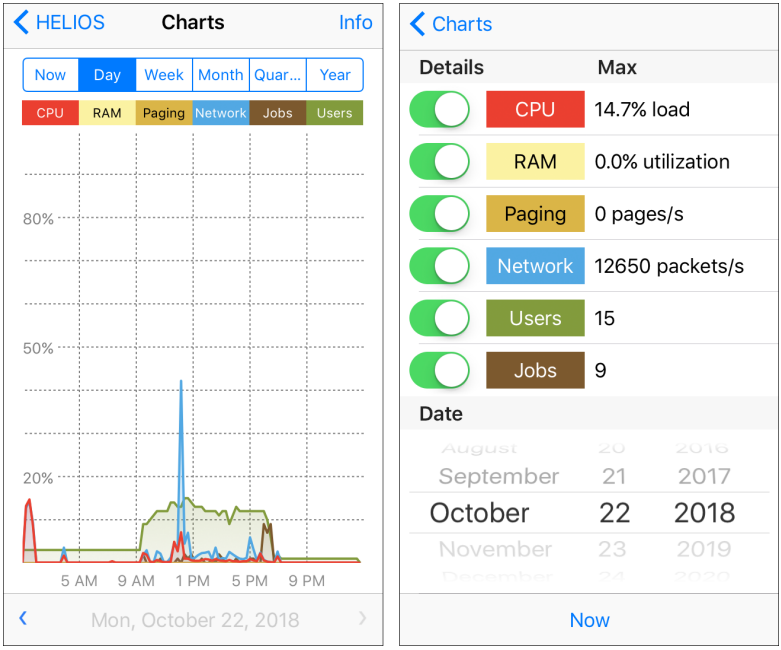


Fig. 4.10: Monitoring the server load and viewing server load peak values

All chart filters:

`Now`	The past half an hour	`CPU`	CPU usage chart
`Day`	Current day	`RAM`	Amount of RAM used
`Week`	Current week	`Paging`	Number of *Pages/sec*
`Month`	Current month	`Network`	Number of *Packets/sec* over the net
`Quarter`	Current quarter	`Users`	Number of logged-in users
`Year`	Current year	`Jobs`	Number of *Jobs/sec*

➢ Tap on the buttons (`Now` … `Year`) to filter the charts by the desired timespan.

➢ Set the sliders (`CPU` … `Jobs`) in the "Details" column to filter the charts by the desired type. By default, all charts are concurrently displayed (Fig. 4.10).

4.2.3 Services

Displays all defined server services (Fig. 4.11). See 4.3 "IT Monitor observed services" for further details on the IT Monitor server supported services.

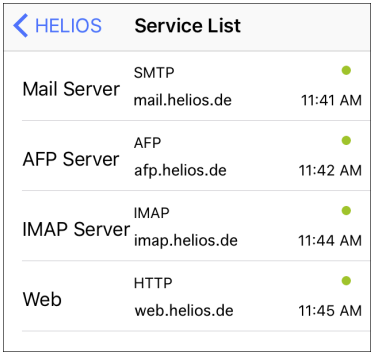
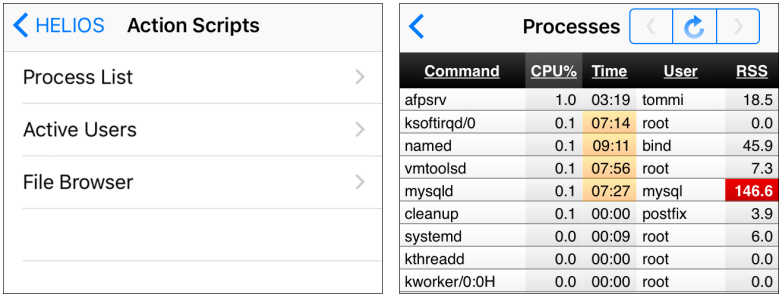


Fig. 4.11: Services list

4.2.4 Action Scripts

Displays all configured action scripts on the server (Fig. 4.12 *left*). Section 4.4 "Server actions" gives details on the IT Monitor server supported actions. The example below (Fig. 4.12 *right*) shows the output of the process list action script, where entries highlighted red and orange indicate different warning levels whose thresholds are defined, and can be adjusted, in the script.



