



# Server-Driven Memento Datetime Negotiation A UWS Case

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# UWS: Uninterruptible Web Service

Google

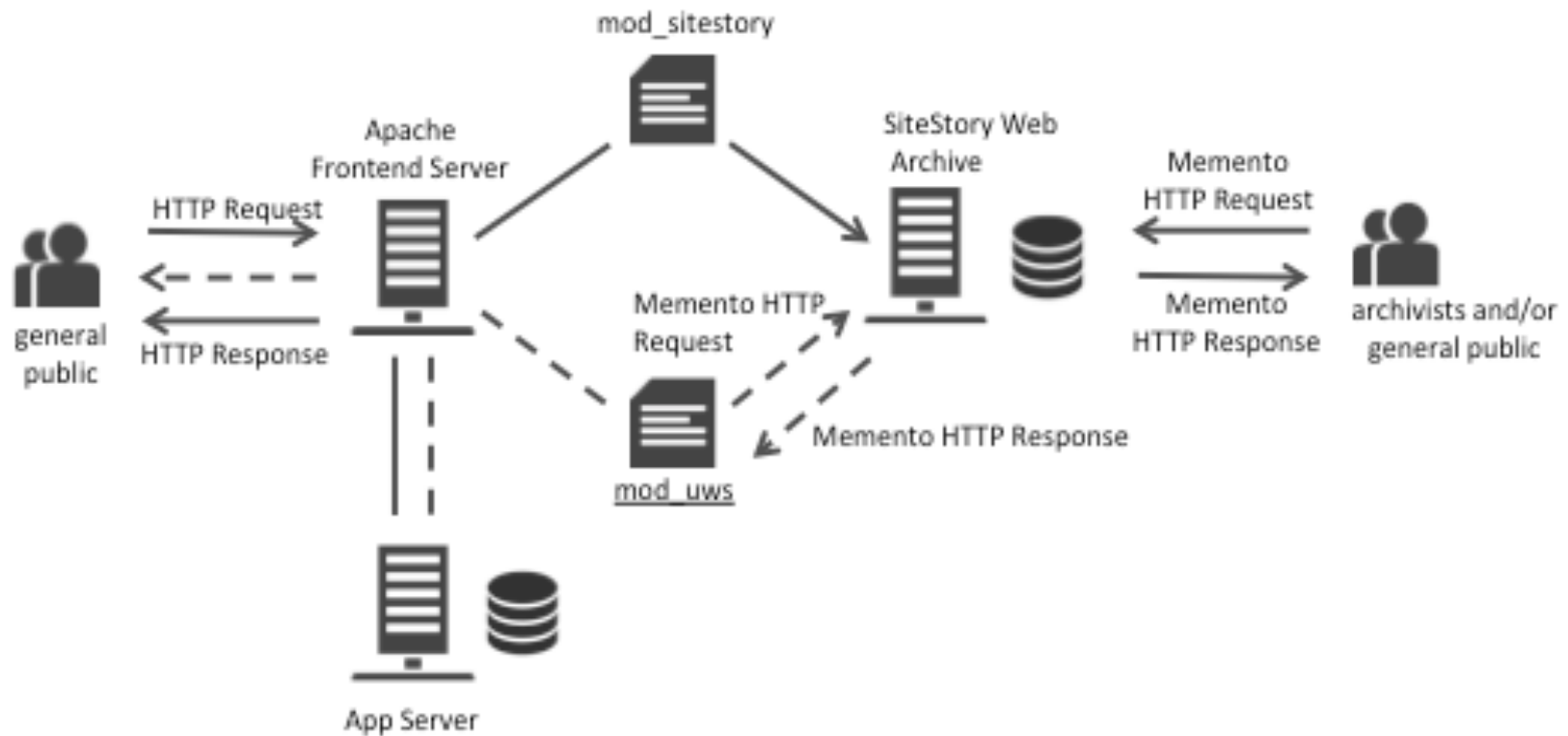
502. That's an error.

