Overview of FastCGI

This document describes FastCGI support on the IBM HTTP Server for i.

FastCGI is an open standard extending the Common Gateway Interface (CGI) standard supported by many common web servers today. This standard defines how information is exchanged between a Web server and FastCGI programs isolated in external processes. On IBM i these external processes are provided by a FastCGI Apache module which make external PASE programs (FastCGI programs) available as CGI jobs which can then be utilized by the native ILE environment resulting in faster HTTP request processing.

The role of FastCGI programs, as dictated by the FastCGI specification, is to process incoming HTTP request data received from browser clients. For example the following steps are taken when a user enters data into a Web form and submits the form to a FastCGI enable Web server for processing:

1. The HTTP request is received at the Web server.
2. The HTTP request's Uniform Resource Identifier (URI) is parsed to identify how the request should be processed.
3. Based on the URI contained in the HTTP request, action is taken to serve a file or process the request through a script or program. FastCGI related URI's are handled by a FastCGI program depending on what server directives have been specified in the HTTP configuration files.

IBM HTTP Server for i administrators control which FastCGI programs the system can run by specifying certain server directives in the HTTP configuration files. With the proper server directives specified, IBM HTTP server for i can recognize which URI's contained in HTTP requests are for a FastCGI program, commonly called a FastCGI script. Depending on the server directives, the server calls that program on behalf of the client.

The IBM HTTP Server for i only supports FastCGI programs that run in the IBM i PASE environment and conform to the FastCGI standard (http://www.fastcgi.com/drupal/).

Configure PASE FastCGI Support for PHP Processing

The following two files are used to configure PASE FastCGI support for PHP processing on IBM HTTP Server for i:
1. IBM HTTP Server (powered by Apache) instance configuration file (httpd.conf)
2. A FastCGI configuration file (fastcgi.conf)
Both configuration files need to exist in the same configuration directory as your IBM HTTP Server instance configuration file.

For example:
/www/myserver/conf/httpd.conf
/www/myserver/conf/fastcgi.conf

Edit your IBM HTTP Server Instance Configuration File

To edit your IBM HTTP Server instance configuration file using the IBM Web Administration of i GUI using the following steps:

1. Bring up the IBM Web Administration for i GUI on port 2001 using a web browser.
2. Sign in using a valid IBM i profile and password.
3. Click the **Manage** tab.
4. Click the **HTTP Servers** sub-tab.
5. Select your IBM HTTP Server instance from the Server drop down list.
6. Expand **Tools**.
7. Click **Edit Configuration File**
8. Add the following PASE FastCGI program (module):

   LoadModule zend_enabler_module /QSYS.LIB/QHTTPSVR.LIB/QZFAST.SRVPGM
9. Associate the .php file extension with the application/x-httpd-php MIME type:

   AddType application/x-httpd-php .php
10. Specify the fastcgi-script handler for PHP

    AddHandler fastcgi-script .php (for all files within the directive scope with a .php extension)

    -or-

    SetHandler fastcgi-script (for all files within the directive scope)
11. Click **Apply**.
12. Click **OK**.

Create the FastCGI Configuration File

To create the FastCGI configuration file using an editor of your choosing. Here is how to create it using Qshell:

For example:

   QSYS/QSH CMD('/usr/bin/touch -C 819 /www/myserver/conf/fastcgi.conf')

Note: The fastcgi.conf file needs to be in CCSID 819 (ASCII).

Edit the FastCGI Configuration File

To edit the FastCGI configuration file so it contains only two lines as follows:

Line 1:

   Server type="application/x-httpd-php" CommandLine="/usr/local/ZendSvr/bin/php-cgi.bin"
   StartProcesses="1" SetEnv="LIBPATH=/usr/local/ZendSvr/lib"
   SetEnv="PHPRC=/usr/local/ZendSvr/etc/" SetEnv="PHP_FCGI_CHILDREN=5"
   SetEnv="PHP_FCGI_MAX_REQUESTS=0" ConnectionTimeout="30"

RequestTimeout="60" SetEnv="CCSID=819" SetEnv="LANG=en_US"
SetEnv="INSTALLATION_UID=20100314091923195088"

Note: This must all be on a single line within file fastcgi.conf.

You may have multiple servers, one per line.

Line 1: Parameter Information		
Parameter Name	**Description**	**Recommended Value**
Server type	Needs to match the MIME type specified on directive AddType in file httpd.conf.	
CommandLine	PASE FastCGI program name	
StartProcesses	Monitor/Start PASE FastCGI worker jobs	"1"
SetEnv	Sets an environment variable	
PHP_FCGI_CHILDREN	Number of FastCGI worker jobs	
PHP_FCGI_MAX_REQUESTS	Number request before worker job recycles	0 never recycle or a large number to avoid job start/stop
SetEnv Lang/SetEnv CCSID Notes: SetEnv Lang/SetEnv CCSID control the FastCGI Language and CCSID for this server. These settings will override the default FastCGI language/CCSID defined for all servers. **Specify both the LANG and CCSID parameters or else both of these parameters should be omitted.** Work Management tooling (WRKACTJOB) will not display the FastCGI PASE Lang/CCSID settings of zfcgi jobs (php-cli), use getenv() API in your script to examine these settings. The language feature (GO LICPGM) matching LANG/CCSID must be installed on your machine or FastCGI will loop reporting a LANG error in the log.		
LANG (optional)	FastCGI language	en_US See PASE locales table in release documentation for supported LANG/CCSID combinations.
CCSID (optional)	FastCGI CCSID	819 (or 1208) See PASE locales table in release documentation for supported LANG/CCSID combinations.
ConnectionTimeout	Number seconds before web server receives time out	

Line 2:

    IpcDir /www/<server instance>/logs

    where   <server instance>   is your server instance name.