Command	CPU%	Time	User	RSS
afpsrv	1.0	03:19	tommi	18.5
ksoftirqd/0	0.1	07:14	root	0.0
named	0.1	09:11	bind	45.9
vmtoolsd	0.1	07:56	root	7.3
mysqld	0.1	07:27	mysql	146.6
cleanup	0.1	00:00	postfix	3.9
systemd	0.0	00:09	root	6.0
kthreadd	0.0	00:00	root	0.0
kworker/0:0H	0.0	00:00	root	0.0

Fig. 4.12: Action scripts and “Process List” action script (*right*)

4.2.5 Messages

The IT Monitor app filters all messages by their type or time of issue, and sorts them into “Alarm Messages” or “Today”, “Yesterday”, and “This Week”.

Alarm Messages

The following figure shows the *Alarm Messages* for the server “HELIOS” (Fig. 4.13 *left*). If the list is longer than the screen can display, a tap on the lower toolbar scrolls the list down to its end. Likewise, a tap on the status bar (where the time is displayed) makes the list jump to its beginning. A tap on the server name (in our example HELIOS) takes the user back to the messages overview.

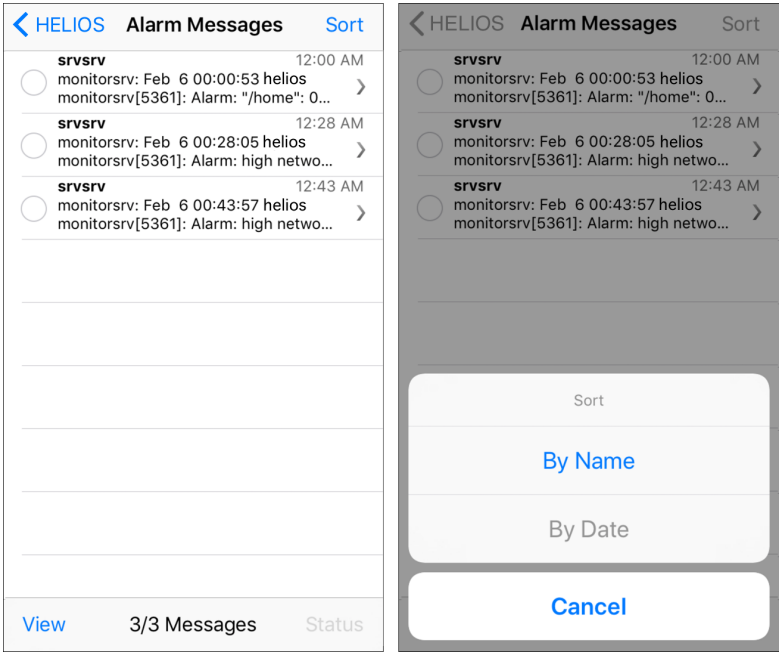


Fig. 4.13: Alarm messages

Today

Displays all messages of the day, beginning at 12 a.m.

Yesterday

Displays all messages of the past day.

This Week

Displays all messages of the current week, beginning with Monday at 12 a.m.

Tapping on Sort opens a menu which allows the user to select the sort order (Fig. 4.13 *right*). Messages can be sorted by either date or name.

If a message is displayed truncated in the messages list, it is larger than the designated space. The whole message is opened by tapping on the corresponding ❯ icon (see Fig. 4.14).

