

IP Mapping Guide

Macrotone
Consulting Ltd.

Geoffrey S. Chapman, Macrotone Consulting UK Ltd.

Macrotone ***Consulting Ltd.***

IP Mapping Guide:

by Geoffrey S. Chapman

Publication date May 2016

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Abstract

This book covers the use of the Macrotone IP Mapping component which allows you to display IP address geolocation information upon a Google Map on your Joomla!TM-powered web sites.

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Preface

Joomla IP Mapping Component

Author: G S Chapman
Date: 22nd May 2016
Version: 1.4.1

DOCUMENT HISTORY

Version	Date	Changed By:	Remarks
1.0.0	18/11/2012	G S Chapman	Initial release
1.0.1	15/01/2013	G S Chapman	Update headers, add a style to the locations table and add additional index files.
1.0.2	08/02/2013	G S Chapman	Improve security checking. Also perform multiple db update when an IP address location is added.
1.0.3	07/04/2013	G S Chapman	Minor corrections and add ability to shrink (compress) the locations table.
1.0.4	18/06/2013	G S Chapman	Add tabular data display and other minor fixes.
1.0.5	22/08/2013	G S Chapman	Added option to display last 'n' days of data. Also only display Akeeba sync icon if Akeeba Admin Tools Pro is installed on the site. Added Transifex details to documentation.
1.1.0	09/10/2013	G S Chapman	Added support for Joomla 3.1. Allow for the use of the Google Closure Compiler to be a module option. Also changes the connection mechanism to Google Closure Compiler to be a default of CURL rather than FURL-Open.
1.2.0	07/11/2013	G S Chapman	Added new cron feature to enable automatic synchronisation with the Akeeba logs. Both front end based and CLI scripts provided.
1.2.3	03/06/2014	G S Chapman	New options to control table display, updated cron task and numerous other minor fixes. This version also introduced the separate Robots table.
1.3.0	23/05/2015	G S Chapman	New geolocation option and other minor enhancements. Joomla 3.x only.
1.3.1	01/06/2015	G S Chapman	Modified mapper handling and a couple of minor changes. Joomla 3.x only.
1.3.2	08/07/2015	G S Chapman	Minor corrections mainly to multiple location updates and back end filters. Joomla 3.x only.
1.3.3	07/01/2016	G S Chapman	Minor corrections mainly to visitor agent and dashboard. Joomla 3.4 only.
1.4.1	22/05/2016	G S Chapman	Update for release 1.4.1.

PURPOSE OF DOCUMENT

This documentation describes the release 1.4.1 version of the Joomla IP Mapping component by Macrotone Consulting Ltd.

Part I. User Guide

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Chapter 1. Overview

This document describes the MacroTone Consulting IP Mapping component. It covers installation and usage of the component, along with suggested configuration options.

It also includes the planning, design and creation of the Joomla IP Mapping component for Joomla! 3.5 and above. The component has its origin in the requirement to present site intrusion attempts in a simple manner upon a map. Inspection of the available possible solutions already available on the JED did not yield anything suitable so a decision was made to write our own.

Inspection of current map applications indicates that Google Maps are probably the most suitable for implementation, with sound support available.

The completed IP Mapping component is available on the MacroTone Consulting Ltd Website:

<http://www.macrotoneconsulting.co.uk/index.php/MacroTone/joomla-extensions.html>

The IP Mapping component uses the free IP to Location service of IPInfoDB [<http://ipinfodb.com/>]. The resolution of this service is not always optimal and can change from time to time. This means the locations are not 100% correct but acceptable. If the location is not found by the IPInfoDB service then a check is performed on the GeoBytes service. This service has changed since the original implementation, and we now use the 'Get City Details' API which is free provided that you do not expect to exceed the services "Reasonable Free Access Limit" of 16,384 accesses per hour. The Geobytes lookup is also provided as a 'fall back' in 'Visitors agent' where the number of visits might well exceed the 'Reasonable Free Access Limit'. The main aim is not to find the visitors exact position but to have an idea where they can be located.

IP Mapping was originally designed with the aim of displaying IP addresses upon Google Maps and experience has shown that although it works well it is very reliant upon the accuracy of the data held by the various IP to Location suppliers. In some cases the determined location is very accurate, but in other cases it can be many miles (kilometres) distant from the true location. HTML5 geolocation offers an alternative mechanism using information obtained from the web browser. If enabled a check is first performed to determine whether a user's browser is capable of supporting HTML5 geolocation and if so, a request is then made to obtain the information. If successful this is then used to display the location upon a map. If unsuccessful, or if the browser does not support HTML5 geolocation, the fall back, existing IP mapping is used instead.

Where ever possible the development tries to lever the supplied features provided in the Joomla core. This enabled the same 'look and feel' as supplied by the standard Joomla components, ensuring user familiarity and making for easier implementation.

Chapter 2. Install and Uninstall

Installing IP Mapper

Installation uses the standard Joomla install method.

Important

Do NOT uninstall Macrotone IP Mapping before updating it! Uninstalling will remove all of your data, including all of your configuration information!

Note

The language (translation) files are NOT installed automatically. You can download and install them from our language download page. Do note that you will have to install both the component and the language packages for the component to work.

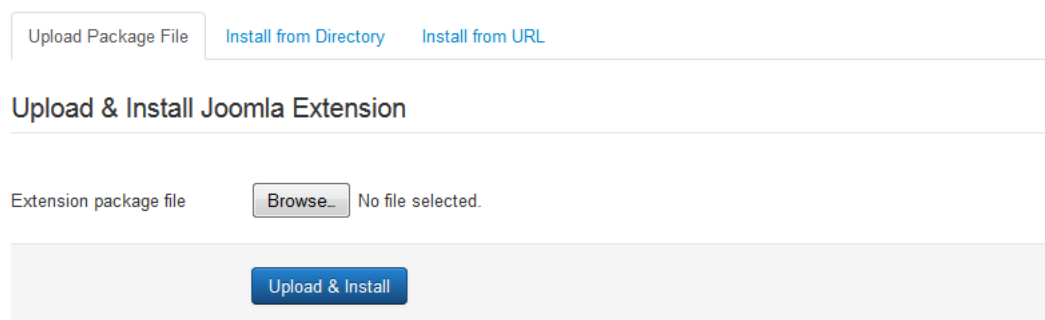
Macrotone Consulting Ltd only produces the English language files. All other languages are contributed freely by third parties. If you spot an error in the first instance please go to the translation project page to find the contact information of the translator. Abandoned languages will show the maintainer being our staff member "geoffc". In this case we will try to help you but our knowledge of foreign languages is very limited; if you would like to fix the language package you will need to create a Transifex account and to volunteer to take over the translation project for that language.

Download the Latest Version

Once you have downloaded the latest version, you are ready to install the component.

Step 1 of 4 - Install the Component: Login to your Joomla Administrative centre and in the Extensions menu, click on the Browse button and navigate to the file location where you downloaded the file. Click on the file and then click on the Install/Uninstall button.

Figure 2.1. Initial Installation Screen.



Upload Package File Install from Directory Install from URL

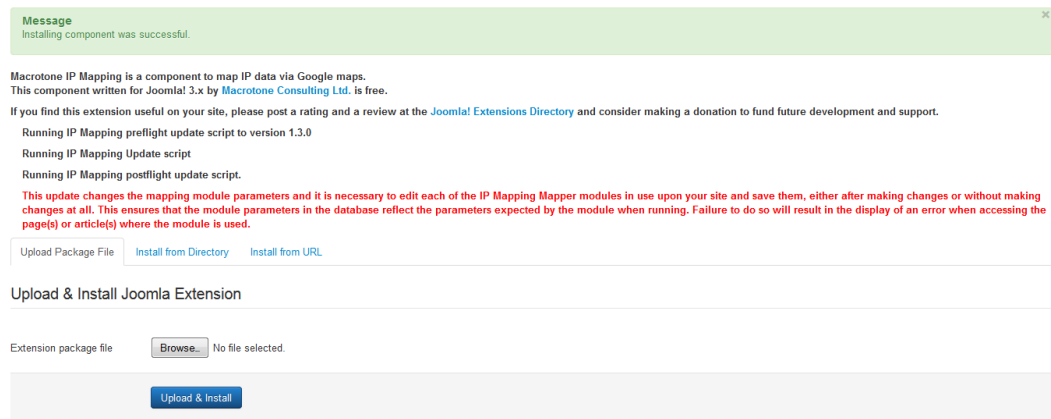
Upload & Install Joomla Extension

Extension package file Browse... No file selected.

Upload & Install

Step 2 of 4 - Once the Component is installed, the following screen will be displayed.

Figure 2.2. After installation screen



Step 3 of 4 - Configure the Component: Navigate to the Component: IP Mapping Control Page. Choose the Options icon on the top right hand side of the page, and set as required, especially the API Key. Settings are described in the documentation.

Step 4 of 4 - If you are intending to use the cron feature read the section in this document specifically about the Cron feature.

Using Live Update

MacroTone IP Mapping integrates the Akeeba Live Update system. Log in to your site's backend and go to Components, MacroTone IP Mapping . Look towards the bottom of the page. There should be an icon which reads "Update found" when there is a new version available. Click on it and then click on "Update now". The new version will be downloaded and installed automatically for you. In case this doesn't work, or if "Live Update not supported" is displayed below the icon, please make sure that your host's firewall allows TCP/IP communications over port 80 and 443 to macrotoneconsulting.co.uk. If your host requests IP addresses instead of domain names, please ask them to trace them from the server as they are multicast hostnames, which means that they resolve to a different IP depending on where in the world you are.

Module Configuration

As well as installing the component there will be two modules installed which will need configuring before use:

mod_ipmapping_mapper: This module is responsible for the display of Google Map in any desired module position in your site template using the data in the database. This component accepts a number of options as to the 'reasons' used for the selection of the data as well as options to control the display of the map itself. Depending upon your requirements you may wish to have multiple copies of the modules available to display different maps.

Important

If your site is using a '.htaccess' file to control site access then it is necessary to allow the 'map_data.php' file to be visible. To do this it is necessary to add the following exception to the '.htaccess' file:

```
RewriteRule ^modules/mod_ipmapping_mapper/map_data\.php$ - [L]
```

The placing of the directive is important, since the .htaccess file is processed in order, hence if placed at the end of the file the directive would never be reached and hence will not work.

mod_ipmapping_visitoragent: This optional module is responsible for the placing visitor information in the location table in the database, if it is desired to track visitor locations. It also has a few options

that should be configured. It will require the setting of an API Key IF the key has not been already specified in the component.

To be able to record visitors data you must ENABLE visitor agent module first. It can be placed at any module position of your template but it is a good idea to place it in a footer (or header) positions.

Test record

The component has been tested successfully on Joomla 3.4.1 with PHP Version 5.5.24 and above with MySQL database version 5.1.36 and above with the following browsers:

- IE11
- Firefox 43
- Google Chrome

De-installation

Uninstalling the component will automatically remove all trace of the component, the modules and the database tables.

Chapter 3. Usage

The administrative back end of the site defines and controls the main storage side of the component. The front end of the site is controlled solely by the use of two supplied modules. A mapper module and the visitor agent module.

This section displays some of the administrative screens available. From the Joomla back end the Components heading will reveal the IP Mapping component. Either select the main title or any of the individually selectable sections.

Back End Screens

There are a number of screens available within the Administration part of the site. These may be presented as tabs within the Control Panel, or accessed directory from the Components drop down menu.

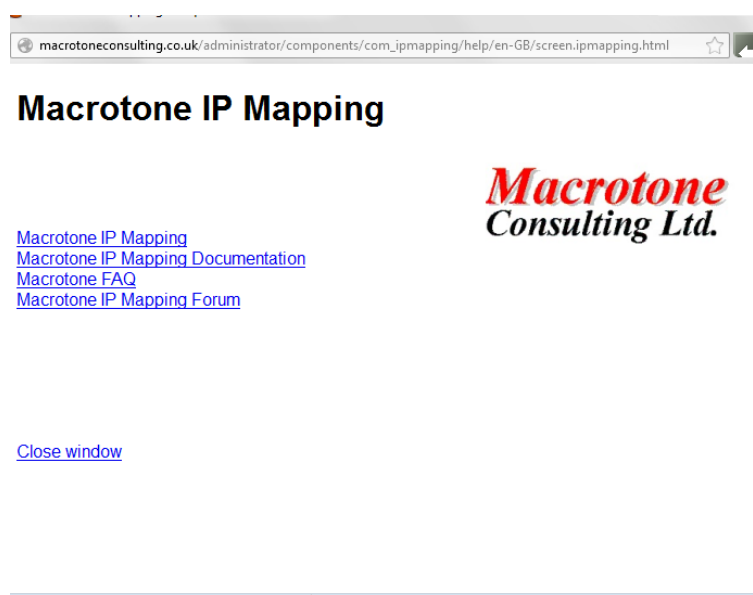
This section looks at each of these in turn and explains their structure and usage.

Help Icon

A number of the back end screens have a 'help' icon displayed in the top right hand corner of the screen. Clicking on the icon will invoke a small pop up window as shown below.

Clicking on each of the links will redirect the browser to the appropriate pages on the support website.

Figure 3.1. Help Screen image.



Control Panel

The main Control Panel is illustrated in Control Panel. There are a number of separate sections.

1. The main tabbed headings – Control Panel, Locations, Reasons, etc.
2. The icons separated into specific types:
 - a. Tools – The first two icons provide an alternative entry point to two of the tabbed sections. The third the 'Akeeba Log Sync' enables the population of IP Mapping locations table to updated from the entries present in the Akeeba Admin Tools Pro log table.

Note

The site has to have Akeeba Admin Tools Pro installed (which is a separately purchased component), otherwise the 'Akeeba Log Sync' icon will not be shown. Any attempt to run the command via a 'backdoor' would also fail.

- b. Updates - This provides an easy check to show that the latest version of the component is installed.
3. The panel which provides details of the credits etc.
 - a. About
 - b. Changelog
 - c. Credits

Figure 3.2. Control Panel

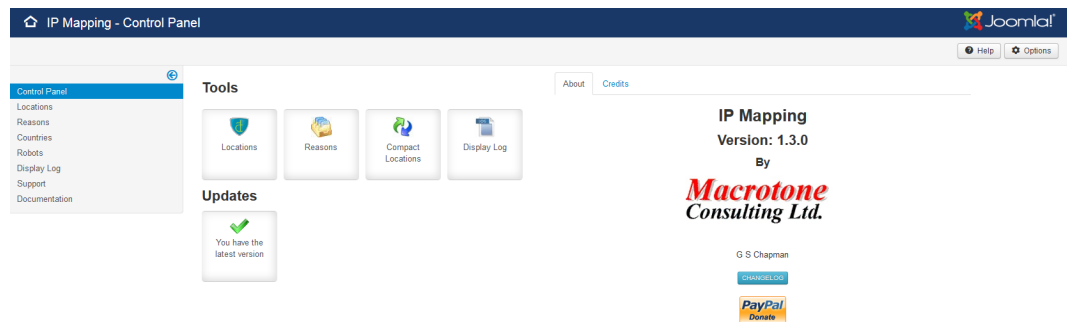
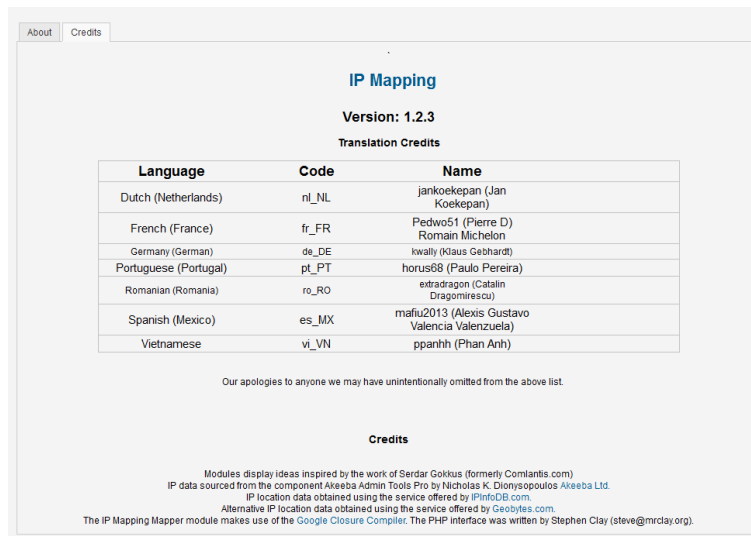


Figure 3.3. About Control Panel Tab.



