



Apache httpd 2.4

The Web Server for the Cloud

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About me

- Mladen Turk
 - ASF Member, Tomcat PMC chair
 - Contributor from 20th century
 - Principal Software Engineer with Red Hat



What we will cover

- What's new in 2.4
 - General improvements
 - Proxy module improvements
- Cloud and the Web



Apache httpd 2.4

- Currently in 2.4.1 (in vote)
- Significant improvements
 - Performance
 - New features
 - Cloud ready
 - Sort of...



Apache httpd 2.4

- Async I/O
 - Event mpm as default
 - Further “modularization”
 - Loadable MPMs
- High performance APR



Apache httpd 2.4

- More advanced logging
 - new log levels

```
[mpm_event:trace6] ... event.c(1372): connections: 0 ...
```

- per module/per directory
- <If> supports per-requests conditions
- Generic shared memory provider



Apache httpd 2.4

- Standard bandwidth control
 - `mod_ratelimit`
- Security enhancements
 - `mod_reqtimeout`
- I/O buffering control
 - `mod_buffer`
- Support for LUA
 - You guess ... `mod_lua`



Reverse proxy

- Cloud is all about horizontal scalability
- Apache httpd still the most frequently used front-end
- Proxy must be cloud friendly
 - `mod_slotmem_shm`
 - originates from `mod_cluster`
 - we just scratch the surface



Reverse proxy features

- Generic reverse proxy implementation
- Supports various protocols
 - HTTP, HTTPS, CONNECT, FTP
 - AJP, FastGCI, SCGI
 - FDPASS
- Clustering and failover
- Load balancing
- Performance



Reverse proxy: What's new in httpd 2.4

- Supports FastCGI and SCGI in balancer
- mod_proxy_express
 - OpenShift
- mod_proxy_html
- mod_fcgid
- Support for dynamic configuration
- Runtime change of clusters w/o restarts
 - we still need descent persistence layer



mod_proxy_balancer

- Loadable strategy modules
 - mod_lbmethod_heartbeat
 - requests
 - traffic
 - busyness
 - custom
- Goal is to catch up with mod_jk
 - Improve AJP
 - Support comet with AJP?



Reverse proxy

- Connection pooling
- Available for named workers
 - ProxyPass ...
- Reusable connection to origin
 - For threaded MPMs
 - Prefork always use single connection



Load Balancer

- Cluster sets with failover
- Group your backend servers
 - lower to higher sets first
 - auto switch back
- Hot standby



Balancer manager

- Monitor the status at run time
- Edit capabilities
- CLI usage
- XML or HTML



Balancer Manager

localhost:8008/balancer-manager?b=mycluster&nonce=2ec85d2a-677c-4c5b-8d06-c9e64e418fab

Load Balancer Manager for localhost

Server Version: Apache/2.4.2-dev (Unix)
Server Built: Feb 14 2012 16:47:05

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

MaxMembers	StickySession	DisableFailover	Timeout	FailoverAttempts	Method	Path	Active
4 [4 Used]	(None)	Off	0	3	bytraffic	/apps	Yes

Worker URL	Route	RouteRedir	Factor	Set	Status	Elected	Busy	Load	To	From
http://servera:8008			1	0	Init Ok	0	0	0	0	0
http://serverb:8008			1	0	Init Ok	0	0	0	0	0
http://serverc:8008			1	0	Init Ok	0	0	0	0	0
http://serverd:8008			1	0	Init Ok	0	0	0	0	0

Edit balancer settings for [balancer://mycluster](#)

LBmethod:	<input type="text" value="bytraffic"/>
Timeout:	<input type="text" value="0"/>
Failover Attempts:	<input type="text" value="3"/>
Disable Failover:	<input type="radio"/> On <input checked="" type="radio"/> Off
Sticky Session:	<input type="text"/> (Use '-' to delete)
<input type="button" value="Submit"/>	



Balancer manager

```
<Proxy balancer://mycluster>  
  BalancerMember http://localhost:8080  
  BalancerMember http://localhost:8081  
  BalancerMember http://localhost:8082 status=+h  
  BalancerMember http://localhost:8083 lbset=1  
  ProxySet lbmethod=bytraffic  
  ProxySet growth=10  
</Proxy>  
ProxyPass /apps/ balancer://mycluster  
ProxyPassReverse /apps/ balancer://mycluster
```



Balancer Manager

localhost:8008/balancer-manager?b=mycluster&nonce=a5fbde28-f4ce-4266-bebb-5b7857d2f712

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http://localhost:8081			1	0	Init Ok	0	0	0	0	0
http://localhost:8082			1	0	Init Stby Ok	0	0	0	0	0
http://localhost:8083			1	1	Init Ok	0	0	0	0	0

Edit balancer settings for [balancer://mycluster](#)

LBmethod:	<input type="text" value="bytraffic"/>
Timeout:	<input type="text" value="0"/>
Failover Attempts:	<input type="text" value="3"/>
Disable Failover:	<input type="radio"/> On <input checked="" type="radio"/> Off
Sticky Session:	<input type="text"/> (Use '-' to delete)
Add New Worker:	<input type="text"/> Are you sure? <input type="checkbox"/>
<input type="button" value="Submit"/>	



Cloud and Web Servers

- Horizontal scalability solved
- Minimized concurrency
- Density still matters
- Transaction time is now important
 - Low latency
 - Fast request/response turnover



Conclusion ...

- httpd 2.4 has painless transition
- Performance is still relevant
- A lot of room for improvement (both for cloud and not)



Thank you.

