

BOMBER-MISSION

A component of the eX-MISSION® Software Suite

Getting Started

How to Contact eX-Mission

USA:
Optimation Inc.
201 Finney Drive, SW
Huntsville,
AL 35824
USA

Tel: +1 877 883 3050
www.ex-mission.com

Europe & Asia Pacific:
Nematron Europe Ltd.
1The Briars
Waterberry Drive
Waterlooville, PO7 7YH
United Kingdom

Tel: +44 239 226 8080
www.ex-mission.net

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Document Revision History

Revision	Date	Comments
1.0	051023	Updated configuration instructions and screenshots.
0.3	031219	Reformatted
0.2	031010	Added configuration instructions + screenshots
0.1	030923	First version

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Notes:

I Introduction

A BRAVE server has limited resources, and can service only a limited amount of traffic. BOMBER is designed to load BRAVE servers and test their performance under different stress conditions.

A BOMBER user sets parameters to define how it publishes messages to a BRAVE server, retrieves messages from it, and displays statistics that reflect the message throughput and communications performance.

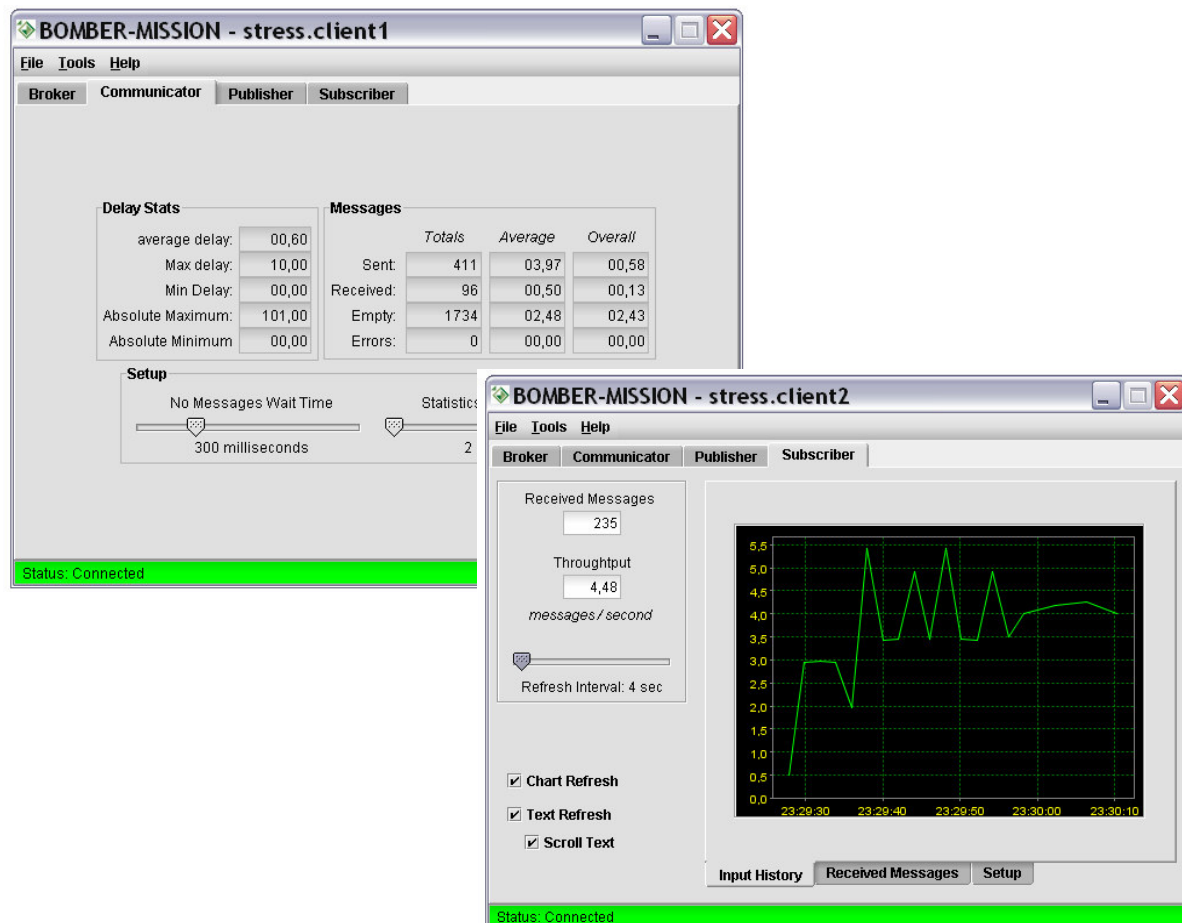


Figure 1. BOMBER-MISSION Screenshots

Notes:

2 Features

BOMBER's main function is to load (or bombard) a BRAVE server with messages. A BOMBER client is never used on its own, and is always run in a framework in conjunction with other BOMBER clients. Each client collects messages posted by other BOMBER clients.

BOMBER clients are always used in groups, simulating a multi-client framework.

