CSS434

Professor

Program 3 Documentation

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# RMI

Since we must repeat the process based on the number of repetitions an argument, the minimum length of arguments is three. Port, Repeats, and host(s) must be included.

## Implementation

A Vector object is kept in the main class to be used to add String values. Starting with the second index of the arguments that contains the first server, the program attemps to do a lookup by concatenating strings to build the proper lookup form. We are given the symbolic\_name to replace with whoserver.

“rmi://serverIp:serverPort/symbolic\_name”

server = (ServerInterface) Naming.lookup("rmi://" + args[j] + ":" + port + "/whoserver");

If a host isn’t found, the try/catch will continue to the next host.

Once established, we create another Vector to get the incoming data.

If a host did not send back appropriate data, the try/catch will continue to the next host.

If both of the above conditions were successful, the host name is added into the class Vector object and each index of data from the incoming Vector is added into the class Vector object as well.

## WhoClient.java SOURCE CODE

/\*\*

\* Created by Christopher on 5/18/2014.

\*/

import java.rmi.\*;

import java.util.\*;

public class WhoClient {

private Vector users = new Vector();

private ServerInterface server;

public WhoClient(String[] args) {

//first arguement is the port number

//Get port number in string to be converted to int later

String port = args[0];

int repeats = Integer.parseInt(args[1]);

long start = new Date().getTime();

//Iterations

for(int i = 1; i <= repeats; i++) {

users.add("Loop: " + i);

//look through each additional argument starting at 1

for (int j = 2; j < args.length; j++) {

//Try to connect to server

try {

//loopup in form of “rmi://serverIp:serverPort/symbolic\_name”

//“rmi://HOSTNAME:PORT/whoserver”

server = (ServerInterface) Naming.lookup("rmi://" + args[j] + ":" + port + "/whoserver");

} catch (Exception e) {

//Print the stack, to be changed or removed for a smaller error

System.out.println(args[j] + ": Host not found.");

//If host not found, continue to the next one

continue;

}

Vector incoming;

//Get incoming data from servers

try {

incoming = server.get();

} catch (RemoteException e) {

//Print out error

System.out.println(args[j] + ": Unable to retrieve data.");

//if data is not received, continue to next host

continue;

}

//add the host name to the list before users of that host

users.add(args[j] + ":");

//Add all users for the host

for (int k = 0; k < incoming.size(); k++) {

users.add(incoming.elementAt(k));

}

}

}

//Print out the list of Hosts and users

for (Object line : users) {

//Cast each item as a String and print

System.out.println((String) line);

}

long end = new Date().getTime();

System.out.println("Run Time = "+ (end-start) + "milliseconds");

}

public static void main(String[] args) {

//Minimum arguments is a port and a hostname, size of 2

if(args.length >= 3) {

int port = Integer.parseInt(args[0]);

if(port <= 1024 || port > 65535) {

System.out.println("Invalid port: range must be 1025-65535");

System.exit(-1);

}

new WhoClient(args);

} else {

System.out.println("Minimum of three(3) arguments needed");

System.out.println("Syntax: java WhoClient port repeats host1 host2 host3 ...");

System.exit(-2);

}

}

}

## WhoClient.java Output 2 host example

Script started on Mon 19 May 2014 12:10:54 PM PDT

ctran206@uw1-320-01:~/CSS434/HW3/RMI$ java WhoClient.[K 58253 10 UW1-320-02 UW1-320-03

Loop: 1

UW1-320-02:

ctran206 pts/2 2014-05-19 12:09 (131.107.147.46)

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 12:09 (131.107.174.46)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

Loop: 2

UW1-320-02:

ctran206 pts/2 2014-05-19 12:09 (131.107.147.46)

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 12:09 (131.107.174.46)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

Loop: 3

UW1-320-02:

ctran206 pts/2 2014-05-19 12:09 (131.107.147.46)

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 12:09 (131.107.174.46)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

Loop: 4

UW1-320-02:

ctran206 pts/2 2014-05-19 12:09 (131.107.147.46)

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 12:09 (131.107.174.46)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

Loop: 5

UW1-320-02:

ctran206 pts/2 2014-05-19 12:09 (131.107.147.46)

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 12:09 (131.107.174.46)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

Loop: 6

UW1-320-02:

ctran206 pts/2 2014-05-19 12:09 (131.107.147.46)

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 12:09 (131.107.174.46)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

Loop: 7

UW1-320-02:

ctran206 pts/2 2014-05-19 12:09 (131.107.147.46)

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 12:09 (131.107.174.46)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

Loop: 8

UW1-320-02:

ctran206 pts/2 2014-05-19 12:09 (131.107.147.46)

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 12:09 (131.107.174.46)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

Loop: 9

UW1-320-02:

ctran206 pts/2 2014-05-19 12:09 (131.107.147.46)

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 12:09 (131.107.174.46)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

Loop: 10

UW1-320-02:

ctran206 pts/2 2014-05-19 12:09 (131.107.147.46)

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 12:09 (131.107.174.46)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

Run Time = 171milliseconds

ctran206@uw1-320-01:~/CSS434/HW3/RMI$ exit

# UWAgent

Using a Migrating Object, replicate the gathering of the Who data from Linux Hosts.

