

What's new in httpd 2.2?

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<http://www.outoforder.cc/presentations/>

2.2?

- major.minor.patch
- Versioning Scheme:
 - Odd = Development / Alpha / Beta
 - 2.1.x & 2.3.x
 - Even = Stable / General Availability
 - 2.0.x & 2.2.x

Stable...

- Rules:
 - Changes require Voting (RTC)
 - Cannot break forward compatibility
 - Module API
 - Binary API
 - Configuration Directives

History

- 1.0.0 Released December 1, 1995.
- 1.3.0 released in June, 1998
- 2.0a1 released in March 2000
- 2.0.35 (first 2.0 GA) released April, 2002
- 2.1-dev created in November, 2002
- 2.1.1 released in November, 2004
- 2.2.0 released on December 1, 2005

The Goals of 2.2

- Core is very similar.
- Not like 1.3 to 2.0 upgrade
- Most 2.0 modules work
- Add new features!

- Authentication
- Caching
- Proxying
- Smart Filtering
- Event MPM
- DBD Framework
- Many Many Others!

Authentication

- Refactor of Authentication Modules
- Split into methods and providers
- Easy to write new providers
 - Before, required each back-end to write a full Basic or Digest Auth Layer
- Removed Auth*Authoritative Directives

Providers?

- Originally introduced as part of mod_dav
- Slowly being incorporated into the rest of tree
- Registered on startup; called at run-time
- Therefore, for authentication:
 - Basic and Digest Auth each **use** providers
 - File systems, DBs, LDAP **are** providers

mod_authn_file

- Provides a back-end for both Basic and Digest Authentication
- Default configuration is partially backwards compatible.

<Location /use-basic>

AuthType Basic

AuthName "Private Area"

AuthBasicProvider file

AuthUserFile /example/.htpasswd

Require valid-user

</Location>

<Location /use-digest>

AuthType Digest

AuthName "Private Area"

AuthDigestProvider file

AuthUserFile /example/.htpasswd

Require valid-user

</Location>

```
<Location /use-file-and-ldap>  
  AuthType Basic  
  AuthName "Private Area"  
  AuthBasicProvider file ldap  
  AuthUserFile /example/.htpasswd  
  AuthLDAPURL ldap://ldap.example.com/o=Example  
  Require valid-user  
</Location>
```

mod_authn_alias

- Mix and match any authentication provider
- Check multiple back-ends of the same type

```
<AuthnProviderAlias ldap ldap-alias I >
```

```
AuthLDAPBindDN cn=youruser,o=ctx
```

```
AuthLDAPBindPassword yourpassword
```

```
AuthLDAPURL ldap://ldap.host/o=ctx
```

```
</AuthnProviderAlias>
```

```
<AuthnProviderAlias ldap ldap-other>
```

```
AuthLDAPBindDN cn=yourotheruser,o=ctx
```

```
AuthLDAPBindPassword yourotherpassword
```

```
AuthLDAPURL ldap://other.ldap.host/o=ctx
```

```
</AuthnProviderAlias>
```

```
<Location /use-aliased-ldap>
```

```
AuthBasicProvider ldap-alias I ldap-other
```

```
Require valid-user
```

```
</Location>
```

mod_authn_dbd

- Connection Pooling
- Currently supports:
 - MySQL
 - SQLite
 - PgSQL
 - Oracle

Caching

- No longer experimental
- Attempts to be HTTP RFC Compliant
- Two Storage Modules:
 - mod_disk_cache
 - htcacheClean
 - mod_mem_cache
 - few advantages over disk_cache

Why Cache?

- Performance....
- Proxied Content
 - Slow back-end servers
- Dynamic Content
 - Don't Regenerate pages for every hit

How Fast?

- `mod_disk_cache`:
 - IO Limited, not CPU.
 - Kernel will use `sendfile()`
 - Easily saturate Gigabit Links

CacheEnable disk /
CacheRoot /var/cache/apache
CacheDirLevels 5
CacheDirLength 3

CachelgnoreCacheControl off
CachelgnoreHeaders None
CachelgnoreNoLastMod On

CacheDefaultExpire 600
CacheMaxExpire 3600

mod_proxy

- Forward and Reverse Proxy
- Protocols:
 - HTTP 0.9, 1.0, 1.1
 - AJP 13
 - FTP
 - CONNECT (SSL Proxying)