The server encountered a temporary error and will retry the request. Please try again in 30 seconds. That's all we know right now.

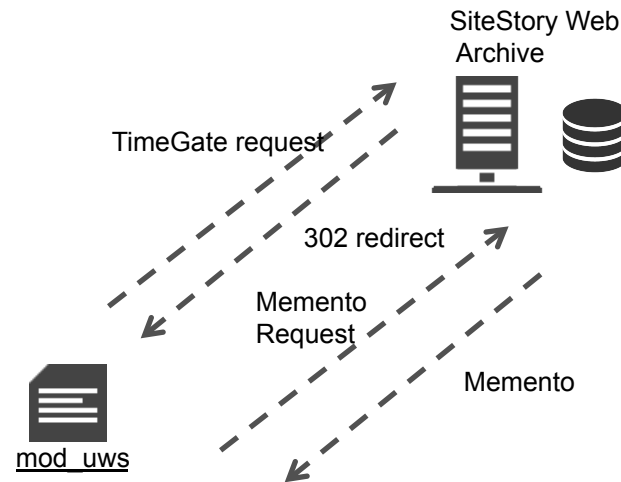
Please try again in 30 seconds. That's all we know right now.



# UWS Architecture



# Memento Datetime Negotiation



# Memento Pattern 2

- **Datetime Negotiation**
  - **Pattern 2.1: 302 Style**
  - **Pattern 2.2 and 2.3: 200 Style**
  - **Agent-driven negotiation**

```
1: UA --- HTTP HEAD/GET; Accept-Datetime: T -----> URI-R
2: UA <-- HTTP 200; Link: URI-G ----- URI-R
3: UA --- HTTP HEAD/GET; Accept-Datetime: T -----> URI-G
4: UA <-- HTTP 302; Location: URI-M; Vary; Link:
   URI-R,URI-T -----> URI-G
5: UA --- HTTP GET URI-M; Accept-Datetime: T -----> URI-M
6: UA <-- HTTP 200; Memento-Datetime: T; Link:
   URI-R,URI-T,URI-G ----- URI-M
```

Figure 2: A Datetime Negotiation Request/Response Chain

# Memento Pattern 4

- **Mementos without a TimeGate**
  - Unnecessary
  - Expensive
- **No Datetime Negotiation**

# Server-driven Content Negotiation

- The selection of the best representation for a response is made by an algorithm located at the server
- It is impossible for the server to accurately determine what might be "best" for any given user
- Having the user agent describe its capabilities in every request can be both very inefficient and a potential violation of the user's privacy
- It complicates the implementation of an origin server and the algorithms for generating responses to a request
- It may limit a public cache's ability to use the same response for multiple user's requests

# Agent-driven Content Negotiation

- Selection of the best representation for a response is performed by the user agent after receiving an initial response from the origin server
- Selection is based on a list of the available representations of the response included within the header fields or entity-body of the initial response, with each representation identified by its own URI.
- Suffers from the disadvantage of needing a second request to obtain the best alternate representation

# Memento Pattern 5?

- **TimeGate and many Mementos of the URI-R are hosted on the same server**
- **Requesting the most recently archived Memento**
- **Server-driven Datetime negotiation**