BOMBER also displays statistics related to the communication with the BRAVE server, such as delays and throughput, as well as information related to the BRAVE server itself, that enable monitoring the correct behaviour of the server.

Note: Before running BOMBER-MISSION clients, make sure you have properly set the domain configuration. Please refer to "Chapter 4, Configuration" for further details.

2.1 BRAVE Statistics

You may monitor statistics from the BRAVE server by clicking on the "Broker" tab. Select the entities you want to collect data from in the list on the left side of the screen.

Monitor the "Queue Length" data. If queue lengths grow continuously, then BRAVE is not able to handle the current load.

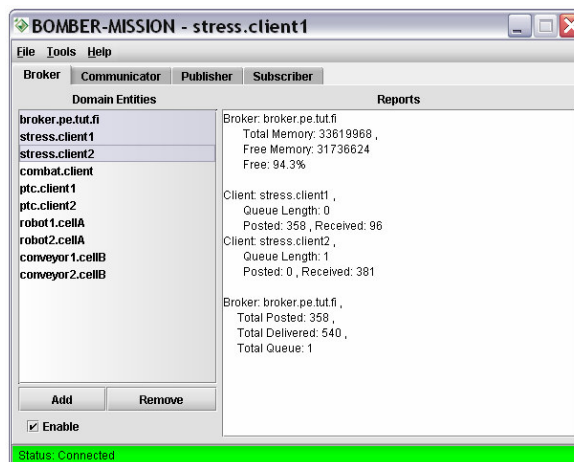


Figure 2. Message Broker Statistics

2.2 Communications Statistics

Click on the “Communicator” tab in the main window to display real-time statistics related to the communications with the BRAVE server. These statistics are collected by the underlying process in charge of dispatching messages produced by the “Message Bomber”, and collecting messages from the BRAVE server and delivering them to the “Message Receiver” for display.

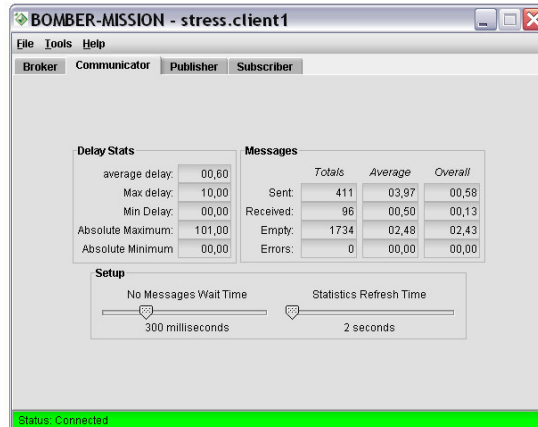


Figure 3. Communication Statistics Screen

2.2.1 Delays

The “Delay Stats” frame displays information regarding the measure of time from when BOMBER starts sending a message, until when the end of the response from the BRAVE server is received. Maximum, minimum, and average values are displayed.

