

```
1: import java.io.*;
2: import java.net.*;
3: import java.util.*;
4:
5: /** Trivial Chat Server to go with our Trivial Chat Client.
6:  *
7:  * WARNING -- this code is believed thread-safe but has NOT been 100% vetted
8:  * by a team of world-class experts for Thread-safeness.
9:  * DO NOT BUILD ANYTHING CRITICAL BASED ON THIS until you have done so.
10: * See the various books on Threaded Java for design issues.
11: *
12: * @author      Ian F. Darwin, http://www.darwinsys.com/
13: * @version $Id: ChatServer.java,v 1.3 2006/04/11 22:40:33 ian Exp $
14: */
15: public class ChatServer {
16:     /** What I call myself in system messages */
17:     protected final static String CHATMASTER_ID = "ChatMaster";
18:     /** What goes between any handle and the message */
19:     protected final static String SEP = ": ";
20:     /** The Server Socket */
21:     protected ServerSocket servSock;
22:     /** The list of my current clients */
23:     protected ArrayList<ChatHandler> clients;
24:     /** Debugging state */
25:     private static boolean DEBUG = false;
26:
27:     /** Main just constructs a ChatServer, which should never return */
28:     public static void main(String[] argv) throws IOException {
29:         System.out.println("DarwinSys Chat Server 0.1 starting...");
30:         if (argv.length == 1 && argv[0].equals("-debug"))
31:             DEBUG = true;
32:         ChatServer w = new ChatServer();
33:         w.runServer(); // should never return.
34:         System.out.println("***ERROR* Chat Server 0.1 quitting");
35:     }
36:
37:     /** Construct (and run!) a Chat Service
38:     * @throws IOException
39:     */
40:     ChatServer() throws IOException {
41:         clients = new ArrayList<ChatHandler>();
42:
43:         servSock = new ServerSocket(Chat.PORTNUM);
44:         System.out.println("DarwinSys Chat Server Listening on port " +
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45:             Chat.PORTNUM);
46:     }
47:
48:     public void runServer() {
49:         try {
50:             while (true) {
51:                 Socket us = servSock.accept();
52:                 String hostName = us.getInetAddress().getHostName();
53:                 System.out.println("Accepted from " + hostName);
54:                 ChatHandler cl = new ChatHandler(us, hostName);
55:                 synchronized (clients) {
56:                     clients.add(cl);
57:                     cl.start();
58:                     if (clients.size() == 1)
59:                         cl.send(CHATMASTER_ID, "Welcome! you're the first one here");
60:                     else {
61:                         cl.send(CHATMASTER_ID, "Welcome! you're the latest of " +
62:                             clients.size() + " users.");
63:                     }
64:                 }
65:             }
66:         } catch(IOException e) {
67:             log("IO Exception in runServer: " + e);
68:         }
69:     }
70:
71:     protected void log(String s) {
72:         System.out.println(s);
73:     }
74:
75:     /** Inner class to handle one conversation */
76:     protected class ChatHandler extends Thread {
77:         /** The client socket */
78:         protected Socket clientSock;
79:         /** BufferedReader for reading from socket */
80:         protected BufferedReader is;
81:         /** PrintWriter for sending lines on socket */
82:         protected PrintWriter pw;
83:         /** The client's host */
84:         protected String clientIP;
85:         /** String form of user's handle (name) */
86:         protected String login;
87:
88:         /* Construct a Chat Handler */
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89:     public ChatHandler(Socket sock, String clnt) throws IOException {
90:         clientSock = sock;
91:         clientIP = clnt;
92:         is = new BufferedReader(
93:             new InputStreamReader(sock.getInputStream()));
94:         pw = new PrintWriter(sock.getOutputStream(), true);
95:     }
96:
97:     /** Each ChatHandler is a Thread, so here's the run() method,
98:      * which handles this conversation.
