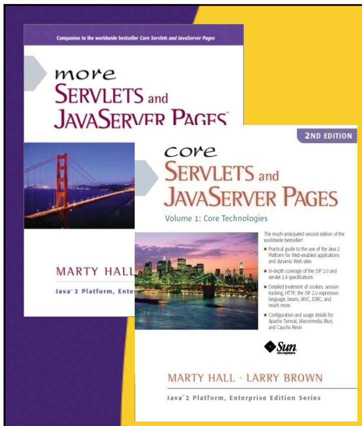
Generating the Server Response: HTTP Status Codes

Originals of Slides and Source Code for Examples:
http://courses.coreservlets.com/Course-Materials/csajsp2.html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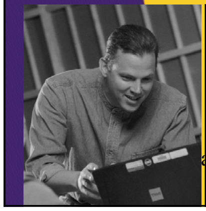


Agenda

- Format of the HTTP response
- How to set status codes
- What the status codes are good for
- Shortcut methods for redirection and error pages
- A servlet that redirects users to browser-specific pages
- A front end to various search engines

HTTP Request/Response

- Request

```
GET /servlet/SomeName HTTP/1.1
Host: ...
Header2: ...
...
HeaderN:
   (Blank Line)
```

- Response

```
HTTP/1.1 200 OK
Content-Type: text/html
Header2: ...
...
HeaderN: ...
   (Blank Line)
<!DOCTYPE ...>
<HTML>
<HEAD>...</HEAD>
<BODY>
...
</BODY></HTML>
```

Setting Status Codes

- **response.setStatus(int statusCode)**
  - Use a constant for the code, not an explicit int. Constants are in HttpServletResponse
  - Names derived from standard message. E.g., SC_OK, SC_NOT_FOUND, etc.
- **response.sendError(int code, String message)**
  - Wraps message inside small HTML document
- **response.sendRedirect(String url)**
  - Sets status code to 302
  - Sets Location response header also

Common HTTP 1.1 Status Codes

- **200 (OK)**
  - Everything is fine; document follows.
  - Default for servlets.
- **204 (No Content)**
  - Browser should keep displaying previous document.
- **301 (Moved Permanently)**
  - Requested document permanently moved elsewhere (indicated in Location header).
  - Browsers go to new location automatically.
  - Browsers are technically supposed to follow 301 and 302 (next page) requests only when the incoming request is GET, but do it for POST with 303. Either way, the Location URL is retrieved with GET.

Common HTTP 1.1 Status Codes (Continued)

