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Web Frameworks

- HTTP Server
- Database
- User accounts, authentication, etc.
- Handling of common problems

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- Comics with comments
- Forums for discussions
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- Comics with comments
- Forums for discussions
- How not to require users to have multiple logins?
- Write my own software … in PHP
- Evolved over time, eventually I got to Lisp

Radiance Goals

- “Do it right this time”
- Run multiple applications side-by-side
- Share resources between applications
- Make as many parts optional as possible
- Configurable by administrator
- Documented well and easy to use

Radiance Problems

1. How to make features optional and exchangeable
2. How to divide up URL address space
3. How to make deployment as easy as possible

1. Interfaces

- Standardise access to common features
- Load interface implementation on demand
- Weak contract to ensure consistency

Interface Definition

```
(define-interface cache
  (defun invalidate (name)
    "Causes the cached value to be re-computed.")

  (defmacro with-caching (name test &body body)
    "Caches the return value if TEST is non-NIL."))
```

Interface Implementation

```
(defvar cache::*caches* (make-hash-table))

(defun cache:invalidate (name)
  (remhash name *caches*))

(defmacro cache:with-caching (name test &body body)
  (once-only (name)
    `(or (and (not ,test) (gethash ,name *caches*))
         (setf (gethash ,name *caches*)
               (progn ,@body)))))
```

Interface Usage

```
(asdf:defsystem another-todo-app
  :components ((:file "todo.lisp"))
  :depends-on ((:interface :cache)))
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todo.lisp

