

IIS 7/8/10

Geoblock
Module

Introduction

This document describes the installation and manual of the IIS 7 geoblock module. The module attaches itself to the beginning of the IIS 7 request pipeline. It checks the country of the request based on it's clients IP address. The GeoIP2 database file by MaxMind is used to do this (<http://www.maxmind.com>). With the IIS 7 management console you can specify the settings of the module.

The installation of the module will be described first and then we will talk about the configuration of the geoblock module.

This update is built using .net framework 4.6, so it will also work on IIS 8 / IIS 10

Installation

The installation of the module consists of two parts. The interface must be registered to the IIS management console in order to set the configuration of the module. The second step is to include the module for the applications.

Copy the files to the server

The module consists of 3 files

- IISGeoIP2blockModule.dll: Contains all the code;
- geoblockModule_schema.xml: Defines the configuration of the module;
- GeoLite2-Country.mmdb: The file to determine the country by IP.

The dll file needs to be copied to:

`%windir%\System32\inetsrv`

The schema xml file needs to be copied to:

`%windir%\System32\inetsrv\config\schema`

The geo ip data file can be put anywhere you like. Make sure the user under which IIS runs can read the file (`IIS_IUSR`) .

Adding the dll to the global assembly cache (GAC)

To register the file to the global assembly cache (GAC), drag the dll to:

`%windir%\assembly`

For newer versions of windows like Windows Server 2008R2, you can't drag the dll to the assembly folder anymore. You have to use another tool. You can use `gacutil.exe` which comes with Visual Studio. Due to the licensing on this tool, I cannot include it into the download unfortunately. You will need 3 files:

- `gacutil.exe`
- `gacutil.exe.config`
- `gacutlc.dll`

Run a command prompt as administrator and change the directory to the folder where `gacutil.exe` and `IISGeoIP2blockModule.dll` are located. Perform the following command:

`gacutil.exe /i IISGeoIP2blockModule.dll`

It will output: Assembly successfully added to the cache

It should be visible in the GAC on this location:

`%windir%\Microsoft.NET\assembly\GAC_MSIL\IISGeoIP2blockModule`

Register the UI to IIS management console

The configuration section

First, IIS needs to be aware of the configuration schema. In order to register the schema open the following file using notepad.

(Note: use **notepad** and not notepad++ or another tool!)

%windir%\System32\inetsrv\config\applicationHost.config

Find the following node

```
<sectionGroup name="system.webServer">
```

And add the following childnode to it

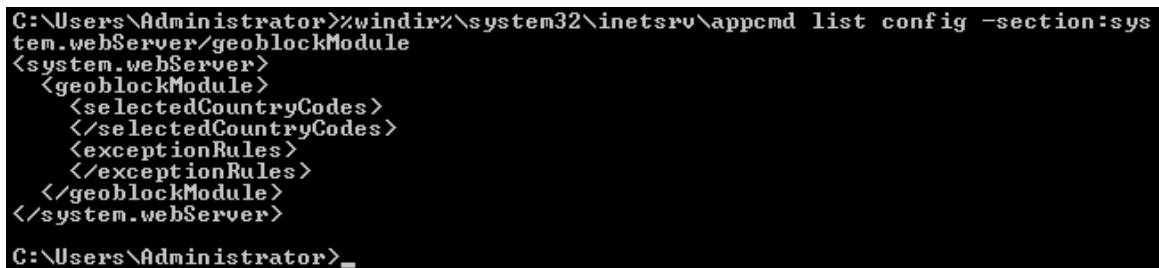
```
<section name="geoblockModule" overrideModeDefault="Allow" />
```

```
<configSections>
...
<sectionGroup name="system.webServer">
  <section name="geoblockModule" overrideModeDefault="Allow" />
...
</configSections>
```

To check whether IIS recognizes the config run the following command

```
%windir%\system32\inetsrv\appcmd list config -
section:system.webServer/geoblockModule
```

If the output looks like the screenshot below, the schema is registered. If not, you did something wrong. Make sure the schema file is copied to the correct locations and that you did not make a typo or something. And of course use good old simple notepad.



```
C:\Users\Administrator>%windir%\system32\inetsrv\appcmd list config -section:system.webServer/geoblockModule
<system.webServer>
  <geoblockModule>
    <selectedCountryCodes>
    </selectedCountryCodes>
    <exceptionRules>
    </exceptionRules>
  </geoblockModule>
</system.webServer>
C:\Users\Administrator>_
```

Find the following node

```
<modules">
```

And add the following childnode to it

```
<add name="Geoblocker"
type="IISGeoIP2blockModule.GeoblockHttpModule,IISGeoIP2blockModule,Version=2.4.0.0, Culture=neutral,PublicKeyToken=50262f380b75b73d"
preCondition="runtimeVersionv4.0" />
```

The UI page

The next step is to register the module interface to the IIS management console. That will enable us to save and update configurations. Open the following file with notepad

```
%windir%\System32\inetsrv\config\administration.config
```

Find the following node

```
<moduleProviders>
```

And add the following childnode to it

```
<add name="Geoblocker"  
type="IISGeoIP2blockModule.GeoblockModuleProvider,  
IISGeoIP2blockModule, Version=2.4.0.0, Culture=neutral,  
PublicKeyToken=50262f380b75b73d"/>
```

Also find the following node

```
<modules>
```

And add the following childnode to it

```
<add name="Geoblocker" />
```

Now launch the IIS management console (run → inetmgr)

You will see the geoblocker module icon in the features view of every website and application.