## Implementation

Keep a Vector container in the object as the object itself is passed to hosts

Server list is parsed from arguments into a new array. A hopPosition keeps track of the position hop of the array. Server list is a subset of the arguments from index 1 to the length of the array.

To do repetitions, an int keeps track of how many repeats and another int keeps track of how many repetitions are completed.

The init function simply stores the first hostname into a string variable. This is done so the object can be passed back to the originating host. Once passed back, a function prints the Vector Object assuming all data is Strings.

### who Function

The bulk of the action happens in the who function. To add loop data into resulting output, every time the hopPosition is 0, the Loop text is added to the final output Vector.

Since we don’t want to modify the Class Vector until we gather data, a new Vector is created. This will happen on every host. Output of the who command is put into a buffered reader so we can parse each line of output. The whoResult is checked if there is any lines of data. While it should be impossible to have no users, I tested just in case. If whoResult has data, the server name is added followed by the users in the result Vector.

To determine the next system to go to. The hopPosition is incremented and checked if the value is lower than the server array length. If it is, then the hop will call the who function on the next host. If there isn’t any further hops, the cycles variable is incremented to show a cycle completion. This is checked if it’s lower than repetitions to determine if any further repeats are needed. If so, the hopPosition is set back to the 0 index and hop is called on the first host again. Since we have logic ahead for Loop string, the repeat shows which loop the repetitions are in.

If there are no more repetitions left, hop is called back on the original host along with the function printWho. I couldn’t find another way to get the updated object back to the origin. So exploiting that the current object gets sent with a hope, the updated Vector can then be printed out.

## WhoAgent.java Source Code

/\*\*

\* CSS434

\* Created by Christopher on 5/18/2014.

\*/

import UWAgent.UWAgent;

import java.io.\*;

import java.net.\*;

import java.util.\*;

public class WhoAgent extends UWAgent implements Serializable {

Vector users; //Container for all inputs

String[] servers; //List of servers

int hopPosition; //Hop position in server array

int repetitions; //Repetition cycles

int cycles; //Number of cycles completed for repetition

String origin; //Originating Host

long start; //Start Date for performance evaluation

public WhoAgent(String[] args) {

start = new Date().getTime(); //Get the start time to evaluate time performance later

users = new Vector();

//Set hop position to 0

hopPosition = 0;

cycles = 0;

//Get number of repetitions from arguement 0

repetitions = Integer.parseInt(args[0]);

//System.out.println("Repeating: " + repetitions + "times");

if(args != null) {

//ignore arg 0 and copy the rest into servers

servers = Arrays.copyOfRange(args, 1, args.length);

} else {

System.out.println("No Servers");

}

}

public void init() {

//Must have at least one server

if(servers.length > 0) {

try {

//get the local host name and store it before any hopping

InetAddress iNet = InetAddress.getLocalHost();

origin = iNet.getHostAddress();

//System.out.println("init Stage");

hop(servers[hopPosition],"who",null);

} catch (UnknownHostException e) {

e.printStackTrace();

}

}

}

public void who() {

//if first hop, add the Loop indication

//System.out.println("Running who on "+ servers[0]);

if(hopPosition == 0 && repetitions != 1) {

users.add("Loop: "+(cycles+1));

}

//Create vector to store the results of command execution

Vector whoResult = new Vector();

//Get the machine runtime

Runtime run = Runtime.getRuntime();

try {

//System.out.println("Executing Who on Local Host");

//Exeute Who and store output into Vector

Process proc = run.exec("who");

InputStream iStream = proc.getInputStream();

BufferedReader br = new BufferedReader(new InputStreamReader(iStream));

String line = br.readLine();

//Check each line and add to whoResult

while(line != null) {

System.out.println(line);

whoResult.add(line);

line = br.readLine();

}

} catch (IOException e) {

e.printStackTrace();

}

//If there is output, add to the class users Vector

if(!whoResult.isEmpty()) {

users.add(servers[hopPosition] + ":");

for(int i = 0; i < whoResult.size(); i++) {

users.add(whoResult.elementAt(i));

}

}

//Increase Hop Number to hop to next server

hopPosition++;

//If there are more servers to run who on

if(hopPosition < servers.length) {

hop(servers[hopPosition],"who",null);

} else {

//System.out.println("End of Cycle " + (cycles+1));

//Since no more hops left, increase cycle count

cycles++;

//If more repetitions are needed, reset hopPosition back to 0

//Hop back to first host

if(cycles < repetitions) {

hopPosition = 0;

hop(servers[0],"who",null);

} else {

//System.out.println("End of All Cycles: Print to Host");