The 'About' panel provides company information. As mentioned the component is provided free, and the user is requested to make a donation if they find it useful upon their site. Users who make a donation tend to obtain preference if they request any enhancements to the product, over those who choose not to do so.

Figure 3.4. Credits Control Panel Tab.

The 'Credits' panel displays the details of all the translators who have contributed in providing their efforts in creating language packs for the IP mapping component.

The 'Credits' panel also gratefully acknowledges the work of other people whose previous work we have made use of in creating the component.

Akeeba Log Synchronisation

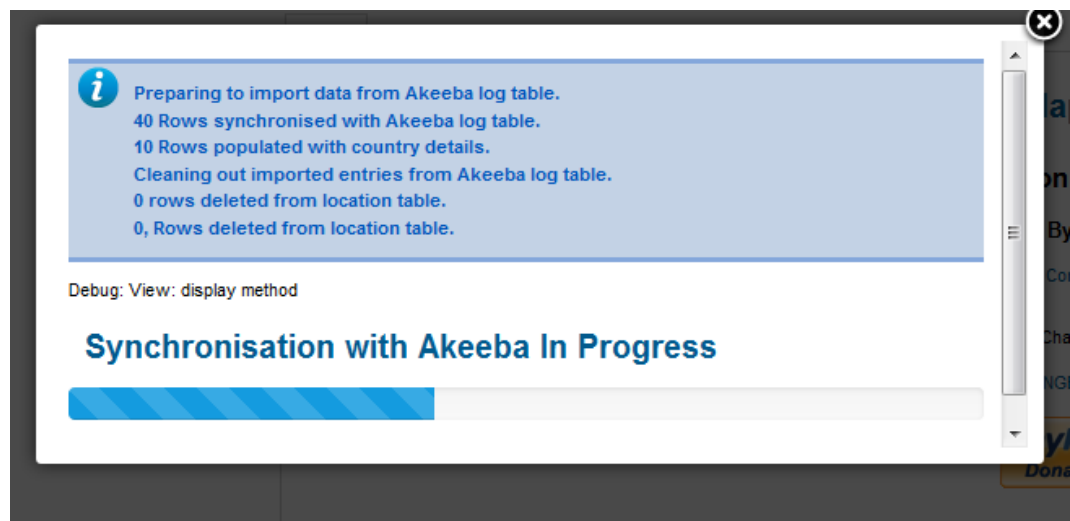
If the Akeeba Sync Log icon is pressed then there is a series of steps performed in the background.

Note

This icon is only displayed if Akeeba Admin Tools Pro is installed upon the site. This requires Akeeba Admin Tools Pro to be installed otherwise any attempt to run it will generate an error message and the process will stop.

1. The entries in the Akeeba Admin Tools Pro Log that are not present in the IP Mapping location table are inserted into the Location table. The 'ordering' column in the table is incremented at the same time.
2. The geolocation details for the entries in the location table are populated initially from the service provided by IPInfoDB and if that is unsuccessful from the Geobytes database.
3. If configured entries in the Akeeba log older than the specified number of days are deleted from the Akeeba log.
4. If configured entries in the location table older than the specified number of days are deleted.
5. The IP Mapping location table is optimised.

The screen below is typical of the display as the actions are performed. The information messages will be dependant upon the stage that the process is performing.

Figure 3.5. Akeeba Log Synchronisation Display

Location table compression

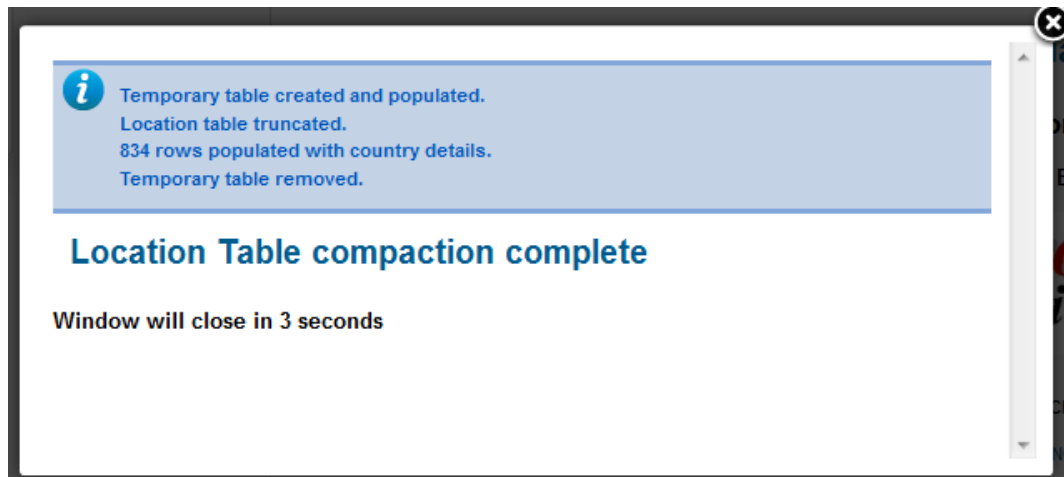
This feature shrinks (compacts) the entries in the Locations table.

Entries (IP addresses) are made into the locations table in an incremental manner. This applies whatever the source of the IP addresses. When entries are removed from the locations table they are removed 'oldest' first, or by specific selection. This means that the record identifiers constantly increase and on a very busy site there is always the possibility of reaching the maximum for the table. There may also be gaps in the record increments. There are two ways in which this can be resolved. The first involves increasing the size of the table field. The second is to provide a means of resetting the table, and it is the second option that has been made implemented in release 1.0.3. The mechanism involves creation of a temporary table and copying existing table entries into the temporary table and then cleaning out (truncate) of the location table before moving of the temporary table entries back into the source table. The final step is to remove the temporary table. Note that the location table entries for the 'visitor' entries are not copied. The reason is that these entries are transient and hence not retained for long periods.

Note

This feature is often only needed on very busy sites, or where there is a requirement to clean up the table periodically.

The modal window, shown below is displayed when the compaction process completes.

Figure 3.6. Compaction/Shrink Display

Locations

Figure 3.7. Locations Display

IP Mapping - Locations

New

Edit

Publish

Unpublish

Archive

Check-in

Trash

Options

Control Panel

Locations

Reasons

Countries

Robots

Display Log

Support

Documentation

Filter:

Ordering

Descending

20

Search

Clear

	IP Address	Latitude	Longitude	HTML5	Country Name	Country Code	City	Path	Agent	Source	Log date	Reason	Published	ID
	86.184.49.85	51.50650024414	-0.50728660822		United Kingdom	UK	Iver	/index.php /i/tao/entries	Mozilla/5.0 (Windows NT 6.1; WOW64; rv:38.0) Gecko/20100101 Firefox/38.0	Visitors Agent Module	2015-05-23 17:24:25	visitors		124
	86.184.49.85	50.43109893799	-3.68429994583		United Kingdom	UK	Totnes	/index.php /i/tao/entries	Mozilla/5.0 (Windows NT 6.1; WOW64; rv:38.0) Gecko/20100101 Firefox/38.0	Visitors Agent Module	2015-05-23 17:23:08	visitors		123
	86.184.49.85	50.43109893799	-3.68429994583		United Kingdom	GB	Totnes	/index.php /i/tao/entries	Mozilla/5.0 (Windows NT 6.1; WOW64; rv:38.0) Gecko/20100101 Firefox/38.0	Visitors Agent Module	2015-05-23 17:21:50	visitors		122
	86.184.49.85	50.43109893799	-3.68429994583		United Kingdom	GB	Totnes	/index.php /i/tao/entries	Mozilla/5.0 (Windows NT 6.1; WOW64; rv:38.0) Gecko/20100101 Firefox/38.0	Visitors Agent Module	2015-05-23 17:20:16	visitors		121
	86.184.49.85	50.43109893799	-3.68429994583		United Kingdom	GB	Totnes	/index.php /i/tao/entries	Mozilla/5.0 (Windows NT 6.1; WOW64; rv:38.0) Gecko/20100101 Firefox/38.0	Visitors Agent Module	2015-05-23 17:16:29	visitors		120
	86.184.49.85	50.43109893799	-3.68429994583		United Kingdom	GB	Totnes	/index.php /i/tao/entries	Mozilla/5.0 (Windows NT 6.1; WOW64; rv:38.0) Gecko/20100101 Firefox/38.0	Visitors Agent Module	2015-05-23 17:05:35	visitors		119

Filter:

- Select Country Code -

- Select Country Name -

- Select City Name -

- Select reason -

- Select Status -

The Locations tab is the display of the IP addresses that are candidates to be mapped. A typical display is shown. Clicking on any of the column headings will cause the display to re-order itself.

The icons on the top right hand side perform the expected actions enabling the editing, creation, deletion and publishing of IP Locations.

Note

Only locations that are 'published' are candidates for mapping.

The edit screen is shown below.

Figure 3.8. Location Editor

The edit screen is a single screen. Some of the fields are display only. For example the geographical location of the IP address is not editable. Entering or updating an IP address and then saving it will populate the geolocation fields when the record is inserted (or saved) into the database from information obtained from the IPInfoDB service. Some of the data fields may be populated from the Akeeba synchronisation process, IF the product is also installed.

Important

Audit fields are not editable.

Reasons

Figure 3.9. Reasons display

Name	Description	Published	Ordering	ID
adminpw	The user attempted an administrator login upon the site.	✓	3	3
antispam	An attempt to enter spam was detected.	✓	5	5
badbehaviour	Bad behaviour was detected.	✓	17	17
csrfshield	A CSRF/Anti-spam form protection attempt to enter spam was detected.	✓	9	9
dfshield	A Direct File Inclusion attempt was detected.	✓	10	10

The Reasons display illustrated above shows the known reasons that are associated with the IP addresses in the Location table. It is used to differentiate the location IP addresses so that they may be displayed (mapped) on a separate Google map. Most of the supplied values are those currently used by Akeeba Admin Tools Pro, but the list can be added to as required.

It is not expected that the supplied values will be changed very often if at all. The description field is for informational purposes only and is not used elsewhere currently. This is not a situation expected to change.

Figure 3.10. Reason editor

IP Mapping - Reason: [EDIT]

Save Save & Close Save & New Save as Copy Close

Details

Reason Name: antispam

Description:

[Toggle Editor]

Font Family Font size Paragraph Styles

An attempt to enter spam was detected.

Path: p Words: 7

Status: Published

Audit Information

Creation Date: 0000-00-00 00:00:00

Created by: 2012-10-25 18:44:36

Modified on:

Modified by:

It is possible to change the defined reasons using the editor. The screen above shows the specific entry for an 'antispam' reason. Reasons cannot be deleted however if the reason is associated with any of the IP addresses. Change the reason for the IP address in the location screen and try to delete the reason again.

Countries

Figure 3.11. Countries Display

IP Mapping - Countries

New Edit Publish Unpublish Archive Check In Trash Options

Control Panel Locations Reasons Countries Support Documentation

Filter: Search Clear

Select Status

Country Name	Country Code	Published	Ordering	ID
<input type="checkbox"/> Afghanistan	AF	<input checked="" type="checkbox"/>	0	1
<input type="checkbox"/> Albania	AL	<input checked="" type="checkbox"/>	0	2
<input type="checkbox"/> Algeria	DZ	<input checked="" type="checkbox"/>	0	3
<input type="checkbox"/> American Samoa	DS	<input checked="" type="checkbox"/>	0	4
<input type="checkbox"/> Andorra	AD	<input checked="" type="checkbox"/>	0	5

Display # 5 Start Prev 1 2 3 4 5 6 7 8 9 10 Next End Page 1 of 48

The countries list contains all of the currently defined country names and their short (two letter) country codes. This table is used to provide the details for the filters used in the front end modules.

The ability to control the countries allows for the situation where a new country comes into being (or disappears) or where the country codes change. This also provides future expansion were a different IP address resolution service to be used where different country codes may be used. i.e. United Kingdom is using the code GB by some providers.

Figure 3.12. Country editor

IP Mapping - Country: [EDIT]

Save Save & Close Save & New Save as Copy Close

Details

Country Name: Afghanistan

Country Code: AF

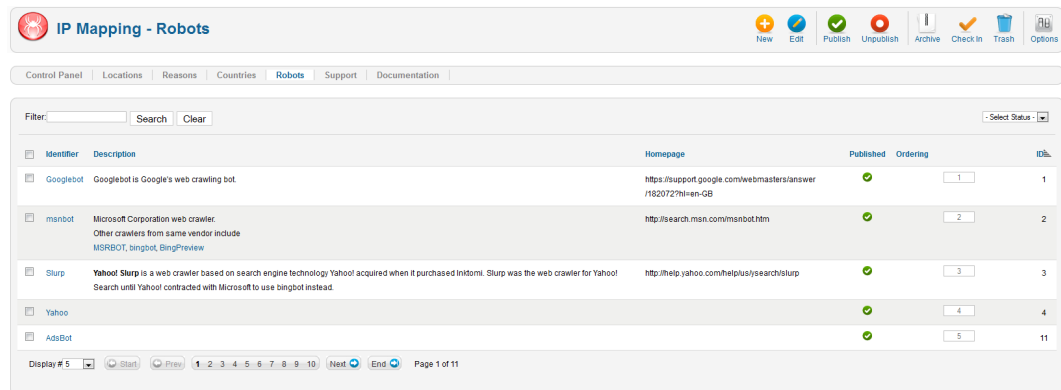
Status: Published

Joomla! 2.5.7

The country edit screen is very simple and enables the entry of a country code and the associated country name.

Robots/Web Crawlers

Figure 3.13. Robots display



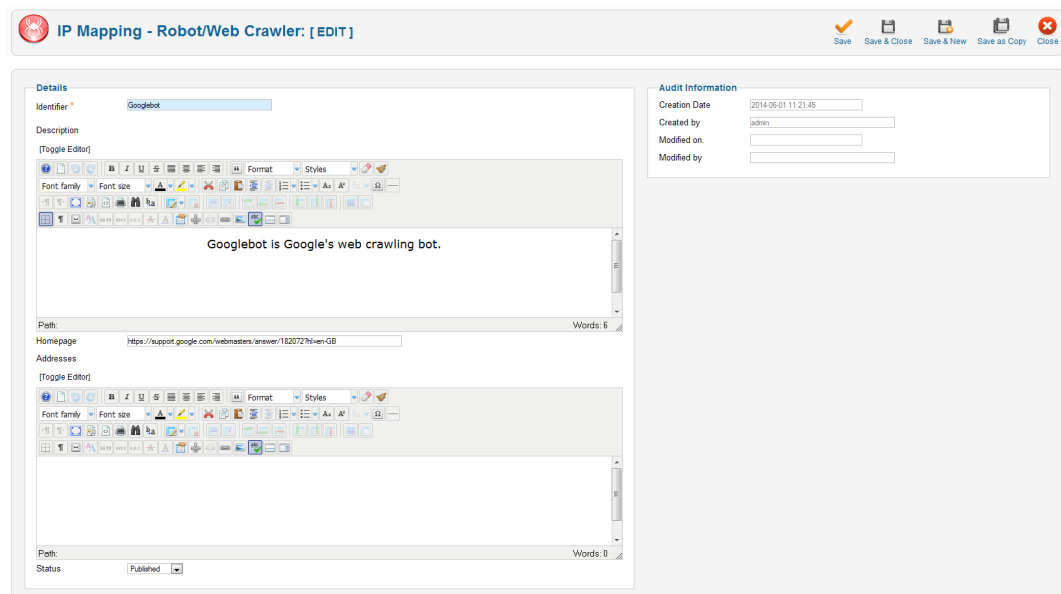
The screenshot shows the 'IP Mapping - Robots' interface. At the top, there are navigation tabs: Control Panel, Locations, Reasons, Countries, Robots (selected), Support, and Documentation. Below the tabs is a search bar with 'Filter:' and 'Search' buttons. The main content is a table with columns: Identifier, Description, Homepage, Published, Ordering, and ID. The table lists five robots: Googlebot, manbot, Slurp, Yahoo, and AdsBot. Each row has a checkbox on the left and a 'Select Status' dropdown on the right. The table is paginated, showing 'Page 1 of 11'.