Open it and change some settings and click apply in the top right corner. Navigate away from the geoblock configuration page, reopen it and if the changed values are still present, the UI works as expected.

If the icon does not appear, check the event log for errors.

Register the module with the IIS request process

At this point we can configure the module, but IIS does not use the module for the applications. And here it gets tricky. You are supposed to select the module from the modules list in the IIS management console. However, the module isn't listed there. This is a bug that should be fixed, but it apparently isn't

<http://forums.iis.net/t/1010569.aspx>

But we can work around this.

We will open up

```
%windir%\Microsoft.NET\Framework64\v4.0.30319\CONFIG\web.config
```

Or when you don't run on 64bits

```
%windir%\Microsoft.NET\Framework\v4.0.30319\CONFIG\web.config
```

Use notepad and run it as administrator.

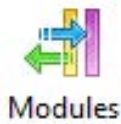
Find the following node

```
<assemblies>
```

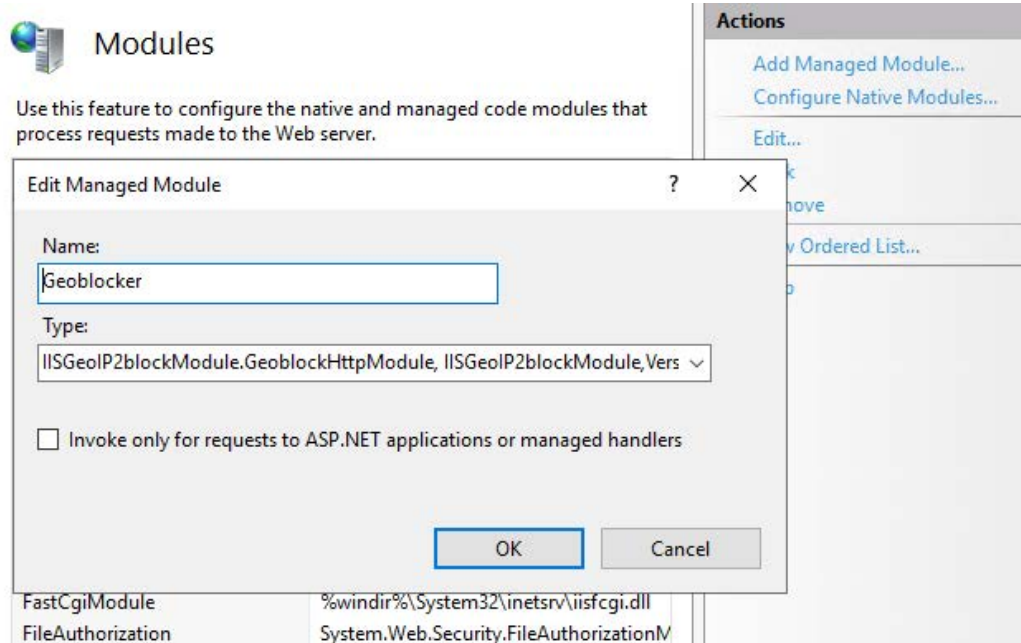
And add the following childnode in it

```
<add assembly="IISGeoIP2blockModule, Version=2.4.0.0, Culture=neutral,
PublicKeyToken=50262f380b75b73d" />
```

Go to the root node in the IIS manager and open up Modules.



Select Add Managed Module...



Now the module can't be selected from the list, but we can manually enter the information.

Name: Geoblocker

Type: IISGeoIP2blockModule.GeoblockHttpModule,
IISGeoIP2blockModule, Version=2.4.0.0, Culture=neutral,
PublicKeyToken=50262f380b75b73d


Press OK. You will be presented with a message stating the type cannot be found in the global assembly cache, but we now better. Press YES and add the module anyway.

Now every application with integrated pipeline using the .NET framework 4 will use the geoblocker module. Note that by default, the geoblocker does not block any requests, until it is configured to do so.

Configuration Manual

The configuration is done with a simple form. On the form you can enable or disable the blocking functionality and select the geo ip data file from maxmind. You can then select countries to allow or deny access. You can specify additional rules to make exceptions.

All the options are described in detail below.



Geoblock Module

Blocks access by country referenced by client IP address.

☒ Enable geoblock module

Deny Action Type

Unauthorized

GeoIP2 Country Database

C:\Geoip\GeoLite2-Country.mmdb

Select file


☒ Allow access for
☐ Deny access for


☐ Mozambique (MZ)
☐ Myanmar (MM)
☐ N/A (--)
☐ Namibia (NA)
☐ Nauru (NR)
☐ Nepal (NP)
☒ Netherlands (NL)
☐ New Caledonia (NC)
☐ New Zealand (NZ)
☐ Nicaragua (NI)
☐ Niger (NE)

Exception rules

Mode	Requestor
Allow	209.85.229.105


Actions

 Apply

 Cancel

Add Allow Exception Rule...