//Hop back to host to send the updated Vector and print

hop(origin, "printWho", null);

}

}

}

//Function to print output for when all work is done

public void printWho() {

//System.out.println("Host is printing");

for(int i = 0; i < users.size(); i++) {

System.out.println((String)users.elementAt(i));

}

long end = new Date().getTime();

System.out.println("Run Time = "+ (end-start) + " milliseconds");

}

}

WhoAgent Output Example 8 Hosts

ctran206@uw1-320-01:~/CSS434/HW3/UWAgent$ ./runAgent.sh 58253 WhoAgent 10 UW1-320-02 UW1-320-03 UW1-320-04 UW1-320-05 UW1-320-06 UW1-320-07 UW1-320-08 UW1-320-09

ctran206@uw1-320-01:~/CSS434/HW3/UWAgent$ Loop: 1

UW1-320-02:

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:53 (131.107.147.46)

ogunarso pts/15 2014-05-19 09:20 (174-21-96-196.tukw.qwest.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

ctran206 pts/11 2014-05-19 10:53 (131.107.174.46)

UW1-320-04:

matkips pts/2 2014-05-19 00:59 (c-76-121-181-161.hsd1.wa.comcast.net)

jordy869 pts/7 2014-05-19 06:34 (c-67-182-145-42.hsd1.wa.comcast.net)

virgillo pts/8 2014-05-19 11:14 (50-54-218-104.evrt.wa.frontiernet.net)

ctran206 pts/9 2014-05-19 10:53 (131.107.174.46)

virgillo pts/10 2014-05-19 11:01 (50-54-218-104.evrt.wa.frontiernet.net)

virgillo pts/11 2014-05-19 11:06 (50-54-218-104.evrt.wa.frontiernet.net)

UW1-320-05:

stknobli pts/4 2014-05-19 11:39 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/5 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:53 (131.107.147.46)

UW1-320-06:

ryanb914 pts/1 2014-05-19 08:33 (192.182.159.38)

jordy869 pts/3 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:55 (131.107.147.46)

bquig pts/7 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

stknobli pts/9 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

bquig pts/8 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

UW1-320-07:

hongbin pts/2 2014-05-19 08:03 (c-98-237-251-168.hsd1.wa.comcast.net)

ctran206 pts/1 2014-05-19 10:55 (131.107.160.46)

ppk0907 pts/5 2014-05-19 11:21 (c-50-159-100-115.hsd1.wa.comcast.net)

stknobli pts/7 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/9 2014-05-19 06:36 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-08:

jordy869 pts/1 2014-05-19 06:37 (c-67-182-145-42.hsd1.wa.comcast.net)

stknobli pts/4 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

vartikav pts/6 2014-05-19 11:02 (c-98-247-20-52.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:55 (131.107.160.46)

thills pts/8 2014-05-19 10:55 (50-47-68-154.evrt.wa.frontiernet.net)

brombadc pts/10 2014-05-19 11:02 (c-24-22-246-11.hsd1.wa.comcast.net)

fatbobby tty7 2014-05-17 13:38 (:0)

fatbobby pts/11 2014-05-17 13:57 (:0)

fatbobby pts/12 2014-05-17 13:57 (:0)

vartikav pts/3 2014-05-19 11:17 (:20.0)

UW1-320-09:

stknobli pts/3 2014-05-19 11:37 (50-46-214-244.evrt.wa.frontiernet.net)

tdjunae pts/1 2014-05-19 11:32 (c-50-135-19-218.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:55 (131.107.159.46)

Loop: 2

UW1-320-02:

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:53 (131.107.147.46)

ogunarso pts/15 2014-05-19 09:20 (174-21-96-196.tukw.qwest.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

ctran206 pts/11 2014-05-19 10:53 (131.107.174.46)

UW1-320-04:

matkips pts/2 2014-05-19 00:59 (c-76-121-181-161.hsd1.wa.comcast.net)

jordy869 pts/7 2014-05-19 06:34 (c-67-182-145-42.hsd1.wa.comcast.net)

virgillo pts/8 2014-05-19 11:14 (50-54-218-104.evrt.wa.frontiernet.net)

ctran206 pts/9 2014-05-19 10:53 (131.107.174.46)

virgillo pts/10 2014-05-19 11:01 (50-54-218-104.evrt.wa.frontiernet.net)

virgillo pts/11 2014-05-19 11:06 (50-54-218-104.evrt.wa.frontiernet.net)

UW1-320-05:

stknobli pts/4 2014-05-19 11:39 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/5 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:53 (131.107.147.46)