Identifier	Description	Homepage	Published	Ordering	ID
<input type="checkbox"/> Googlebot	Googlebot is Google's web crawling bot.	https://support.google.com/webmasters/answer/152072?hl=en-GB	<input checked="" type="checkbox"/>	1	1
<input type="checkbox"/> manbot	Microsoft Corporation web crawler. Other crawlers from same vendor include MSRBOT, bingbot, BingPreview	http://search.msn.com/msnbot.htm	<input checked="" type="checkbox"/>	2	2
<input type="checkbox"/> Slurp	Yahoo! Slurp is a web crawler based on search engine technology Yahoo! acquired when it purchased Inetom. Slurp was the web crawler for Yahoo! Search until Yahoo! contracted with Microsoft to use Bingbot instead.	http://help.yahoo.com/help/plus/search/slurp	<input checked="" type="checkbox"/>	3	3
<input type="checkbox"/> Yahoo			<input checked="" type="checkbox"/>	4	4
<input type="checkbox"/> AdsBot			<input checked="" type="checkbox"/>	5	11

The Robots display illustrated above shows the known robots, also known as web crawlers that may be encountered upon web sites. The information in this table is used to identify visitors to the site that are not individuals but search agents seeking to build up information resources upon other web sites. Typically these robots are used by companies such as Google, Microsoft, Yahoo etc. The site may not wish the visit by these agents to be recorded within the displayed maps. There is an option in the 'visitors agent module' to prohibit this recording and the information upon which agent to exclude is stored in the 'robots' table.

The table enables site administrators to add and otherwise control which agents are within the list of robots to exclude. There are a lot of robots in use on the web and they are being added to all the time. They are also sometimes specific to particular counties, or specific topic, hence it is reasonable to provide this level of control.

Figure 3.14. Robot editor



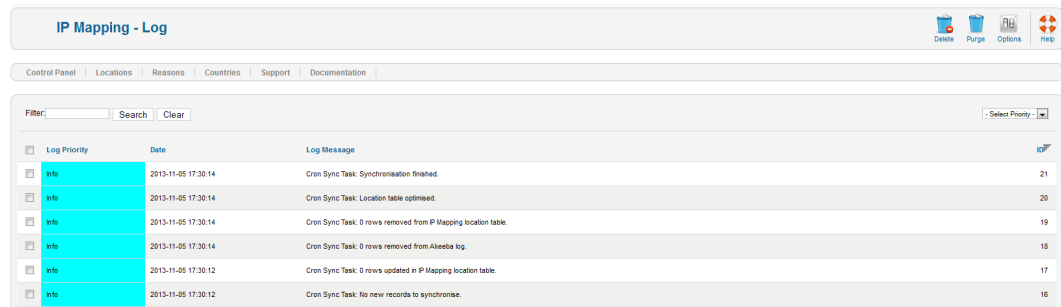
The screenshot shows the 'IP Mapping - Robot/Web Crawler: [EDIT]' interface. The top bar has a title 'IP Mapping - Robot/Web Crawler: [EDIT]' and buttons for Save, Save & Close, Save & New, Save as Copy, and Close. The main content is divided into two panels. The left panel, titled 'Details', contains fields for Identifier (Googlebot), Description (Googlebot is Google's web crawling bot.), Path, Homepage (<https://support.google.com/webmasters/answer/152072?hl=en-GB>), Addresses, and Status (Published). The right panel, titled 'Audit Information', contains fields for Creation Date (2014-06-01 11:21:45), Created by (admin), Modified on, and Modified by.

It is possible to add or change any of the specific agents using the editor. The screen above shows one the specific entry for a robot. The only mandatory field is the identifier name, which is the specific string contained within the software (browser) accessing the site. The description, homepage and addresses fields enable the adding of information that may aid in identifying whether the agent should be used in the search list, in the 'visitor agent module'. It is likely that future component releases will

add, remove or otherwise modify the existing entries. Any entries added by a site administrator will remain unaltered.

Log Display

Figure 3.15. Log Display



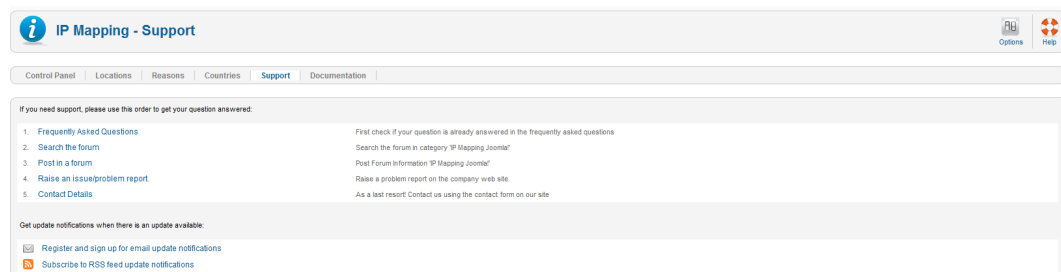
Log Priority	Date	Log Message	
Info	2013-11-05 17:30:14	Cron Sync Task: Synchronisation finished.	21
Info	2013-11-05 17:30:14	Cron Sync Task: Location table optimised.	20
Info	2013-11-05 17:30:14	Cron Sync Task: 0 rows removed from IP Mapping location table.	19
Info	2013-11-05 17:30:14	Cron Sync Task: 0 rows removed from Akesba log.	18
Info	2013-11-05 17:30:12	Cron Sync Task: 0 rows updated in IP Mapping location table.	17
Info	2013-11-05 17:30:12	Cron Sync Task: No new records to synchronise.	16

The log display is used to display the optionally generated messages (component option) from the application. In release 1.2 this is the results of the cron job runs but its usage will be extended with further releases.

Records may be individually deleted or alternatively all the records may be purged from the table.

Support Tab

Figure 3.16. Support Tab Control Panel



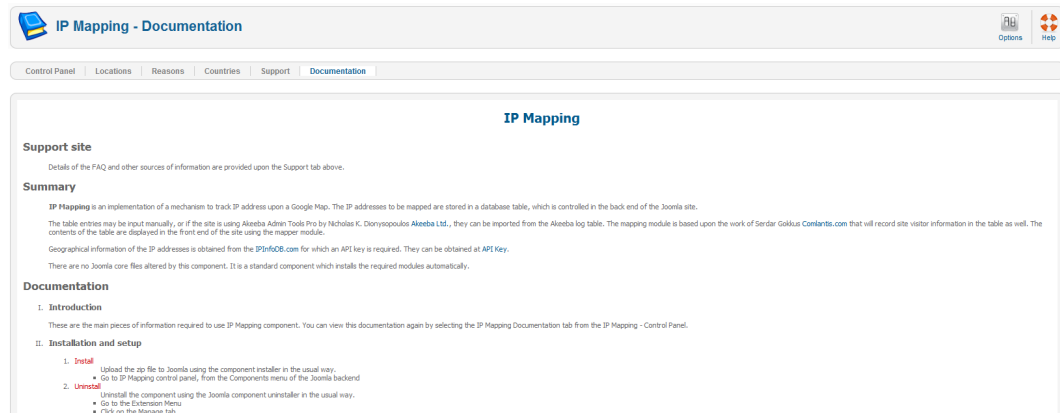
The 'Support' tab provides details of how additional information and/or assistance may be obtained on the product. As can be seen Macrotone provide a Frequently Asked Question (FAQ [<http://macrotoneconsulting.co.uk/index.php/Macrotone/ip-mapping-faq.html>]) on the company web-site, and additionally provide a Forum where users may raise questions.

There is also the ability to raise an issue on the company web site from this panel.

Finally there is the ability to send an email which will be answered as and when circumstances permit. Preference is usually given to forum entries.

Documentation Tab

Figure 3.17. Documentation Tab Control Panel



There is some basic information about the component provided in the ‘Documentation’ tab, but the user is referred to the MacroTone site for the full documentation for the latest information and recent changes since the product installation.

Component Options

The component itself has a few options which are described below:

Figure 3.18. General Option Settings.

There are a few options available to configure the component. These are all assessed from the ‘Option’ icon in the top right hand side of most of the Administrator screens. Hovering over the option title will display tool tips explaining what the particular option setting does.

One of the options specify the API Key as used to reference the IPInfoDB database to obtain the Geographical location for the given IP addresses/ delete mode. It is necessary to register on the IPInfoDB site to obtain an API key which is then entered into the screen displayed above.

Note

If the Visitor Agent module is also used on the site then it also requires the API key to enable correct population of the database table. If not explicitly specified in the Module configuration the value specified in the component will be used instead.

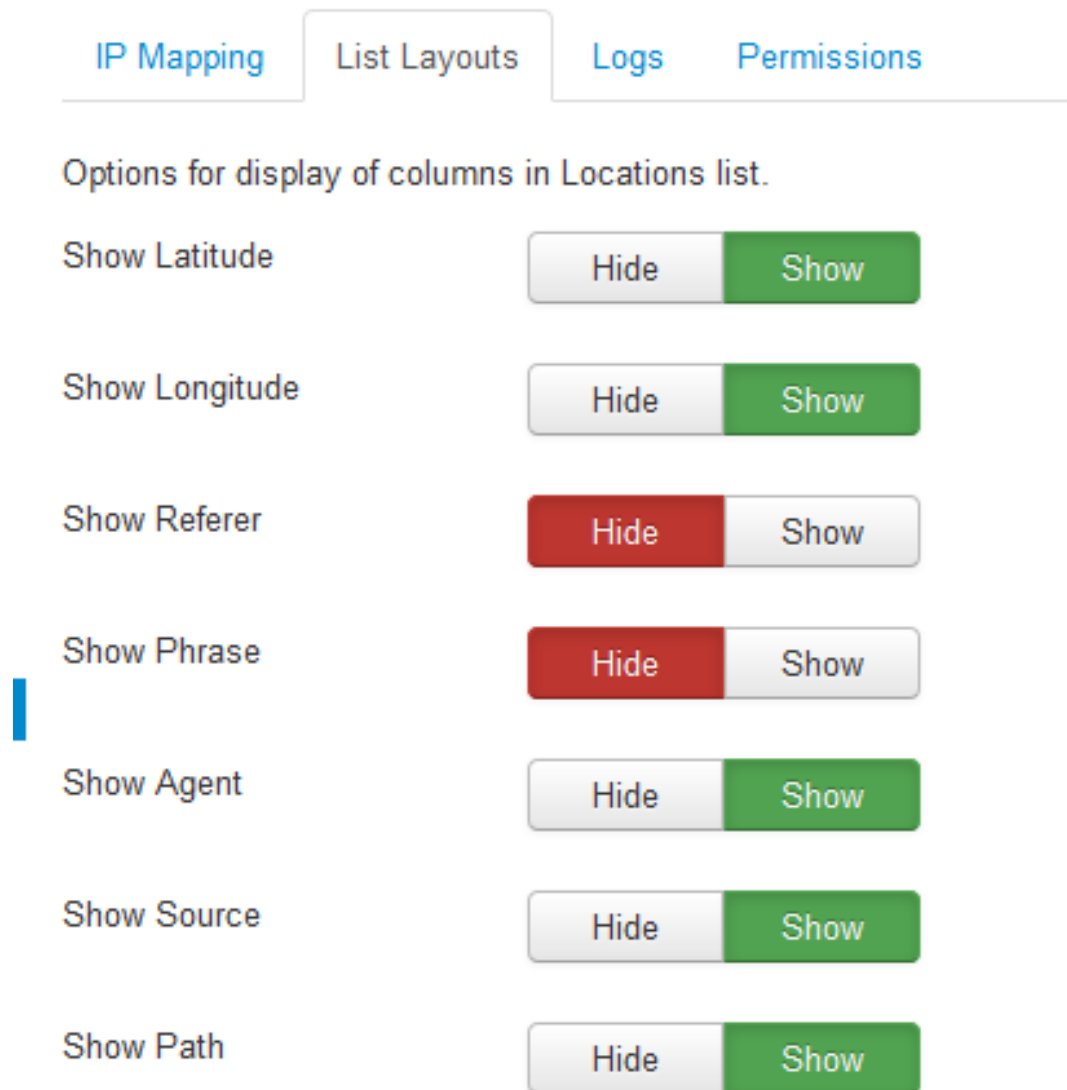
The second option is to automatically clean the synchronised entries out of the Akeeba Admin Tools Pro log when the synchronisation process completes. It may or may not, depending upon site policy be desirable to perform this task automatically.

The next option enables the specification of the number of days worth of entries to retain in the Akeeba Log. Any days that are 'older' than the number of days specified will be removed from the Akeeba Log. It is recommended to leave at least a days worth of entries in the Akeeba logs.

Note

If Akeeba Admin Tools Pro is not installed upon the site then the settings of the previous two entries are ignored and are unused.

The last item is the secret key or 'pass phrase' required to run the front end cron tasks. See notes in the 'Cron' section of this manual for more details. The key should be specified as alphanumeric otherwise problems may prevent the cron task from running.

Figure 3.19. List Layout Settings.

IP Mapping List Layouts Logs Permissions

Options for display of columns in Locations list.

Show Latitude	Hide Show
Show Longitude	Hide Show
Show Referer	Hide Show
Show Phrase	Hide Show
Show Agent	Hide Show
Show Source	Hide Show
Show Path	Hide Show

There are a number of different fields that can be displayed in the back end locations list display. Not all of these will be of interest to every administrator, so there are options to show only the relevant fields for that specific site.

Figure 3.20. Log Option Settings.

IP Mapping List Layouts **Logs** Permissions

Parameters to control the component logging configuration.

Enable logging

Enable Debug

The log tab currently has two possible options, which control entries in the log table. At release 1.2 the log was only populated by the running of the cron tasks, which displays the information as to how many records are synchronised, updated etc., as currently show in the Sync window if the 'Akeeba Sync icon is clicked.

Later versions have added logging to a number of the other code blocks.

In release 1.2.3 there is a second option to specifically enable the placement of 'debug' messages in the log. It is recommended that this is left off unless requested by the developer, as it can generate a lot of messages which will not be very useful to the majority of administrators.

Front End Screens

There are no user front end screens as all the control is performed by the two supplied modules.

There is however the ability to perform the Akeeba synchronisation from the front end via the use of the cron facility introduced in version 1.2.0. This is a directly accessible screen, however it redirects the caller to the site home page, even if there is an error in the calling URL, such as a missing secret key. The 'secret key' required on access to this page which controls whether the underlying task activities are carried out. Messages are entered into the IP Mapping log, if component logging is enabled.

See the section below about cron for more detailed information.

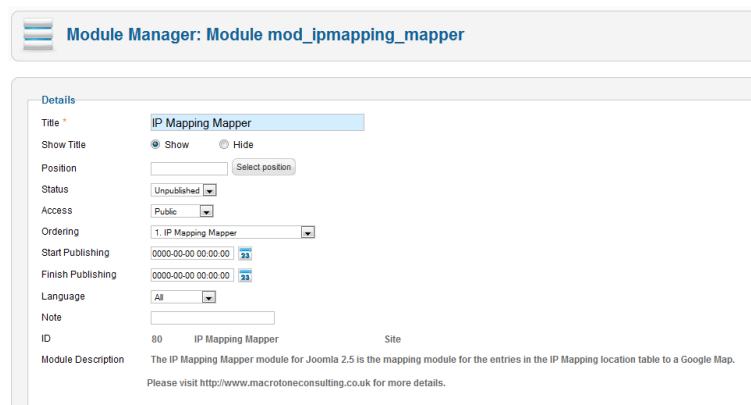
Chapter 4. IP Mapping Modules

There are two supplied modules used with IP Mapping and these are described in this section. These modules are based upon the work originally published by www.comlantis.com (now defunct) written by Serdar Gokkus updated for the recent changes in the Google Maps v3 API, and Joomla 3.x..

IP Mapping Mapper Module

This module shows to the user the IP address location in a map using the Google Maps API V3 which is free for not commercial use, if you have any doubts about the use for your site please read the Google maps APIs' licence at <http://code.google.com/apis/maps/terms.html> The users location is based on the http://www.ipinfodb.com/ip_location_api.php free script. Please read the Terms and conditions on their site.

