Integrating Web Applications
with Apache Web Server

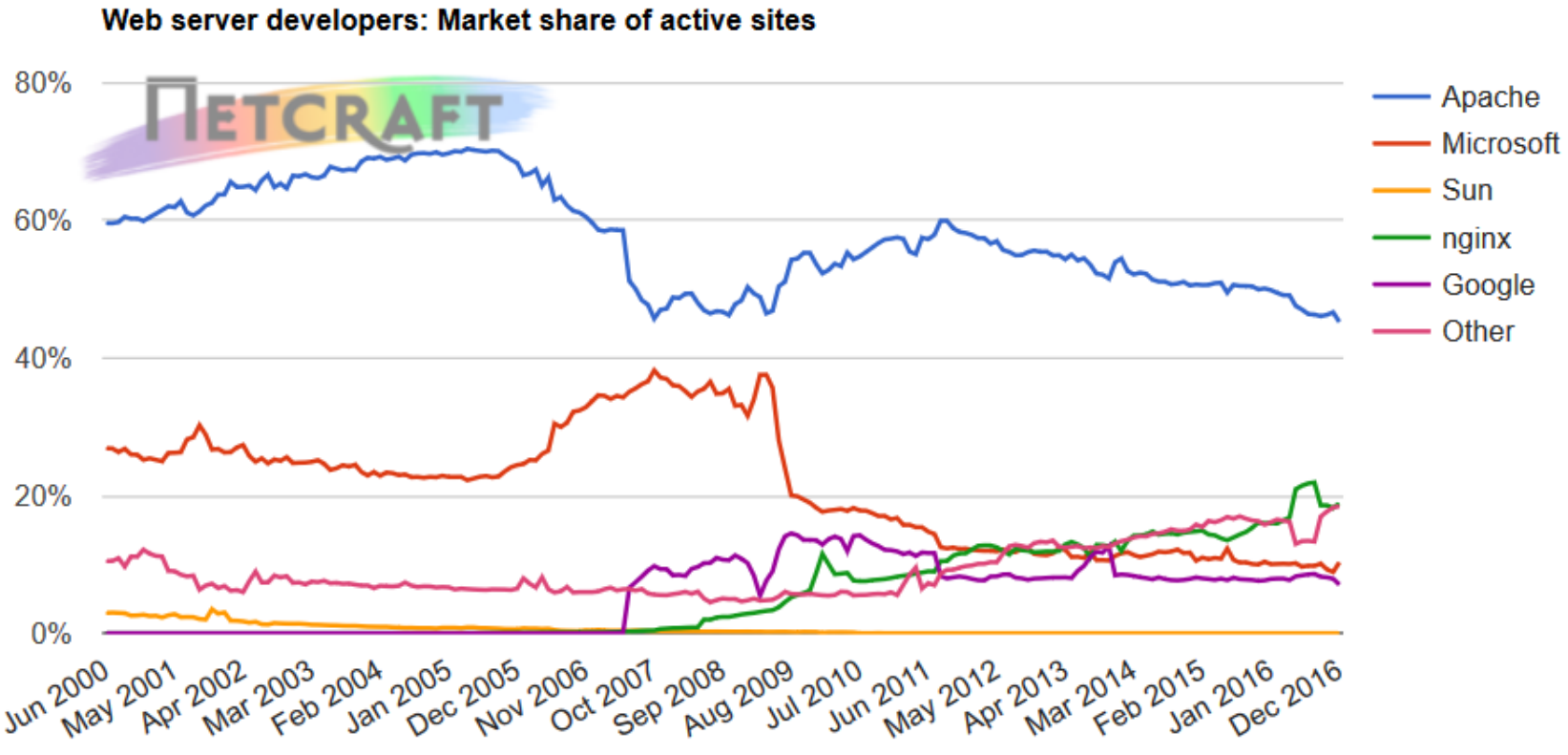
Presented by Andy Carlson

For supplementary content visit
www.andydoestech.com/olf2018.html

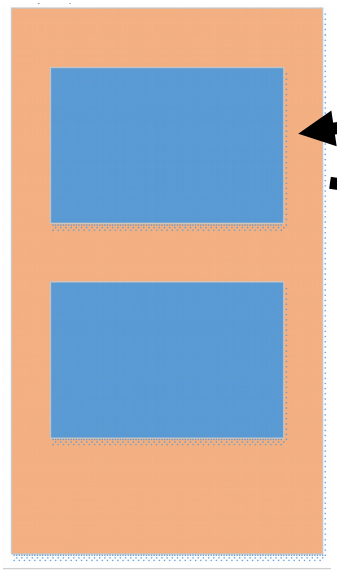
Overview of Apache

- Most Popular HTTP server on the internet
- Highly configurable with modules
- Wide range of language support
  (PHP, Python, Ruby, Perl, CGI)
- Runs on all popular operating systems
- Easy to install
- Free and Open Source

