Generating the Server Response: HTTP Status Codes
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

• Typical Request

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

• Typical Response

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

- The status line consists of
  - the HTTP version (HTTP/1.1)
  - The status code (200)
  - Short message corresponding to the status code (OK)
- In most cases, the headers are optional except for Content-Type which specifies the MIME type of the document
  - Some responses don’t contain a document, particularly if there is some type of failure
Setting Status Codes

• `response.setStatus(int statusCode)`
  − Status line of HTTP response comes before anything else so set the status code *before* returning any content with the PrintWriter
  − Use constants in HttpServletResponse, not an explicit int.
    • e.g., SC_OK, SC_NOT_FOUND, etc.

• `response.sendRedirect(String url)` throws `java.io.IOException`
  − Sets status code to 302
  − Sends a temporary redirect response to the client using the specified redirect location URL.
  − Sets Location response header also
Common HTTP 1.1 Status Codes

- **200 SC_OK**
  - Everything is fine; document follows.
  - Default for servlets.

- **204 SC_NO_CONTENT**
  - Browser should keep displaying previous document.

- **301 (SC_MOVED_PERMANENTLY)**
  - Requested document permanently moved elsewhere (indicated in Location header).
  - Browsers go to new location automatically.
Common HTTP 1.1 Status Codes (Continued)

- **302 SC_MOVED_TEMPORARILY** (Found)
  - Requested document temporarily moved elsewhere (indicated in Location header).
    - In HTTP 1.0 the message was Moved Temporarily instead of Found
  - Browsers go to new location automatically.
  - Servlets should use sendRedirect, not setStatus, when setting this header.

- **401 SC_UNAUTHORIZED**
  - Browser tried to access password-protected page without proper Authorization header.

- **404 SC_NOT_FOUND**
  - No such page. Servlets should use sendError to set this.
  - Problem: Internet Explorer 5 and later ignore this message and displays its own static and relatively useless message (against HTTP specs)
    - Can be turned off in Advanced tab under Internet Options
A Servlet That Redirects Users to Browser-Specific Pages

// Servlet sends IE users to the Netscape homepage
// and all other users to the Microsoft homepage

public class WrongDestination extends HttpServlet {
    public void doGet(HttpServletRequest request,
                        HttpServletResponse response)
        throws ServletException, IOException {
        String userAgent = request.getHeader("User-Agent");
        // Internet Explorer is the only browser that contains
        // MSIE in the User-Agent header

        if ((userAgent != null) &&
                (userAgent.indexOf("MSIE") != -1)) {
            response.sendRedirect("http://home.netscape.com");
        } else {
            response.sendRedirect("http://www.microsoft.com");
        }
    }
}
A Servlet That Redirects Users to Browser-Specific Pages
A Front End to Various Search Engines

- Allow user to enter search string and then select a search engine from a list
- SearchEngineForm creates web page for user to enter search string and select search engine
  - parameters: searchString and searchEngine
  - action performed by doGet in SearchEngine
- SearchEngine verifies each parameter
  - if null or length < 0 then invokes reportProblem which invokes sendError
  - if parameters OK, invokes makeURL in SearchUtilities which concatenates searchString to the base URL for each engine
  - This value is returned to SearchEngines which invokes sendRedirect with the specific URL for the requested search engine
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);
        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)

```java
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(response.SC_NOT_FOUND, message);
}
```
public class SearchSpec {

    /** Builds a URL for the results page by simply concatenating the base URL (http://...?someVar="") with the URL-encoded search string */
    private String name, baseURL;

    public SearchSpec(String name, String baseURL) {
        this.name = name;
        this.baseURL = baseURL;
    }

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

    ...
}
private static SearchSpec[] commonSpecs = {
    new SearchSpec("Google", 
        "http://www.google.com/search?q="),
    new SearchSpec("AllTheWeb", 
        "http://www.alltheweb.com/search?q="),
    new SearchSpec("Yahoo", 
        "http://search.yahoo.com/bin/search?p="),
    new SearchSpec(" AltaVista", 
        "http://www.altavista.com/web/results?q="),
    new SearchSpec(" Lycos", 
        "http://search.lycos.com/default.asp?query="),
    new SearchSpec(" HotBot", 
        "http://hotbot.com/default.asp?query="),
    new SearchSpec(" MSN", 
        "http://search.msn.com/results.asp?q="),
};
Front End to Search Engines: HTML Form

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- Lycos
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Submit Query
Front End to Search Engines: Result for Valid Data

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Front End to Search Engines: Result for Invalid Data

HTTP Status 404 - Missing search engine name.

type Status report
message Missing search engine name.
description The requested resource (Missing search engine name) was not found on this server.

Apache Tomcat/4.1.12-LE-jdk14

404 Missing search engine name

/servlet/coreServlets:SearchEngines was not found on this server.

Resin 2.1.1 (built: Mon May 13 16:53:21 PDT 2002)