Big Features

- Connection Pooling
- AJP
 - Native Protocol for talking to Tomcat
 - Replace mod_jk, mod_jk2, mod_webapp..
- mod_proxy_balancer
 - Load Balancer
 - Change Worker Status

```
# Set the soft maximum (smax) to 1..  
ProxyPass / http://server.example.com/ smax=1  
ProxyPassReverse / http://server.example.com/
```

```
ProxyPass /balancer-manager !  
<Location /balancer-manager>  
    # <insert authentication here>  
    SetHandler balancer-manager  
</Location>
```

```
ProxyPass /balancer-manager !  
<Location /balancer-manager>  
  # <insert authentication here>  
  SetHandler balancer-manager  
</Location>
```

```
ProxyPass / balancer://example/  
<Proxy balancer://example/>  
  BalancerMember http://server1/  
  BalancerMember http://server2/  
  BalancerMember http://server3/  
</Proxy>
```

Load Balancer Manager for ooo.thunder.in.force-elite.com

Server Version: Apache/2.1.5-dev (Unix) DAV/2 mod_ssl/2.1.5-dev OpenSSL/0.9.7g mod_transform/0.7.0
Server Built: May 19 2005 18:16:37

LoadBalancer Status for [balancer://test](#)

StickySession	Timeout	FailoverAttempts	Method	
	0	4	Requests	
Scheme	Host	Route	RouteRedir	Factor Status
http	1.thunder			1 Ok
http	2.thunder			1 Ok
http	3.thunder			1 Ok
http	4.thunder			1 Ok
http	5.thunder			1 Ok

*Apache/2.1.5-dev (Unix) DAV/2 mod_ssl/2.1.5-dev OpenSSL/0.9.7g mod_transform/0.7.0 Server at
ooo.thunder.in.force-elite.com Port 80*

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Edit worker settings for [http://1.thunder](#)

Load factor:

Route:

Route Redirect:

Disabled:

Apache/2.1.5-dev (Unix) DAV/2 mod_ssl/2.1.5-dev OpenSSL/0.9.7g mod_transform/0.7.0 Server at
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mod_filter

- Dynamic Configuration of Output Filters
- AddOutputFilterByType?
 - What if you don't know the type?
 - Proxies!
 - Chains?

FilterDeclare SSI

FilterProvider SSI INCLUDES \

resp=Content-Type \$text/html

FilterChain SSI

```
FilterProvider unpack jpeg_unpack Content-Type $image/jpeg
FilterProvider unpack gif_unpack Content-Type $image/gif
FilterProvider unpack png_unpack Content-Type $image/png
```

```
FilterProvider downsample downsample_filter \
    Content-Type $image
FilterProtocol downsample "change=yes"
```

```
FilterProvider repack jpeg_pack Content-Type $image/jpeg
FilterProvider repack gif_pack Content-Type $image/gif
FilterProvider repack png_pack Content-Type $image/png
```

```
<Location /image-filter>
    FilterChain unpack downsample repack
</Location>
```

Event MPM

- Experimental MPM
- Requires:
 - Linux 2.6 (EPoll)
 - *BSD / Mac OS X 10.4 (KQueue)
 - Solaris 10 (Event Ports)

HTTP Keep Alive

- Sends Multiple HTTP Requests over a single TCP Socket.
- Performance Tuning Docs commanded that it is Disabled!
- Designed to improve performance?
- Apache HTTPD is the problem....

Why?

- All other MPMs:
 - Child waits `KeepAliveTimeout` seconds
 - No other requests served
 - Fill up to `MaxClients`

The Solution!

- Event MPM uses a separate thread:
 - Handles all listening Sockets
 - Handles all KeepAlive connections
 - Workers pass a KeepAlive Conn back
 - Workers free to service other requests

Not Perfect.

- Pipelined Requests with `mod_ssl`
 - No easy solution at this time
 - Maybe fixed in 2.4?

mod_dbd

- Database Services for other modules
 - Connection Pooling
 - Connection Sharing (cross module)
- Make it easier to build applications on top of httpd.

More Features

- `mod_ssl`: TLS Upgrade inside HTTP
- `mod_info`: Hooks, File Names, and Line Numbers
- Large File Support enabled by default
- `libpcre` Updated to 5.0
- Dump loaded modules, `httpd -M`

Even More Features

- `mod_version: <IfVersion >=2.2</code>`
- `graceful-stop`: Drop sockets quickly
- Default Configuration Re-vamped.
- `httxt2dbm`: Create DBM Files for RewriteMap

Future Development

- Async MPMs
- AAA/Require/Satisfy Any
- Debug Logging per Module
- More Protocols:
 - mod_ftp
 - mod_smtpd

Questions?

- Slides Online: <http://www.outoforder.cc/>
- See Also:
 - TUI 9: AAA in Apache 2.2