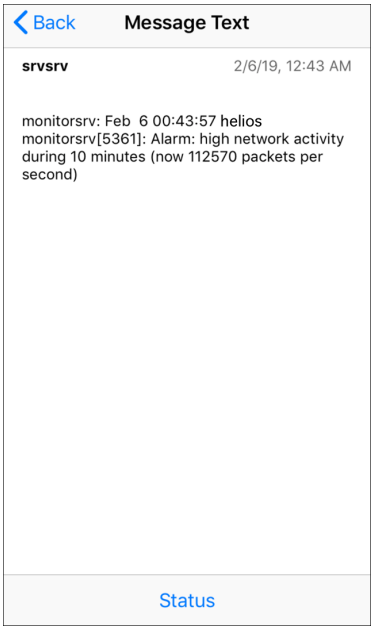


Fig. 4.14: Full message

Tapping on Status allows the user to either *delete*, *resolve*, *accept*, or *reset* the message. In addition, the message text can also be sent by e-mail, using the `Open Mail App` entry (see Fig. 4.15).

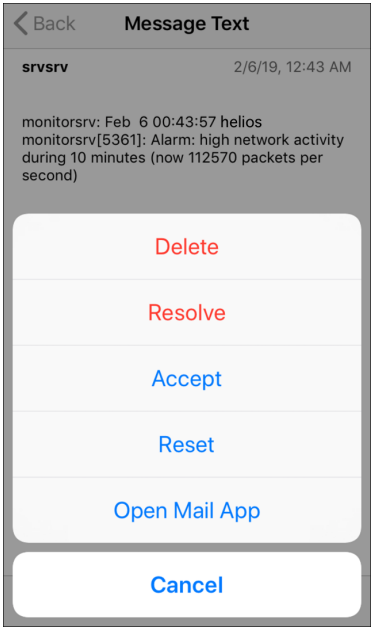


Fig. 4.15: Message status

Search in messages

It may also be searched for particular services (e.g. “monitorsrv”):

➢ Enter your search term into the search field which is located above the first message. (The search field becomes visible when tapping on the status bar.)

Matching results are already displayed as the search term (Fig. 4.16 *left*) is being entered.

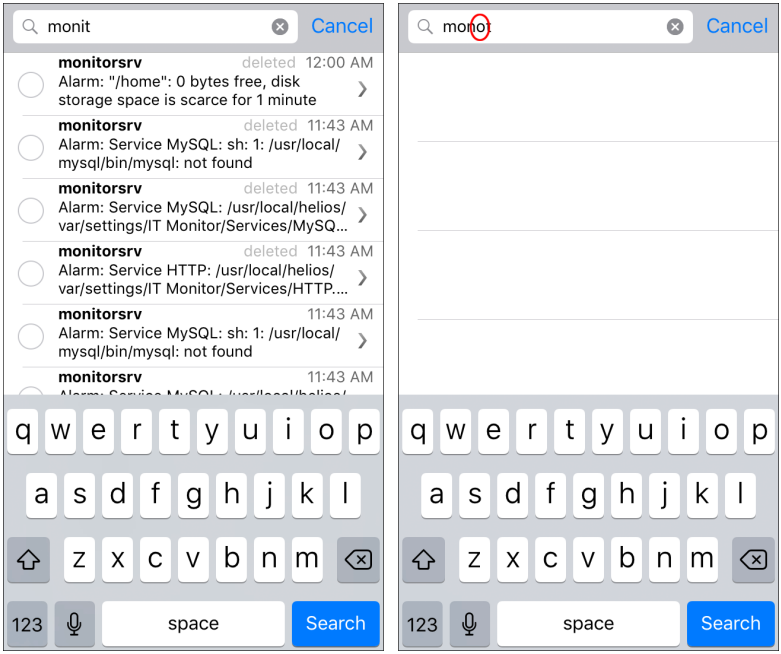


Fig. 4.16: Searching for services

If no matches are found, e.g. because there was a typo in the the search term, the list remains empty (Fig. 4.16 *right*).