2.2.2 Messages

The “Messages” frame displays information regarding the different messages transferred in the CAMX communications. Messages are split into:

- **Sent:** messages posted to BRAVE.
- **Received:** messages received from BRAVE.
- **Empty:** empty messages received from BRAVE, in response to a request from the BOMBER client, indicating an empty message queue.
- **Errors:** CAMX Error messages received from the server.

The statistics show the total amount for each category, the current average in messages/second, and the overall average for the session.

2.2.3 Setup

The “Setup” frame allows you to configure two parameters:

- **Statistics Refresh Time:** the period at which the statistics in this screen are refreshed.
- **No Messages Wait Time:** when the server has no messages to deliver, the BOMBER client will wait this period (in milliseconds) to check for new messages.

Calibrate the “No Messages Wait Time” to optimize performance and reduce empty messages.

2.3 Message Publisher

In order to publish messages to the Message Broker, select the “Publisher” tab from the main window.

2.3.1 Message Sequence Simulator

Configure the BOMBER to simulate a CAMX client.

The setup sub-tab enables the user to configure messages to send to the client being tested. In this way, the user can test that the client responds to given messages as expected.

Any number of XML messages may be loaded into a sequence. The **root element of any XML message to be loaded must be namespace-qualified**, in order for BOMBER to implement the IPC/CAMX protocol.

The user can throttle the speed of execution of the sequence. Each message has a configurable *delay*, which will elapse before the next message is sent. A sequence may be run once, forever, or for a configurable number of repetitions. The user can visualize the outgoing messages in the lower-left scroll-pane, or may choose to disable this option.

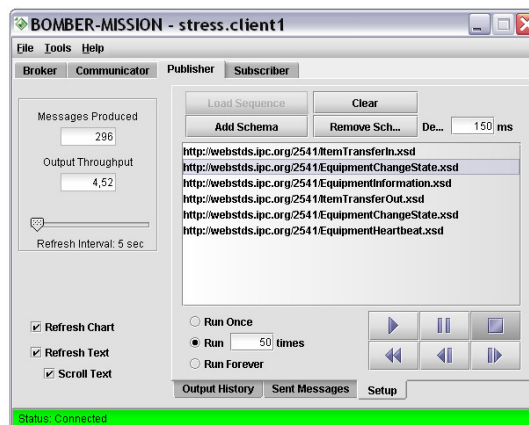


Figure 4. Message publisher simulator screen.

2.3.2 Message Output History

The Output History and Sent Messages sub-tabs enable the user to monitor the output of messages.

You may save CPU resources by turning off the chart, clicking on the “Refresh Chart” checkbox.

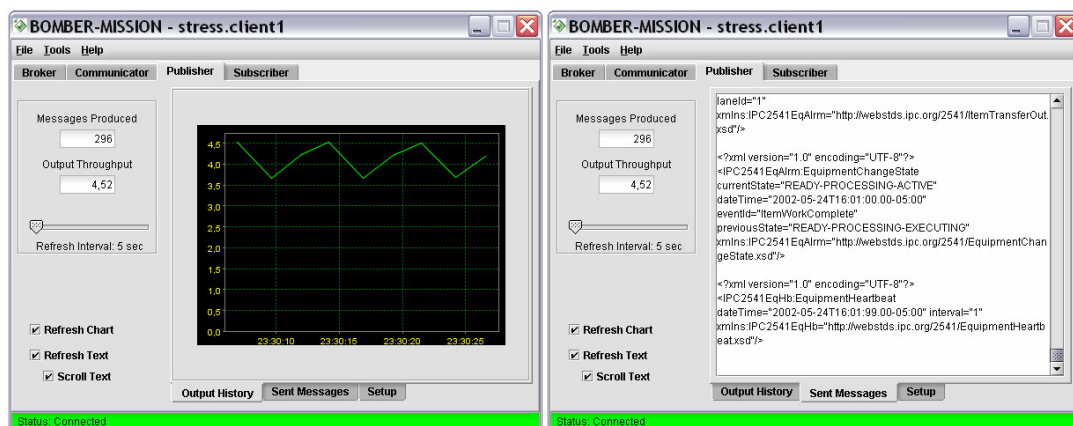


Figure 3. Message output history

2.4 Message Subscriber

In order to display messages received from the Message Broker, select the “Subscriber” tab from the main window.