```
(defun render-todo-list (user)
  (cache:with-caching (user (changes-made-p user))
    (render-template (template "todo-list.html")
                     (fetch-todo-items user))))
```

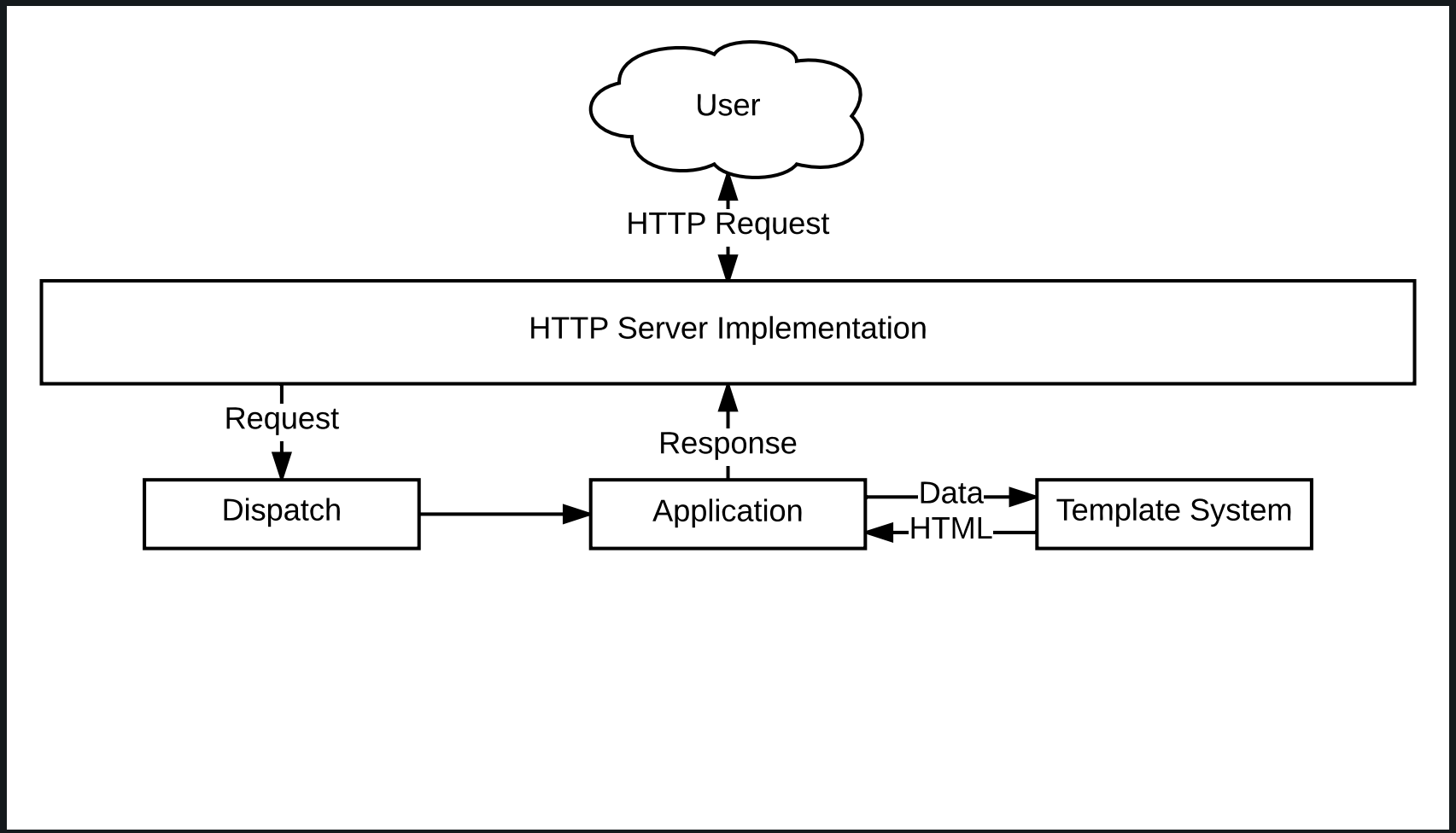
Interface Advantages

- No overhead as everything is direct calls
- Supports all kinds of definitions
- Allows framework to grow or shrink as needed
- Implementation can be exchanged

2. Routing

- Find proper content to deliver on an address
- Share the address space between applications
- Make it easy to visualise and understand

Routing Life-Cycle



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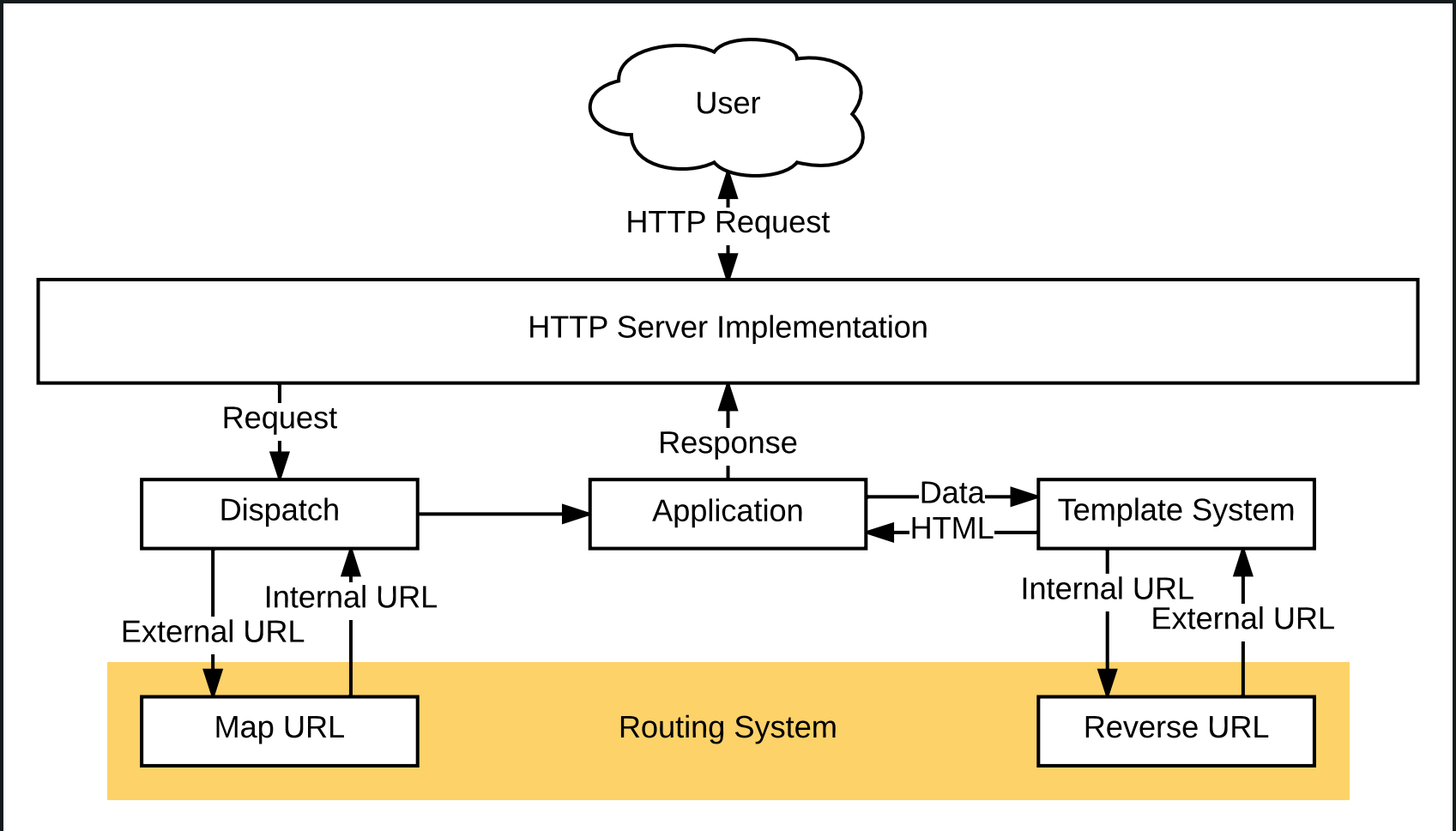

Page Definition