Generally, the search is executed in the message title. If a certain content is searched *within* the message body, an asterisk character (*) that precedes the search text must be used (see Fig. 4.17). An exclamation mark (!) that precedes the search text negates it, i.e. all entries but the negated search text are returned. Asterisk and exclamation mark can also be combined. For example, the search text `!*packet` lists all content that does not contain the term “packet”.

Note: Multiple words are treated as a phrase (no quotes required).

The virtual keyboard can be hidden by tapping on Search.

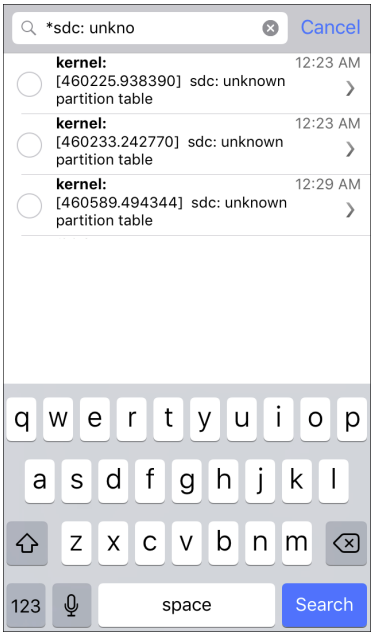


Fig. 4.17: Search for certain content

Single entries can be selected by tapping on them. Tapping on Status allows the user to choose whether to delete or accept the selected entries, or decide whether a solution for the problem has already been found (Fig. 4.18). A tap on `Open Mail App` opens an e-mail client program which allows you to send the content of one or more selected messages.

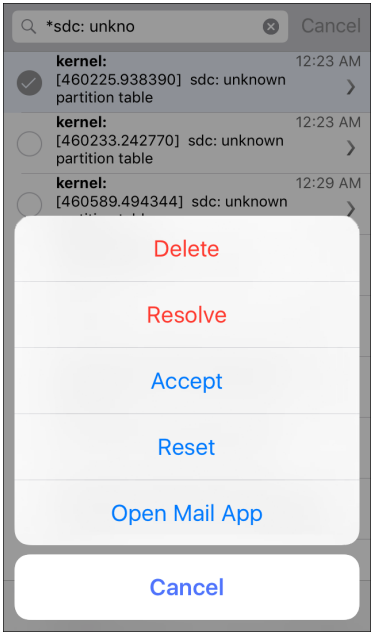


Fig. 4.18: Edit search results

4.3 IT Monitor observed services

The services listed below are supported by the IT Monitor server (the corresponding scripts are stored in "HELIOSDIR/var/settings/IT Monitor/Services"):

AFP *(User credentials:* ***not required****)*
Checks if the AFP service is available.

DNS *(User credentials: **not required**)*
Connects to a Domain Name Server and resolves the given fully qualified domain name.

FTP *(User credentials: **required**)*
Performs an FTP login with the given user credentials.

HTTP *(User credentials: **not required**)*
Retrieves the start page from an HTTP server and checks the result status code.

IMAP *(User credentials: **optional**)*
Performs an IMAP login if user credentials are given, otherwise retrieves IMAP capability list.

LDAP *(User credentials: **required**)*
Connects to an LDAP server and performs the "WhoAmI" command.

LPD *(User credentials: **not required**)*
Connects to an LPD server and checks the status of the Hold queue.

MS SQL *(User credentials: **not required**)*
Connects to a Microsoft SQL server and checks its reply.

MySQL *(User credentials: **not required**)*
The check uses the "mysql" command line utility to connect to a MySQL server and retrieves the database overview list.

PING *(User credentials: **not required**)*
Checks if the given host responds to an ICMP ping.

POP3 *(User credentials: **optional**)*
Performs a POP3 login if user credentials are given, otherwise checks greeting message.

SMB *(User credentials: **not required**)*
Connects to an SMB/CIFS server, sends a "Negotiate Protocol" request and checks the reply.

SMTP *(User credentials:* ***not required****)*
Connects to an SMTP server and checks the greeting message.