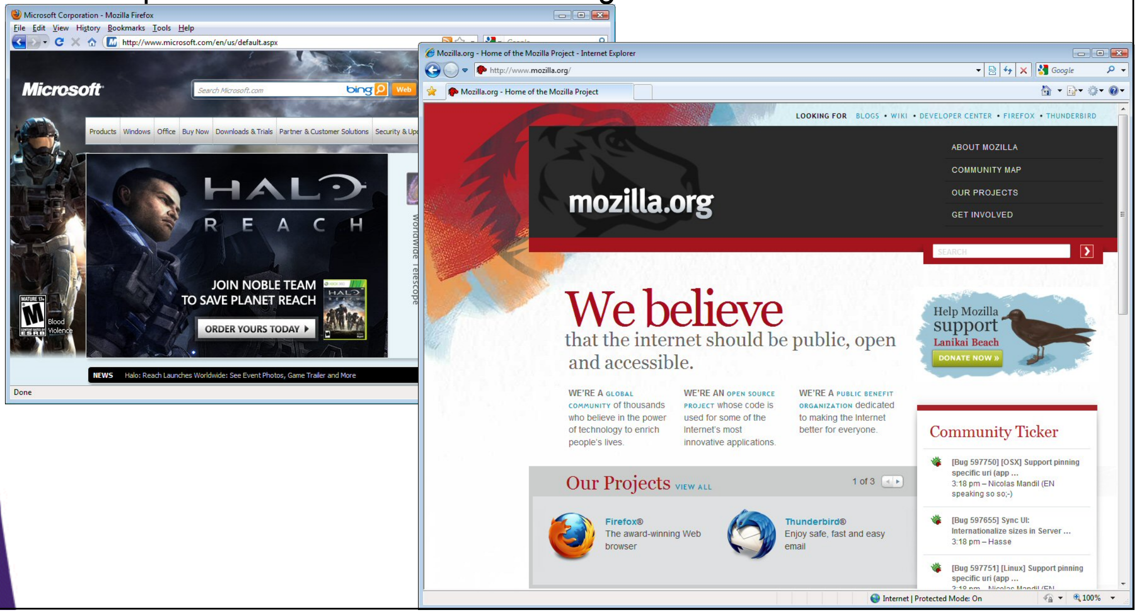
- **302 (Found)**
  - Requested document temporarily moved elsewhere (indicated in Location header).
  - Browsers go to new location automatically.
  - Servlets should use sendRedirect, not setStatus, when setting this header. See example.
- **401 (Unauthorized)**
  - Browser tried to access password-protected page without proper Authorization header.
- **404 (Not Found)**
  - No such page. Servlets should use sendError to set this.
  - Problem: Internet Explorer and small (< 512 bytes) error pages. IE ignores small error page by default.
  - Fun and games: http://www.plinko.net/404/

A Servlet That Redirects Users to Browser-Specific Pages

```
@WebServlet("/wrong-destination")
public class WrongDestination extends HttpServlet {
  public void doGet(HttpServletRequest request,
                    HttpServletResponse response)
      throws ServletException, IOException {
    String userAgent = request.getHeader("User-Agent");
    if ((userAgent != null) &&
        (userAgent.contains("MSIE")) {
      response.sendRedirect("http://home.mozilla.com");
    } else {
      response.sendRedirect("http://www.microsoft.com");
    }
  }
}
```