# Memento Pattern 5?

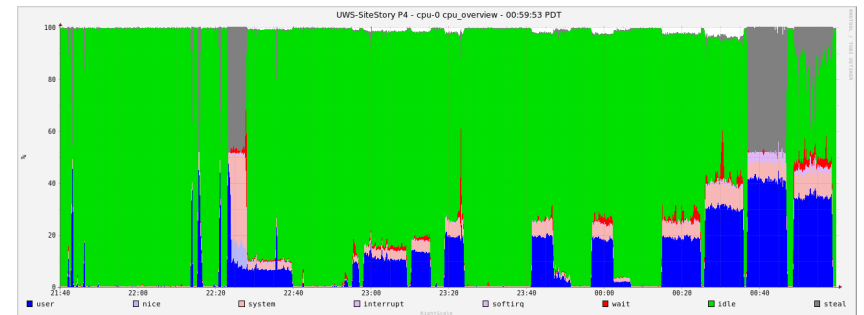
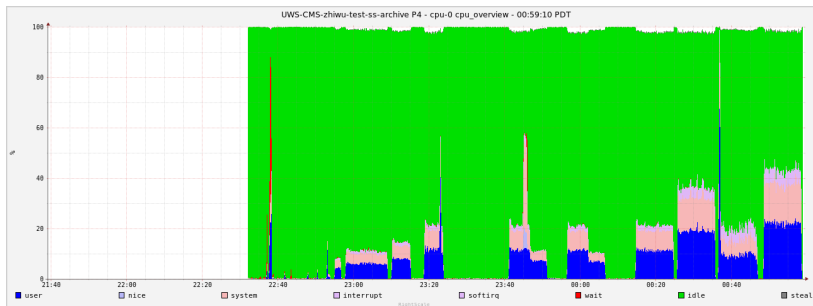
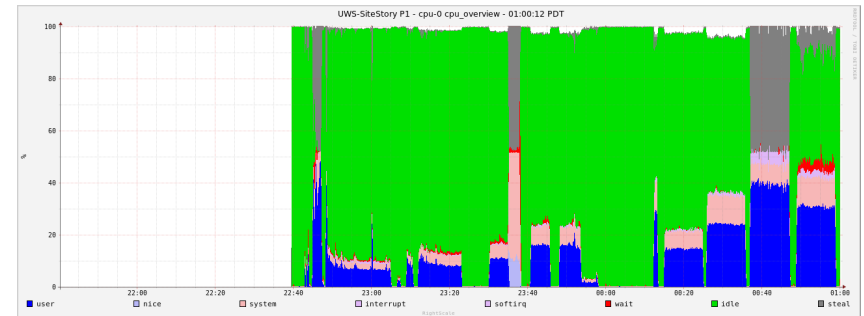
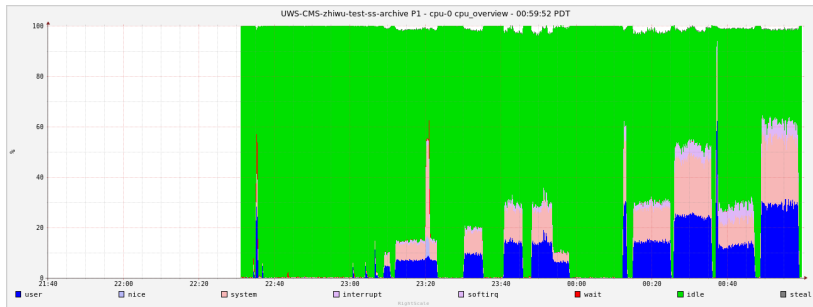
```
GET /timegate/http://a.example.org/ HTTP/1.1
Host: arxiv.example.net
Accept-Datetime: Thu, 25 June 2015 20:35:00 GMT
Connection: close
```

```
HTTP/1.1 200 OK
Date: Thu, 25 June 2015 20:35:01 GMT
Server: Apache-Coyote/1.1
Vary: accept-datetime
Memento-Datetime: Thu, 25 June 2015 20:34:20 GMT
Link: <http://a.example.org/>; rel="original",
      <http://arxiv.example.net/timemap/http://a.example.org/>
      ; rel="timemap"; type="application/link-format",
      <http://arxiv.example.net/timegate/http://a.example.org/>
      ; rel="timegate"
Content-Length: length
Content-Type: text/html;charset=utf-8
Connection: close
```

```
<html><p>Hello World!</p></html>
```

# Experiment Results

- Reduces UWS load by about 1/4 to 1/3
- No significant SiteStory load increase



# Questions

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