Note: "monitorsrv" needs not be installed on the server running the observed services.

Own custom services (see 6.2 "Custom scripts for monitoring services") can also be set up, which will be available in the "Service Details" window after being copied to the "var/settings/IT Monitor/Services" folder.

4.4 Server actions

A collection of sample action scripts is supplied with IT Monitor Server. Located in "var/settings/IT Monitor/Actions/Samples", the scripts are automatically copied to "var/settings/IT Monitor/Actions" during the installation in order to become available in the "Actions" window. Own custom action scripts (see 6.1 "Custom action scripts") can also be set up, which will be available in the "Actions" window after being copied to "var/settings/IT Monitor/Actions".

The following server sample actions are included with the HELIOS IT Monitor Server software:

4.4.1 Server process list

Note: The complete column headers can only be displayed if the iPhone is operated in landscape view mode.

Name Process List (Fig. 4.19)

Function Server process listing

Use

The sorting order can be changed by tapping *once* on the respective column header. A *double-tap* on the column header zooms and centers the respective column:

`PID`	Process ID
`Command`	Process name
`CPU%`	Processor load
`Time`	Processing time in seconds since process started
`User`	Logged-in user who started process
`RSS`	*Resident Set Size*; the currently used memory in MB
`S`	Process status, e.g.: *S=Sleeping* *W=Waiting* *R=Running* For a complete list see the “ps” manpage of your server OS. The manpage is available by calling `man ps` in a shell.

PID	Command	CPU%	Time	User	RSS	S
339	java	12.2	14:20	root	41.0	Ss
2200	Adobe Photoshop CS3	3.9	13:38	henk	164.4	S
2191	IT Monitor	3.0	00:03	henk	45.8	S
96	WindowServer	1.7	02:51	_windowser	41.0	Ss
189	coreaudiod	1.2	00:45	_coreaudioc	2.8	Ss
2148	iPhone Simulator	0.8	00:07	henk	16.5	S
2152	backboardd	0.7	00:36	henk	21.2	S
2120	iTunes	0.6	01:14	henk	104.5	S
2169	securityd	0.6	00:00	henk	7.9	S
33	opendirectoryd	0.3	00:03	root	3.6	Ss
334	authsrv	0.3	00:00	root	2.1	Ss
2160	SpringBoard	0.2	00:03	henk	38.6	S

Fig. 4.19: “Process List” action script

Note: Depending on the limits specified in the “Process List” action script, the `CPU%` (CPU usage), `Time` (CPU time), and `RSS` (amount of used memory) values can appear highlighted in *orange* (warn level 1) or *red* (warn level 2). Threshold values can be changed in the “index.pl” file of the action script.

4.4.2 Server users list

Note: The complete column headers of some scripts can only be displayed if the iPhone is operated in landscape view mode.

Name Active Users (Fig. 4.20)

Function Active users and uptime listing

Use Shows all users that are currently using HELIOS services; also displays the server uptime

`User`	Logged-in user who started process
`Service`	HELIOS service the user has logged on to
`PID`	Process ID
`When`	Time that the user logged on to the HELIOS service
`Address`	Address of the host the user has logged on from

User	Service	PID	When	Address
ronald	pcshare	16772	08:34:34	Cynoga.dyn.helios.de
	/helios/release,/updates-ro,/local/hlocal/win32,/helios/winwork			
tommi	afpsrv	16778	08:34:47	lungus.dyn.helios.de
	Transfer,Support			
moni	afpsrv	18880	10:16:39	moni.dyn.helios.de
	~moni,Helios,Fax			
kirsten	pcshare	14065	04:54:36	med.dyn.helios.de
	/helios/winwork,/local/hlocal/win32,/helios/release			
henk	afpsrv	16830	08:36:00	land.dyn.helios.de

Fig. 4.20: “Active Users” action script

4.4.3 Server file browser

Name File Browser (Fig. 4.21)

