iAMP Server

IBM i + Apache + MySQL + PHP

Aura Equipements is providing an Independent distribution of Apache, MySQL and PHP for IBM i.

Main advantages

- Easy, light, quick installation Using GUI or Command-line interface
- Updates PHP, Apache (optional) and i5 toolkit in one request.
- Quick and experienced technical support for PHP or the toolkit.
- Fast and efficient web server.
- Uses standard Apache, MySQL and PHP packages.
- Full version support which allows multiple installs running at the same time.
- Common extensions included in the package.

Features

- PHP 5.3.8 base, optimized for IBM i, supports OS Version V5R3 to V7R1
- PHP CLI, PHP CGI and handler 2.0 interface available
- Optional : Apache 2.2.21
- Optional: uses standard IBM i HTTP server, with FastCGI technology.
- Optional : MySQL Server 5.1.59
- Install on any valid directory in the IFS.
- Debugging support enabled using the Xdebug extension.
- APC, Xcache and memcache optimization extensions.
- Database extensions for PHP : MySQL, Oracle, MS Sql, DB2, Easycom, …
- Server instances identified by a name, and managed using subsystem(s).
- Can be removed in a few easy steps

Installation

Requirements

OS/400 V5R3 or above is required.

V5R4 needs PTF SI23691 (Cum level C6297540)

Recent PTF cumulative are recommended for V5R4 and V6R1.

What is installed?

Type	Default name or path	Description
Library	IAMPSVR	Main iAMP server library. Contains commands, programs and files. Additional object descriptions will be created for Apache and MySQL instances in this library.
Library	EASYCOM	Easycom server library. Contains all the server functions for the i5 Toolkit, native access to all IBM I objects, programs and files.
Directory	"/usr/local/iamp"	iAMP Server Base Directory. Contains common files and libraries, in sub directories : • "/usr/local/iamp/bin" • "/usr/local/iamp/lib" • "/usr/local/iamp/logs" We suggest to install the three sub directories listed here after - PHP, Apache and MySql - in current Base Directory, as far as they are sharing common objects.
"	"/usr/local/iamp/php"	PHP sub directory.
"	"/usr/local/iamp/apache"	Apache sub directory
"	"/usr/local/iamp/mysql"	MySQL sub directory
"	"/var/mysql"	MySQL database and configuration files
Text File	"/etc/iamp.tab"	
Subsystem	IAMPSVR	For Apache and/or MySQL instances (optional). When a web server instance is created, using standard iAMP Apache server, a subsystem is required to run it. If IBM HTTP server id used to run PHP, no additional subsystem is needed. If MySql is installed, a subsystem is required to run it.

Command line installation (Windows not needed)

Proceed with the following steps

1. Transfer the save file in the location of your choice. For example `QGPL/IAMP`.
   a. Create the save file :
      `CRTSAVF QGPL/IAMP`
   b. Transfer the save file using FTP into the save file
      For example, using Windows FTP command line, open a "Command" Window, and type:

```
   FTP <AS/400 IP address or name>
   Answer to requested user and password

In the FTP command invite, type following commands:
   ftp> bin
   200 Representation type is binary IMAGE.

   ftp> put iamp530.bd  QGPL/IAMP
   200 PORT subcommand request successful.
   150 Sending file to member IAMP in file IAMP in library QGPL.
   250 File transfer completed successfully.

   ftp> quit
   221 QUIT subcommand received.
```

2. Restore installation program from save file to QTEMP library.
   `RSTOBJ OBJ(INST_IAMP) SAVLIB(QTEMP) DEV(*SAVF) SAVF(QGPL/IAMP) RSTLIB(QTEMP)`
3. Run installation command
   `QTEMP/INST_IAMP     <F4>`

The command has 5 optional sections: Easycom, PHP, Apache, Web Server and MySQL

Main section:

```
Installation *SAVF file  . . . . SRC
  Library  . . . . . . . . . . .                    *CURLIB
IAMP IBMi library  . . . . . . . LIB              IAMPSVR
Installation base path . . . . . BASE_PATH        '/usr/local/iamp'
```

Installation *SAVF file (SRC) : Name and library of the save file transferred by FTP (IAMP in QGPL as show in the example above).

IAMP IBMi library (LIB) : Name of the main iAMP server library to create.

Installation base path (BASE_PATH) : Directory path where common iAMP Server files are installed.