A Servlet That Redirects Users to Browser-Specific Pages

- **Original URL for *both***
  - http://localhost/status-codes/wrong-destination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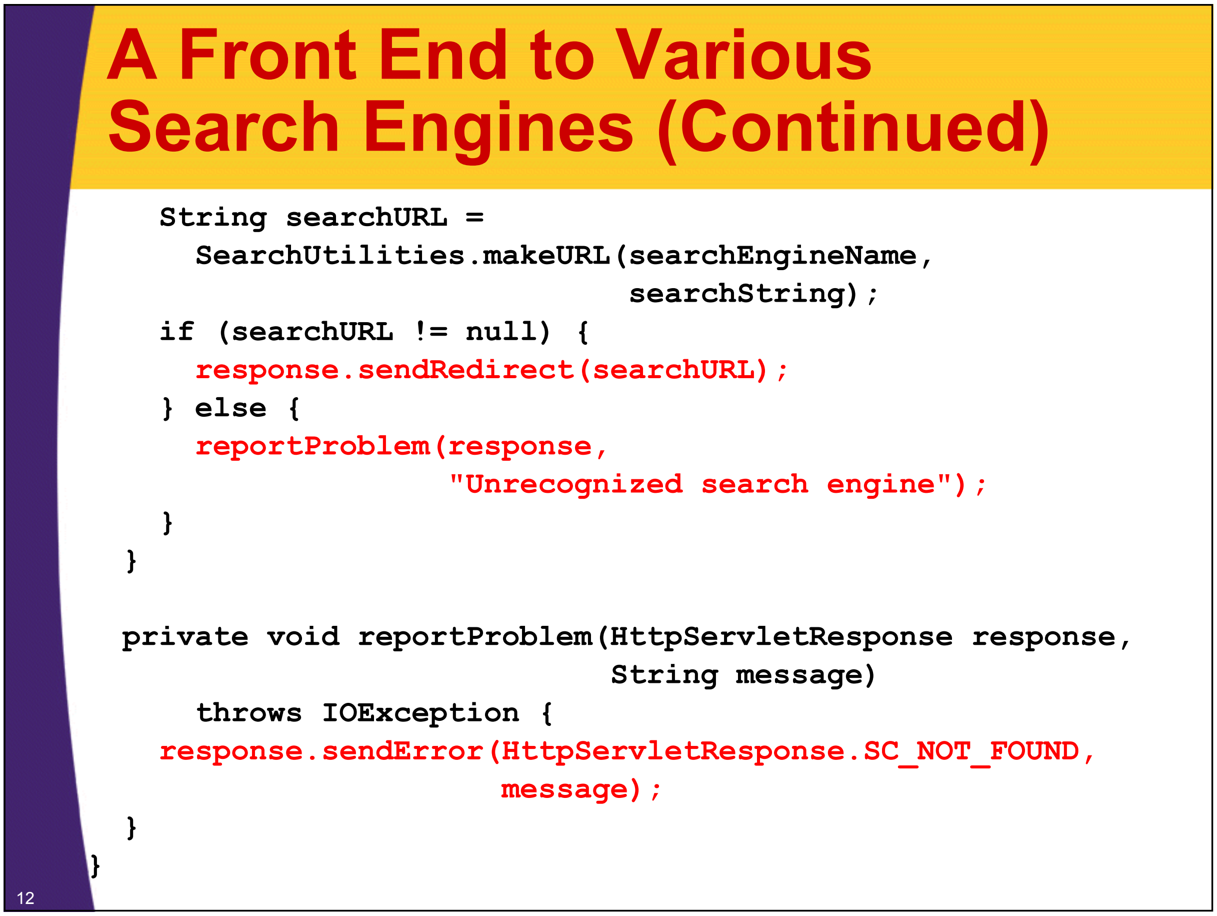
Community Ticker