Overview of Apache



Understanding HTTP

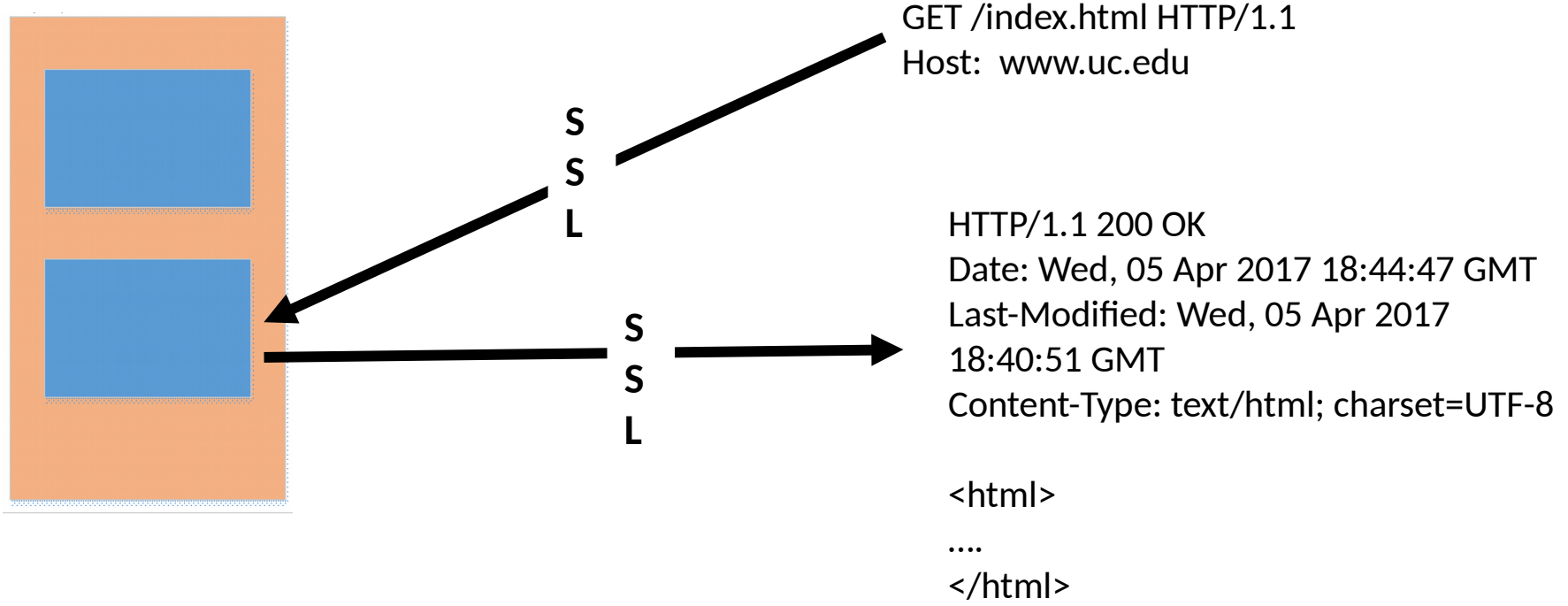


GET /index.html HTTP/1.1
Host: www.uc.edu

HTTP/1.1 200 OK
Date: Wed, 05 Apr 2017 18:44:47 GMT
Last-Modified: Wed, 05 Apr 2017
18:40:51 GMT
Content-Type: text/html; charset=UTF-8

<html>
....
</html>

Understanding HTTP



Apache Modules

- mod_rewrite
  - URL Rewriting
- mod_proxy
  - Connection Proxying
- mod_headers
  - Header Rewriting
- mod_substitute
  - Replace Text in HTTP Response
- mod_macro
  - Reuse Common Configuration

Using Modules

- Loading Modules
  - Syntax: `LoadModule module_name module_file_path`
- Be aware of Distro-specific configuration
- Building from source? Remember to configure your build with necessary modules.

mod_rewrite

- RewriteEngine
- RewriteBase
- RewriteRule
- RewriteCond

mod_rewrite

- RewriteEngine on | off
  - Turns RewriteEngine on or off
- RewriteBase URL
  - Sets base URL for rewriting

mod_rewrite - RewriteRule

- Syntax: RewriteRule path url flag
- Path
  - Static Text
  - Regular Expression
- URL
  - Relative or absolute URL
  - Regex Variables
- Flag
  - Configures how RewriteRule is executed

mod_rewrite – RewriteRule Example

Example

Perform redirect for requests to /maps and anything underneath it to maps.google.com (preserving URL) and don't perform any matching RewriteRules