Easycom server section :

```
Install Easycom Server . . . . . SEAC             *YES
Easycom library to install . . . EACLIB           EASYCOM
Easycom subsystem name . . . . . EACSBS           EASYCOM
Easycom service port number  . . EACPORT          6077
```

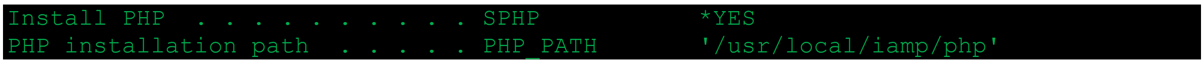
If Easycom server is already installed for PHP or any other development tool, you don't have to install it again.

Easycom library to install (EACLIB) is the name of the Easycom library to create. Install Easycom server in its own library.

Easycom subsystem name (EACSBS) is the name of the subsystem where Easycom client connections will run.

Easycom service port (EACPORT) is the TCP/IP port number. Default is 6077. This number will be referenced in "php.ini" file.

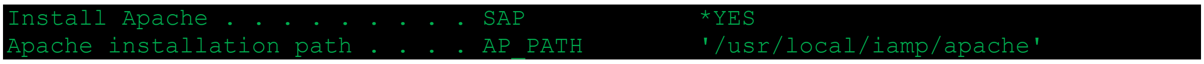
PHP section:



```
Install PHP . . . . . . . . . . . SPHP                *YES
PHP installation path  . . . . .  PHP_PATH            '/usr/local/iamp/php'
```

PHP installation path (PHP_PATH) is the IFS directory path where PHP will be installed.
We suggest to install PHP in a sub directory of the base path (BASE_PATH).
This directory will contain PHP executable files and libraries ("**bin"** and "**lib"** subdirectories), and extension libraries ("**lib/ php_extensions**" subdirectory).

Apache section:



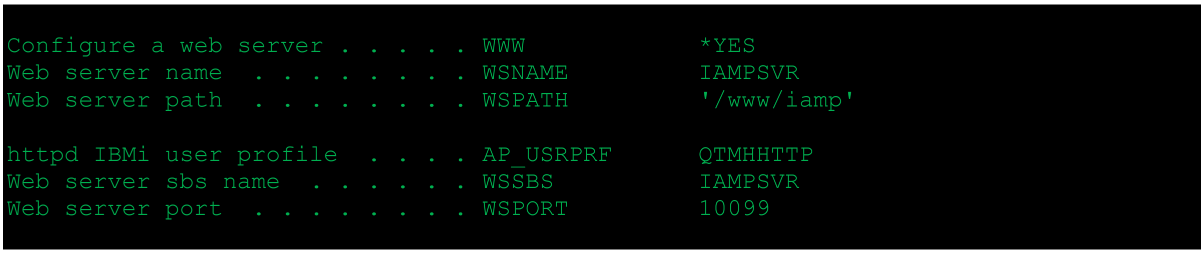
```
Install Apache . . . . . . . . .  SAP                 *YES
Apache installation path . . . .  AP_PATH             '/usr/local/iamp/apache'
```

Apache installation is optional. The PHP server provided with iAMP server can also be installed in Fast CGI mode, for the IBM I HTTP server.

The Apache server provided with iAMP server is a standard version, including latest security updates. It can load PHP as a module.

Apache Installation path (AP_PATH) is the directory path where Apache files and libraries are to be installed.
We suggest to install Apache in a sub directory of the base path (BASE_PATH).

Web server section:



```
Configure a web server . . . . .  WWW                 *YES
Web server name  . . . . . . . .  WSNAME              IAMPSVR
Web server path  . . . . . . . .  WSPATH              '/www/iamp'

httpd IBMi user profile  . . . .  AP_USRPRF           QTMHHTTP
Web server sbs name  . . . . . .  WSSBS               IAMPSVR
Web server port  . . . . . . . .  WSPORT              10099
```

This section is shown if Apache and/or PHP was selected. The subsystem name is asked only if Apache was selected.

Web server name (WSNAME) : Unique name to give to the Web Server instance. This name will be used in the command lines to start and stop the instance.
A job description (JOBD) is created with this name, to start the server instance.