A Front End to Various Search Engines

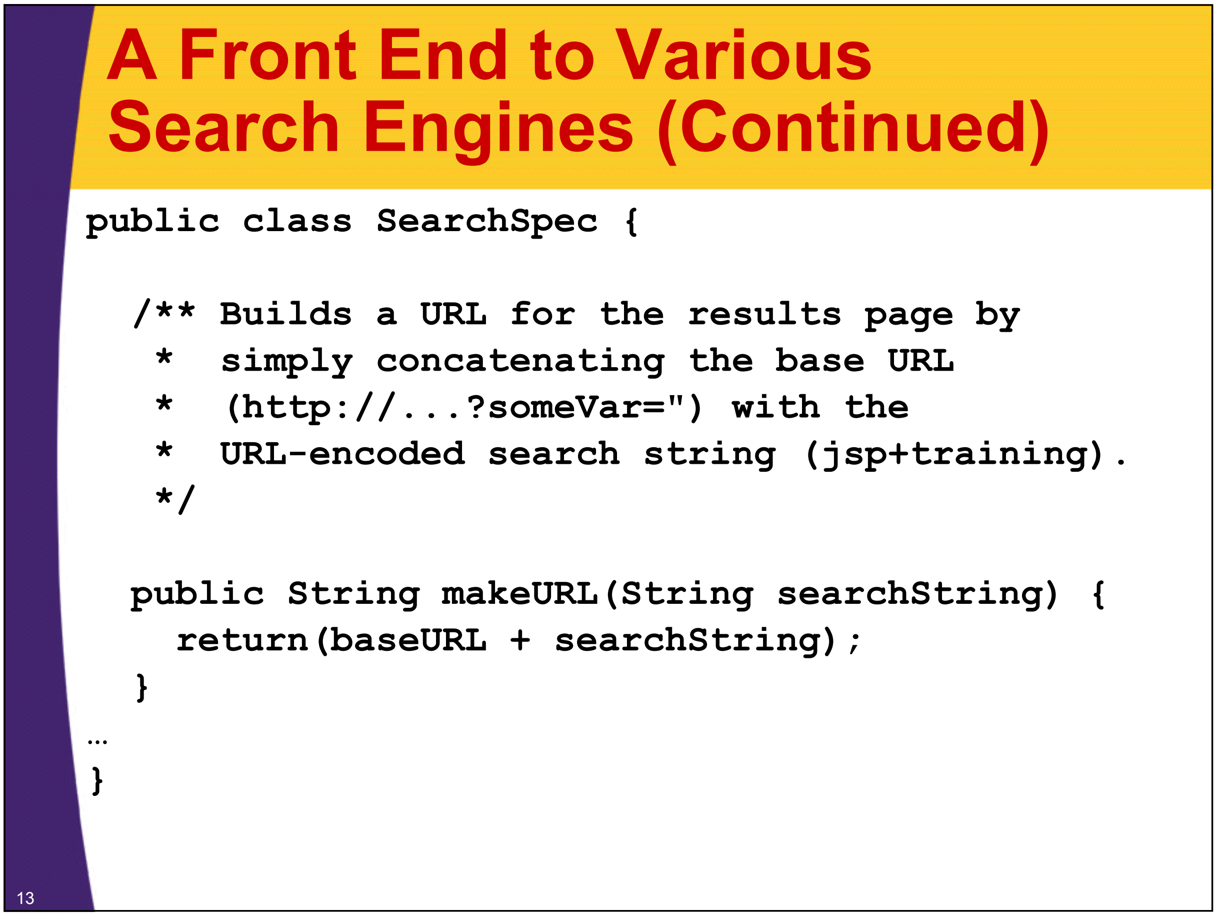
```
@WebServlet("/search-engines")
public class SearchEngines extends HttpServlet {
  public void doGet(HttpServletRequest request,
                    HttpServletResponse response)
      throws ServletException, IOException {
    String searchString =
      request.getParameter("searchString");
    if ((searchString == null) ||
        (searchString.length() == 0)) {
      reportProblem(response, "Missing search string");
      return;
    }
    searchString = URLEncoder.encode(searchString, "utf-8");
    String searchEngineName =
      request.getParameter("searchEngine");
    if ((searchEngineName == null) ||
        (searchEngineName.length() == 0)) {
      reportProblem(response, "Missing search engine name");
      return;
    }
```



A Front End to Various Search Engines (Continued)

```
    String searchURL =
      SearchUtilities.makeURL(searchEngineName,
                              searchString);
    if (searchURL != null) {
      response.sendRedirect(searchURL);
    } else {
      reportProblem(response,
                    "Unrecognized search engine");
    }
  }

  private void reportProblem(HttpServletResponse response,
                             String message)
      throws IOException {
    response.sendError(HttpServletResponse.SC_NOT_FOUND,
                       message);
  }
}
```



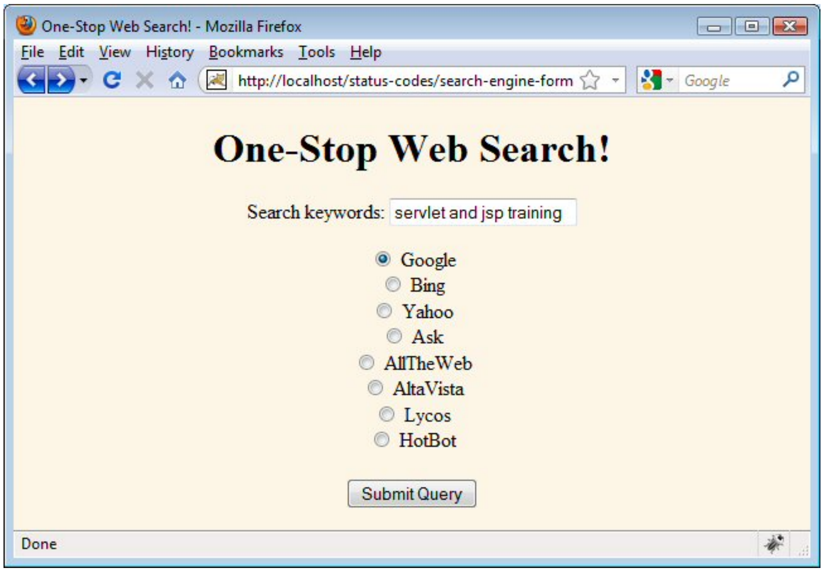
A Front End to Various Search Engines (Continued)

```
public class SearchSpec {

  /** Builds a URL for the results page by
   *  simply concatenating the base URL
   *  (http://...?someVar=") with the
   *  URL-encoded search string (jsp+training).
   */

  public String makeURL(String searchString) {
    return(baseURL + searchString);
  }
…
}
```

