Switchbox

Testing Documentation

Version 0.3

Version History:

Version Number	Date	Person	Description
0.1	09/02/09	John Hoare	Initial Version – Incomplete, needs Performance Tests to be written, as well as more function tests.
0.2	09/19/09	John Hoare	Modified test cases, Added Performance tests.
0.3	09/20/09	John Hoare	Updated edge-case testing to be more applicable to our system.

Table of Contents

I. Function Tests

F1: Logon – join

Description: Test that a user can join the system

Initial Configuration: Switchbox running with no clients.

Test Description:	1. Client A joins
Expected Results:	1. Client A receives join message and has no error

Test Description:	1. Client B joins
Expected Results:	1. Client B receives join message and has no error 2. Client A has no messages.

Test Description:	1. Client C joins
Expected Results:	1. Client C receives join message and has no error 2. Client B and C have no messages.

F2: Point-To-Point Communication

Description: Test point-to-point communication between two nodes.

Initial Configuration: Clients A, B and C are connected to switch box.

Test Description:	1. Client A sends test to client B.
Expected Results	1. Client A : No message received 2. Client B : Got message from client A 3. Client C : No message received

Test Description:	1. Client B sends test to client C.
Expected Results:	1. Client A : No message received

	2. Client B : No message received 3. Client C : Got message from client B

Test Description:	1. Client D joins switchbox 2. Client A sends message to client D
Expected Results:	1. Client A : No message received 2. Client B : No message received 3. Client C : No message received 4. Client D : Got message from client A

F3: Collective Communication: Broadcast

Description: Test sending a broadcast message to all clients
Initial Configuration: Continue from test 1

Test Description:	Client A sends broadcast test message
Expected Results:	1. Client A receives broadcast message 2. Client B receives broadcast message 3. Client C receives broadcast message

Test Description:	Client B sends broadcast test message
Expected Results:	1. Client A receives broadcast message 2. Client B receives broadcast message 3. Client C receives broadcast message

Test Description:	Client C sends broadcast test message
Expected Results:	1. Client A receives broadcast message 2. Client B receives broadcast message 3. Client C receives broadcast message

Test Description:	1. Client D joins switchbox 2. Client A sends broadcast test message
Expected Results:	1. Client A receives broadcast message 2. Client B receives broadcast message 3. Client C receives broadcast message 4. Client D receives broadcast message

F4: Collective communication: Group-based multicast

Description: Test for multicast communication
Initial Configuration: Continue from Test 2

Test Description:	Client B add to multicast group 1 Client A send message to multicast group 1
Expected Results:	1. Client A: No message received 2. Client B: Receive Message 3. Client C: No message received

Test Description:	Client C add to multicast group 1 Client A send message to multicast group 1
Expected Results:	1. Client A: No message received 2. Client B: Receive Message 3. Client C: Receive Message

Test Description:	Client B remove from multicast group 1 Client A send message to multicast group 1
Expected Results:	1. Client A: No message received 2. Client B: No message received 3. Client C: Receive Message

II. Performance Tests

Latency Tests

Test Description:	Client A and Client B sending unicast messages from A to B. Continuously add groups of two clients sending unicast messages.
Expected Results:	Continuously monitor latency of every unit. Calculate latency across all pairs. Plot average latency for each pair.

Scalability Test

Test Description:	Client A and Client B sending unicast messages from A to B. Continuously add groups of two clients sending unicast messages.
Expected Results:	Continuously monitor latency of every unit. Calculate latency across all pairs. Plot average latency for each pair.

III. Edge Case tests

EC1: Invalid Sent Destination

Description: Test to make sure that the switchbox handles unknown addresses gracefully

Initial Configuration: Clients A, connected to switchbox. Client B is not connected.

Test Description:	1. Client A sends unicast message to Client B
Expected Results:	1. Client A receives address not found error for client B.

EC2: Invalid Group Destination

Description: Test to make sure that the switchbox handles bad group destinations correctly and gracefully.

Initial Configuration: Clients A connected to switchbox. Group 1 exists but has no online members. Group 2 does not exist.

Test Description:	Client A sends multicast message to Group 1.
Expected Results:	Client A gets no message. (switchbox silently drops the message)

Test Description:	Client A sends multicast message to Group 2.
Expected Results:	Client A gets a no such group message from the switchbox.