Note: This IpcDir line must all be on a single line within file fastcgi.conf.

Line 2: Parameter Information		
Parameter Name	**Description**	**Recommended Value**
IpcDir	Is used to create the FastCGI sockets file. Note the specified directory must be file read/write capable by the Web server.	

Line 3 (optional):

    Language LANG=en_US CCSID=819

Notes: This must all be on a single line within file fastcgi.conf. **Specify both the LANG and CCSID parameters or else this configuration line must be omitted.**

Work Management tooling (WRKACTJOB) will not display the FastCGI PASE Lang/CCSID settings of zfcgi jobs (php-cli), use getenv() API in your script to examine these settings. The language feature (GO LICPGM) matching LANG/CCSID must be installed on your machine or FastCGI will loop reporting a LANG error in the log.

Line 3: Parameter Information		
Parameter Name	**Description**	**Recommended Value**
Language	Default FastCGI language and CCSID for all servers	
LANG	FastCGI default language	en_US See PASE locales table in release documentation for supported LANG/CCSID combinations.
CCSID	FastCGI default CCSID	819 or 1208 See PASE locales table in release documentation for supporte LANG/CCSID

		combinations.

Restart your IBM HTTP Server instance

To restart your IBM HTTP Server instance using either start/stop Apache option in Zend Server for IBM i Setup menu or PHP Restart button in the Zend Server for IBM i Administration interface.

Note:
It is possible to use IBM commands to restart your IBM HTTP Server instance using either the ENDTCPSVR/STRTCPSVR commands or the IBM Web Administration for IBM i

PHP File Requirements

PHP files with a .php file extension need to be in CCSID 819 (ASCII). You can create a CCSID 819 php file using Qshell similar to how you created the fastcgi.conf configuration file above.

For example:

QSYS/QSH CMD('/usr/bin/touch -C 819 /www/myserver/htdocs/helloworld.php')

Note: The fastcgi.conf file needs to be in CCSID 819 (ASCII).

Software Requirements

IBM i 5.4

License program:

5722SS1	30	Qshell
5722SS1	33	Portable App Solutions Environment
2ZSVRPI	*BASE	Zend Server for IBM i 5.0.2 (PHP 5.3)
5722DG1	*BASE	IBM HTTP Server for i
5733SC1	*BASE	IBM Portable Utilities for i
5733SC1	1	OpenSSH, OpenSST, Zlib

Required PTFs:
1. Current PTF Group for 5722DG1(minimum SF99114 - Group 22)
2. FastCGI PTF
    *   5722SS1 – SI41324
    *   5722DG1 –SI41577, SI41688

IBM i 6.1

License program:

5761SS1	30	Qshell
5761SS1	33	Portable App Solutions Environment
2ZSVRPI	*BASE	Zend Server for IBM i 5.0.2 (PHP 5.3)
5761DG1	*BASE	IBM HTTP Server for i
5733SC1	*BASE	IBM Portable Utilities for i
5733SC1	1	OpenSSH, OpenSST, Zlib

Required PTFs:
1. Current PTF Group for 5761DG1(minimum SF99115 - Group 13)
2. FastCGI PTF
   - 5761SS1 – SI41326
   - 5761DG1 – SI41253, SI41704

IBM i 7.1

License program:

5770SS1	30	Qshell
5770SS1	33	Portable App Solutions Environment
2ZSVRPI	*BASE	Zend Server for IBM i 5.0.2 (PHP 5.3)
5770DG1	*BASE	IBM HTTP Server for i
5733SC1	*BASE	IBM Portable Utilities for i
5733SC1	1	OpenSSH, OpenSSL, zlib

Required PTFs:
1. Current PTF Group for 5770DG1(minimum SF99368 - Group 1)
2. FastCGI PTF
   - 5770SS1 –SI41325
   - 5770DG1 –SI41367, SI41706

New FastCGI directives

If HTTP server is set up to use basic user authentication and enabled to process requests using client's authority by specifying directive UserID %%CLIENT %%, after a valid user login, the http server will swap to the client's user profile and use the authority of that profile to process requests. User may receive an Internal Server Error when using FastCGI if the client's user profile does not have *ALLOBJ special authority. This is because when the fastCGI socket file is created, by default user *PUBLIC is excluded, and only user QTMHHTTP is given the needed *RWX permissions, so any user other than QTMHHTTP who does not have *ALLOBJ is excluded from using the socket file.

To solve that problem, we introduce three new directives (IpcPublic, IpcGroup, IpcOwner) to be used in the fastcgi.conf file. We allow the administrator to set the public, group, owner privileges for the FastCGI socket(s) files.

For example:

```
; Authorizations of socket files (*R-read, *W-write, *X-execute)
; IpcPublic *RWX              -- set *PUBLIC access value
; IpcGroup profile *RWX     -- set *GROUP profile access value
; IpcOwner profile *RWX     -- set *OWNER profile access value
; IpcOwner qttmhttp *RWX    -- default *OWNER access values (no action default)
IpcPublic *RWX
```