Front End to Search Engines: HTML Form



One-Stop Web Search! - Mozilla Firefox

http://localhost/status-codes/search-engine-form

One-Stop Web Search!

Search keywords: servlet and jsp training

● Google
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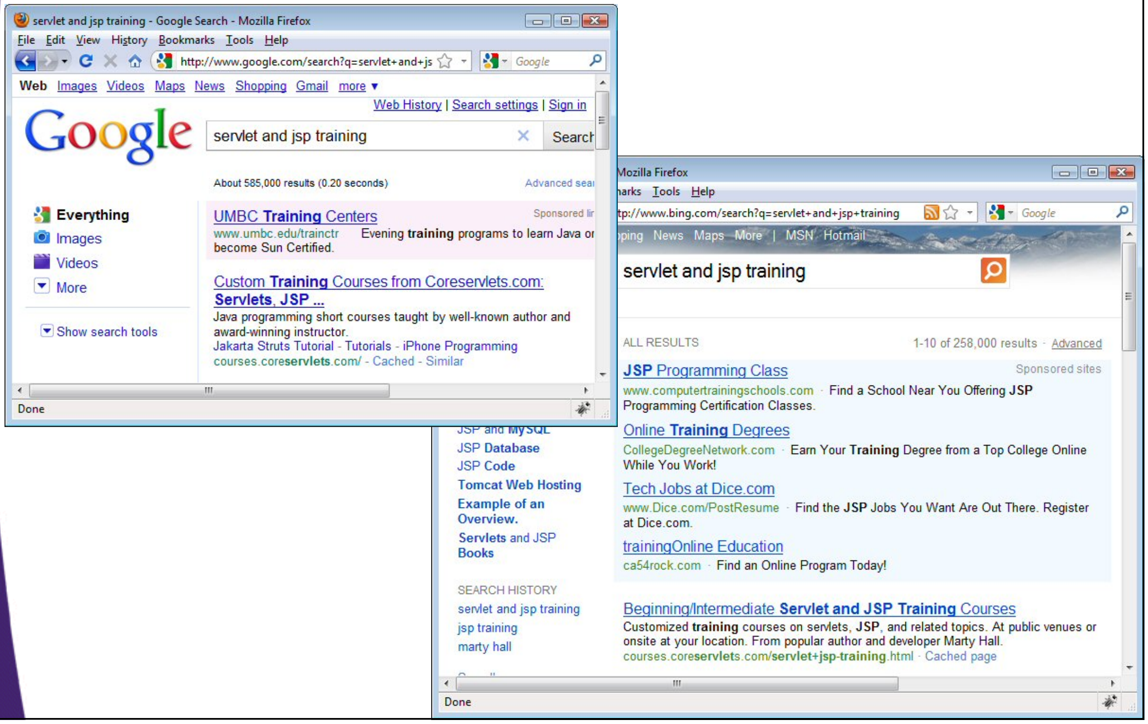
○ Yahoo
○ Ask
○ AllTheWeb
○ AltaVista
○ Lycos
○ HotBot

