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Apache

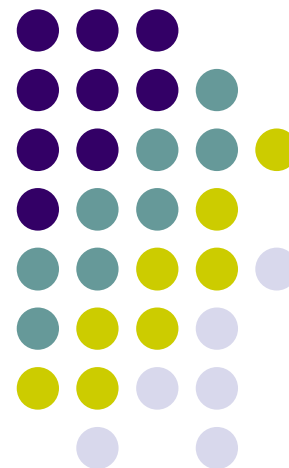


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# Web Server

- $\mu\mu$  (daemon, httpd) :
  - TCP connection client
  -
- Web servers:
  - HTML
  - links
- Web site = host + Web server + information (file system)

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# Web Server



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- UNIX, Ms Windows, Macintosh, VMS, VM, ...
- μ Web Servers:
  - <http://www.w3.org/Servers.html/>
- μ Web Server:
  - CERN, NCSA ( web server)
  - Apache, MS IIS, Netscape

# Apache



- $\mu$
- :
- $\mu$
- HTPP 1.1. 1.2.
- modules
- $\mu$  installation/complie
- Apache home: <http://www.apache.org/>



## (Ubuntu)

- apt-get install apache2
  - apt-get install apache2-mpm-prefork
  - apt-get install apache2-mpm-worker
  - apt-get install apache2-mpm-perchild
- daemon : apache2
  - port 80 ( http )
  - port 443 ( https )
- script : apache2
  - /etc/init.d/apache2 start



# Configuration

- /etc/apache2/apache2.conf
  - httpd.conf
  - ports.conf
  - conf.d/
  - mods-available
  - mods-enabled/
  - sites-available/
  - sites-enabled/
  - proxy-conf



# Apache (1)

- ServerType {standalone|inetd}
- Listen 80
  - $\mu$  Apache  $\mu$
  - $\mu$   $\mu$   $\mu$
  - $\mu$   $\mu$   $\mu$   $\mu$   $\mu$
  - directives BindAddress and Port
- ServerRoot /etc/apache2
  - apache 1.3 - ServerRoot /etc/httpd
- PidFile /var/run/apache2.pid
  - apache 1.3 - PidFile /var/run/httpd.pid



## Apache (2)

- TimeOut <seconds>

- $\mu$   $\mu$  Server  $\mu$

- KeepAlive <on|off>

- / HTTP persistent

- KeepAliveTimeOut <seconds>

- $\mu$   $\mu$  Server  $\mu$
- $\mu$  persisten

- MaxKeepAliveRequests <n>

- $\mu$   $\mu$   $\mu$
- persistent





# Server (1)

- **ServerName**
  - `ServerName server`
  - `ServerName server` `ServerAlias` URLs (redirection URLs).
  - `ServerName www.cnms.uop.gr:80`
  - <http://httpd.apache.org/docs/2.2/mod/core.html#servername>
- **ServerAdmin**
  - `ServerAdmin admin@cnms.uop.gr`
- **DocumentRoot**
  - `DocumentRoot "/var/www/html"` (default )



## Server (2)

- User/Group
  - . . User apache
  - . . Group apache
- UserDir
  - user-specific directories
  - . . UserDir disable root
  - . . UserDir WWW
- DirectoryIndex
  - . . DirectoryIndex index.html

# Log



- logging (LogLevel)
  - Emerg, Alert, Crit, Error, Warn, Notice, Info, Debug
- LogFormat
- ErrorLog logs/error\_log
- TransferLog logs/access\_log
- CustomLog



# (Authentication)

- AuthName
  - $\mu$  username / password
  - . . AuthName "Password Required to enter this area"
- AuthType Basic
- AuthUserFile .htpasswd
- AuthGroupFile .htgroup
- Require valid-user
  - $\mu$   $\mu$   $\mu$
  - . . Require user root



(1)

- allow from all|...
  - . . allow from 192.168.1.5
- deny from all|...
  - . deny from 147.102.5.1
- Order allow,deny

## (2)



- - .htaccess
  - <Files ...>...</Files>
    - 
    - ...
- ```
<Files ~ "\.(gif|jpe?g|png)$">  
  Order allow,deny  
  Deny from all  
</Files>
```



## (3)

- `<Directory ...>...</Directory>`
  - 
  - . . .  
`<Directory /user/*/*/WWW>`  
AllowOverride FileInfo AuthConfig Limit  
Options Indexes SymLinksIfOwnerMatch ExecCGI  
`</Directory>`
- `<DirectoryMatch regex>...</Directory>`
  - . . . `<DirectoryMatch "^/www/(.+)?[0-9]{3}">`
    - $\mu$           www           $\mu$



