

CSS497 Fall 2005

Redesigning and Enhancing the UWAgent Execution Engine

Status Report: Fri 09/30/2005

Summary

Dates: Sat 09/24/2005 – Fri 09/30/2005

This work period:

- Added a new version of hop() to allow the caller to specify a set of gateways that agents traverse while hopping from the source to the destination node.
- Created a test agent, GatewayHopTest.java.
- Tested hopping from mnode8 to mnode9 through medusa. Testing from uw1-320-20 is not yet possible because of firewall restrictions.

Next work period:

- Implement and test hopping back and forth between uw1-320-20 and mnode8 through medusa (once a port is opened on the firewall).
- Implement inter-agent communication through a gateway.

Code Changes

Here is the new hop() methods. I added a *destination* parameter, since otherwise the original destination was lost during the hop to medusa.

```
// hop method that supports over-gateway navigation
public final void hop(String hostName, String[] gateway, String funcName, String[] func_args) {
    hop(hostName, gateway, "", funcName, func_args);
}

// hop method that supports over-gateway navigation
public final void hop(String hostName, String[] gateway, String destination, String funcName,
String[] func_args) {
    UWUtility.LogEnter("gateway version; hostName = " + hostName + ", funcName = " + funcName);

    // Save the ultimate destination, so it doesn't get lost during gateway traversal
    if (!"".equals(destination)) {
        destination = hostName;
    }

    UWPlace uwp = getPlace();
    String uwpGateway = uwp.getGateway(); // get -g option from UWPlace
    if (gateway.length > 0) { // still have gateways remaining to traverse
        String nextHostName = gateway[0]; // get first gateway

        String[] newGatewayList = new String[gateway.length - 1];

        // remove gateway[0]
        for (int i=1; i<gateway.length; i++) {
            newGatewayList[i-1] = gateway[i];
        }

        UWUtility.LogInfo("Hopping to " + nextHostName);
        hop(nextHostName, newGatewayList, destination, funcName, func_args);
        UWUtility.LogInfo("After hop");
    } else {
```

```

        setNextFunc(funcName);
        setFuncArgs(func_args);
        try {
            notifyRelativesOfLocation(InetAddress.getByName(hostName));
        } catch (java.net.UnknownHostException e) {}

        uwp.sendAgent(this, destination);
    }
    UWUtility.LogExit();
}

```

Here is the test agent, GatewayHopTest.java.

```

import java.io.*;

// Test hop functionality via a gateway
// To run (example):
//     java UWPlace &
//     java UWInject localhost GatewayHopTest mnode8 medusa
public class GatewayHopTest extends UWAgent implements Serializable {
    private String hopTo = "mnode8"; // destination node
    private String firstGateway = "medusa"; // gateway protecting the destination node

    public GatewayHopTest() {}

    public GatewayHopTest(String[] hopToArgs)
    {
        hopTo = hopToArgs[0];
        firstGateway = hopToArgs[1];
    }

    private void printMsg(String message) {
        if (message.equals("")) {
            System.out.println();
        } else {
            System.out.println(getAgentId() + ": " + message);
        }
    }

    public void printMsg(String[] args) {
        printMsg(args[0]);
    }

    public void init() {
        printMsg("");
        printMsg("Hello from GatewayHopTest");

        String[] args = new String[1];
        String[] gateway = new String[1];
        printMsg("Hopping to " + hopTo);
        args[0] = "*** Hop to " + hopTo + " complete ***";
        gateway[0] = firstGateway;

        hop(hopTo, gateway, "printMsg", args);
        printMsg("GatewayHopTest exiting");
        printMsg("");
    }
}

```

Output

This shows an agent hopping from mnode9 to mnode8 via the medusa gateway. The source code is in `/home/uwagent/MA/UWAgent.new`.

mnode9 (source node)

```
[uwagent@mnode9 UWAgent.new]$ java UWPlace &
[1] 15225
[uwagent@mnode9 UWAgent.new]$ java UWInject localhost GatewayHopTest mnode8 medusa
[uwagent@mnode9 UWAgent.new]$
0: Hello from GatewayHopTest
0: Hopping to mnode8
0: GatewayHopTest exiting
```

medusa (gateway)

```
[uwagent@medusa UWAgent.new]$ java UWPlace
```

mnode8 (destination node)

```
[uwagent@mnode8 UWAgent.new]$ java UWPlace
0: *** Hop to mnode8 complete ***
```