UW1-320-06:

ryanb914 pts/1 2014-05-19 08:33 (192.182.159.38)

jordy869 pts/3 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:55 (131.107.147.46)

bquig pts/7 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

stknobli pts/9 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

bquig pts/8 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

UW1-320-07:

hongbin pts/2 2014-05-19 08:03 (c-98-237-251-168.hsd1.wa.comcast.net)

ctran206 pts/1 2014-05-19 10:55 (131.107.160.46)

ppk0907 pts/5 2014-05-19 11:21 (c-50-159-100-115.hsd1.wa.comcast.net)

stknobli pts/7 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/9 2014-05-19 06:36 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-08:

jordy869 pts/1 2014-05-19 06:37 (c-67-182-145-42.hsd1.wa.comcast.net)

stknobli pts/4 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

vartikav pts/6 2014-05-19 11:02 (c-98-247-20-52.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:55 (131.107.160.46)

thills pts/8 2014-05-19 10:55 (50-47-68-154.evrt.wa.frontiernet.net)

brombadc pts/10 2014-05-19 11:02 (c-24-22-246-11.hsd1.wa.comcast.net)

fatbobby tty7 2014-05-17 13:38 (:0)

fatbobby pts/11 2014-05-17 13:57 (:0)

fatbobby pts/12 2014-05-17 13:57 (:0)

vartikav pts/3 2014-05-19 11:17 (:20.0)

UW1-320-09:

stknobli pts/3 2014-05-19 11:37 (50-46-214-244.evrt.wa.frontiernet.net)

tdjunae pts/1 2014-05-19 11:32 (c-50-135-19-218.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:55 (131.107.159.46)

Loop: 3

UW1-320-02:

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:53 (131.107.147.46)

ogunarso pts/15 2014-05-19 09:20 (174-21-96-196.tukw.qwest.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

ctran206 pts/11 2014-05-19 10:53 (131.107.174.46)

UW1-320-04:

matkips pts/2 2014-05-19 00:59 (c-76-121-181-161.hsd1.wa.comcast.net)

jordy869 pts/7 2014-05-19 06:34 (c-67-182-145-42.hsd1.wa.comcast.net)

virgillo pts/8 2014-05-19 11:14 (50-54-218-104.evrt.wa.frontiernet.net)

ctran206 pts/9 2014-05-19 10:53 (131.107.174.46)

virgillo pts/10 2014-05-19 11:01 (50-54-218-104.evrt.wa.frontiernet.net)

virgillo pts/11 2014-05-19 11:06 (50-54-218-104.evrt.wa.frontiernet.net)

UW1-320-05:

stknobli pts/4 2014-05-19 11:39 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/5 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:53 (131.107.147.46)

UW1-320-06:

ryanb914 pts/1 2014-05-19 08:33 (192.182.159.38)

jordy869 pts/3 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:55 (131.107.147.46)

bquig pts/7 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

stknobli pts/9 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

bquig pts/8 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

UW1-320-07:

hongbin pts/2 2014-05-19 08:03 (c-98-237-251-168.hsd1.wa.comcast.net)

ctran206 pts/1 2014-05-19 10:55 (131.107.160.46)

ppk0907 pts/5 2014-05-19 11:21 (c-50-159-100-115.hsd1.wa.comcast.net)

stknobli pts/7 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/9 2014-05-19 06:36 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-08:

jordy869 pts/1 2014-05-19 06:37 (c-67-182-145-42.hsd1.wa.comcast.net)

stknobli pts/4 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

vartikav pts/6 2014-05-19 11:02 (c-98-247-20-52.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:55 (131.107.160.46)

thills pts/8 2014-05-19 10:55 (50-47-68-154.evrt.wa.frontiernet.net)

brombadc pts/10 2014-05-19 11:02 (c-24-22-246-11.hsd1.wa.comcast.net)

fatbobby tty7 2014-05-17 13:38 (:0)

fatbobby pts/11 2014-05-17 13:57 (:0)

fatbobby pts/12 2014-05-17 13:57 (:0)

vartikav pts/3 2014-05-19 11:17 (:20.0)

UW1-320-09:

stknobli pts/3 2014-05-19 11:37 (50-46-214-244.evrt.wa.frontiernet.net)

tdjunae pts/1 2014-05-19 11:32 (c-50-135-19-218.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:55 (131.107.159.46)

Loop: 4

UW1-320-02:

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:53 (131.107.147.46)

ogunarso pts/15 2014-05-19 09:20 (174-21-96-196.tukw.qwest.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

ctran206 pts/11 2014-05-19 10:53 (131.107.174.46)

UW1-320-04:

matkips pts/2 2014-05-19 00:59 (c-76-121-181-161.hsd1.wa.comcast.net)

jordy869 pts/7 2014-05-19 06:34 (c-67-182-145-42.hsd1.wa.comcast.net)

virgillo pts/8 2014-05-19 11:14 (50-54-218-104.evrt.wa.frontiernet.net)

ctran206 pts/9 2014-05-19 10:53 (131.107.174.46)

virgillo pts/10 2014-05-19 11:01 (50-54-218-104.evrt.wa.frontiernet.net)

virgillo pts/11 2014-05-19 11:06 (50-54-218-104.evrt.wa.frontiernet.net)