Web Server path (WSPATH) : IFS directory path to the application files.
Subdirectories are created for the web server :

Subdirectory	Description
conf	Contains httpd.conf and fastcgi.conf
conf/php	Default location of php.ini
conf/php/conf.d	Additional options for PHP
htdocs	Default web server root documents
logs	**Apache** or **php** log files

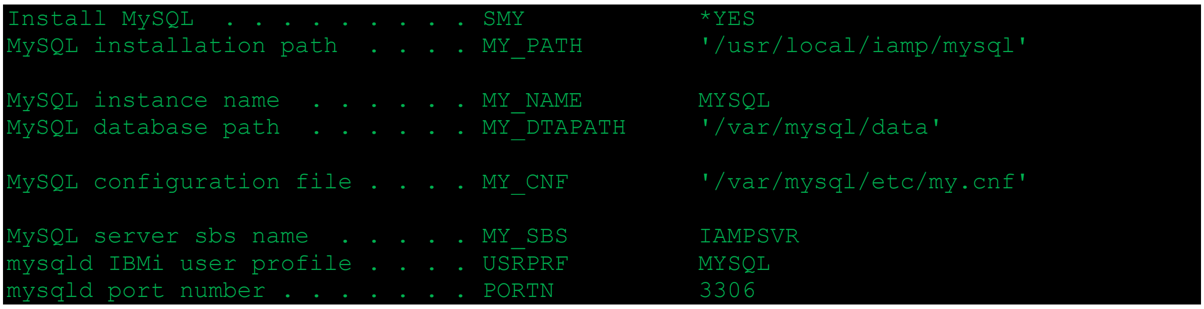
httpd IBMi user profile (AP_USRPRF). This user profile will be the owner of the web server directory tree.

This user profile is referenced in "httpd.conf" configuration file, and in the JOBD created for the web server instance.

Web Server sbs name (WSSBS) is the name of the subsystem where the instance will run. If it doesn't exist, it will be created in main iAMP library (LIB)

Web server port (WSPORT) is the TCP/IP port number used by the web server instance.
Default HTTP port is 80. If you set a value different from 80, you will need to add this value in the URL when accessing your web server from a navigator.
For example, if you set WSPORT to 10090, your web server will be accessible by:
http://my_system_name:10090

MySQL Section:



```
Install MySQL  . . . . . . . . . . SMY            *YES
MySQL installation path  . . . . . MY_PATH        '/usr/local/iamp/mysql'

MySQL instance name  . . . . . . . MY_NAME        MYSQL
MySQL database path  . . . . . . . MY_DTAPATH     '/var/mysql/data'

MySQL configuration file . . . . . MY_CNF         '/var/mysql/etc/my.cnf'

MySQL server sbs name  . . . . . . MY_SBS         IAMPSVR
mysqld IBMi user profile . . . . . USRPRF         MYSQL
mysqld port number . . . . . . . . PORTN          3306
```

MySQL installation path (MY_PATH) : IFS directory path where MySQL will be installed.
We suggest to install MySQL in a sub directory of the base path (BASE_PATH).
This directory will contain MySQL executable files and libraries ("**bin"** , "**etc**", "**plugin**" and "**share"** subdirectories).

MySQL Instance name (MY_NAME) : Unique name for this MySQL instance. This name will be used to Start and Stop the server instance.

MySQL database path (MY_DTAPATH) : A subdirectory will be created in this directory path, for each database.

MySQL Configuration file (MY_CNF)

MySQL Server SBS name (MY_SBS) : Name of the subsystem where MySQL is to be running. If iy doesn't already exist, it is created in iAMP base library (LIB).

MySQL IBMi User profile (USRPRF)

MySQL port number (PORTN) : Default TCP/IP port number is 3306.

On command line:

```
        QTEMP/INST_IAMP SRC(QGPL/IAMP)
```

The installation will carry out the same actions as the GUI installation and provide progress information messages.

All directories and files are accessible for qtmhhttp user profile, which will be the user for the PHP binaries.