Figure 4.1. Mapping Module Details



The screenshot shows the Joomla! Module Manager interface for the 'IP Mapping Mapper' module. The title is 'IP Mapping Mapper'. The 'Show Title' option is set to 'Show'. The 'Position' is set to 'Select position'. The 'Status' is 'Unpublished'. The 'Access' is 'Public'. The 'Ordering' is '1. IP Mapping Mapper'. The 'Start Publishing' and 'Finish Publishing' dates are both set to '0000-00-00 00:00:00'. The 'Language' is 'All'. The 'Note' field is empty. The 'ID' is '80'. The 'Module Description' states: 'The IP Mapping Mapper module for Joomla 2.5 is the mapping module for the entries in the IP Mapping location table to a Google Map. Please visit <http://www.macrotoneconsulting.co.uk> for more details.'

The module may be placed anywhere in the positions available in the site template. This may also be within an article as described in the section Inserting a module inside an article .

Figure 4.2. Mapping Module Assignment



The screenshot shows the Joomla! Menu Assignment screen for the 'IP Mapping Mapper' module. The 'Module Assignment' is set to 'No pages'. The 'Menu Selection' section shows 'Hidden Menu', 'Main Menu', 'Top', and 'User Menu'. The 'Main Menu' is selected. The 'Raise an Issue' checkbox is unchecked. The 'Select All', 'Clear Selection', and 'Toggle Selection' buttons are visible.

Note

The module assignment screen will look slightly different to the above dependant upon the specific menus available upon the specific site.

General Options

Figure 4.3. Mapping Module General Parameters

The screenshot shows the 'IP Mapping Mapper' configuration page. At the top, there are five buttons: 'Save', 'Save & Close', 'Save & New', 'Save as Copy', and 'Close'. Below these is a 'Title' field containing 'IP Mapping Mapper'. A navigation bar includes 'Module' (selected), 'Menu Assignment', 'Module Permissions', 'Google Map Parameters', 'Table Parameters', and 'Advanced'. The main section is titled 'IP Mapping Mapper' and includes a 'Site' button. The 'IP Mapping module' section contains the following parameters:

- Reasons:** A text input field with 'All x' and a clear button.
- Use Google CC:** A toggle switch currently set to 'No'.
- Frequency of map update (ms.):** A text input field with the value '5000'.
- Start date:** A date picker field.
- End date:** A date picker field showing '2015-05-21 10:35:07'.
- Display Latest (days):** A text input field with the value '0'.
- Show creator:** A toggle switch currently set to 'Yes'.

The module general parameter are used to specify the choice of IP addresses to be placed upon the map which will be generated by the Mapper module. This is a multiple choice option. It is not usual to display the 'visitors' reason alongside the other reasons, but this is possible if desired.

The frequency of map update (duration in milliseconds) is most useful when visitor information (real-time) is required. The default value of 5000 is very low (as this is specified in milliseconds, meaning a map update every 5 seconds!) The choice of value should be driven by the requirement as to how often the map should be updated. A very high value is common when the other 'reason' codes are being mapped. Values in the hours are common.

Note

There is a maximum value that can be specified of 2147483647, which if exceeded will be reset to the maximum. Similarly the minimum frequency update that will be accepted is 500, which equates to an update every half a second.

The start and end date are used when the reason codes other than 'visitor' are used. For example it may be desirable to map Spam attempts on a monthly basis and have different modules (one for each month). This is common if the module display is used in articles.

If the parameter for the to display the last 'n' days worth of data has a value greater than zero then the specified dates are silently ignored. The value is a numeric value greater than zero (0). A value of zero causes the specified date range to be used.

Release 1.3.1 changed the behaviour of the mapper module slightly. Prior to this release version once the map was displayed upon the screen it would be updated as specified by the update interval with new entries retrieved from the database. It did not however update the 'clustering'. The net result was that IF the map display was left open for longer periods of time then the map display would get cluttered with all the new location icons. The amount of time required before this was noticeable is dependant upon how many 'new' location entries are being added in the given time period. One other factor was that if entries were removed from the database, as would occur if the visitor agent was configured to remove entries older than the specified time, these would NOT be removed from the map display, or from the tabular display if it was configured to be displayed.

In release 1.3.1 this has changed and there is a new parameter to specify the map refresh interval. This is a multiple of the map update interval and is expressed in minutes. Now when new (visitor) entries are updated, the clustering of the map icons is automatically updated. The 'new' optional map refresh interval will clean out all the map markers (and cluster markers) and retrieve all the required entries from the database and add them to the 'now' empty map display. This is only refreshing the map, NOT the whole web page. This will happen asynchronously so there may be small periods of time, dependant upon the load upon the users browsing machine, while the map is updated. The default is to NOT refresh the map display.

If multiple map displays are present upon the web page, each map acts totally independently, with each having separate update and refresh intervals.

Google Closure Compiler

Since its initial release the component has made use of the Google Closure Compiler to reduce the size of the Javascript included in the web page used to display the map. The Closure Compiler is a tool for making JavaScript download and run faster. It is a true compiler for JavaScript. Instead of compiling from a source language to machine code, it compiles from JavaScript to better JavaScript. It parses your JavaScript, analyses it, removes dead code and rewrites and minimises what's left. It also checks syntax, variable references, and types, and warns about common JavaScript pitfalls.

The Closure Compiler has three possible three levels of compilation, which range from simple removal of whitespace and comments to aggressive code transformations.

WHITESPACE_ONLY

The WHITESPACE_ONLY compilation level removes comments from your code and also removes line breaks, unnecessary spaces, extraneous punctuation (such as parentheses and semicolons), and other whitespace. The output JavaScript is functionally identical to the source JavaScript.

This compilation level provides the least compression of the three levels.

SIMPLE_OPTIMIZATIONS

The SIMPLE_OPTIMIZATIONS compilation level performs the same whitespace and comment removal as WHITESPACE_ONLY, but it also performs optimisations within expressions and functions, including renaming local variables and function parameters to shorter names. Renaming variables to shorter names makes code significantly smaller. Because the SIMPLE_OPTIMIZATIONS level renames only symbols that are local to functions, it does not interfere with the interaction between the compiled JavaScript and other JavaScript.

Compilation with SIMPLE_OPTIMIZATIONS always preserves the functionality of syntactically valid JavaScript, provided that the code does not access local variables using string names (by using eval() statements, for example).

SIMPLE_OPTIMIZATIONS is the default compilation level.

ADVANCED_OPTIMIZATIONS

The ADVANCED_OPTIMIZATIONS compilation level performs the same transformations as SIMPLE_OPTIMIZATIONS, but adds a variety of more aggressive global transformations to achieve the highest compression of all three levels. The ADVANCED_OPTIMIZATIONS level compresses JavaScript well beyond what is possible with other tools.

The IP Mapping component makes use of the 'SIMPLE_OPTIMIZATIONS' option. Tests have revealed that using the ADVANCED_OPTIMIZATIONS may not produce code that runs efficiently.

Google Map Options

Figure 4.4. Mapping Module Google Map Parameters.

The screenshot shows a configuration window for Google Map parameters. It is organized into two main sections: 'General Parameters' and 'Google Map Parameters'. The 'Google Map Parameters' section is expanded, showing various settings:

- Initial type of google map:** Roadmap (dropdown)
- Cluster old markers:** Yes (radio button selected)
- Marker to show location:** standard (dropdown)
- Map width value type:** Percentage(%) (radio button selected)
- Map width:** 100 (text input)
- Map height:** 600 (text input)
- Display Maptype Control:** Yes (radio button selected)
- Maptype Control Format:** Default (dropdown)
- Maptype Control Position:** Top Right (dropdown)
- Display Zoom Toolbar:** Yes (radio button selected)
- Display Pan Control:** Yes (radio button selected)
- Zoom Control Style:** Large (dropdown)
- Zoom Control Position:** Top Left (dropdown)
- Display Scale:** No (radio button selected)
- Zoom Strategy:** Auto zoom to show all markers (radio button selected)
- Zoom Value:** 6 (text input)

Below the 'Google Map Parameters' section is an 'Advanced Options' section, which is currently collapsed.

These options reflect very closely the available settings that can be made with the Google Maps API. A lot of the following information is that as shown on the Google web site but enclosed below for the convenience of our users.

Table 4.1. Google Map Types

Constant	Description
HYBRID	This map type displays a transparent layer of major streets on satellite images.
ROADMAP	This map type displays a normal street map.

Constant	Description
SATELLITE	This map type displays satellite images.
TERRAIN	This map type displays maps with physical features such as terrain and vegetation.

Note

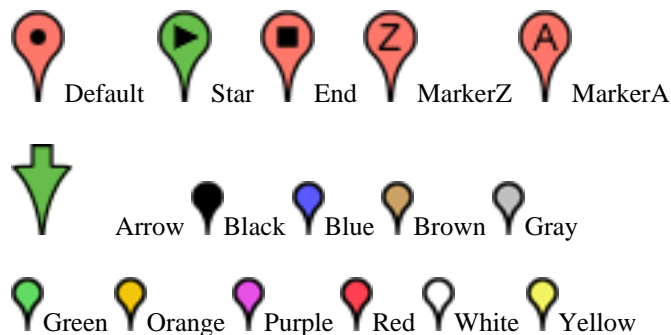
Normally, one just uses either “ROADMAP” or “HYBRID“, as there are not as many use cases for “TERRAIN” and “SATELLITE” types.

Cluster old markers: Instruction to group markers in a cluster.

Position Marker: It is possible to change the marker used on the map, Choose from one of the available types as illustrated below.

Note

Other markers may be available.



Map width value type: Specifies whether the values entered for the map width are in pixels or percent.

Note

In some circumstances the entered values for map width may be ignored, as in the use of the module in a side bar.

Map width: Specifies the width of the desired Google map

Map height: Specifies the height of the desired Google map

Display Maptype Control: Control switch between map types

The MapType control may be shown in one of the following style options:

- HORIZONTAL_BAR displays the array of controls as buttons in a horizontal bar as is shown on Google Maps.

Figure 4.5. Maptype Control Format - Horizontal



- DROPDOWN_MENU displays a single button control allowing you to select the map type via a dropdown menu.

Figure 4.6. Maptype Control Format - Drop Down

- DEFAULT displays the "default" behaviour, which depends on screen size and may change in future versions of the API

Figure 4.7. Maptype Control Format - Default

Maptype Control Position: The position of the control upon the map. The possible values are explained in more details below under 'Zoom Control Position'.

Display Pan Control: Instructs whether the Pan control should be shown on the map.

Figure 4.8. Pan Control

Display Zoom Toolbar: Instructs whether to display the zoom controls.

Zoom Control Style: The available style settings are as shown in the table below.

Table 4.2. Google Map Zoom Control styles.

Constant	Description
DEFAULT	The default zoom control. The control which DEFAULT maps to will vary according to map size and other factors. It may change in future versions of the API. Currently SMALL
LARGE	The larger control, with the zoom slider in addition to +/- buttons.

Constant	Description
SMALL	A small control with buttons to zoom in and out.

Figure 4.9. Zoom Control - Small



Figure 4.10. Zoom Control - Large



Zoom Control Position: Specifies the position of zoom control on the Google map.

Identifiers used to specify the placement of controls on the map. Controls are positioned relative to other controls in the same layout position. Controls that are added first are positioned closer to the edge of the map.

TL	- TC -	TR
LT		RT
LC		RC
LB		RB
BL	- BC -	BR

Elements in the top or bottom row flow towards the middle. Elements positioned at the left or right sides flow downwards.

Table 4.3. Google Map positions

Constant	Description
BOTTOM_CENTER	Elements are positioned in the centre of the bottom row.
BOTTOM_LEFT	Elements are positioned in the bottom left and flow towards the middle. Elements are positioned to the right of the Google logo.
BOTTOM_RIGHT	Elements are positioned in the bottom right and flow towards the middle. Elements are positioned to the left of the copyrights.
LEFT_BOTTOM	Elements are positioned on the left, above bottom-left elements, and flow upwards.
LEFT_CENTER	Elements are positioned in the centre of the left side.
LEFT_TOP	Elements are positioned on the left, below top-left elements, and flow downwards.
RIGHT_BOTTOM	Elements are positioned on the right, above bottom-right elements, and flow upwards.
RIGHT_CENTER	Elements are positioned in the centre of the right side.
RIGHT_TOP	Elements are positioned on the right, below top-right elements, and flow downwards.
TOP_CENTER	Elements are positioned in the centre of the top row.
TOP_LEFT	Elements are positioned in the top left and flow towards the middle.
TOP_RIGHT	Elements are positioned in the top right and flow towards the middle.

Display Scale: Controls the display of the map scale as shown in the figure below.

Figure 4.11. Display Scale

Zoom Strategy:

Auto zoom to show all markers: In this zoom strategy all markers will be showed automatically. Map will decide to zoom out or zoom in itself.

Centre to the last marker and use defined zoom value: The last marker will be centred in the map. In this modus a zoom factor will be used which is configured with Zoom Value.

Zoom Value: Zoom value of map. Used only if "Centre to the last marker and use defined zoom value" is selected!

Table Options

Figure 4.12. Mapping Module Table Options

The screenshot shows the 'IP Mapping Mapper' configuration page. At the top, there's a title field set to 'IP Mapping Mapper'. Below it are several tabs: 'Module', 'Menu Assignment', 'Module Permissions', 'Google Map Parameters', 'Table Parameters' (which is active), and 'Advanced'. Under the 'Table Parameters' tab, there are several settings:

- Display location table:** A toggle switch set to 'No'.
- Title for table data:** A text input field containing 'Mapping Data'.
- Max no table rows:** A text input field containing '100'.
- Height of table (px):** A text input field containing '400'.
- Show date:** A toggle switch set to 'Yes'.
- Show country:** A toggle switch set to 'Yes'.
- Show city:** A toggle switch set to 'Yes'.
- Show IP addresses:** A toggle switch set to 'No'.
- Show search phrase:** A toggle switch set to 'No'.
- Show referrer:** A toggle switch set to 'Yes'.
- Show referrer link:** A toggle switch set to 'No'.

These options are used to display a table below the map showing the data used to generate the map itself. Settings include specifying how many records should be displayed in the table.

Release 1.2.3 has added additional options to control which table columns are displayed. This is particularly useful where the module is located in a side panel and the scroll bars are considered distracting. The IP display is only possible when the country column is displayed.

If all of the columns are marked as being not required (hidden) then the table display will NOT be present even if it is requested.

Advanced Options

Figure 4.13. Mapping Module Advanced Options

The screenshot shows the 'Advanced Options' section of the 'IP Mapping Mapper' configuration page. It is expanded, showing three sub-sections: 'General Parameters', 'Google Map Parameters', and 'Advanced Options'. The 'Advanced Options' section contains the following settings:

- Module Class Suffix:** A text input field.
- Caching:** A dropdown menu set to 'Use Global'.
- Cache Time:** A text input field containing '900'.

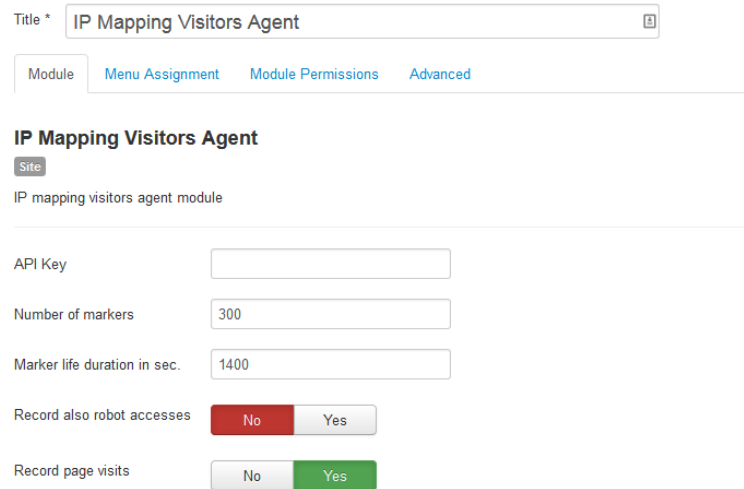
These options are used to control the module style and cache settings.

IP Mapping Visitor Agent module

This module controls the insertion of IP addresses into the database table for site visitors. If there is no desire to capture site visitor information then this module does not need to be configured at all. To capture visitor information it is necessary to configure the module and assign it to a location on the site template, often in a footer (or a header) position.