# Directive AllowOverride

- $\mu$  directives  $\mu$  directives.
- directives .htaccess
  - AuthConfig
    - directives
  - FileInfo
    - directives
  - Indexes
    - directives indexing
  - Limit
    - directives host
  - Options
    - directives  $\mu$   $\mu$   $\mu$   $\mu$  <Directory>





# Directive AllowOverride (Options)

- Options [+|-]option [[+|-]option]

- 

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- None
- All
- ExecCGI
- FollowSymLinks
  - server
- SymLinksOwnerMatch
- Indexes
- MultiViews

symbolic links

directory

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# Virtual Hosts

- IP-based Virtual Host



web site

IP address

- Name-Based Virtual Host



IP

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- <http://httpd.apache.org/docs/2.2/vhosts/>



# IP-Based Virtual Hosts

```
<VirtualHost 192.168.1.100>  
  ServerName host1.cnms.uop.gr  
  DocumentRoot /www/docs1  
</VirtualHost>  
<VirtualHost 192.168.1.200>  
  ServerName host2.cnms.uop.gr  
  DocumentRoot /www/docs2  
</VirtualHost>
```



# Name-Based Virtual Hosts

```
NameVirtualHost 192.168.1.100
```

```
<VirtualHost 192.168.1.100>
```

```
    ServerName host1.cnms.uop.gr
```

```
    DocumentRoot /www/docs1
```

```
</VirtualHost>
```

```
<VirtualHost 192.168.1.100>
```

```
    ServerName host2.cnms.uop.gr
```

```
    DocumentRoot /www/docs2
```

```
    ErrorLog logs/host2
```

```
</VirtualHost>
```



# Web Server

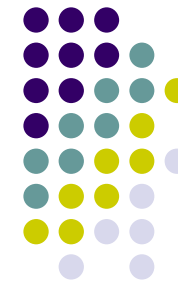
- host
- DNS alias  $\mu$  host  
(*www.domain.country*)
- **DocumentRoot** **Log** directories **ServerRoot**,  
administrator  $\mu$   $\mu$
- $\mu$  CGI rules

# Apache 2 MPM( Multiprocessing Modules ) (1)



- prefork
  - non-threaded, pre-forking web server
- worker (pthread)
  - multi-process multi-threaded server
- perchild
  - multi-process multi-threaded server

Apache 1.3      Unix      μ      μ      μ

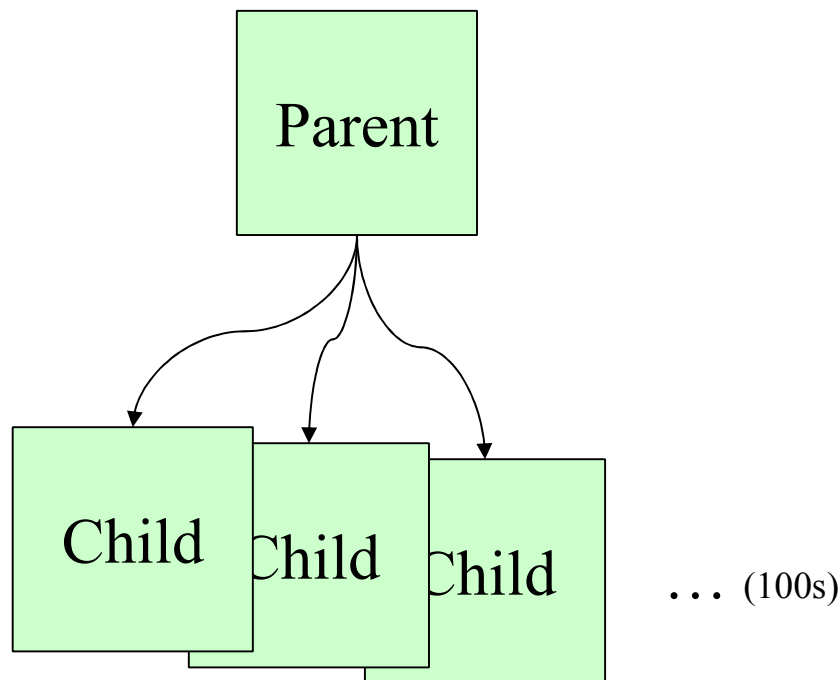


# Prefork

- Apache 1.3,
- Apache 2.0 Prefork

- ( )