IBM i HTTP Server Configuration

IBMi HTTP Server configuration options can be set in the “httpd.conf” file in “conf” subdirectory of the web server.
You can access it using “IBM web administration for i” application on the IBM i:
http://myibm:2001/HTTPAdmin .
This is also an easy way to restart the HTTP server when changes are made to php.ini. (Like activating/un-activating the debugger, xcache, apc, …)

Stop/Start/Restart HTTP server

You can restart the HTTP server using the “IBM web administration for i” web application (see above), or by the following commands on a 5250 terminal:
To end (the command may return when web site is not completely ended):

```
ENDTCPSVR SERVER(*HTTP) HTTPSVR(IAMPSVR)
```

To start:

```
STRTCPSVR SERVER(*HTTP) HTTPSVR(IAMPSVR)
```

‘IAMPSVR’ is the HTTP name you have chosen during the installation (WSNAME option). It is visible in the IBM web administration for i” web application

Fast CGI configuration

Fast CGI configuration is in the “fastcgi.conf” file in the “conf” subdirectory of the web server.
You can change the number of prestart PHP jobs, the request timeout, and also initial environment settings.
You can access it for example with the following command:
EDTF STMF('/www/iamp/conf/fastcgi.conf')
Here is a sample:

```
; FastCGI configuration for PHP+Apache
; 5 worker jobs and UTF-8 (1208)
Server type="application/x-httpd-php" CommandLine="/usr/local/iamp/bin/php-fcgi" StartProcesses="1"
  SetEnv="PHP_FCGI_CHILDREN=5" SetEnv="PHP_FCGI_MAX_REQUESTS=0" SetEnv="PHPRC=/usr/local/iamp/etc/"
  SetEnv="PHP_INI_SCAN_DIR=/usr/local/iamp/etc/conf.d" ConnectionTimeout="30" RequestTimeout="120"
  SetEnv="CCSID=1208"
; named socket for communication with Apache
IpcDir /www/iampsvr/log
```

IMPORTANT: All “server type” options must be on a single line (not as shown above).
Be careful when changing this file: if there is an error in it, the IBM i may constantly create jobs because each job fails. (Check that you don’t have spools constantly created in QEZJOBLOG).

iAMP Embedded Apache Configuration

Currently, Apache can be configured by editing manually the configuration files.
Configuration files are in ‘conf’ subdirectory in the web site root (default is "/www/iamp/conf/" as shown above).
You can update or view files using WRKLNK command (using a network share is more convenient…):

```
WRKLNK '/www/iamp/conf/*'
```

‘ httpd.conf ’ is the main configuration file.
Additional include files are in ‘extra’ subdirectory. They are referenced from the httpd.conf file and should be un-commented as required.

httpd.conf contains a <directory> section:

```
<Directory "/www/iamp/htdocs">
```

This section points to the htdocs directory. There is a very restrictive directory entry which stops access to any files which needs to be updated before the website pages will be displayed.

Stop/Start/Restart HTTP server

You can restart the Embedded HTTP server by restarting the configured subsystem.

To stop it:

```
ENDSBS IAMPSVR *IMMED
```

To start:

```
STRSBS IAMP/IAMPSVR
```

(if you chose IAMPSVR for the subsystem name during the setup)

PHP configuration

The ini options can be located in the php.ini file that is under “php”, and also in the “php/conf.d” subdirectory of the web site. (the options are **not** in the installation directory, but in the site directory. This provides the ability of having different PHP options for each site).

You can update it using for example the WRKLNK command (if site root is /www/iamp) :

```
WRKLNK '/www/iamp/conf/php/*'
```

The ‘extension_dir’ and the ‘error_log’ options are automatically updated by the setup program to take care of the installation directory that was chosen.

Remarks:

- APC extension is enabled by default
- The Xdebug (php/conf.d/php.ini) and Xcache extensions are not enabled by default. You can enable them by modifying the .ini files and restarting the HTTPD server.

Un-installation

Complete Un-installation can be performed in the following steps:

1) Stop all services using ENDTCPSVR and ENDSBS commands.
2) Remove the web server definition using “IBM web administration for i” application (http://myibm:2001/HTTPAdmin), using the ‘Stop’ and then ‘Delete’ option on the web entry.
3) Remove the iamp, web and MySQL directories using WRKLNK. For example (replace with your directory) :
    - wrklnk '/usr/local/iamp/'
    - then use option ‘4’ type F4 and type *ALL in the subtree option
    - wrklnk '/www/iamp/'
    - then use option ‘4’ type F4 and type *ALL in the subtree option
    - wrklnk ‘/var/mysql’
    - then use option ‘4’ type F4 and type *ALL in the subtree option

    NB: You can see the used directories by displaying the /etc/iamp.tab file, using DSPF ‘/etc/iamp.tab’.
4) delete the IAMP library: DLTLIB IAMP
5) delete the iAMP configuration file: DLTF ‘/etc/iamp.tab’

This un-installation procedure is valid only if you need to remove ALL the components.