Function Server file listing

Use Allows listing the server files in a specified folder, and viewing document formats that are supported by iOS

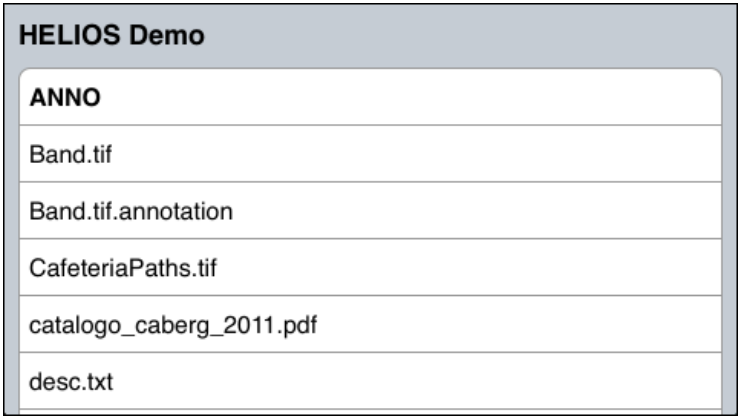


Fig. 4.21: “File Browser” action script

5 Internet remote access

If you have hosts in your local network that have IT Monitor server installed and running, you cannot access its services from outside the network directly. To use the services remotely, e.g. from the Internet, you need a network proxy on which IT Monitor server is also installed. No additional license is required for this IT Monitor server. No further configuration of the “monitorsrv” program is required. “monitorsrv” on the proxy simply forwards requests for “monitorsrv”, and only requests for “monitorsrv”, to any hosts within the local network that are running “monitorsrv”. When adding a server to the “Server List” (see Fig. 4.8), you merely need to specify the address of the host in the local network, and also the proxy address (else this field remains empty). User name and password refer to the host in the local network.

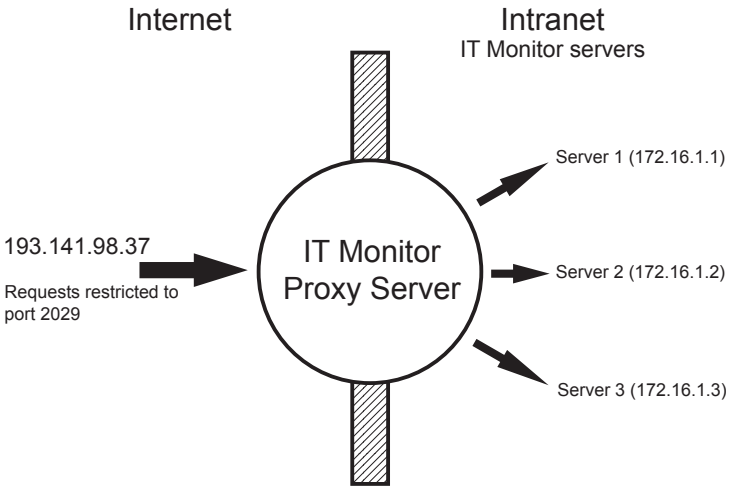


Fig. 5.1: Accessing the HELIOS IT Monitor server from the Internet

5.1 Proxy functionality

Instructions on the configuration of the HELIOS IT Monitor app proxy server settings are given in 4.1.1 “Add server”.

“monitorsrv” can be installed without any licenses on a proxy server which has one internet connection as well as one intranet connection. The proxy allows remote IT Monitor iPhone app users to connect to the observed intranet server (e.g. *Server1 172.16.1.1*) to access the IT Monitor server statistics. The communication between the iPhone and the IT Monitor server is usually done via the TCP port 2029 (see **TcpPort**). If a proxy server is used, the connection gets into the proxy on port 2029 (see **ProxyPort**), the proxy connects the incoming iPhone to the intranet server on port 2029. The connection is

done via a private protocol therefore the incoming proxy functionality cannot connect to non IT Monitor servers.