The Visitors Agent module setting screens are shown below:

Figure 4.14. Visitors Agent Module details



Title * IP Mapping Visitors Agent

Module Menu Assignment Module Permissions Advanced

IP Mapping Visitors Agent

Site

IP mapping visitors agent module

API Key

Number of markers 300

Marker life duration in sec. 1400

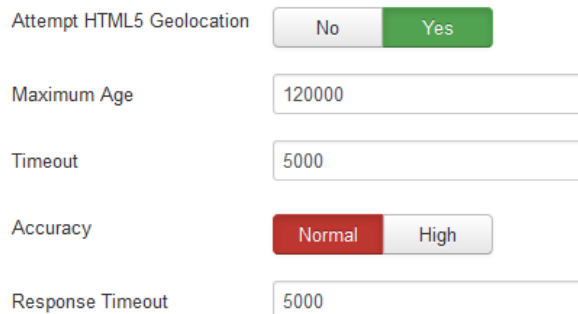
Record also robot accesses No Yes

Record page visits No Yes

In the module details one defines the position where one wished the module to be placed. It is common to not display the module title and of course the module should be published IF it is desired to collect visitor information.

Figure 4.15. Visitors Agent Module HTML5 geolocation

HTML5 Geolocation controls



Attempt HTML5 Geolocation No Yes

Maximum Age 120000

Timeout 5000

Accuracy Normal High

Response Timeout 5000

Visitor Agent Filters.



Use Google CC No Yes

Load JQuery No Yes

JQuery CDN Link http://ajax.googleapis.com/ajax/libs.

Country filter None

The use of HTML5 geolocation is optional since it can impact the visitor usage of the site. For that reason the default is not to enable it. Not all browsers support HTML5 geolocation, hence forth known

as geolocation in this document. Most of the common browsers do but how they interpret the design and implement it can vary.

If enabled when a visitor is upon a page, a small popup window is initiated to ask the user whether they wish to share their location details with the site. This is part of the browser design. The user has a number of choices:

- To share the details of the visitor on a single (one time only) basis.
- To share the detail on this and every other page on the site and make it the default, so the user is not prompted again.
- To decline the request and not provide details for this page.
- To decline for this and every other page upon the site and make it the default.
- To ignore the request or just close the popup window.

Note

Not all browsers provide all of the options, or do not immediately appear to do so.

The first four possibilities are easy to handle since they are simple yes or no responses. If the user replies yes then their location is stored by the component. Likewise if they decline to share then the default IP location determination is used and stored.

The last possibility requires some special handling since we require to either store the geolocation determined value or the IP determine location. A timer is implemented that will, if no response is received store the IP derived location. There is some additional code that handles the situation where the user later decides to share their location, in which case an attempt is made to update the earlier store IP derived location.

The position to place the Visitor Agent is usually on a position that is on all the site pages such as a footer, or a header.

Figure 4.16. Visitors Agent Module assignment

Note

The module assignment screen will look slightly different to the above dependant upon the specific menus available upon the specific site.

Figure 4.17. Visitors Agent Module Parameters

The parameters are really self evident. If the administrative component is configured the API key for the IPInfoDB will be used. If it is not specified in the component then it is necessary to specify it in the Agent module.

To restrict the number of markers on the 'visitor' map displays one can specify a value in the module. This value is then used to restrict the number of values contained within the database for the 'visitors' reason.

The lifetime of the 'visitors' reason within the database can also be specified in the module. This means that only a few hours worth of entries are available for mapping.

Any web site gets a number of visit from robots such as Google, Yahoo etc. If it is desired to also collect this visitor information then the option is available.

Prior to release 1.2.3 the list of robots, or web spiders as they are often named, was build into the module. The list was periodically updated, but may not contain any specific robot that may visit a specific site. There are literally hundred if not more, robots, and more are being deployed upon a regular basis. This means that it would be a virtually impossible task to ensure that they are always up to date, and 'complete. For that reason the robots list was relocated to a separate database table, and the ability provided for site administrators to add, edit and otherwise control the specific robots it is required to block for a specific site. See the details of the robots screens above.

Finally it is possible to apply a country filter to the collected results, so for example it may be desirable to only collect information for the United Kingdom. A drop down select list is provided to select the desired country.

Note

Note that it has not been possible to verify that all of the countries it is possible to specify, work as expected, mainly due to the fact that we do not receive visitors from all of the countries (currently).

Note

Private (or reserved) IP addresses are not recorded by the visitors' agent.

Note

Version 1.3.0 of the visitor agent has been extensively modified to handle the HTML5 geolocation, but also to centralise more of the PHP functions in a helper class. For this reason the module is smaller than previously. It also makes AJAX calls back to the server to handle the storing of the results in the database.

Chapter 5. Cron tasks

Cron is basically a time-based job scheduler that runs in the background on UNIX systems. Typically a task requiring repetitive actions to be carried out on a regular (pre-determined) basis would be ideal candidates for using cron.

Joomla systems can offer a number of different mechanisms to perform repetitive actions. The one that is best for any given site is very dependant upon the facilities offered by the hosting supplier.

Pseudo-cron

Plugin capture

It is possible to make use of a 'bespoke' plugin which can be invoked when someone accesses one or more pages upon a site and performs some predefined tasks. This is not really a 'real' cron since there is no possible way in which one can guarantee that there would be a site visitor at any predetermine time, and it has an unavoidable side effect of slowing the site access for the specific visitor that happen to visit the site at or immediately after the desired time. For this reason we have not implemented such a mechanism, however for some other 'short' running tasks it might be suitable, so although not suitable for our implementation it may in some circumstances provide a reasonable solution.

Front-end access

Browser access

This mechanism makes use of the front end of the site and provides a task that may be invoked by a web browser, but more commonly by a utility accessing a web page such as wget or curl. Such tasks typically when invoked in this way, do NOT provide progress details.

The front-end access URL's for cron tasks are not usually designed to be run from a normal web browser, but from an unattended cron script, utilising a server side executable as a means of accessing the function. Typically utilities such as wget, curl or lynx are used, which can be thought of as applications which simulates the behaviour of the browser. They typically try to access the cron supplied site URL so that the accessed page actions occur.

Normal web browsers tend to be "impatient". If a web page returns a bunch of redirection headers, the web browser thinks that the web server has had some sort of malfunction, and stop loading the page. It will also show some kind of "destination unreachable" message. Remember, these browsers are meant to be used on web pages which are supposed to show some content to a human. This behaviour is normal. Most browsers will quit after they encounter the twentieth page redirect response, which is bound to happen. Using browsers such as Firefox, Internet Explorer, Chrome, Safari, Opera or any other browser are **not** intended to work with the front-end cron based features. They are **NOT** meant to work by design.

Command line utilities, by default, will also give up loading a page after it has been redirected a number of times. For example, wget gives up after 20 redirects, curl does so after 50 redirects. Depending upon the actual task being executed it may be advisable to configure the command line utility with a large number of redirects. The number will depend upon the task itself.

Tip

There are several locations upon the web that provide a free service enabling of scripts supporting the CRON daemon. There is a free service from Webcron that provides a simple interface, that we have tested out ourselves. There is also a paid service that Webcron.org provide that fully supports a number of front-end features and is reasonably cheap - you need to spend

about 1 Euro for 1000 runs. Just make sure you set up your Webcron [<http://webcron.org/>] CRON job time limit to be at least 10% more than the time it takes for the script to execute upon your site. If you do not know, a good value can be determined from timing how long the script takes to run on a typical work load. Just run the script from your site's front end several times and average out the run times and add about 10% more to the required value.

It should be noted that IF your site uses any redirection component such as sh404SEF (and possibly .htaccess) that the URL specified in the Webcron service should be the 'redirected' URL and NOT the initial URL, otherwise a 301 error is seen.

One feature that is often included is the supply of a 'Secret key' or 'Pass Phrase'. It is a character based string which will allow the CRON job to ascertain that it has the right to request to run is acceptable. It can be thought of as an additional security feature.

Tip

Use only lower- and upper-case alphanumeric characters (0-9, a-z, A-Z) in your secret key. Other characters may need to be manually URL-encoded in the CRON job's command line. This is error prone and can cause the backup to never start even though you'll be quite sure that you have done everything correctly.

Most hosts offer a CPanel of some kind. There will be a section named something like "CRON Jobs", "scheduled tasks" or the like. The help screen they provide should describe how to set up a scheduled job. The missing part would be the command to issue. Simply putting the URL in there is unlikely to work.

Warning

If your host only supports entering a URL in their "CRON" feature, this may not work with most cron scripts. There is no workaround. It is a hard limitation imposed by the host.

Important

Be careful with any caching that may be present upon the web site. If the specific page being accessed is present within the cache it will be delivered to the caller, BUT the underlying actions will NOT be invoked. It is better to disable cache for the specific page.

We wasted a lot of time with tracking down this specific problem, and have not found it mentioned anywhere else on the web.

Linux System

The following is a selection of possible commands that may be used, depending on the executable's installed upon the web server:

```
lynx -source "http://www.yourwebsite.com/index.php?
option=com_ipmapping#38;task=cron.sync&secret=YourSecretKey" > /
dev/null
```

Or

```
wget -O /dev/null -q "http://www.yourwebsite.com/index.php?
option=com_ipmapping&task=cron.sync&secret=YourSecretKey" > /dev/
null
```

If you access your website using an HTTPS protocol, you may want to use this command instead:

```
wget --no-check-certificate -O /dev/null
"http://www.yourwebsite.com/index.php?"
```

```
option=com_ipmapping&task=cron.sync&secret=YourSecretKey" > /dev/  
null
```

Some hosting company block the lynx and wget command in which case you should be able to use the curl command instead:

```
curl --silent --compressed "http://www.yourwebsite.com/index.php?  
option=com_ipmapping&task=cron.sync&secret=YourSecretKey" > /dev/  
null 2>&1
```

or

```
curl -L -v "http://www.yourwebsite.com/index.php?  
option=com_ipmapping&task=cron.sync&secret=YourSecretKey" > /dev/  
null 2>&1
```

Depending upon the PATH setting in your session it may be necessary to specify the full path to the executable, and is probably a good idea to specify it as a default anyway.

i.e. /usr/bin/wget instead of wget.

Important

Any line breaks which may be shown in the above examples are included for formatting clarity only. One should not have a line break in the command line!

Warning

Do not forget to surround the URL in double quotes. If you don't the script will fail. The reason is that the ampersand is also used in UNIX to separate multiple commands within a single command line. If one doesn't use the double quotes at the start and end of the script URL, your host will think that an attempt has been made to run multiple commands and load your site's home page instead of the front-end page URL.

Contact your host; they usually have a nifty help page for all this stuff.

Important

Using a web browser (Internet Explorer, Google Chrome, ...) or wget version 1.10 and earlier may result into an error message concerning the maximum redirections limit being exceeded. This is not a bug. Most network software will stop dealing with a web site after it has redirected the request more than 20 times. This is a safety feature to avoid consuming network resources on misconfigured web sites which have entered an infinite redirection loop. To avoid this problem (if you encounter it, there is the option --max-redirect on wget version 1.11 and above.

Warning

Any ampersands entered in the crontab entries should be written as a single ampersand, not as an HTML entity (&). Failure to do so will result in a 403: Forbidden error message and the task will not run. This is not a bug, it's the way wget works.

Wget

GNU Wget is a free software package for retrieving files using HTTP, HTTPS and FTP, the most widely-used Internet protocols. It is a non-interactive command line tool, so it may easily be called from scripts, cron jobs, terminals without X-Windows support, etc.

GNU Wget has many features to make retrieving large files or mirroring entire web or FTP sites easy, including:

- Can resume aborted downloads, using REST and RANGE
- Can use filename wild cards and recursively mirror directories
- NLS-based message files for many different languages
- Optionally converts absolute links in downloaded documents to relative, so that downloaded documents may link to each other locally
- Runs on most UNIX-like operating systems as well as Microsoft Windows
- Supports HTTP proxies
- Supports HTTP cookies
- Supports persistent HTTP connections
- Unattended / background operation
- Uses local file timestamps to determine whether documents need to be re-downloaded when mirroring
- GNU Wget is distributed under the GNU General Public License.

Downloading GNU Wget

If GNU Wget is not installed upon your private system, the source code can be found on <http://ftp.gnu.org/gnu/wget/> [via http] [<http://ftp.gnu.org/gnu/wget/>] and <ftp://ftp.gnu.org/gnu/wget/> [via FTP] [<ftp://ftp.gnu.org/gnu/wget/>]. It can also be found on one of the GNU FTP mirrors. For more download options, see the download information on the Wget Wiki [<http://wget.addictivecode.org/Faq#download>].

CURL command

cURL is a software package which consists of command line tool and a library for transferring data using URL syntax. It is a standard command present on most (all?) UNIX systems.

cURL supports various protocols like, DICT, FILE, FTP, FTPS, Gopher, HTTP, HTTPS, IMAP, IMAPS, LDAP, LDAPS, POP3, POP3S, RTMP, RTSP, SCP, SFTP, SMTP, SMTPS, Telnet and TFTP.

Command Line Alternative

If you have access a the command-line version of PHP, scheduled tasks can use a different, probably better - and faster - way of scheduling.

In this situation a script which can be run from the command-line PHP interface (PHP CLI) is used. This doesn't require the front-end in order to work; it is self-contained, and can run even if the web server is down!

In order to schedule such a task, one has to use the following command line to the host's CRON interface:

```
/usr/local/bin/php /home/USER/webroot/cli/cron.php
```

where `/usr/local/bin/php` is the path to the site PHP CLI executable, `/home/USER/webroot` is the absolute path to your web site's root, and `cron.php` is the name of your script located in the 'cli' subdirectory. This information can be supplied by your host.

Note

The use of the PHP CGI executable is not suitable. To check which version is available run the PHP command with the --v option which will display the executable specifics.

Securing the script

We earlier mentioned the use of a secret key to be provided when the front end is accessed. We have not implemented such a mechanism for the CLI script. Instead we make use of the htaccess file. The PHP script has to be called using HTTP, and needs to be able to load the web environment, so it cannot be hidden away in a private part of your server's directory structure, and has to be called through Joomla. This opens up the risk that anyone could come along and type the URL into their browser - thus causing the script to be run independently of CRON. The easiest way to protect against this (if using Apache as your web server - most do) is to add some rules to your .htaccess file that prohibits anyone other than the local machine from running the script.

Note

For the following rules to work, you must have an Apache web server with mod_rewrite enabled.

Note

For example: If the file you want to run is called 'script_name', you could add the following to your .htaccess file to ensure that nobody else can run the script:

```
RewriteEngine On
RewriteCond %{REMOTE_ADDR} !^127\.0\.0\.0
RewriteCond %{REMOTE_ADDR} !^x\.x\.x\.x
RewriteCond %{QUERY_STRING} script_name [NC]
RewriteRule ^(.*)$ index.php [F,L]
```

...where x.x.x.x is the actual IP address of your server (if you have an SSL certificate, this will be unique to your hosting account - otherwise the IP address might be shared with other hosting accounts on the same server). You can find the IP address of your domain by running a ping test against your domain name (in Windows, go to Start->Run, type in 'cmd' and press enter, then type 'ping www.mydomain.com' and press enter)..Please note, you must add a backslash before each dot of your IP address.

What is Cron Job?

Cron is a daemon that executes commands at specified intervals. These commands are called "cron jobs." The Cron daemon is available on Unix, Linux and Mac servers. Windows servers use a Scheduled Task to execute commands.

Cron Job Command Basics

The way you set up a CRON job on your server depends on what software you are using to manage your hosting account. Some web hosting control panels (such as cPanel or Plesk) offer a graphical user interface (GUI) which makes it much easier to set up the scheduled task. If you do not have a GUI available, you will have to enter the necessary commands using Telnet or SSH.

A quick search on the Internet for 'cron' followed by the name of your web control panel should yield plenty of articles that tell you how to physically set up a new CRON job, but it is usually fairly self-explanatory if using something like cPanel or Plesk.

In any case, a CRON job is made up of 2 main elements: a command to be run, and an interval definition (i.e. something that tells it how often to run). You might also be asked to provide an e-mail address to which any error messages or other output can be sent.