2.4.1 Message Filter

Choose the Setup sub-tab in order to select which messages will be processed by bomber. Select messages from the upper pane and add them to the selection list by clicking the down-arrow button. Remove messages from the selection list using the up-arrow button. Use the Custom button to add messages which are not in the pre-loaded lists.

Any message that is received by BOMBER and that is not in the selection list will be quietly ignored and discarded.

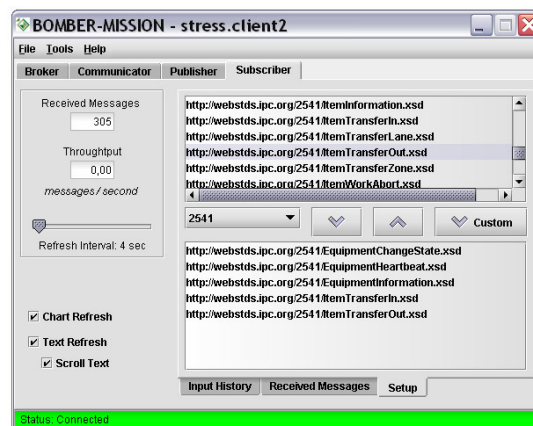


Figure 4. Incoming message selection setup.

2.4.2 Message Input History

The Input History and Received Messages sub-tabs enable the user to monitor the incoming messages. Any message that has not been selected in the setup tab will not be considered.

You may save CPU resources by turning off the chart, clicking on the “Refresh Chart” checkbox.

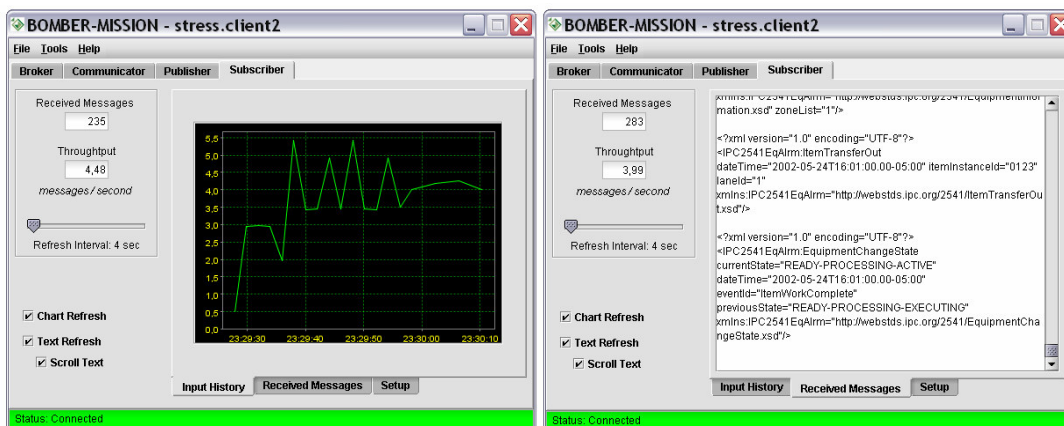


Figure 5. Message input history

3 Configuration

Configuration of BOMBER is simple and straightforward. It takes two steps: configuring each BOMBER client, and setting up the Domain.

3.1 Configuring a BOMBER Client

Simply edit the `bomber.ini` configuration file, which is located in the same directory as `bomber.exe`, and set the following parameters:

- `brokerName`: the URI for the Message Broker
- `brokerURL`: the URL for the BRAVE server
- `clientNames`: the URIs for the multiple BOMBER clients, comma separated