Solution

```
RewriteRule /maps(.*)$ http://maps.google.com$1 [L]
```

mod_rewrite - RewriteCond

- Syntax: RewriteCond Haystack Needle [Flag]
- Haystack
  - Variable
- Needle
  - Regular Expression
- Flag
  - Configures how RewriteRule is executed
- Note: followed by other RewriteCond and/or RewriteRule

mod_rewrite – RewriteCond Example

Example

Evaluate the request URL to see if it contains the word “pageid” or “storyid”

Solution

RewriteCond %{REQUEST_URI} “^.*pageid.*$” [OR]
RewriteCond %{REQUEST_URI} “^.*storyid.*$”

mod_proxy

- ProxyPass
- ProxyPassReverse
- ProxyPassMatch

mod_proxy – ProxyPass

- Syntax: ProxyPass Path URL
- Path
  - URL path
- URL
  - Protocol, hostname, port, and path of remote server
- Note: This only proxies HTTP Request traffic bound for the remote server

mod_proxy - ProxyPassReverse

- Syntax: ProxyPassReverse Path URL
- Path
  - URL path
- URL
  - Protocol, hostname, port, and path of remote server
- Note: This only proxies HTTP Response traffic coming from the remote servere

mod_proxy – Proxy Example 1

Example

Proxy traffic for content under the /home URL to http://userhome.local:8080

Solution

ProxyPass /home http://userhome.local:8080/
ProxyPassReverse /home http://userhome.local:8080/

mod_proxy – ProxyPassMatch

- Syntax: ProxyPassMatch PathExpression URL
- PathExpression
  - Regular Expression
- URL
  - Protocol, hostname, port, and path of remote server
- Note: This only proxies HTTP Request traffic bound for the remote server

mod_proxy – Proxy Example 2

Example

Proxy traffic for each users doc folder URL to http://userdocs.local:8080. User folders are located under /home.

Solution

ProxyPassMatch /home/([a-z0-9]*)/docs http://userdocs.local:8080/$1
ProxyPassReverse /home http://userdocs.local:8080/

mod_header – Add Header

- Syntax: `Header set Name Value`
- Name
  - Name of header field
- Value
  - Value of header field

mod_header – Header Example 1

Example

Add header named RequestComplete with a value of Yes

Solution

Header set RequestComplete Yes

mod_header – Edit Header

- Syntax: Header edit Name SearchExpression ReplaceExpression
- Name
  - Name of header field
- SearchExpression
  - Regular Expression
- ReplaceExpression
  - Regular Expression

mod_header – Header Example 2

Example

Replace Location header field containing http://web01.local:8080 with http://public.server while preserving the path

Solution

Header edit Location “^http://web01.local:8080(.*)$” “http://public.server$1”

mod_substitute

- SetOutputFilter *
- Substitute

* Not provided by mod_substitute

mod_substitute – SetOutputFilter

- Syntax: SetOutputFilter Filter;Filter;…
- Filter
  - Order of filter to apply to content
- Necessary when proxied server compresses data
- Example
  - SetOutputFilter Inflate;Substitute;Deflate

mod_substitute – Substitute

- Syntax: Substitute RegexSubstitute
- RegexSubstitute
  - Syntax:
    - s|Search|Replace|Flag
  - Common Flag: i = Case Insensitive
- Replaces Content in HTTP Response

mod_substitute – Substitute Example

Example

Replace links in HTML response that begin with http://web01.local:8080 with https://public.server (assume data from web01.local is compressed)

Solution

SetOutputFilter INFLATE;SUBSTITUTE;DEFLATE

Substitute “s|(href=\”http)(://)web01.local:8080|$1s$2public.server|i”

mod_macro – Define Macro

- Syntax:

```
<Macro Name $variable1 ...>
    Directive1
    ...
</Macro>
```

- Name
  - Name of Macro
- variable1, variableN
  - variables passed as parameters to Macro
- Directive1, DirectiveN
  - Directives executed when Macro is called

mod_macro – Call Macro

- Syntax: `Use MacroName Param1`
- MacroName
  - Name of macro being called
- Param1, ParamN
  - Parameters passed to macro

mod_macro – Define Example

Example

Create a macro that will check the value of REQUEST_URI. If it begins with a value redirect to an http URL while preserving the URL path.

Solution

```
<Macro RedirectOnPath $PathBegin $TargetURL>
    RewriteCond “%{REQUEST_URI}” “^$PathBegin”
    RewriteRule ^(.*)$ http://$TargetURL$1
</Macro>
```

mod_macro – Call Example

Example

Call the RedirectOnPath Macro to search for paths beginning with “/audio” and redirect to http://music.server.

Solution

Use RedirectOnPath /audio http://music.server

Examples ☺

Questions ☺☺