UW1-320-05:

stknobli pts/4 2014-05-19 11:39 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/5 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:53 (131.107.147.46)

UW1-320-06:

ryanb914 pts/1 2014-05-19 08:33 (192.182.159.38)

jordy869 pts/3 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:55 (131.107.147.46)

bquig pts/7 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

stknobli pts/9 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

bquig pts/8 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

UW1-320-07:

hongbin pts/2 2014-05-19 08:03 (c-98-237-251-168.hsd1.wa.comcast.net)

ctran206 pts/1 2014-05-19 10:55 (131.107.160.46)

ppk0907 pts/5 2014-05-19 11:21 (c-50-159-100-115.hsd1.wa.comcast.net)

stknobli pts/7 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/9 2014-05-19 06:36 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-08:

jordy869 pts/1 2014-05-19 06:37 (c-67-182-145-42.hsd1.wa.comcast.net)

stknobli pts/4 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

vartikav pts/6 2014-05-19 11:02 (c-98-247-20-52.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:55 (131.107.160.46)

thills pts/8 2014-05-19 10:55 (50-47-68-154.evrt.wa.frontiernet.net)

brombadc pts/10 2014-05-19 11:02 (c-24-22-246-11.hsd1.wa.comcast.net)

fatbobby tty7 2014-05-17 13:38 (:0)

fatbobby pts/11 2014-05-17 13:57 (:0)

fatbobby pts/12 2014-05-17 13:57 (:0)

vartikav pts/3 2014-05-19 11:17 (:20.0)

UW1-320-09:

stknobli pts/3 2014-05-19 11:37 (50-46-214-244.evrt.wa.frontiernet.net)

tdjunae pts/1 2014-05-19 11:32 (c-50-135-19-218.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:55 (131.107.159.46)

Loop: 5

UW1-320-02:

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:53 (131.107.147.46)

ogunarso pts/15 2014-05-19 09:20 (174-21-96-196.tukw.qwest.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

ctran206 pts/11 2014-05-19 10:53 (131.107.174.46)

UW1-320-04:

matkips pts/2 2014-05-19 00:59 (c-76-121-181-161.hsd1.wa.comcast.net)

jordy869 pts/7 2014-05-19 06:34 (c-67-182-145-42.hsd1.wa.comcast.net)

virgillo pts/8 2014-05-19 11:14 (50-54-218-104.evrt.wa.frontiernet.net)

ctran206 pts/9 2014-05-19 10:53 (131.107.174.46)

virgillo pts/10 2014-05-19 11:01 (50-54-218-104.evrt.wa.frontiernet.net)

virgillo pts/11 2014-05-19 11:06 (50-54-218-104.evrt.wa.frontiernet.net)

UW1-320-05:

stknobli pts/4 2014-05-19 11:39 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/5 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:53 (131.107.147.46)

UW1-320-06:

ryanb914 pts/1 2014-05-19 08:33 (192.182.159.38)

jordy869 pts/3 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:55 (131.107.147.46)

bquig pts/7 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

stknobli pts/9 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

bquig pts/8 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

UW1-320-07:

hongbin pts/2 2014-05-19 08:03 (c-98-237-251-168.hsd1.wa.comcast.net)

ctran206 pts/1 2014-05-19 10:55 (131.107.160.46)

ppk0907 pts/5 2014-05-19 11:21 (c-50-159-100-115.hsd1.wa.comcast.net)

stknobli pts/7 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/9 2014-05-19 06:36 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-08:

jordy869 pts/1 2014-05-19 06:37 (c-67-182-145-42.hsd1.wa.comcast.net)

stknobli pts/4 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

vartikav pts/6 2014-05-19 11:02 (c-98-247-20-52.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:55 (131.107.160.46)

thills pts/8 2014-05-19 10:55 (50-47-68-154.evrt.wa.frontiernet.net)

brombadc pts/10 2014-05-19 11:02 (c-24-22-246-11.hsd1.wa.comcast.net)

fatbobby tty7 2014-05-17 13:38 (:0)

fatbobby pts/11 2014-05-17 13:57 (:0)

fatbobby pts/12 2014-05-17 13:57 (:0)

vartikav pts/3 2014-05-19 11:17 (:20.0)

UW1-320-09:

stknobli pts/3 2014-05-19 11:37 (50-46-214-244.evrt.wa.frontiernet.net)

tdjunae pts/1 2014-05-19 11:32 (c-50-135-19-218.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:55 (131.107.159.46)

Loop: 6

UW1-320-02:

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:53 (131.107.147.46)

ogunarso pts/15 2014-05-19 09:20 (174-21-96-196.tukw.qwest.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

ctran206 pts/11 2014-05-19 10:53 (131.107.174.46)