```
(define-page add-page "todo/add" ()
  (render-template (template "todo-add.html")))
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(define-page add-page "todo/add" ()
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todo-add.html

```
<form method="post">
  <textarea name="text"></textarea>
  <input type="submit" @formaction="todo/submit" />
</form>
```

Routing Example

Request `http://example.com/doit/add`

1. Map `example.com/doit/add` to `todo/add`
2. Dispatch to `add-page`
3. Reverse `todo/list` to `example.com/doit/submit`
4. Deliver compiled HTML

Route Definition

```
(define-string-route todo :mapping
  "/doit/(.*)" "todo/\\1")

(define-string-route todo :reversal
  "todo/(.*)" "/doit/\\1")
```

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```

alternatively

```
(define-route todo :mapping (uri)
  (when (begins-with "doit/" (path uri))
    (setf (domains uri) '("todo")
          (path uri) (subseq (path uri) 5))))
```

Routing Advantages

- Easier to visualise when developing
- URLs can be arbitrarily rewritten
- Easy to set up with shorthands

3. Environments

- Specify interface to implementation mapping
- Unify configuration of applications
- Ease setup for non-developers

Configuring Interfaces

```
(radiance:startup :my-env)

(setf (mconfig :radiance-core :interface :cache)
      "my-cache")
  ;=> "my-cache"
```

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```
my-env/radiance-core/radiance-core.conf.lisp
((:interfaces (:cache . "my-cache")
              ...)
 ...)
```

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(setf (mconfig :radiance-core :interface :cache)
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my-env/radiance-core/radiance-core.conf.lisp

```
((:interfaces (:cache . "my-cache")
              ...)
 ...)
```

repl

```
(ql:quickload :another-todo-app)
  ;=> Loading my-cache...
```

Environment Access

```
(in-package :another-todo-app)
(defvar *image-cache* (config-pathname "images/"))

(define-trigger startup ()
  (defaulted-config "Simple ToDo Lists" :title)
  (defaulted-config 256 :max-items))

(defun add-item (text user)
  (when (<= (config :max-items) (count-items user))
    (error "Too many items!"))
  ...)
```

Environment Advantages

- Easy to switch between setups
- Config files for people with no Lisp knowledge
- Unified place for storage of files

Putting it All Together

- Bulk of features provided through interfaces
- Features are pluggable, but standardised

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- Features are pluggable, but standardised
- Routing gives a convenient development view
- Setup is quick and relatively simple
- Environments standardise file storage
- Unified configuration and setup

Existing Applications

- Reader: A blog
- Purplish: An imageboard
- Filebox: A file storage
- Plaster: A paste service
- Chatlog: An IRC log viewer

Resources

Website

https://shirakumo.org/radiance

Documentation

https://shirakumo.org/radiance/documentation

Lengthy Tutorial

https://shirakumo.org/radiance/tutorial

Existing Applications

https://github.com/shirakumo

Acknowledgements

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