Add Deny Exception Rule...

 Help

Enable geoblock module

With this checkbox you can quickly enable or disable the module. This comes especially in handy when using the applicationHost.config option to attach the module to the websites and applications. Because adding and removing the module in the IIS 7 management console is not always straightforward.

Deny Action Type

Selects the type of action to be taken when a request is denied. The following list shows the available actions:

- Unauthorized
- Forbidden
- Not Found
- Abort

GeoIP2 data file

This value should contain a filepath to the GeoLite2-Country.mmdb (free) or GeoIP2-Country.mmdb (commercial) file by MaxMind. You can use the 'select file' button to browse for the file.

The file could be embedded in the module as a resource, but because the file should be updated every once in a while, the decision was made to make this configurable.

Allow / Deny access for

You have the choice to include or exclude the selected countries. When 'allow access for' is checked, only the selected countries are granted access. When 'deny access for' is checked, the selected countries are denied access.

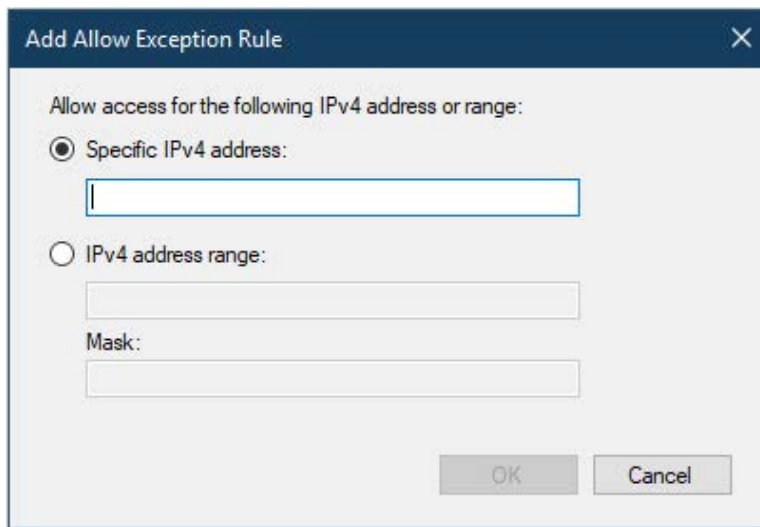
Country select

With the country list you can select the countries you want to allow or deny access. The countries in the list are retrieved from the country lookup class from MaxMind. Behind every country the country code is shown. This is the country code used by MaxMind.

Exception rules

There is a possibility that someone is blocked that should not be blocked. Or you always want to grant some clients access, or block them. To cope with these situations, you can specify exception rules. These rules are just like normal IPv4 address and domain restrictions in IIS 7. Select 'Add Allow Exception Rule' or 'Add Deny Exception Rule' in the top right task list to add a rule using the form below.

You can specify a single IP address, or an entire IP range. The geoblocker first checks the exception rules, before checking the country.



The screenshot shows a dialog box titled "Add Allow Exception Rule" with a close button (X) in the top right corner. The main text inside the dialog is "Allow access for the following IPv4 address or range:". Below this text are two radio button options. The first option, "Specific IPv4 address:", is selected with a filled radio button and has a single-line text input field next to it. The second option, "IPv4 address range:", is unselected with an empty radio button and has two text input fields: the top one for the address range and the bottom one for the "Mask:". At the bottom right of the dialog are two buttons: "OK" and "Cancel".

Apply / Cancel

In the top right corner you can find the apply and cancel actions. The actions are enabled when you change one of the settings. When apply is clicked, the changes are saved to the configuration file. When cancel is clicked, the form will reset to the last saved configuration.

Testing the geoblock module

Testing is quite simple. Configure the module for an application and make sure you will be blocked. Then make a simple request for an image or something that you can put in the application root folder. The page you will see will look something like this if you open it on the server itself.

Server Error in Application "DEFAULT WEB SITE/GEOBLOCKTEST"

Internet Information Services 7.0

Error Summary

HTTP Error 403.6 - IP is blocked by geoblocker
The IP address from which you are browsing is not permitted to access the requested Web site.

Detailed Error Information

Module	Geoblocker	Requested URL	http://213.132.176.137:80/geoblockTest/welcome.png
Notification	BeginRequest	Physical Path	C:\inetpub\wwwroot\geoblockTest\welcome.png
Handler	StaticFile	Logon Method	Not yet determined
Error Code	0x00000000	Logon User	Not yet determined

When opened from a remote client, it will look like this

Server Error

403 - Forbidden: Access is denied.
You do not have permission to view this directory or page using the credentials that you supplied.

Note that the requested file can be in cache, so it will still display. Add a random string behind the request like `/welcome.png?randomness` to be sure the image is requested instead of being retrieved from cache.

IIS also has an module called 'Error Pages'. You can add the 403.6 error page with this module to give a more explanatory message to the users.