The second need for the proxy is that the intranet IT Monitor server can send push notifications which are sent to a HELIOS push notification server on the Internet. This HELIOS push server communicates with the Apple push services, which will notify the corresponding iPhone users.

Note: The installation of an IT Monitor server on a proxy server does not require any HELIOS licenses. In this case the IT Monitor server will only behave like a proxy computer.

5.2 Non-proxy environments

The IT Monitor server needs to have working internet DNS name services and must be allowed to do TCP internet connections to port 2061, to communicate with the HELIOS push notification server for sending push alarms.

The IT Monitor iPhone app must be allowed to connect to the IT Monitor server on port 2029. In case IT Monitor server is in the Intranet, the port 2029 must be connected via a gateway (router/firewall/NAT) to the Intranet server on port 2029. If required, the port can be specified in the iPhone host settings by using the `hostname:port` syntax. When using multiple intranet IT Monitor servers, different ports can be used to connect to the different intranet server, e.g.:

iPhone “Host”	Router Incoming/Forward	IT Monitor Host
myrouter:2029	myrouter:2029 / Server 1:2029	Server 1:2029
myrouter:2030	myrouter:2030 / Server 2:2029	Server 2:2029
myrouter:2031	myrouter:2031 / Server 3:2029	Server 3:2029

In case IT Monitor server is available directly on the Internet, with a valid DNS configuration without any outgoing/incoming communication limitations, there is no configuration change required.

5.3 Security considerations

In some environments it is advisable that the proxy connects to the HELIOS Monitor servers over the IP address exclusively rather than over the host name. This adds security because host names can be guessed much easier than IP addresses by unauthorized persons.

6 Develop own scripts

6.1 Custom action scripts

Action scripts have a structure compatible with CGI scripts. A script is executed on the monitored server and outputs HTML which is displayed on the iPhone.

Action scripts are stored in the “var/settings/IT Monitor/Actions” directory, which is automatically created during installation (see 4.4 “Server actions”). To make a custom script become available in the “Action Scripts” menu of the IT Monitor app, it must be copied to “var/settings/IT Monitor/Actions”. For each action script its own folder must be created. The name of this folder is displayed as the action script name on the iPhone. The start file in this directory must be named “index.pl”. Other suffixes are also permitted, e.g. “html”, “cgi”, “exe”, “sh” or “bin”. “pl” indicates a Perl script. The folder may contain more files, e.g. PNG images.

The benefit of the supported Apache CGI-compatible scripts is that

- existing web solutions can be displayed on the iPhone. Development and testing can be done against Apache, and deployed as an IT Monitor CGI action. Actions can be developed in all available languages such as Shell, Perl, PHP, Java, C, Basic.
- the script runs with the privileges of the IT Monitor Server user credentials. An action script allows presenting on the iPhone screen any information from the server or available intranet. This is a very versatile functionality. For example, today’s orders or the current inventory or financial status can be reported on the iPhone.

6.2 Custom scripts for monitoring services

Scripts for monitoring services are executed on the host running “monitorsrv” and return an exit code which decides if a service has been successful or if it has failed. These scripts need not be installed on the server running the services that are subject to surveillance. The scripts can be developed in all available languages such as Shell, Perl, PHP, Java, C, Basic.

Service scripts are stored in the “var/settings/IT Monitor/Services” directory, which is automatically created during installation (see 4.3 “IT Monitor observed services”). To make a custom service script become available in the “Services” menu of the IT Monitor app, it must be copied to “var/settings/IT Monitor/Services”.

7 Statistics database

The statistics database is stored as „HELIOSDIR/var/run/statistics.sqlite“. It is SQLite compatible, with the “SQLite” root user included. Every 10 seconds server utilization data is captured, the database is flushed every minute.