The command to run is made up of 4 parts:

- An executable (i.e. a program that is capable of running PHP scripts)
- One or more configuration options (specific to the executable)
- An output path (where to put any output from the script)
- A URL (the script to be called)

In the following example, the crontab command shown below will activate the cron tasks automatically on the hour:

```
0 * * * * wget -O - -q -t 1 "http://www.yourwebsite.com/index.php?
option=com_ipmapping&task=cron.sync&secret=YourSecretKey"
```

The 0 * * * * part in the example above is the time when the cron job is going to happen. The following schematic tries to explain the general crontab syntax:

Important

Any line breaks which may be shown in the above examples are included for formatting clarity only. One should not have a line break in the command line!

```
# +----- minute (0 - 59)
# | +----- hour (0 - 23)
# | | +----- day of month (1 - 31)
# | | | +----- month (1 - 12)
# | | | | +----- day of week (0 - 7) (Sunday=0 or 7)
# | | | | |
* * * * * command to be executed
```

The frequency with which one wishes a specific script to run, should be carefully evaluated. Running it too often when there is nothing much to do is probably wasteful of system resources. On the other hand not running it frequently enough means that the expected actions are not 'up to date'. Generally once an hour is more than adequate in our tests, especially since we used to manually perform the task twice or three times a day.

Trouble shooting cron

If your cron task is not working, you should:

- Make sure your website can be triggered via your browser: Click on your cron URL. That will trigger it manually via your browser so you will see if this URL can be reached or not.
- If you use a third-party SEF component, your website may redirect the current page to the SEF one may break the cron service. So you can either configure your SEF component to not transform non-SEF into SEF URLs or directly write your SEF cron URL on the cron interface.
- Make sure your website can be triggered by the outside: If you have an .htaccess with password protection, your website will obviously not accept to be triggered by an anonymous user.
- If you use a security component on your Joomla website and use a remote cron facility, this component might block the cron task. If you are using RSFirewall, you could try disabling the DoS protection from the Components => RSFirewall => Configuration => Active scanner configuration options.
- Sometimes cron jobs can't trigger an URL including a "&" (see above) or can only trigger a script (instead of an URL). In that case, you should create a file with a suitable name at the root of your website including the code below:

```
<?php
$ch = curl_init();
curl_setopt($ch, CURLOPT_URL, 'http://www.yourwebsite.com/
index.php?
option=com_ipmapping&task=cron.sync&secret=YourSecretKey');
curl_setopt($ch, CURLOPT_RETURNTRANSFER, 1);
curl_setopt($ch, CURLOPT_TIMEOUT, 10);
curl_setopt($ch, CURLOPT_FOLLOWLOCATION, true);
curl_setopt($ch, CURLOPT_AUTOREFERER, true);
echo curl_exec($ch);
curl_close($ch);
```

Important

Any line breaks which may be shown in the above examples are included for formatting clarity only. One should not have a line break in the command line!

Then configure your cron to trigger that script.

Please don't forget to replace 'yourwebsite.com' by the URL of your own website.

- Make sure that there is no system cache storing up your pages accessed by a front end based cron task. If there is the cron task will only work when the cache entries expire, which will depend upon the cache settings.

Chapter 6. Screens and Usage Notes

Sample Screens

The output of Google maps is familiar to most people who use the web and the display from this component is no different in any regard other than the information that is ‘superimposed’ upon the map. For that reason only a few samples are presented below:

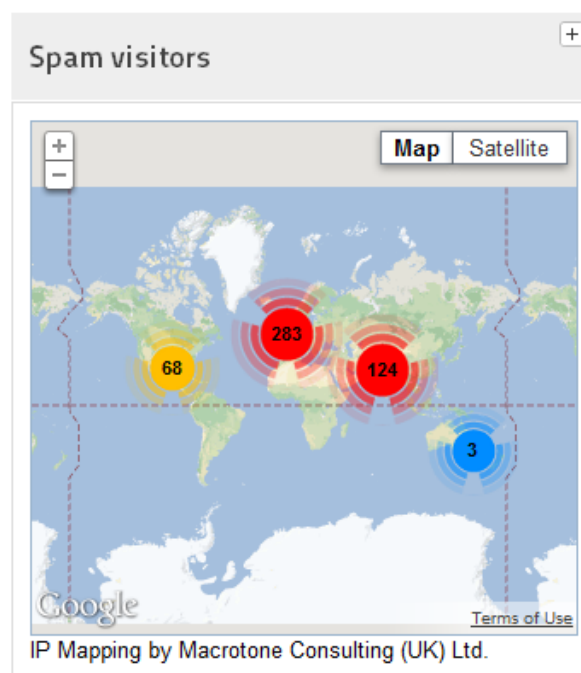
This first display is taken from the module displayed within an article.

Figure 6.1. Sample Output Screen (1)



The following display shows the module within the side bar.

Figure 6.2. Sample Output Screen (2)



Usage Notes

Inserting a module inside an article

[This is included as a convenience and is taken from the official Joomla docs [http://docs.joomla.org/How_do_you_put_a_module_inside_an_article%3F].]

You will usually want to associate modules with articles in some way. The modules are allocated to module positions and the module positions appear somewhere on the Web page as determined by the template. However, it is sometimes useful to have a module actually embedded within the article.

To insert a module inside an article, use the *{loadposition xx}* command, as follows:

- Create a module and set its position to any value that doesn't conflict with an existing template position. You can type in the position value instead of selecting it from the drop-down list. For example, use the position *myposition*.
- Assign the module to the Menu Items that contain the articles that you want the module to show in. You can also just assign the module to *all* Menu Items.
- Edit the articles where you want this module to appear and insert the text *{loadposition myposition}* in the article at the place where you want the module.

Note

This only works when the *Content - Load Module* plug-in is enabled. If this plug-in is disabled, the text *{loadposition myposition}* shows unchanged in the article.

loadmodule

An alternative to "*{loadposition xx}*" is the "*{loadmodule yyy}*" variation which is handled by the same plugin.

In this case the plugin looks for the first module that whose *type* matches the string 'yyy'. So, you could load ' "mod_login" module by placing *{loadmodule login}* in your text.

See also 'Modules Anywhere' by Peter van Westen of NoNumber [<http://www.nonumber.nl/>] which can also be used to perform this task.

Modules within Modules

It is possible in Joomla! 2.5 and above to include a module within a "Custom HTML" module as they are processed by content plug-ins in the same way as articles.

You should remember when doing this that you may experience formatting issues as the "chrome" of the "Custom HTML" module will surround the "chrome" of the included module potential having undesirable effects of the formatting or layout.

Modules Anywhere

It is also worth mentioning that there is a third party utility known as 'Modules Anywhere by Nonumber [<http://www.nonumber.nl/>] solutions (obtainable from the JED [Joomla Extensions Directory]) that is also very useful and makes adding modules to articles very simple. Highly recommended.

Map icons not displayed.

There are a few circumstances where the map icons are not displayed.

If the site is using an '.htaccess' file it is necessary to allow the 'map_data.php' file to be visible. To do this it is necessary to add the following exception to the '.htaccess' file:


```
RewriteRule ^modules/mod_ipmapping_mapper/map_data.php$ - [L]
```

The placement of this directive within the .htaccess file is important, as described elsewhere in this document.

A second possible (although unlikely) cause is the settings upon map_data.php file.

If the above suggestion does not work try changing the permissions upon the file map_data.php in the directory "modules/mod_ipmapping_mapper/" to 755.

i.e.

```
cd modules/mod_ipmapping_mapper
chmod 755 map_data.php
```

One way to assist in determining the cause of problems is to use the Firefox browser with the Firebug extension and turn on the Web Console and inspect the generated messages. [Go to Tools -> Web Developer -> Web Console].


Geolocation information not determined.

Prior to release 1.2.3 the determination of the geolocation information made use of a PHP function that required the setting of the 'allow_url_fopen' to be enabled. This is considered by some to be a potential security problem and a number of sites may have this option disabled. To enable it one can place a command in the php.ini file.

Release 1.2.3 added the ability to automatically use Curl as an alternative when communicating with the geolocation provider.

Checked Out State

IP Mapping makes use of the ability of Joomla to control multi-user access on records. In this component we control all of the records types (location and reasons). When a User edits an item, Joomla!

changes the item's status to Checked Out (represented by the  padlock icon). The record is locked and only the User who has checked it out can modify it. This is a safety/security feature that prevents two Users from editing an Item at the same time, thus preventing the loss of any data upon saving.

A table record remains "Checked Out" until the User clicks Apply, Save, or Cancel while editing it. Once saved, the record item is Checked In. However, if there's a connection error, such as when the User presses the browser's Backicon, or they choose another IP Mapping Item without saving or cancelling the work in progress, the IP Mapping Item remains Checked Out. This means no one else can edit it.

Using the Global Checkin can be used to unlock all Items that are currently Checked Out, or depending on the items marked only the specific item groups, across the whole site. It can only be performed by a Super administrator. The action commences as soon as the IP Mapping Item is clicked.

WARNING: Performing a Global Checkin while IP Mapping items are open for editing will result in data loss. *All* Checked Out Items will be checked in, and any unsaved changes will be lost.

In the rare situation of a lock not being freed, the lock can be released either with the IP Mapping list or from the Global Checkin.

Creating a language translation.

Transifex

One method that we have recently decided to make use of is the 'Transifex' project. To be truly multi-lingual most freely available Joomla component (including modules and plugins) relies on local

communities to create language packs. We realise that is can be a very dirty job, that is very time consuming. Transifex provides a mechanism to make language translations faster but with less work. Making use of this mechanism we hope to be able to provide users with a wider variety of available languages ready to download.

Looking at the number of existing components already making use of Transifex, we are joining an already varied and wide ranging community.

Transifex comes with the options of a client or a web interface and also has an extensive help system.

One site that might provide useful to translators starting to get to grips with Transifex and its usage is provided here. Not being multilingual ourselves we cannot really make any valid comments upon how useful they specifically are, but they certainly appear to be informative and complete.

Basically the language files are placed upon the Transifex server by ourselves within a 'project' i.e 'Issue Tracker'. The translators have an account (free upon request) on Transifex and request access to a language, which if granted allows access to the specific language files. The translators can edit the language strings for their specific language directly online, or via the use of a 'Transifex client' (freely downloadable) download the files, perform the translation locally and then upload them back to the Transifex server.

On our end we are kept informed of the state of translations automatically and via the use of a Joomla component named CTransifex (Compojoom) which can automatically generate the required installable zip files and make them available for users to download.

This avoids the need to create multiple zip files manually making the distribution task much simpler and relieving the translators from the tedious task of maintaining zip files, and at the same time providing an easier translation tool.

There are more details upon our website <http://macrotoneconsulting.co.uk/index.php/Macrotone/language-guide-extensions.html> and also upon the Transifex web site <https://www.transifex.com/>.

Manual method.

Those unwilling or unable to make use of Transifex, we here describe a manual mechanism for creating an installable extension pack. For translating extensions for Joomla! 1.6, 1.7, 2.5 see this article: Creating language packs for extensions in Joomla 1.6/1.7: http://docs.joomla.org/Creating_language_packs_for_extensions_in_Joomla_1.6/1.7

The following example illustrates the build of the Portuguese Brazilian language for the Macrotone IP Mapping component.

1) We will prepare folder structure for the new created translation. Create the following folders on your disc:

```
lang/admin
lang/modules
```

Open text editor and paste the following content:

```
<html><body bgcolor="#FFFFFF"></body></html>
```

Save it as index.html in all folders (as lang/admin/index.html, lang/modules/index.html and lang/index.html).

2) Unzip the Macrotone IP Mapping component ZIP file somewhere on your disc.

Go to:

admin/language/en-GB/ folder (which is included in the unzipped Macrotone IP Mapping structure)

and open both files in your text editor:

```
en-GB.com_ipmapping.ini
en-GB.com_ipmapping.sys.ini
```

Translate the strings to your language and save them as (in our example we use Portuguese Brazilian prefixes):

```
lang/admin/pt-BR.com_ipmapping.ini
lang/admin/pt-BR.com_ipmapping.sys.ini
```

Go to:

modules/mod_ipmapping_mapper/language/en-GB/ folder (which is included in the unzipped MacroTone IP Mapping structure)

and open the files in your text editor:

```
en-GB.mod_ipmapping_mapper.ini
en-GB.mod_ipmapping_mapper.sys.ini
```

Translate the strings to your language and save them as (in our example we use Portuguese Brazilian prefixes):

```
lang/modules/pt-BR.mod_ipmapping_mapper.ini
lang/modules/pt-BR.mod_ipmapping_mapper.sys.ini
```

Files should be saved as UTF-8 without BOM encoding.

Go to:

modules/mod_ipmapping_visitoragent/language/en-GB/ folder (which is included in the unzipped MacroTone IP Mapping structure)

and open the files in your text editor:

```
en-GB.mod_ipmapping_visitoragent.ini
en-GB.mod_ipmapping_visitoragent.sys.ini
```

Translate the strings to your language and save them as (in our example we use Portuguese Brazilian prefixes):

```
lang/modules/pt-BR.mod_ipmapping_visitoragent.ini
lang/modules/pt-BR.mod_ipmapping_visitoragent.sys.ini
```

Files should be saved as UTF-8 without BOM encoding.

3) Open text editor and paste there the following content:

```
<?xml version="1.0" encoding="UTF-8"?>
<extension type="file" version="2.5" method="upgrade">
  <name>pt-BR.com_ipmapping</name>
  <tag>pt-BR</tag>
  <version>1.0.0</version>
  <creationDate>08/01/2013</creationDate>
  <author>MacroTone Consulting Ltd</author>
  <authorEmail>support@macrotoneconsulting.co.uk</authorEmail>
  <authorUrl>www.macrotoneconsulting.co.uk</authorUrl>
  <copyright>(C) 2012-2013 MacroTone Consulting Ltd</copyright>
  <license>http://www.gnu.org/licenses/gpl-2.0.html GNU/GPL</
license>
```

```
<description>Brazilian-Portuguese language pack for IP Mapping</description>
<fileset>
  <files folder="admin" target="administrator/language/pt-BR">
    <filename>pt-BR.com_ipmapping.ini</filename>
    <filename>pt-BR.com_ipmapping.sys.ini</filename>
    <filename>index.html</filename>
  </files>
  <files folder="modules" target="language/pt-BR">
    <filename>pt-BR.mod_ipmapping_mapper.ini</filename>
    <filename>pt-BR.mod_ipmapping_visitoragent.ini</filename>
    <filename>pt-BR.mod_ipmapping_mapper.sys.ini</filename>
    <filename>pt-BR.mod_ipmapping_visitoragent.sys.ini</filename>
    <filename>index.html</filename>
  </files>
</fileset>
</extension>
```

Edit it, changing the language specifics and the author as required and save it as:

lang/install.xml file.

So now you should have the following folder structure in the folder lang:

```
install.xml
index.html
admin/index.html
admin/pt-BR.com_ipmapping.ini
admin/pt-BR.com_ipmapping.sys.ini
modules/index.html
modules/pt-BR.mod_ipmapping_mapper.sys.ini
modules/pt-BR.mod_ipmapping_mapper.ini
modules/pt-BR.mod_ipmapping_visitoragent.sys.ini
modules/pt-BR.mod_ipmapping_visitoragent.ini
```

Select all files included in lang folder and add them into ZIP file called lang-prefix-LANG-PREFIX.com_ipmapping.zip (in our example the file will have the following name: pt-BR.com_ipmapping.zip).

Now the translation is ready and can be installed via standard Joomla! installation procedure.

Remember that the Joomla Language core pack for your desired language must be installed otherwise the language installation will fail.

Joomla 3.x support

Releases 1.1.0 to 1.2.3 support Joomla 3.1 and Joomla 2.5, the versions available at the time of release. Release 1.3.0 and above run only upon Joomla 3.3.x and above. See the company website for future announcements.

Other Problems and Issues.

Please see the FAQ and the Forum entries on the company web site which will be updated with any new problem and their resolution when or if they are discovered.

Chapter 7. Version Changes

The following is a list of the principle changes that have occurred during each release.

Release Versions

IP Mapping 1.4.1

- + New option for where web server is located behind a proxy server such as CloudFlare.
- ~ Numerous minor code cleanups resolving code warning messages seen in PHPStorm.
- ~ Change mapper module to use windows.load rather than document.ready function.