UW1-320-04:

matkips pts/2 2014-05-19 00:59 (c-76-121-181-161.hsd1.wa.comcast.net)

jordy869 pts/7 2014-05-19 06:34 (c-67-182-145-42.hsd1.wa.comcast.net)

virgillo pts/8 2014-05-19 11:14 (50-54-218-104.evrt.wa.frontiernet.net)

ctran206 pts/9 2014-05-19 10:53 (131.107.174.46)

virgillo pts/10 2014-05-19 11:01 (50-54-218-104.evrt.wa.frontiernet.net)

virgillo pts/11 2014-05-19 11:06 (50-54-218-104.evrt.wa.frontiernet.net)

UW1-320-05:

stknobli pts/4 2014-05-19 11:39 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/5 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:53 (131.107.147.46)

UW1-320-06:

ryanb914 pts/1 2014-05-19 08:33 (192.182.159.38)

jordy869 pts/3 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:55 (131.107.147.46)

bquig pts/7 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

stknobli pts/9 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

bquig pts/8 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

UW1-320-07:

hongbin pts/2 2014-05-19 08:03 (c-98-237-251-168.hsd1.wa.comcast.net)

ctran206 pts/1 2014-05-19 10:55 (131.107.160.46)

ppk0907 pts/5 2014-05-19 11:21 (c-50-159-100-115.hsd1.wa.comcast.net)

stknobli pts/7 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/9 2014-05-19 06:36 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-08:

jordy869 pts/1 2014-05-19 06:37 (c-67-182-145-42.hsd1.wa.comcast.net)

stknobli pts/4 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

vartikav pts/6 2014-05-19 11:02 (c-98-247-20-52.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:55 (131.107.160.46)

thills pts/8 2014-05-19 10:55 (50-47-68-154.evrt.wa.frontiernet.net)

brombadc pts/10 2014-05-19 11:02 (c-24-22-246-11.hsd1.wa.comcast.net)

fatbobby tty7 2014-05-17 13:38 (:0)

fatbobby pts/11 2014-05-17 13:57 (:0)

fatbobby pts/12 2014-05-17 13:57 (:0)

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UW1-320-09:

stknobli pts/3 2014-05-19 11:37 (50-46-214-244.evrt.wa.frontiernet.net)

tdjunae pts/1 2014-05-19 11:32 (c-50-135-19-218.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:55 (131.107.159.46)

Loop: 7

UW1-320-02:

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:53 (131.107.147.46)

ogunarso pts/15 2014-05-19 09:20 (174-21-96-196.tukw.qwest.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

ctran206 pts/11 2014-05-19 10:53 (131.107.174.46)

UW1-320-04:

matkips pts/2 2014-05-19 00:59 (c-76-121-181-161.hsd1.wa.comcast.net)

jordy869 pts/7 2014-05-19 06:34 (c-67-182-145-42.hsd1.wa.comcast.net)

virgillo pts/8 2014-05-19 11:14 (50-54-218-104.evrt.wa.frontiernet.net)

ctran206 pts/9 2014-05-19 10:53 (131.107.174.46)

virgillo pts/10 2014-05-19 11:01 (50-54-218-104.evrt.wa.frontiernet.net)

virgillo pts/11 2014-05-19 11:06 (50-54-218-104.evrt.wa.frontiernet.net)

UW1-320-05:

stknobli pts/4 2014-05-19 11:39 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/5 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:53 (131.107.147.46)

UW1-320-06:

ryanb914 pts/1 2014-05-19 08:33 (192.182.159.38)

jordy869 pts/3 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:55 (131.107.147.46)

bquig pts/7 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

stknobli pts/9 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

bquig pts/8 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

UW1-320-07:

hongbin pts/2 2014-05-19 08:03 (c-98-237-251-168.hsd1.wa.comcast.net)

ctran206 pts/1 2014-05-19 10:55 (131.107.160.46)

ppk0907 pts/5 2014-05-19 11:21 (c-50-159-100-115.hsd1.wa.comcast.net)

stknobli pts/7 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/9 2014-05-19 06:36 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-08:

jordy869 pts/1 2014-05-19 06:37 (c-67-182-145-42.hsd1.wa.comcast.net)

stknobli pts/4 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

vartikav pts/6 2014-05-19 11:02 (c-98-247-20-52.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:55 (131.107.160.46)

thills pts/8 2014-05-19 10:55 (50-47-68-154.evrt.wa.frontiernet.net)

brombadc pts/10 2014-05-19 11:02 (c-24-22-246-11.hsd1.wa.comcast.net)

fatbobby tty7 2014-05-17 13:38 (:0)

fatbobby pts/11 2014-05-17 13:57 (:0)

fatbobby pts/12 2014-05-17 13:57 (:0)

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UW1-320-09:

stknobli pts/3 2014-05-19 11:37 (50-46-214-244.evrt.wa.frontiernet.net)

tdjunae pts/1 2014-05-19 11:32 (c-50-135-19-218.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:55 (131.107.159.46)

Loop: 8

UW1-320-02:

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:53 (131.107.147.46)

ogunarso pts/15 2014-05-19 09:20 (174-21-96-196.tukw.qwest.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

ctran206 pts/11 2014-05-19 10:53 (131.107.174.46)

UW1-320-04:

matkips pts/2 2014-05-19 00:59 (c-76-121-181-161.hsd1.wa.comcast.net)

jordy869 pts/7 2014-05-19 06:34 (c-67-182-145-42.hsd1.wa.comcast.net)

virgillo pts/8 2014-05-19 11:14 (50-54-218-104.evrt.wa.frontiernet.net)

ctran206 pts/9 2014-05-19 10:53 (131.107.174.46)

virgillo pts/10 2014-05-19 11:01 (50-54-218-104.evrt.wa.frontiernet.net)

virgillo pts/11 2014-05-19 11:06 (50-54-218-104.evrt.wa.frontiernet.net)

UW1-320-05:

stknobli pts/4 2014-05-19 11:39 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/5 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:53 (131.107.147.46)

UW1-320-06:

ryanb914 pts/1 2014-05-19 08:33 (192.182.159.38)

jordy869 pts/3 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:55 (131.107.147.46)

bquig pts/7 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

stknobli pts/9 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

bquig pts/8 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

UW1-320-07:

hongbin pts/2 2014-05-19 08:03 (c-98-237-251-168.hsd1.wa.comcast.net)

ctran206 pts/1 2014-05-19 10:55 (131.107.160.46)

ppk0907 pts/5 2014-05-19 11:21 (c-50-159-100-115.hsd1.wa.comcast.net)

stknobli pts/7 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/9 2014-05-19 06:36 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-08:

jordy869 pts/1 2014-05-19 06:37 (c-67-182-145-42.hsd1.wa.comcast.net)

stknobli pts/4 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

vartikav pts/6 2014-05-19 11:02 (c-98-247-20-52.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:55 (131.107.160.46)

thills pts/8 2014-05-19 10:55 (50-47-68-154.evrt.wa.frontiernet.net)

brombadc pts/10 2014-05-19 11:02 (c-24-22-246-11.hsd1.wa.comcast.net)

fatbobby tty7 2014-05-17 13:38 (:0)

fatbobby pts/11 2014-05-17 13:57 (:0)

fatbobby pts/12 2014-05-17 13:57 (:0)

vartikav pts/3 2014-05-19 11:17 (:20.0)

UW1-320-09:

stknobli pts/3 2014-05-19 11:37 (50-46-214-244.evrt.wa.frontiernet.net)

tdjunae pts/1 2014-05-19 11:32 (c-50-135-19-218.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:55 (131.107.159.46)

Loop: 9

UW1-320-02:

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:53 (131.107.147.46)

ogunarso pts/15 2014-05-19 09:20 (174-21-96-196.tukw.qwest.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

ctran206 pts/11 2014-05-19 10:53 (131.107.174.46)

UW1-320-04:

matkips pts/2 2014-05-19 00:59 (c-76-121-181-161.hsd1.wa.comcast.net)

jordy869 pts/7 2014-05-19 06:34 (c-67-182-145-42.hsd1.wa.comcast.net)

virgillo pts/8 2014-05-19 11:14 (50-54-218-104.evrt.wa.frontiernet.net)

ctran206 pts/9 2014-05-19 10:53 (131.107.174.46)

virgillo pts/10 2014-05-19 11:01 (50-54-218-104.evrt.wa.frontiernet.net)

virgillo pts/11 2014-05-19 11:06 (50-54-218-104.evrt.wa.frontiernet.net)

UW1-320-05:

stknobli pts/4 2014-05-19 11:39 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/5 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:53 (131.107.147.46)

UW1-320-06:

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jordy869 pts/3 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:55 (131.107.147.46)

bquig pts/7 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

stknobli pts/9 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

bquig pts/8 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

UW1-320-07:

hongbin pts/2 2014-05-19 08:03 (c-98-237-251-168.hsd1.wa.comcast.net)

ctran206 pts/1 2014-05-19 10:55 (131.107.160.46)

ppk0907 pts/5 2014-05-19 11:21 (c-50-159-100-115.hsd1.wa.comcast.net)

stknobli pts/7 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/9 2014-05-19 06:36 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-08:

jordy869 pts/1 2014-05-19 06:37 (c-67-182-145-42.hsd1.wa.comcast.net)

stknobli pts/4 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

vartikav pts/6 2014-05-19 11:02 (c-98-247-20-52.hsd1.wa.comcast.net)

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thills pts/8 2014-05-19 10:55 (50-47-68-154.evrt.wa.frontiernet.net)

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fatbobby pts/11 2014-05-17 13:57 (:0)

fatbobby pts/12 2014-05-17 13:57 (:0)

vartikav pts/3 2014-05-19 11:17 (:20.0)