If you need to remove a server or a service instance, prefer using the un-installation commands.

Extensions provided

APC

extension=apc.so

The Alternative PHP Cache (APC) is a free and open opcode cache for PHP. Its goal is to provide a free, open, and robust framework for caching and optimizing PHP intermediate code.

See : http://fr.php.net/manual/en/intro.apc.php

BC Math

extension=bcmath.so

For arbitrary precision mathematics PHP offers the Binary Calculator which supports numbers of any size and precision, represented as strings.

See : http://fr.php.net/manual/en/intro.bc.php

Bcompiler

extension=bcompiler.so

Binary compiler. Encodes a script or a part of script into binary.

See : http://fr.php.net/manual/en/intro.bcompiler.php

Bzip2

extension=bz2.so

The bzip2 functions are used to transparently read and write bzip2 (.bz2) compressed files.

See : http://fr.php.net/manual/en/intro.bzip2.php

calendar

extension=calendar.so

The calendar extension presents a series of functions to simplify converting between different calendar formats.

See : http://fr.php.net/manual/en/intro.calendar.php

cURL

extension=curl.so

PHP supports libcurl, a library created by Daniel Stenberg, that allows you to connect and communicate to many different types of servers with many different types of protocols.

libcurl currently supports the http, https, ftp, gopher, telnet, dict, file, and ldap protocols. libcurl also supports HTTPS certificates, HTTP POST, HTTP PUT, FTP uploading (this can also be done with PHP's ftp extension), HTTP form based upload, proxies, cookies, and user+password authentication.

See : http://fr.php.net/manual/en/intro.curl.php

date

This extension is embedded in PHP.

These functions allow you to get the date and time from the server where your PHP scripts are running. You can use these functions to format the date and time in many different ways.

See: http://fr.php.net/manual/en/intro.datetime.php

DOM

this extension is embedded in PHP.

The DOM extension allows you to operate on XML documents through the DOM API with PHP 5.
See: http://fr.php.net/manual/en/intro.dom.php

Exif

extension=exif.so
With the exif extension you are able to work with image meta data. For example, you may use exif functions to read meta data of pictures taken from digital cameras by working with information stored in the headers of the JPEG and TIFF images.
See : http://fr.php.net/manual/en/intro.exif.php

Filter

This extension is embedded in PHP.
This extension filters data by either validating or sanitizing it. This is especially useful when the data source contains unknown (or foreign) data, like user supplied input.
See : http://fr.php.net/manual/en/intro.filter.php

fileinfo

extension=fileinfo.so
The functions in this module try to guess the content type and encoding of a file by looking for certain *magic* byte sequences at specific positions within the file.
See : http://fr.php.net/manual/en/intro.fileinfo.php

FTP

extension=ftp.so
The functions in this extension implement client access to files servers speaking the File Transfer Protocol (FTP).
See : http://fr.php.net/manual/en/intro.ftp.php

gd

extension=gd.so
image managing functions. Note: the extension supports JPEG, GIF, XBM and PNG image formats.
See: http://fr.php.net/manual/en/intro.image.php

Hash

This extension is embedded in PHP.

Message Digest (hash) engine. Allows direct or incremental processing of arbitrary length messages using a variety of hashing algorithms.
See : http://fr.php.net/manual/en/intro.hash.php

Gettext

extension=gettext.so
The gettext functions implement an NLS (Native Language Support) API which can be used to internationalize your PHP applications.

See : http://fr.php.net/manual/en/intro.gettext.php

Gmp

extension=gmp.so

This extension allow you to work with arbitrary-length integers using the GNU MP library.

See : http://fr.php.net/manual/en/intro.gmp.php

i5comm

extension=i5comm.so

the i5 toolkit based on Easycom technology.

See: http://www.easycom-aura.com//Data/WebHelp/PHP/easycomforphp.htm

ibm_db2

extension=ibm_db2.so

These functions enable you to access IBM DB2 Universal Database, IBM Cloudscape, and Apache Derby databases using the DB2 Call Level Interface (DB2 CLI).

See : http://fr.php.net/manual/en/intro.ibm-db2.php

iconv

extension=iconv.so

This module contains an interface to iconv character set conversion facility. You can convert from one character set to another.

See : http://fr.php.net/manual/en/intro.iconv.php

IMAP

extension=imap.so

These functions enable you to operate with the IMAP protocol, as well as the NNTP, POP3 and local mailbox access methods.