99:      */
100:    public void run() {
101:        String line;
102:        try {
103:            while ((line = is.readLine()) != null) {
104:                char c = line.charAt(0);
105:                line = line.substring(1);
106:                switch (c) {
107:                    case Chat.CMD_LOGIN:
108:                        if (!Chat.isValidLoginName(line)) {
109:                            send(CHATMASTER_ID, "LOGIN " + line + " invalid");
110:                            log("LOGIN INVALID from " + clientIP);
111:                            continue;
112:                        }
113:                        login = line;
114:                        broadcast(CHATMASTER_ID, login +
115:                            " joins us, for a total of " +
116:                            clients.size() + " users");
117:                        break;
118:                    case Chat.CMD_MESG:
119:                        if (login == null) {
120:                            send(CHATMASTER_ID, "please login first");
121:                            continue;
122:                        }
123:                        int where = line.indexOf(Chat.SEPARATOR);
124:                        String recip = line.substring(0, where);
125:                        String mesg = line.substring(where+1);
126:                        log("MESG: " + login + "-->" + recip + ": " + mesg);
127:                        ChatHandler cl = lookup(recip);
128:                        if (cl == null)
129:                            psend(CHATMASTER_ID, recip + " not logged in.");
130:                        else
131:                            cl.psend(login, mesg);
132:                        break;
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133:         case Chat.CMD_QUIT:
134:             broadcast(CHATMASTER_ID,
135:                 "Goodbye to " + login + "@" + clientIP);
136:             close();
137:             return;           // The end of this ChatHandler
138:
139:         case Chat.CMD_BCAST:
140:             if (login != null)
141:                 broadcast(login, line);
142:             else
143:                 log("B<L FROM " + clientIP);
144:             break;
145:         default:
146:             log("Unknown cmd " + c + " from " + login + "@" + clientIP);
147:         }
148:     }
149: } catch (IOException e) {
150:     log("IO Exception: " + e);
151: } finally {
152:     // the sock ended, so we're done, bye now
153:     System.out.println(login + SEP + "All Done");
154:     synchronized(clients) {
155:         clients.remove(this);
156:         if (clients.size() == 0) {
157:             System.out.println(CHATMASTER_ID + SEP +
158:                 "I'm so lonely I could cry...");
159:         } else if (clients.size() == 1) {
160:             ChatHandler last = (ChatHandler)clients.get(0);
161:             last.send(CHATMASTER_ID,
162:                 "Hey, you're talking to yourself again");
163:         } else {
164:             broadcast(CHATMASTER_ID,
165:                 "There are now " + clients.size() + " users");
166:         }
167:     }
168: }
169: }
170:
171: protected void close() {
172:     if (clientSock == null) {
173:         log("close when not open");
174:         return;
175:     }
176:     try {
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177:         clientSock.close();
178:         clientSock = null;
179:     } catch (IOException e) {
180:         log("Failure during close to " + clientIP);
181:     }
182: }
183:
184: /** Send one message to this user */
185: public void send(String sender, String mesg) {
186:     pw.println(sender + SEP + mesg);
187: }
188:
189: /** Send a private message */
190: protected void psend(String sender, String msg) {
191:     send("<*" + sender + ">", msg);
192: }
193:
194: /** Send one message to all users */
195: public void broadcast(String sender, String mesg) {
196:     System.out.println("Broadcasting " + sender + SEP + mesg);
197:     for (int i=0; i<clients.size(); i++) {
198:         ChatHandler sib = (ChatHandler)clients.get(i);
199:         if (DEBUG)
200:             System.out.println("Sending to " + sib);
201:         sib.send(sender, mesg);
202:     }
203:     if (DEBUG) System.out.println("Done broadcast");
204: }
205:
206: protected ChatHandler lookup(String nick) {
207:     synchronized(clients) {
208:         for (int i=0; i<clients.size(); i++) {
209:             ChatHandler cl = (ChatHandler)clients.get(i);
210:             if (cl.login.equals(nick))
211:                 return cl;
212:         }
213:     }
214:     return null;
215: }
216:
217: /** Present this ChatHandler as a String */
218: public String toString() {
219:     return "ChatHandler[" + login + "];"
220: }
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ChatServer.java

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221:      }  
222: }
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