Overview of new features in Apache 2.0

This document describes some of the major changes between the 1.3 and 2.0 versions of the Apache HTTP Server.

- Core Enhancements
- Module Enhancements

See also

- Upgrading to 2.0 from 1.3

Core Enhancements

Unix Threading

On Unix systems with POSIX threads support, Apache can now run in a hybrid multiprocess, multithreaded mode. This improves scalability for many, but not all configurations.

New Build System

The build system has been rewritten from scratch to be based on `autoconf` and `libtool`. This makes Apache's configuration system more similar to that of other packages.

Multiprotocol Support

Apache now has some of the infrastructure in place to support serving multiple protocols. `mod_echo` has been written as an example.

Better support for non-Unix platforms

Apache 2.0 is faster and more stable on non-Unix platforms such as BeOS, OS/2, and Windows. With the introduction of platform-specific multi-processing modules (MPMs) and the Apache Portable Runtime (APR), these platforms are now implemented in their native API, avoiding the often buggy and poorly performing POSIX-emulation layers.

New Apache API

The API for modules has changed significantly for 2.0. Many of the module-ordering/-priority problems from 1.3 should be gone. 2.0 does much of this automatically, and module ordering is now done per-hook to allow more flexibility. Also, new calls have been added that provide additional module capabilities without patching the core Apache server.

IPv6 Support

On systems where IPv6 is supported by the underlying Apache Portable Runtime library, Apache gets IPv6 listening sockets by default. Additionally, the `Listen`, `NameVirtualHost`, and `VirtualHost` directives support IPv6 numeric address strings (e.g., "`Listen [2001:db8::1]:8080`").

Filtering

Apache modules may now be written as filters which act on the stream of content as it is delivered to or from the server. This allows, for example, the output of CGI scripts to be parsed for Server Side Include directives using the `INCLUDES` filter in `mod_include`. The module `mod_ext_filter` allows external programs to act as filters in much the same way that CGI programs can act as handlers.

Multilanguage Error Responses

Error response messages to the browser are now provided in several languages, using SSI documents. They may be customized by the administrator to achieve a consistent look and feel.

Simplified configuration

Many confusing directives have been simplified. The often confusing `Port` and `BindAddress` directives are gone; only the `Listen` directive is used for IP address binding; the `ServerName` directive specifies the server name and port number only for redirection and vhost recognition.

Native Windows NT Unicode Support

Apache 2.0 on Windows NT now uses utf-8 for all filename encodings. These directly translate to the underlying Unicode file system, providing multilanguage support for all Windows NT-based installations, including Windows 2000 and Windows XP. *This support does not extend to Windows 95, 98 or ME, which continue to use the machine's local codepage for filesystem access.*

Regular Expression Library Updated

Apache 2.0 includes the Perl Compatible Regular Expression Library (PCRE). All regular expression evaluation now uses the more powerful Perl 5 syntax.

Module Enhancements

`mod_ssl`

New module in Apache 2.0. This module is an interface to the SSL/TLS encryption protocols provided by OpenSSL.

`mod_dav`

New module in Apache 2.0. This module implements the HTTP Distributed Authoring and Versioning (DAV) specification for posting and maintaining web content.

`mod_deflate`

New module in Apache 2.0. This module allows supporting browsers to request that content be compressed before delivery, saving network bandwidth.

`mod_auth_ldap`

New module in Apache 2.0.41. This module allows an LDAP database to be used to store credentials for HTTP Basic Authentication. A companion module, `mod_ldap` provides connection pooling and results caching.

`mod_auth_digest`

Includes additional support for session caching across processes using shared memory.

`mod_charset_lite`

New module in Apache 2.0. This experimental module allows for character set translation or recoding.

`mod_file_cache`

New module in Apache 2.0. This module includes the functionality of `mod_mmap_static` in Apache 1.3, plus adds further caching abilities.

`mod_headers`

This module is much more flexible in Apache 2.0. It can now modify request headers used by `mod_proxy`, and it can conditionally set response headers.

`mod_proxy`

The proxy module has been completely rewritten to take advantage of the new filter infrastructure and to implement a more reliable, HTTP/1.1 compliant proxy. In addition, new `<Proxy>` configuration sections provide more readable (and internally faster) control of proxied sites; overloaded `<Directory "proxy:...">` configuration are not supported. The module is now divided into specific protocol support modules including `proxy_connect`, `proxy_ftp` and `proxy_http`.

`mod_negotiation`

A new `ForceLanguagePriority` directive can be used to assure that the client receives a single document in all cases, rather than NOT ACCEPTABLE or MULTIPLE CHOICES responses. In addition, the negotiation and MultiViews algorithms have been cleaned up to provide more consistent results and a new form of type map that can include document content is provided.

`mod_autoindex`

Autoindex'ed directory listings can now be configured to use HTML tables for cleaner formatting, and allow finer-grained control of sorting, including version-sorting, and wildcard filtering of the directory listing.

`mod_include`

New directives allow the default start and end tags for SSI elements to be changed and allow for error and time format configuration to take place in the main configuration file rather than in the SSI document. Results from regular expression parsing and grouping (now based on Perl's regular expression syntax) can be retrieved using `mod_include`'s variables `$0` .. `$9`.

`mod_auth_dbm`

Now supports multiple types of DBM-like databases using the `AuthDBMType` directive.