See: http://fr.php.net/manual/en/intro.imap.php

Libxml

This extension is embedded in PHP.

JSON

extension=json.so

This extension implements the » JavaScript Object Notation (JSON) data-interchange format.

See : http://fr.php.net/manual/en/intro.json.php

Mbstring

extension=mbstring.so

Multibyte strings management.

See: http://fr.php.net/manual/en/intro.mbstring.php

Memcache

extension=memcache.so

Memcache module provides handy procedural and object oriented interface to memcached, highly effective caching daemon, which was especially designed to decrease database load in dynamic web applications.
See : http://fr.php.net/manual/en/intro.memcache.php

Mysqli

extension=mysqli.so
MySQL improved extension.
See: http://fr.php.net/manual/en/intro.mysqli.php

Mysql

extension=mysql.so
MySQL standard extension
See: http://fr.php.net/manual/en/intro.mysql.php

OCI8

extension=oci8.so
This extension allow you to access Oracle Database 11g, 10g, 9i and 8i.

Openssl

This extension is embedded in PHP.

Pcre

This extension is embedded in PHP.

pdo_easycom

extension=pdo_easycom.so
This extension allows IBM i database access using the PDO abstraction layer.

pdo_mysql

extension=pdo_mysql.so
This extension allows MySQL access using the PDO abstraction layer.

pdo_oci

extension=pdo_oci.so
This extension allows Oracle access using the PDO abstraction layer.

PDO

extension=pdo.so
The *PHP Data Objects* (PDO) extension defines a lightweight, consistent interface for accessing databases in PHP.

Posix

extension=posix.so
NB : this is recommended not active this extension.
This module contains an interface to those functions defined in the IEEE 1003.1 (POSIX.1) standards document which are not accessible through other means.
See: http://fr.php.net/manual/en/intro.posix.php

Reflection

This extension is embedded in PHP.

Simplexml

This extension is embedded in PHP.

SOAP

This extension is embedded in PHP.

SPL

This extension is embedded in PHP.

Sockets

extension=sockets.so

The socket extension implements a low-level interface to the socket communication functions based on the popular BSD sockets, providing the possibility to act as a socket server as well as a client.

See : http://fr.php.net/manual/en/intro.sockets.php

wddx

extension=wddx.so

These functions are intended for work with » WDDX.

See : http://fr.php.net/manual/en/intro.wddx.php

xcache

zend_extension=xcache.so

This extension allows op-code and variable cache. It cannot be used at the same time as APC extension.

The default login and password for xcache administration are: “admin” password=“ibmi”.

(see conf.d/xcache.ini for setting a new password and tune settings)

See: http://xcache.lighttpd.net/

xdebug

zend_extension=xdebug.so

(**see conf.d/xdebug.ini**)

This extension allows remote debugging (from Eclipse IDE for example) and more user-friendly error displays, such as call stack of the error.

See: http://xdebug.org/

Xml

This extension is embedded in PHP.

XSL

extension=xsl.so

The XSL extension implements the XSL standard, performing » XSLT transformations using the » libxslt library
See: http://fr.php.net/manual/en/intro.xsl.php

Zip

extension=zip.so
This extension enables you to transparently read or write ZIP compressed archives and the files inside them.
See : http://fr.php.net/manual/en/intro.zip.php

zlib

This extension is embedded in PHP.

Appendix A – included components and versions

Main components:

php 5.3.8
apache 2.2.21
MySQL 5.1.59

Dynamic libraries:

libevent 2.0.12
libxslt 1.1.26
libxml2 2.7.8
libgmp 5.0.2
libiconvg
libintl
libmysqlclient 6.0.0
libpq
libsqllite3
libstdc++

Apache included modules:

core, mod_authn_file, mod_authn_default, mod_authz_host, mod_authz_groupfile, mod_authz_user, mod_authz_default, mod_auth_basic, mod_include, mod_filter, mod_log_config, mod_env, mod_setenvif, mod_version, mod_ssl, prefork, http_core, mod_mime, mod_autoindex, mod_asis, mod_cgi, mod_negotiation, mod_dir, mod_actions, mod_userdir, mod_alias, mod_so

Apache dynamic modules:

mod_cache, mod_headers, mod_info, mod_mem_cache, mod_rewrite.so, mod_status