Done

Front End to Search Engines: Result for Valid Data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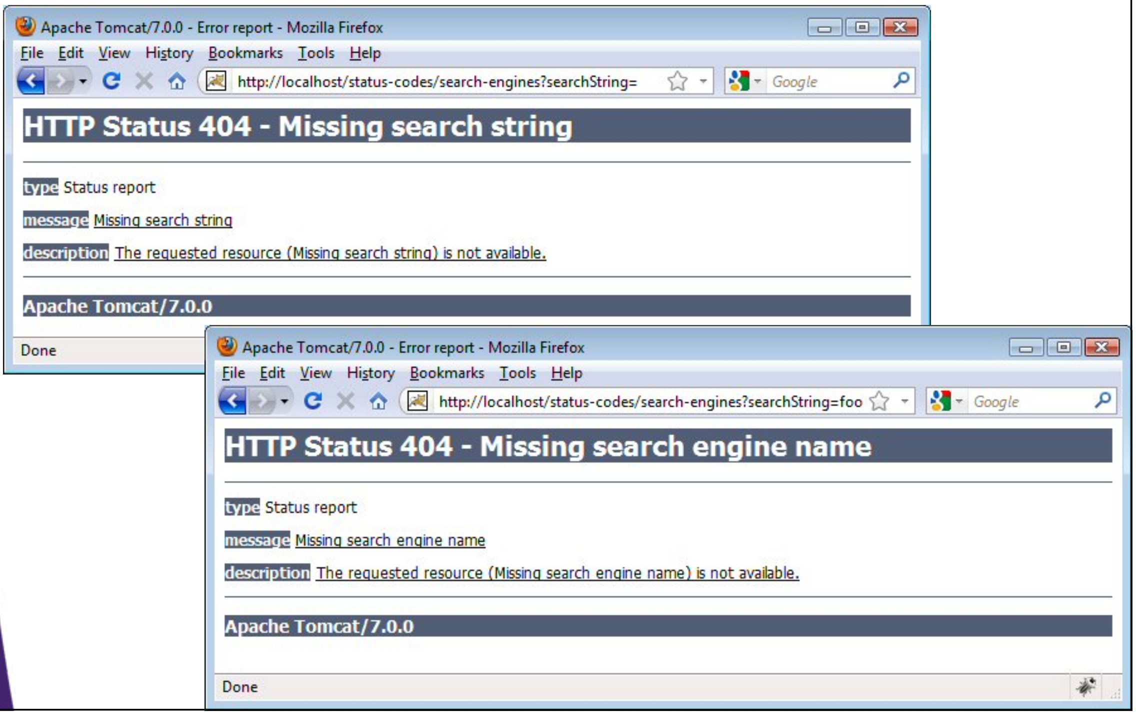
Done

Front End to Search Engines: Result for Invalid Data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Google
Done

http://localhost/status-codes/search-engines?searchString=

HTTP Status 404 - Missing search string

type Status report

message Missing search string

description The requested resource (Missing search string) is not available.

Apache Tomcat/7.0.0

Apache Tomcat/7.0.0 - Error report - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Google
Done

http://localhost/status-codes/search-engines?searchString=foo

HTTP Status 404 - Missing search engine name

type Status report

message Missing search engine name

description The requested resource (Missing search engine name) is not available.

Apache Tomcat/7.0.0

Summary

- **HTTP is important**
  - Many servlet tasks can *only* be accomplished with HTTP status codes
- **Setting status codes**
  - Redirect user with response.sendRedirect(someURL)
    - If you insert user-supplied data into the URL, encode with URLEncoder.encode
  - Send 404 error pages with sendError
  - In general, set via response.setStatus
- **Most important status codes**
  - 200 (default)
  - 302 (forwarding; set with sendRedirect)
  - 401 (password needed)
  - 404 (not found; set with sendError)

Questions?