- $\mu$



# Apache 2 MPM( Multiprocessing Modules ) (2)



- worker
  - multi-process multi-threaded server
  - (process) μ
  - threads.
  - O server μ μ μ .
  - μ
- perchild
  - multi-process, multi-threaded web server
  - μ μ .
  - threads
  - O server μ μ μ threads .
  - μ

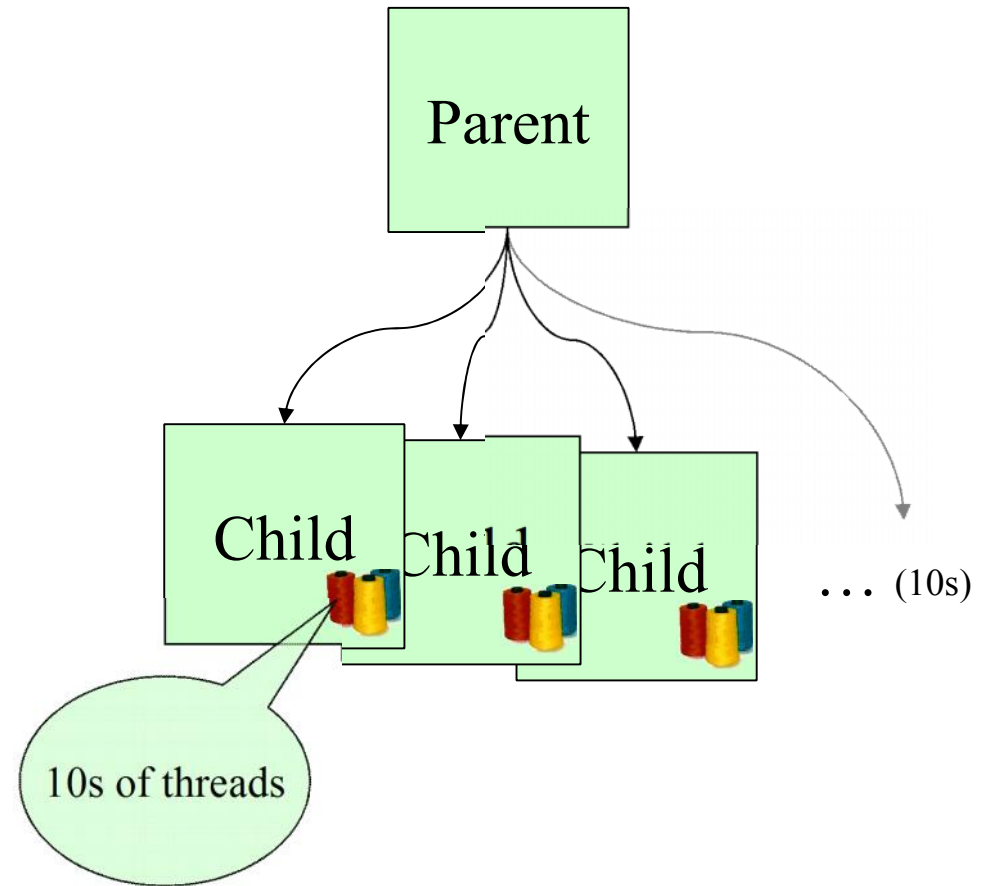




# Worker

- Apache 2.0 Worker

- ( )
- 





# μ μ (Modules)

- μ API
- Pluggable Interface
- μ



# In-process Modules

- $\mu$ 
  - CGI (mod\_cgi)
  - mod\_perl
  - mod\_php
  - mod\_python
  - mod\_tcl