- It contains all historic performance data
- Records older than *one year* will automatically be deleted
- Messages older than *three weeks* will automatically be deleted
- If missing, the database will be created

8 Preferences

This chapter lists all preferences that are pertinent to IT Monitor server. Find a description of how to set, view, change or delete preferences, with the HELIOS utility programs “prefdump”, “prefvalue”, and “prefrestore”, in the HELIOS Base manual.

Important: Make sure that preference keys *DO NOT* start or end with a slash (“/”) character, and note that they are case-sensitive! Also, if any preference key or preference value includes spaces, that key or value must be enclosed in quotes.

```
Key:  Programs/monitorsrv/<preference>
```

TcpPort `int` `2029`

TCP/IP communication port for the communication between iPhone clients and IT Monitor server.

ipaccess `str` `ipaccess`

Specifies the file name of the IP access list that contains all client IP addresses which are allowed to communicate with the IT Monitor server.

RemoteProxy `str` `""`

If “monitorsrv” cannot access the Internet directly, another “monitorsrv” that acts as proxy server (and hence serves as an intermediary) is required. This preference specifies the IP address, or the hostname, of the remote proxy server, e.g.: “proxy.helios.de”.

ProxyPort `str` `"2029"`

Specifies the proxy server TCP port.

Users `strlist` `""`

Allows only those users to monitor the IT Monitor app server information who are listed in this preference. Exceptions are user "root" and members of the groups "SysAdm" and "ITMAdm", who are not restricted by this preference.

The following preferences can also be set from the iPhone client:

MinDiskFreeSpace `int` `8`

Specifies the minimum allowed free disk space (in MB) on the server.

MinDiskFreeSpaceDur `int` `60`

Specifies the time span in seconds before the alarm is set off if the minimum allowed free disk space is exceeded.

MaxProcessorUsage `int` `99`

Specifies the maximum allowed processor usage in percent.

MaxProcessorUsageDur `int` `300`

Specifies the time span in seconds before the alarm is set off if the maximum allowed processor usage is exceeded.

MaxMemoryUsage `int` `95`

Specifies the maximum allowed memory usage in percent.

MaxMemoryUsageDur `int` `10`

Specifies the time span in seconds before the alarm is set off if the maximum allowed memory usage is exceeded.

MaxMemoryPages `int` `2000`

Specifies the maximum allowed number of pages (paging action) per second.

MaxMemoryPagesDur `int` `10`

Specifies the time span in seconds before the alarm is set off if the maximum allowed pages per second are exceeded.

MaxNetworkPackets `int` `30000`

Specifies the maximum allowed network packets that are transferred per second.

MaxNetworkPacketsDur `int` `60`

Specifies the time span in seconds before the alarm is set off if the maximum allowed network packets per second are exceeded.

Listener/<e-mail address> `str` `<name>`

Specifies a user who should be informed about alert messages via e-mail. `<name>` is the user name for the e-mail address. Multiple listeners can be specified by setting this preference as many times as needed.

8.1 Service monitoring preferences

Note: It depends on the individual service which of the following preferences need to be set in the “Services” section of the IT Monitor Server app:

`Key: Programs/monitorsrv/Services/<service name>/<preference>`

service `str` `""`

(`Service` in the IT Monitor Server app)

Specifies the script name that does the monitoring, e.g. *AFP.pl*.

host `str` `localhost`

(`Host` in the IT Monitor Server app)

Specifies the server to be monitored. The string can also include a port number. It must be separated from the server name with a colon, e.g. *localhost:2009*.

interval `int` `600`

(`Check Interval` in the IT Monitor Server app)

States the interval in seconds with which the specified service is monitored.

user `str` `""`

(`User` in the IT Monitor Server app)

Specifies the user name under which the login on the server **host** is done.

passwd `str` `""`

(`Password` in the IT Monitor Server app)

Specifies the corresponding password for **user**.

Note: The password is stored unencrypted in the preferences file.

---

options `str` `""`

(`Options` in the IT Monitor Server app)

Allows specifying additional options for custom service scripts.

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