IP Mapping 1.4.0

- ~ Modify locations display to trim path and phrase columns similar to referrer column.
- Remove documentation page from back end.
- ~ Modify table charset and collation to match Joomla 3.5 utf8mb4_unicode_ci.
- Remove meta table.
- + Add South Sudan (SS) to countries table.

IP Mapping 1.3.3

- # Fix undefined PHP notices in Visitor Agent module.
- + Add a few additional scrappers and advertising bots to the robots table.
- + Update copyright year to 2016.
- ~ Get component version from manifest file rather than meta table.
- # Fix error when changelog displayed multiple times from dashboard (cpanel) view.

IP Mapping 1.3.2

- ~ Add additional checks for updating multiple locations in back end.
- # Correct use of back end filters in locations display.
- ~ Modify field used for country code if Geobytes determination used. Applies to front and back end.
- ~ Modify locations information received to ensure no stray quote characters.
- Support for Akeeba Restore Points removed as they are no longer supported by Akeeba.

IP Mapping 1.3.1

- ~ Add country code ZZ to list of ignored locations in mapper module.
- # Correct problem preventing location displays if path variable contained an ampersand.
- ~ Modify back end location creation logdate handling.

- ~ Set default reason_id to 'Other' if not specified in back end manual location creation.
- ~ Modify mapper module to handle clustering over long time periods. New option for complete map refresh provided.

IP Mapping 1.3.0

- ! The minimum required Joomla! version is 3.3
- ~ Change back end list display ordering to match Joomla 3.3 standard method.
- + New options to control of referer, phrase, source and agent fields in back end locations table.
- + New option in Visitor Agent module to control use of HTML5 geolocation data capture.
- # Correct logging of arrays in initial call.
- # Correct back end locations filter on published state.
- ~ Update copyright year to 2015
- # Correct typo in mapper module preventing control of referrer field display.
- + New option to control display of marker Info Window, creator information and table data title in mapper module.
- # Remove use of Top function from Visitor Agent module.
- ~ Update credits to be an iframe with the contents fetched from the main site. Thus ensuring they are always up to date.
- ~ Change Geobytes API to use getcitydetails instead of former IPlocation method which is discontinued.

IP Mapping 1.2.3

- + Add logging DEBUG options to back end.
- + Add check for PHP setting allow_url_fopen and if not enabled use CURL interface instead.
- # Correct update of multiple fields error in back end.
- + Add the ability to control the display of more of the table fields in the mapper display.
- + Add additional table to control robots (web crawlers).

IP Mapping 1.2.2

- ~ Extent recent change for truncating Akeeba log to web invoked cron task.
- ~ Add some DEBUG logging entries to the mapping module.
- ~ Modify location update so that any other unset locations for a specific IP are updated when one is manually updated.
- + Add some additional code to correct for Mapper module display problems with Tabs and Bootstrap front ends.
- ~ Update reference to use version 2.1.1 of the Google Cluster Marker javascript code.
- # Fix delete of individual log items from log table.

- # Fix problem of running Akeebasync and compact using IE browser.
- # Fix list checkall toggle on list views for Joomla 3.x.

IP Mapping 1.2.1

- # Fix overlapping of mapper table referrer field over the edges.
- # Fix wrong name in front end route parser.
- + Add separate tab in CPanel for credits including translators.
- ~ Update all copyright year 2014
- ~ Modify sync process so only required number of days loaded.
- ~ Ensure admin creation fields populated on sync task.

IP Mapping 1.2.0

- ~ Code refactoring.
- + Add logging option. Note that this is currently only used for the recording of Cron messages.
- + New cron ability for automating synchronisation task.
- # Remove any stray quote marks in city names returned by IP location determination.

IP Mapping 1.1.0

- + Add support for Joomla 2.5 and 3.x in one install.
- ~ Change use of JRequest to JInput instead.
- ~ Change deprecated function JRegister getValue to use get instead.
- ~ Remove redundant CSS from documentation view.
- + Make use of Google Closure Compiler optional.
- ~ Make the connection to Google Closure Compiler use CURL as default rather than FURLOpen.

IP Mapping 1.0.5

- + Only display Akeeba Sync Icon if Akeeba Admin Tools Pro is installed.
- + Change mapper module to accept parameter to only display the last 'n' days worth of data, where 'n' is a number greater than zero (0).

IP Mapping 1.0.4

- + Add integration with Akeeba system restore option.
- + Add ability to provide a tabular list of displayed locations below the map.
- # Correct SQL error in Visitors module.

IP Mapping 1.0.3

- + Change to set private IP address details to Unknown.

- + Introduce compaction for location table.

- # Fix location sort problem on country name and country code.

IP Mapping 1.0.2

- + Add additional update to locations to minimise IP provider services.

IP Mapping 1.0.1

- + Add style code to referer field to preserve table display appearance.

- + Add missing index.html file in main directory.

- + Update headers for 2013

IP Mapping 1.0.0

- + Initial Release

Part II. Design Guide

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Chapter 8. Design

This section describes the design criteria used for the component. It provides the rationale behind the design and helps to understand how the component works.

One of the criteria in the design is to make use of as much of the supplied Joomla functionality and provide familiarity of use with the standard Joomla components.

Planning and Analysis

The original intent for this component was to be able to display the information captured by Akeeba Admin Tools Pro by the Web Application Firewall in a graphical manner to make interpretation easier. Inspection and searching on the web did not reveal anything that would do the job required and instead we decided to adapt some work written for Joomla 1.5 that would display Site visitor information instead,

Planning and Project Analysis

The first action is to define the application requirements. These are then used to design a database and an outline that describes how the user interface accepts and presents data.

The project leads establish requirements that define the information that must be tracked, security requirements, data management functions, and how to present data to users.

Gather the Necessary Data

The source of the data was already determined and already available, so all that was required was to use the supplied data and to add the additional geographic location data and present it in a form suitable for mapping.

Define Security Requirements

Security was not deemed to be a problem for the component since the data is freely available as regards which IP addresses are assigned to which service providers. Also the specific IP addresses of the visitors has been freely provided so all that is being done is to present the data in another form.

Select Data Management Functions

The project leads also determine how information will be entered into the system. For this project, it must be possible to:

- Create and edit reasons
- Create location data
- Edit location data
- Assign reasons to location records.

Select Data Presentation Functions

Once the data has been collected there is the display. The team decided that the displays should be:

- Selectable for one or more specific reason codes.
- Selectable over a date range.
- Visitor data collected by the Visitor agent should permit automatic trimming of 'old' records.

- Provide the ability to have more than one map on a ‘page’.

Define Special Function Requirements

Provide a mechanism to control the locations table, particularly for busy sites where there are many visitors, and/or entries detected by the Akeeba Admin Tools Pro component..

Designing the Database Objects

Once the database requirements are defined, the next step is to turn these into a database design and an outline that describes how the user interface accepts and presents data. Given the requirements described above the two main tables can be created:

- *Location* contains the IP locations

Further detail notes upon the table is provided below.

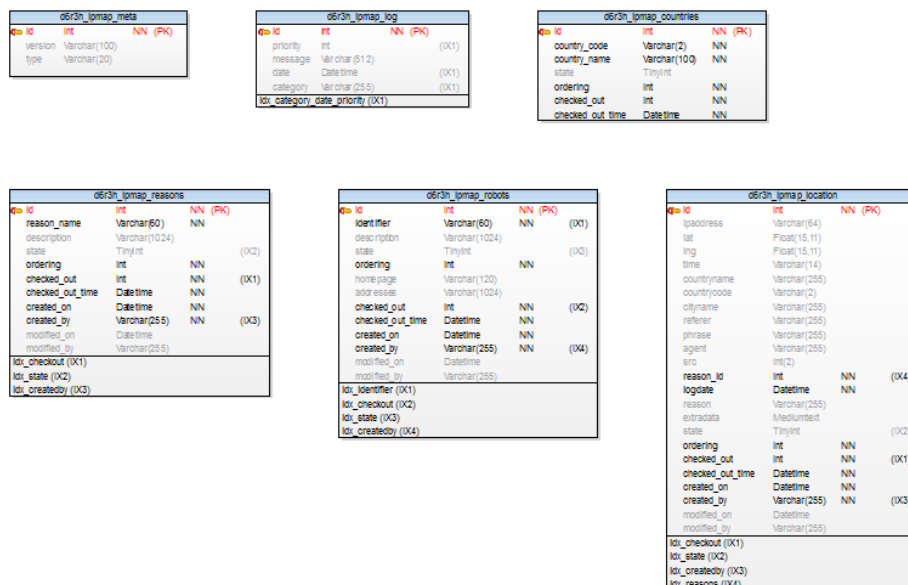
Subsidiary tables are created to provide reference data. Sample reference data is supplied on installation. The provide samples should be tailored by the site administrator to reflect actual ‘real’ life terms used by the organisation. Once obvious example is for foreign language sites to be able to tailor the codes for their own use.

- *Reasons* define the ‘mapping reason’. i.e. Whether the IP address is classes as that of a site ‘visitor’ or of a ‘spammer’ or of a source of a ‘dfishield’ attack attempt, etc. The list is extensible and should be tailed for the specific site requirements.
- *Countries*. This table contains a list of country names and short country codes, used in the initial release to supply the details for the module filters.

System generated primary keys are used for all tables so that all the data can be edited without executing a cascade update.

The data model designed is shown in Figure 8.1.

Figure 8.1. Data model for IP Mapping 1.3.0



About the Locations Table

This table contains the IP addresses that are candidates for displaying upon a Google map. Each IP address record will contain details of the geographic location of the IP address as determined by the IP information database. This information is populated automatically when the entries are made into the table.

There are several reasons and to why it is desirable to enter IP addresses and there is an associated reason code that is used to differentiate the entries.

Table 8.1. Locations table description

Column Name	Type	Size	Not Null?	Constraints	Description
id	Number	n/a	Yes	Primary key	A unique numeric identification for each record. Populated by an auto-sequence.
ipaddress	Varchar	64	No	None	The IP address to be mapped.
lat	Float	15,11	No	None	Latitude of the source of the IP address .
lng	Float	15,11	No	None	Longitude of the source of the IP address.
html5	Int	n/a	No	None	Specifies whether HTML5 geolocation was used to determine the location. Default of zero indicates that IP mapping was used.
time	Varchar	14	No	None	Time to associate with the IP address.
countryname	Varchar	255	No	None	Country name of the IP address.
countrycode	Varchar	2	No	None	Country code of the IP address.
cityname	Varchar	255	No	None	Name of the City where the IP address is located.
referrer	Varchar	255	No	None	Referer of the IP address.
phrase	Varchar	255	No	None	Phrase to be displayed.
path	Varchar	255	No	None	The page address upon which the location check is initiated.
state	Number	.	No	None	Indicates that record is visible to front end.
agent	Varchar	255	No	None	IP agent.
src	Int	11	No	None	Source of the ip address.
reason_id	Int	2	Yes	None	'Foreign key to the ipmap_reasons table. The purpose of the entry in this table.
logdate	Date	n/a	No	None	Logdate of entry.
reason	Varchar	255	255	None	Reason for entry. i.e. loginfailure, admin-pw, rfishield, antispam etc. [Duplicate of reason code.]
extradata	Mediumtext	-	No	None	Optional additional text or comments.
ordering	Number	n/a	No	None	Order in which records are displayed
checked_out	Number	11	Yes	None	Joomla field record locking
checked_out_time	Date	n/a	Yes	None	Joomla field record locking
created_on	Date	n/a	Yes	None	Date the record was created.
created_by	Varchar	255	Yes	None	The user who created the record.
modified_on	Date	n/a	Yes	None	The date the record was last modified.
modified_by	Varchar	255	Yes	None	The user who last modified the record.

Notes:

1. The geolocation data is populated by calls to the IPInfoDB service for which an API key is required. This is a no cost item.
2. If the IPInfoDB database returns a zero latitude and longitude this usually indicates that it could not return the true location. We have experienced problems with addresses in the 142.4.xxx.xxx and 147.255.xxx.xxx range. In this situations there is a backup check using the Geobytes database [<http://getcitydetails.geobytes.com/GetCityDetails>]. (<http://getcitydetails.geobytes.com/GetCityDetails>). If you expect to exceed the services “Reasonable Free Access Limit” of 16,384 accesses per hour, (about 4.5 look-ups per second), or wish to access the service via SSL, then you may wish to purchase some Mapbytes to pay for these additional look-ups, and thereby become a VIP. We generally only use it as a backup so currently do not register as a VIP.

About the Reason Code Table

The IP Mapping Reason codes relate to the different reasons that an IP address is may be displayed on map. For example an IP address may be displayed as it is the address of a visitor to the site and we desire to map visitors locations. Alternatively we may desire to map the locations of IP addresses from where we have detected attempts to introduce ‘SPAM’ into the various articles etc. present upon the site.

Table 8.2. Reason Table description

Column Name	Type	Size	Not Null?	Constraints	Description
id	Number	n/a	Yes	primary key	A unique numeric ID that identifies an IP Mapping reason. Populated by an auto sequence.
reason_name	Varchar	60	Yes	None	The name used to display on the screens.
description	Varchar	1024	No	None	A brief description of the reason.
state	Number	4	No	None	Indicates record is visible in front end.
ordering	Number	11	No	None	Specifies ordering of reasons.
checked_out	Number	11	Yes	None	Joomla field record locking
checked_out_time	Date	n/a	Yes	None	Joomla field record locking
created_on	Date	n/a	Yes	None	Date the record was created.
created_by	Varchar	255	Yes	None	The user who created the record.
modified_on	Date	n/a	Yes	None	The date the record was last modified.
modified_by	Varchar	255	Yes	None	The user who last modified the record.

About the Countries Table

The IP Mapping Countries table contains the list of the countries of the world and their country codes.

In this initial release this table is used to provide the drop down list for the filters used in the IP Mapping. Their usage is expected to be expanded with later releases.

Table 8.3. Countries Table description

Column Name	Type	Size	Not Null?	Constraints	Description
id	Number	n/a	Yes	primary key	A unique numeric ID that identifies a country. Populated by an auto sequence.

Column Name	Type	Size	Not Null?	Constraints	Description
country_name	Varchar	80	Yes	None	The name of the country.
country_code	Varchar	3	No	None	The short two letter code for the country.
state	Number	4	No	None	Indicates country is selectable.
ordering	Number	11	No	None	Specifies ordering of countries.
checked_out	Number	11	Yes	None	Joomla field record locking
checked_out_time	Date	n/a	Yes	None	Joomla field record locking

About the Robots Table

This table contains the details of the robots or web spiders. The table is used to eliminate the robot data from any recorded visitors to a site. Each record contains the known details for one specific robot. The table is populated with some of the more commonly encountered robots but more are being deployed regularly and the table provided the ability for site administrators to add their own specific robots that they may encounter.

The only required field is the identifier field which contains the details of the robot as stored in the header of the connecting client. The other fields are either to enable control of the records or provide information that may or may not be of interesting about the specific robot itself.

Table 8.4. Robot table description

Column Name	Type	Size	Not Null?	Constraints	Description
id	Number	n/a	Yes	Primary key	A unique numeric identification for each record. Populated by an auto-sequence.
identifier	Varchar	60	Yes	None	The identifier string present in the accessing software header.
description	Varchar	1024	No	None	Short descriptive text about the robot if any is known. .
hostname	Varchar	120	No	None	Details of the hostname or source of the robot when known. This information may provide some assistance in determining the source of the robot.
addresses	Varchar	1024	No	None	Informational details of some of the addresses that are used specifically by the robot, when known.
state	Number	4	No	None	Indicates that record is visible to visitor agent (front end).
ordering	Number	11	No	None	Order in which records are retrieved (displayed).
checked_out	Number	11	Yes	None	Joomla field record locking
checked_out_time	Date	n/a	Yes	None	Joomla field record locking
created_on	Date	n/a	Yes	None	Date the record was created.
created_by	Varchar	255	Yes	None	The user who created the record.
modified_on	Date	n/a	Yes	None	The date the record was last modified.
modified_by	Varchar	255	Yes	None	The user who last modified the record.

Notes:

1. The order in which the robot identifiers are placed in the search list within the visitors modules is determined by the ordering column. Hence the most frequently encountered are placed first in the list.
2. The only mandatory field that the site administrator must supply is the 'identifier' field which is used to check the visitor agent header to determine whether it is a true individual or a robot/web crawler.