httpd

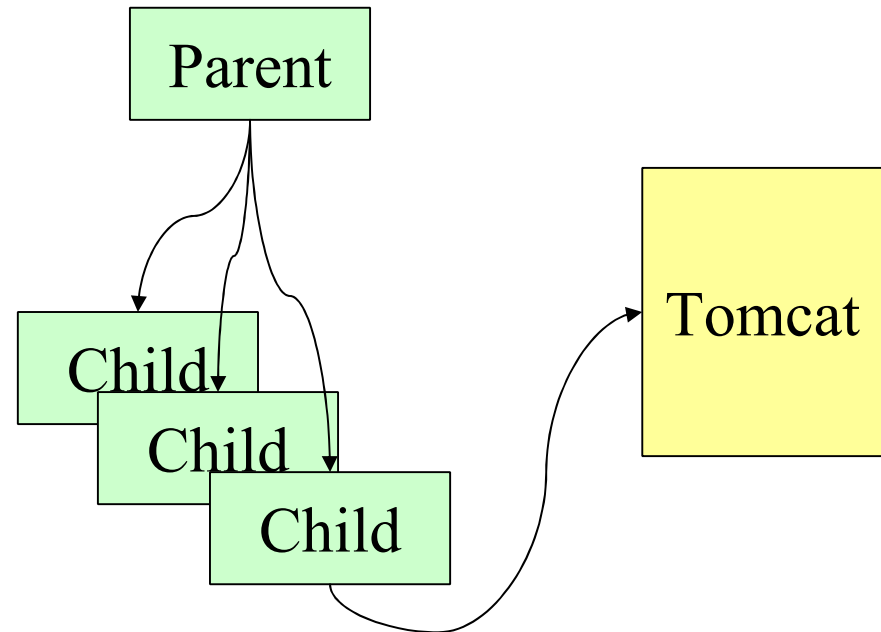


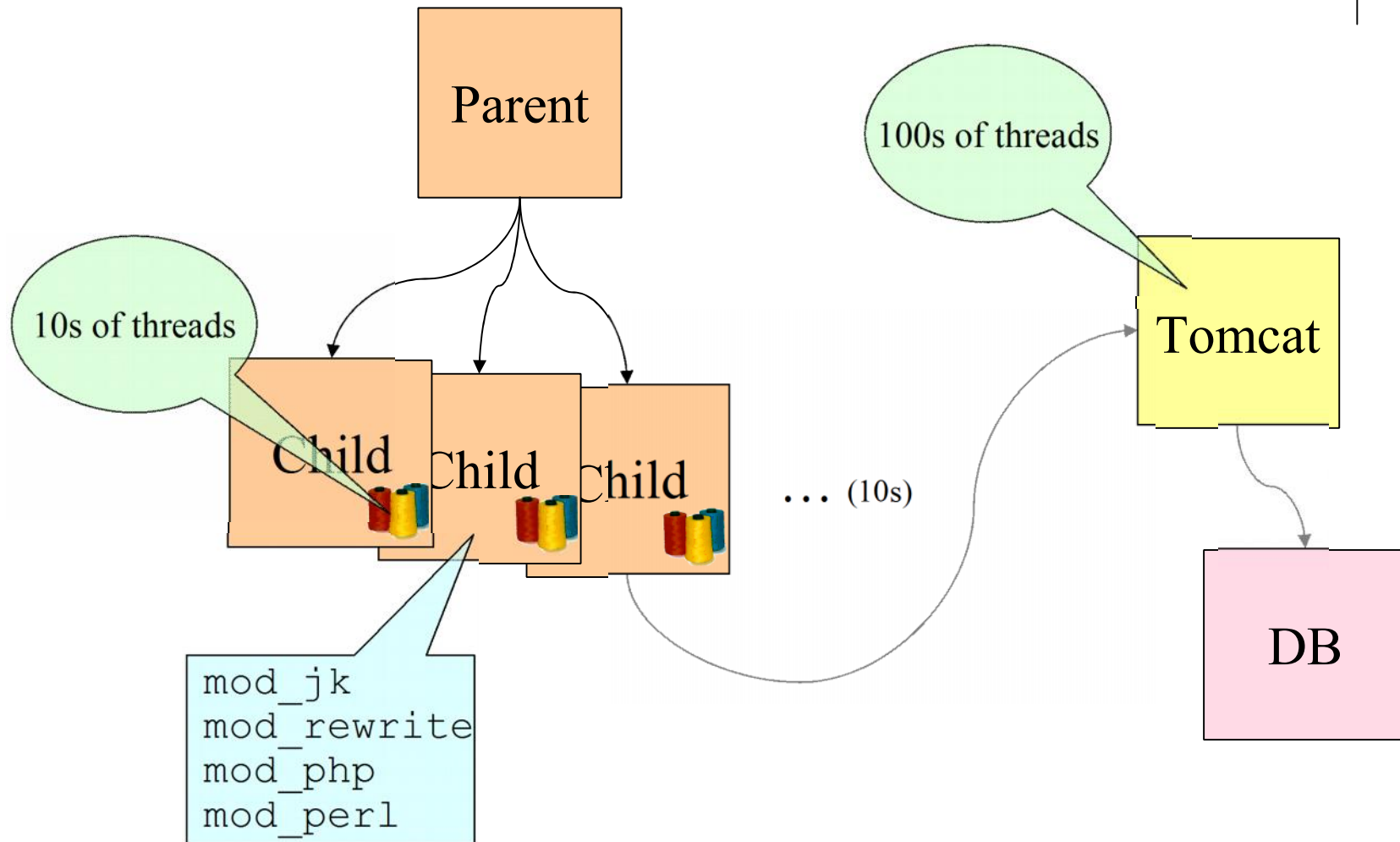
# Out-of-process Modules



httpd ( . . .  
Application Server)