UW1-320-09:

stknobli pts/3 2014-05-19 11:37 (50-46-214-244.evrt.wa.frontiernet.net)

tdjunae pts/1 2014-05-19 11:32 (c-50-135-19-218.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:55 (131.107.159.46)

Loop: 10

UW1-320-02:

jordy869 pts/3 2014-05-19 06:30 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:53 (131.107.147.46)

ogunarso pts/15 2014-05-19 09:20 (174-21-96-196.tukw.qwest.net)

UW1-320-03:

drpier pts/1 2014-05-19 09:47 (c-98-237-196-210.hsd1.wa.comcast.net)

jordy869 pts/2 2014-05-19 06:32 (c-67-182-145-42.hsd1.wa.comcast.net)

ushab pts/5 2014-05-19 10:03 (c-98-237-196-53.hsd1.wa.comcast.net)

matkips pts/10 2014-05-19 00:40 (c-76-121-181-161.hsd1.wa.comcast.net)

ctran206 pts/11 2014-05-19 10:53 (131.107.174.46)

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jordy869 pts/7 2014-05-19 06:34 (c-67-182-145-42.hsd1.wa.comcast.net)

virgillo pts/8 2014-05-19 11:14 (50-54-218-104.evrt.wa.frontiernet.net)

ctran206 pts/9 2014-05-19 10:53 (131.107.174.46)

virgillo pts/10 2014-05-19 11:01 (50-54-218-104.evrt.wa.frontiernet.net)

virgillo pts/11 2014-05-19 11:06 (50-54-218-104.evrt.wa.frontiernet.net)

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jordy869 pts/5 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:53 (131.107.147.46)

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jordy869 pts/3 2014-05-19 06:35 (c-67-182-145-42.hsd1.wa.comcast.net)

ctran206 pts/4 2014-05-19 10:55 (131.107.147.46)

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stknobli pts/9 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

bquig pts/8 2014-05-19 11:17 (d-10-156-3-100.dhcp4.washington.edu)

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hongbin pts/2 2014-05-19 08:03 (c-98-237-251-168.hsd1.wa.comcast.net)

ctran206 pts/1 2014-05-19 10:55 (131.107.160.46)

ppk0907 pts/5 2014-05-19 11:21 (c-50-159-100-115.hsd1.wa.comcast.net)

stknobli pts/7 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

jordy869 pts/9 2014-05-19 06:36 (c-67-182-145-42.hsd1.wa.comcast.net)

UW1-320-08:

jordy869 pts/1 2014-05-19 06:37 (c-67-182-145-42.hsd1.wa.comcast.net)

stknobli pts/4 2014-05-19 11:38 (50-46-214-244.evrt.wa.frontiernet.net)

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ctran206 pts/7 2014-05-19 10:55 (131.107.160.46)

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brombadc pts/10 2014-05-19 11:02 (c-24-22-246-11.hsd1.wa.comcast.net)

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tdjunae pts/1 2014-05-19 11:32 (c-50-135-19-218.hsd1.wa.comcast.net)

ctran206 pts/7 2014-05-19 10:55 (131.107.159.46)

Run Time = 890 milliseconds

#: WhoAgent 0 exiting; sending exit message to parent (id -1)

#: WhoAgent 0 exiting; sending exit message to parent (id -1)

# Performance Evaluation

|  |  |  |
| --- | --- | --- |
|  | RMI | UW Agent |
| Servers | Time(ms) | Time(ms) |
| 1 | 105 | 134 |
| 2 | 175 | 240 |
| 4 | 281 | 496 |
| 8 | 499 | 991 |

## Conclusion

RMI is clearly faster for this purpose than a mobile agent. This is expected as the RMI only has to return the output of a command that is mainly strings while the UWAgent program has to pass along an entire object from machine to machine. If we could remove data transfer latency as a factor, I would expect execution time to be very similar.

UWAgent hoping is time consuming. The current implementation of a sequential hop between systems is a very inefficient use of the Mobile Agent system. To make this better we could implement this as a parallel Mobile Agent where all agents spawn and run simultaneously. In my attempts to implement this, it was difficult due to the out of order return of the Mobile Agents. In addition, the agents would execute loops out of order so the time stamps were also out of sync.

RMI has the advantage in this case where we simply want some basic output from a form of execution. A mobile agent would be more advantageous for complex tasks that are more suited to distributed and parallel execution. One such case was our previous Heat2D assignment. Each node is effectively separate until the edges are exchanged. RMI would need the parent process to manage the nodes and the Server Nodes must be passed information from the parent and knowledge of children.

Another case where a mobile agent would be advantageous is asynchronous programs. In RMi, there was a program that was matched to accept the calling client. In a Mobile Agent, having the ability to send any program for execution without having to worry about compatibility is significant. A server can process who commands but at the same time later be used to calculate a BLAST sequence alignment. This would be more difficult to implement and run with RMI while the simplicity of a Mobile Agent wouldn’t depend on the nodes awareness of the program.