Important

The entries in this table do not 'reject' or stop the specified robots from accessing the site, for which they need to be added to the site 'robots.txt' table. Instead they are used to prevent their occurrence in the recorded site visitors tables.

Log Table

The Log table is used by the component itself to record informational messages as various tasks are performed.

This is the same format as the Joomla JLog table which is not surprising since it is populated by the JLog method.

Table 8.5. Log table description

Column Name	Type	Size	Not Null?	Constraints	Description
id	Int	11	Yes	Primary key	The system generated unique identifier for the record. Populated by an auto-sequence.
priority	Int	11	Yes	None	An integer indicating the priority of the message. i.e. Info, Debug etc.
message	Varchar	512	Yes	None	The message containing the details of the specific task stage, count etc.
date	Datetime	N/A	Yes	None	The date and time when the message was recorded.
category	Varchar	255	Yes	None	The category of the message.

Meta Data Table

The Meta table is used by the component itself to record version numbers of its component parts. i.e. Modules, plugins etc.

Table 8.6. Meta data component table description

Column Name	Type	Size	Not Null?	Constraints	Description
id	Int	11	Yes	Primary key	The system generated unique identifier for the record. Populated by an auto-sequence.
version	Varchar	100	Yes	None	Version number of the installed component.
type	Varchar	20	Yes	None	Type of extension.

Important

This table was removed from the release in version 1.4.0. The details are retained for reference purposes only, since it was applicable for releases prior to 1.4.0.

HTML5 Geolocation overview

Geolocation is the determination of where one is located in the world and (optionally) sharing that information with people that are trusted. There is more than one way to figure out where one is located — the IP address, the wireless network connection, which cell tower the phone (or PC) is communicating with, or dedicated GPS hardware that calculates latitude and longitude from information sent by satellites in the sky.

IP Mapping was originally designed with the aim of displaying IP addresses upon Google Maps and experience has shown that although it works well it is very reliant upon the accuracy of the data held by the various database and communication suppliers. HTML5 geolocation offers an alternative mechanism. If enabled a check is first performed to determine whether a user's browser is capable of supporting HTML5 geolocation and if it is a request is then made to obtain the information. If successful this is then used to display the location upon a map. If unsuccessful, or if the browser does not support HTML5 geolocation, the fall back, existing IP mapping is used instead.

The HTML5 geolocation API enables the sharing of your location with trusted web sites. The latitude and longitude are available to JavaScript on the web page, which in turn can send it back to the remote web server and do fancy location-aware things such as finding local businesses or showing the location on a map.

Privacy is an obvious concern when one is involved with sharing your physical location with a remote web server. The geolocation API explicitly states: “User Agents must not send location information to Web sites without the express permission of the user.” In other words, sharing your location is always opt-in. If you don't want to, you don't have to.

The geolocation API lets one share your location with trusted web sites. The geolocation API is supported by most browsers on the desktop and mobile devices.

The geolocation API centres around a new property on the global navigator object: `navigator.geolocation`.

Important

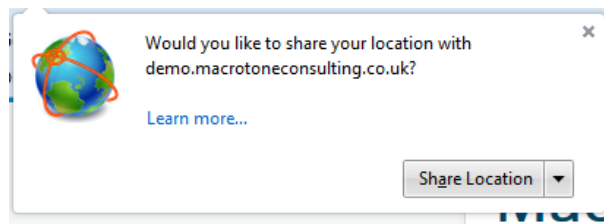
The HTML5 geolocation is asynchronous which means that there may be a delay before an actual location is stored with in the database and the visitor displaying the page.

The simplest use of the geolocation API looks like this:

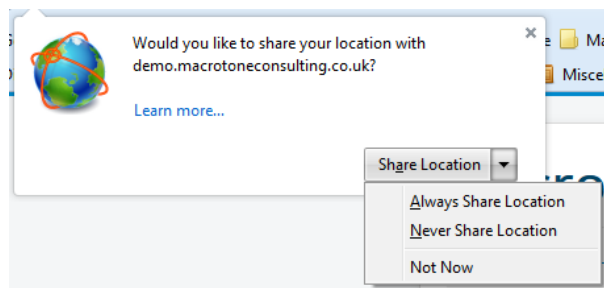
```
function get_location() {  
    navigator.geolocation.getCurrentPosition(show_map);  
}
```

That has no detection, no error handling, and no options. Your web application should probably include at least the first two of those.

What one does if geolocation support is not available is optional but usual results in a fall back mechanism. The following occurs when a call is made to `getCurrentPosition()`. As geolocation support is opt-in, it means that the browser will never force one to reveal the current physical location to a remote server. The user experience differs from browser to browser. In Mozilla Firefox, calling the `getCurrentPosition()` function of the geolocation API will cause the browser to pop up an “infobar” at the top of the browser window. The infobar looks like this:

Figure 8.2. Geolocation opt-in infobar

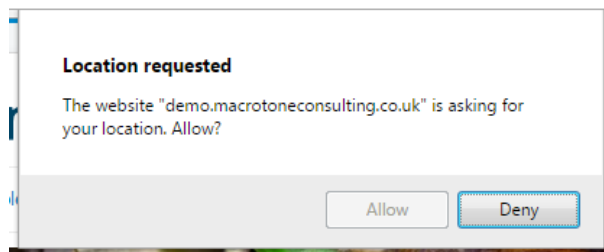
Selecting the menu item displays a few more options.

Figure 8.3. Firefox Geolocation opt-in infobar (2)

The Chrome geolocation request box is slightly different as shown below, and there is no specific 'Not Now' option. However with the UI design, the user is more likely to choose either Allow or Deny, which will then return an answer to the navigator.geolocation.getCurrentPosition function. There is the option however that the user can also click an "X" on the far right of the advisory notice. This is essentially the same as clicking "Not now" in Firefox. No result is returned to the geolocation function.

Figure 8.4. Chrome Geolocation opt-in infobar

The Opera opt in popup is displayed below.

Figure 8.5. Opera Geolocation opt-in infobar

For completeness we show the Internet Explorer (IE 11) opt in bar as well below:

Figure 8.6. IE Geolocation opt-in infobar

Other browsers, such as Safari etc., will have different request boxes displayed.

Note that the file name or site address as shown in the above image will vary depending upon the site name. The infobar informs the end user of the following information:

1. that a website wants to know your location
2. which website wants to know your location
3. allows the user to click through to Mozilla's "Location-Aware Browsing" help page which explains what the heck is going on (short story: Google provides the location and stores your data in accordance with its Location Service Privacy Policy)
4. allows the user to choose to share their location
5. allows the user to choose not to share their location
6. permits the user to tell their browser to remember their choice (either way, share or don't share) so that they never see the infobar again on the specific website

Furthermore, this infobar is

1. non-modal, so it won't prevent the user from switching to another browser window or tab
2. tab-specific, so it will disappear if they switch to another browser window or tab and will reappear when they switch back to the original tab
3. unconditional, so there is no way for a website to bypass it
4. blocking, so there is no chance that the website can determine the location while its waiting for the answer

The JavaScript code that causes the infobar to appear is a single function call which takes a callback function. The call to `getCurrentPosition()` will (should?) return immediately, but that doesn't mean that one has access to the users location. The first time you are guaranteed to have location information is in the callback function. A typical callback function might look like this:

```
function show_map(position) {
    var latitude = position.coords.latitude;
    var longitude = position.coords.longitude;
    // let's show a map or do something interesting!
}
```

The callback function will be called with a single parameter, an object with two properties: `coords` and `timestamp`. The timestamp is just that, the date and time when the location was calculated. (Since this is all happening asynchronously, one cannot really know when that will happen in advance. It might take some time for the user to read the infobar and agree to share their location. Devices with dedicated GPS hardware may take some more time to connect to a GPS satellite. And so on.) The `coords` object has properties like `latitude` and `longitude` which are what one would expect: the user's physical location in the world.

Table 8.7. Position Object

Property	Type	Notes
<code>coords.latitude</code>	double	decimal degrees
<code>coords.longitude</code>	double	decimal degrees
<code>coords.altitude</code>	double or null	meters above the reference ellipsoid
<code>coords.accuracy</code>	double	meters
<code>coords.altitudeAccuracy</code>	double or null	meters
<code>coords.heading</code>	double or null	degrees clockwise from true north
<code>coords.speed</code>	double or null	meters/second

Property	Type	Notes
timestamp	DOMTimeStamp	like a Date() object

Only three of the properties are guaranteed to be present (coords.latitude, coords.longitude, and coords.accuracy). The rest might come back null, depending on the capabilities of the device and the backend positioning server that it communicates with. The heading and speed properties are calculated based on the user's previous position, if possible.

Handling Errors

Geolocation can be complicated. Things can go wrong. We have mentioned the “user consent” angle already. If your web application wants the users location but the user doesn't want to give it to you, you cannot use it. The user preference is king. But what does that look like in code? It looks like the second argument to the `getCurrentPosition()` function: an error handling callback function.

```
navigator.geolocation.getCurrentPosition(
    show_map, handle_error)
```

If anything goes wrong, the error callback function will be called with a `PositionError` object. (See specific situation where the error callback is not called. i.e Firefox 'Not Now' selected or popup window closed.)

Table 8.8. PositionError Object

Property	Type	Notes
code	short	an enumerated value
message	DOMString	not intended for end users

The code property will be one of

1. `PERMISSION_DENIED` - if the user clicks that “Don't Share” button or otherwise denies you access to their location.
2. `POSITION_UNAVAILABLE` - if the network is down or the positioning satellites can't be contacted.
3. `TIMEOUT` - if the network is up but it takes too long to calculate the user's position. How long is “too long”?

Be gracious in defeat.

```
function handle_error(err) {
    if (err.code == 1) {
        // user said no!
    }
}
```

The `getCurrentPosition()` function has an optional third argument, a `PositionOptions` object. There are three properties you can set in a `PositionOptions` object. All the properties are optional. You can set any or all or none of them.

Table 8.9. PositionOptions Object

Property	Type	Default	Notes
enableHighAccuracy	Boolean	false	true might be slower
timeout	long	(no default)	in milliseconds

Property	Type	Default	Notes
maximumAge	long	0	in milliseconds

The `enableHighAccuracy` property is exactly what it sounds like. If true, and the device can support it, and the user consents to sharing their exact location, then the device will try to provide it. Both iPhones and Android phones have separate permissions for low- and high-accuracy positioning, so it is possible that calling `getCurrentPosition()` with `enableHighAccuracy:true` will fail, but calling with `enableHighAccuracy:false` would succeed. IP Mapping automatically sets this property to false.

The `timeout` property is the number of milliseconds your web application is willing to wait for a position. This timer doesn't start counting down until after the user gives permission to even try to calculate their position. One is not timing the user; one is timing the network. IP Mapping sets this parameter to 5000 milliseconds

The `maximumAge` property allows the device to answer immediately with a cached position. For example, let's say you call `getCurrentPosition()` for the first time, the user consents, and your success callback function is called with a position that was calculated at exactly 10:00 AM. Exactly one minute later, at 10:01 AM, you call `getCurrentPosition()` again with a `maximumAge` property of 75000.

```
navigator.geolocation.getCurrentPosition(
    success_callback, error_callback, {maximumAge: 75000});
```

Using these options one is effectively stating that one doesn't necessarily need the user's exact current location. One would be satisfied with knowing where they were 75 seconds ago (75000 milliseconds). The device knows where the user was 60 seconds ago (60000 milliseconds), because it calculated their location after the first time you called `getCurrentPosition()`. So the device doesn't bother to recalculate the user's current location. It just returns exactly the same information it returned the first time: same latitude and longitude, same accuracy, and same timestamp.

For IP Mapping our intent is not necessarily to be able to pinpoint exactly where they are located since we are really only interested in the general area, probably only the city itself. For this reason a large value is preferable and can be set in the module parameters.

Handling Firefox 'Not Now' option

Since geolocation executes asynchronously, the `navigator.geolocation.getCurrentPosition()` function implements success/failure handlers and a timeout parameter so it can let you know if it was able to determine a location in a reasonable amount of time. We saw above, that it is constructed as follows:

```
navigator.geolocation.getCurrentPosition(success_handler,
    error_handler, {timeout:ms, maximumAge:ms,
    enableHighAccuracy:boolean});
```

This function looks straightforward but there are several caveats. First, not all browsers respect the timeout parameter consistently (specifically Firefox). Second, setting a maximum age in hopes of getting a recently cached value doesn't work consistently and may cause no return. Finally, because of the varied implementations for user privacy preferences and dialogs, this function cannot be relied on to always return. In some cases where a visitor ignores or dismisses the location sharing prompt, your application could be left waiting indefinitely for a result.

In particular in Firefox it appears that if the user hits Not Now, then one never gets a response back from the handler. This is an implementation decision by Mozilla (Firefox developers). Therefore, we have to set up a timeout which can check a flag that would be set by one of the handlers. If this flag is not set (meaning the handlers didn't fire in the allotted time), we have two options:

1. Assume that the user denied the request (even though the denial was temporary)
2. You can ask the user for permission again (via the same call) and the user will be presented with the dialog again.

This second option is not considered reasonable and would be very annoying, so we assume they denied temporarily and ask them again (politely!) the next time they visit the site (or the page).

Note

We also have a decision to make as to whether we record the visit. It is sensible to assume that we should, using the IP location detection, but what if the user then decides to accept the sharing of their location. i.e After the timeout has fired. If we also record this then we would have two locations stored in our system. One with the IP determined address and the other with the Geolocation determined address. So we have to add an additional check into the code to ensure that the specific IP address has not recorded the location in the time period since the timeout default fired.

To protect against these conditions, we write our own timeout like this:

```
// Check for HTML5 geolocation support.
if(navigator.geolocation) {

    // Start a timer to ensure we get some kind of response.
    // Make sure to clear this timer in our success and error
handlers
    location_timeout = setTimeout(function(){
        _error_handler({'TIMEOUT':'1'})
    }, 8000);

    // Call the HTML5 geolocation feature with our handlers for
success/error and an 8-second timeout.
    navigator.geolocation.getCurrentPosition(success_handler,
error_handler, {timeout:8000});
}

// If navigator.geolocation is not available (no HTML5
geolocation support).
// Fall back to IP-based geolocation.
else {
    IpFallback_Function();
}
}
```

Note

We also have to ensure that the timeout variable is visible to all of the functions, so define it outside of the setting after the geolocation navigator call illustrated above.

The `navigator.geolocation.getCurrentPosition()` function returns either a `Position` object or a `PositionError` object. The `PositionError` object should contain a constant with a numeric error code and an error message string we can use to determine what went wrong. The following is a sample error handler using a switch case statement:

```
function error_handler(error) {

    // Respond to the possible error states.
    // In our live implementation we do not really care about these
so do not display them.
    // But they are handy for testing and development.
    switch(error.code){
        case error.PERMISSION_DENIED:
            console.log("The user prevented this page from retrieving a
location.");
    }
```

```
        break;
    case error.POSITION_UNAVAILABLE:
        console.log("The browser was unable to determine its
location: " + error.message);
        break;
    case error.TIMEOUT:
        console.log("The browser timed out before retrieving its
location.");
        break;
    default:
        console.log("There was an unspecified or novel error.
Nuts.");
    }

    // Clear the previously set timeout so we don't execute the
error_handler twice.
    clearTimeout(location_timeout);

    // Call our IP-based geolocation function as a fallback.
    IpFallback_Function();
}
```

Our success handler is also slightly modified to handle the timeout.

```
function success_handler(position) {

    // Clear the timeout since the success_handler has executed...
    clearTimeout(location_timeout);

    // Get the coordinates from the HTML5 geolocation API.
    var latitude = position.coords.latitude;
    var longitude = position.coords.longitude;

    // If HTML5 geolocation reports success but fails to provide
coordinates...
    if (!latitude || !longitude) {
        console.log("navigator.geolocation.getCurrentPosition returned
bad data.");

        // Call our IP-based geolocation function as a fallback.
        IpFallback_Function();
    }
    else {
        // HTML5 geolocation success!
        // Call our database save function to store the result.
    }
}
```

So our code has been made slightly more complicated but is more robust because of the change. The above code is more representative than an illustration of the actual code implemented. Some timeout values may need modifying depending upon the 'responsiveness' of the web sites involved and their efficiency in saving values to the database.

Part III. Appendices

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Appendix A. GNU General Public License version 3

Version 3, 29 June 2007

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