- Tomcat
  - mod\_jk/jk2, mod\_jserv
- mod\_proxy
- mod\_jrun

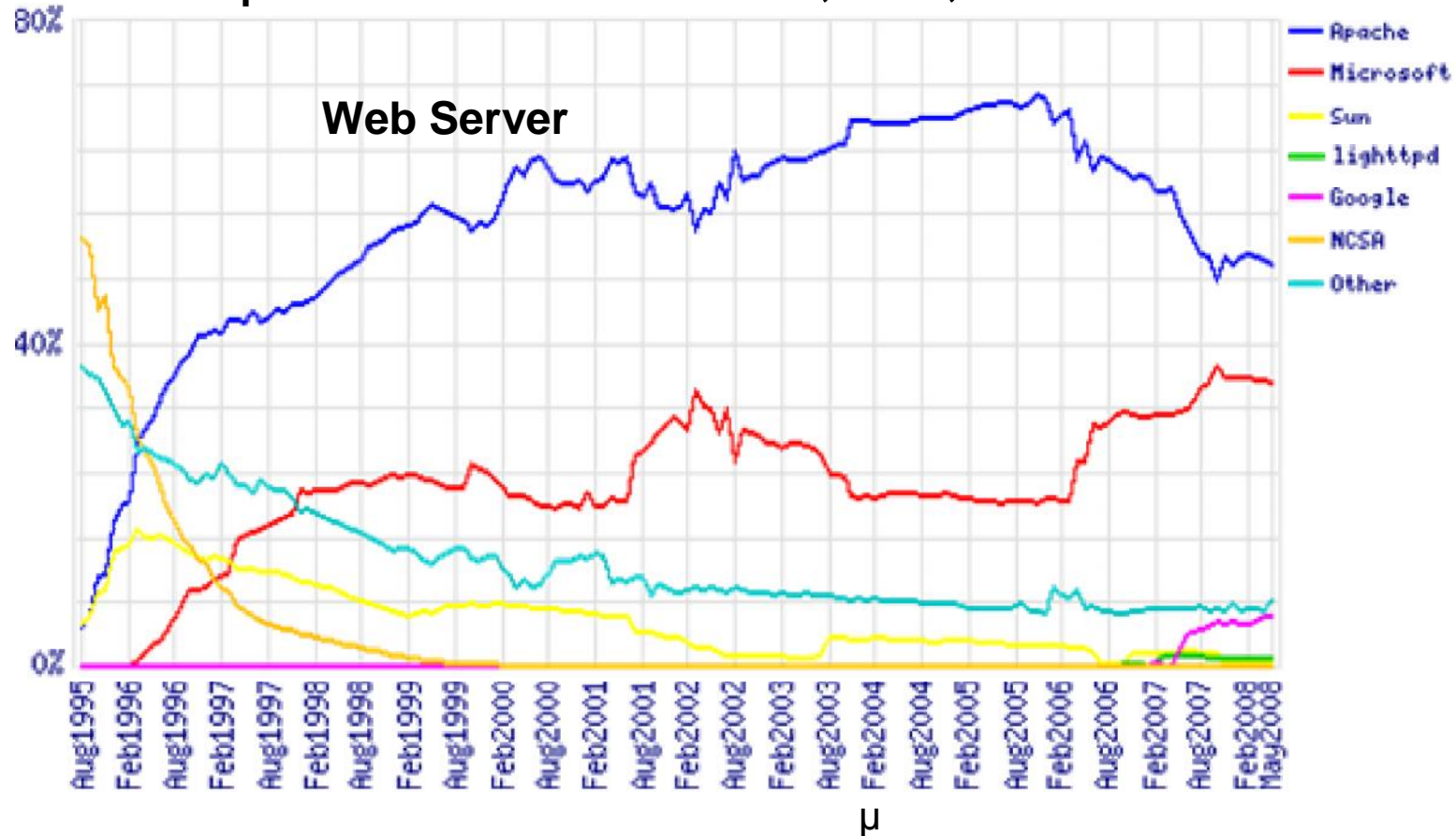






# Web Servers (1)

- netcraft.com 2008 Web Server  $\mu$  168,408,112 sites





# Web Servers (2)

- netcraft.com 2008 Web Server  $\mu$  168,408,112 sites