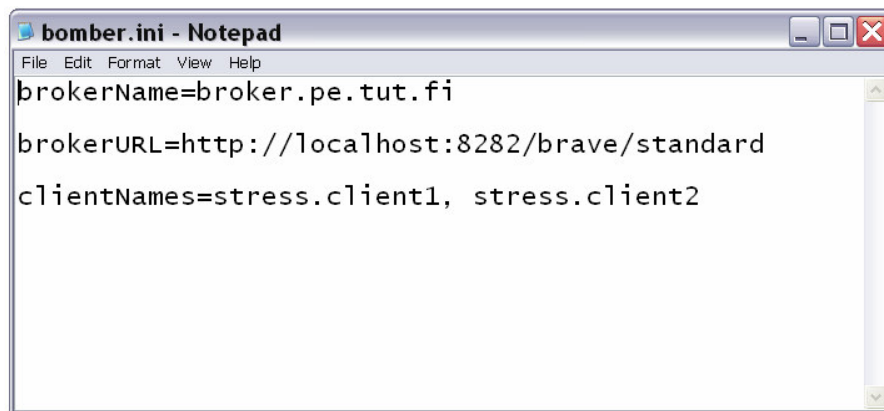


Figure 5. Example bomber.ini file

When bomber starts, you will be given a choice for one of the clients that has been configured in the `clientNames` parameter of `bomber.ini`. The selected client name will be used to communicate with the message broker.

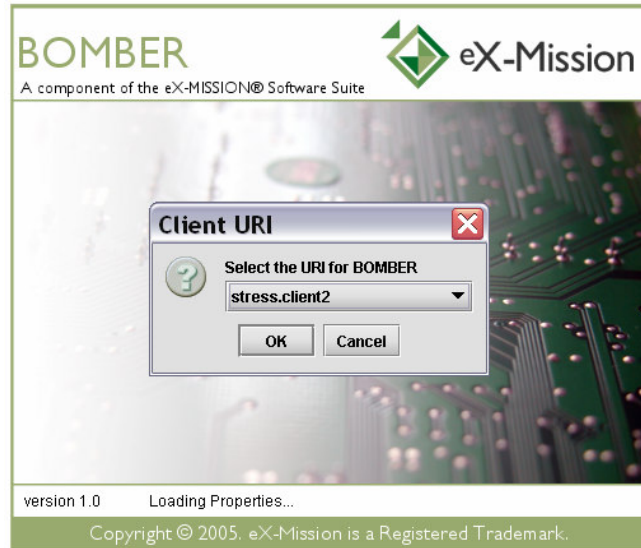


Figure 7. Selection of client name to communicate with the Message Broker

3.2 Setting the Domain Configuration

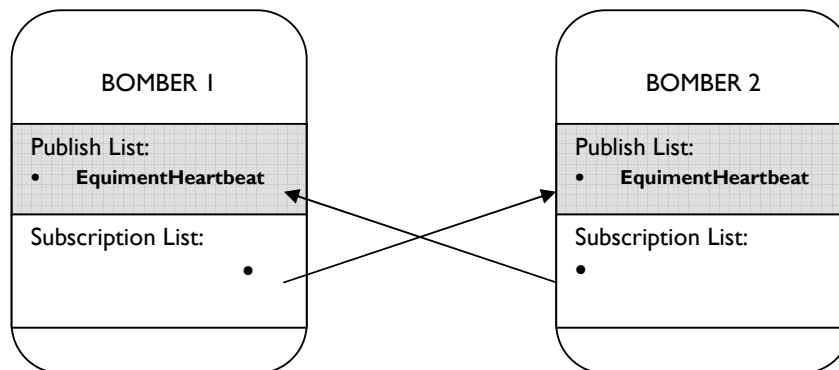
In order to properly simulate a simple CAMX framework, you must set up the Domain Configuration, to set the publishing permissions for BOMBER clients. BOMBER simulates CAMX clients by producing IPC-2541 EquipmentHeartbeat messages (<http://webstds.ipc.org/2541/EquipmentHeartbeat.xsd>).

You must set permissions for each BOMBER client to publish EquipmentHeartbeat messages, and you must set BOMBER clients to subscribe to EquipmentHeartbeat messages produced by other clients.

Use COMBAT-MISSION Software to easily set up BOMBER publishing and subscription interests.

3.2.1 Example Domain Configuration I

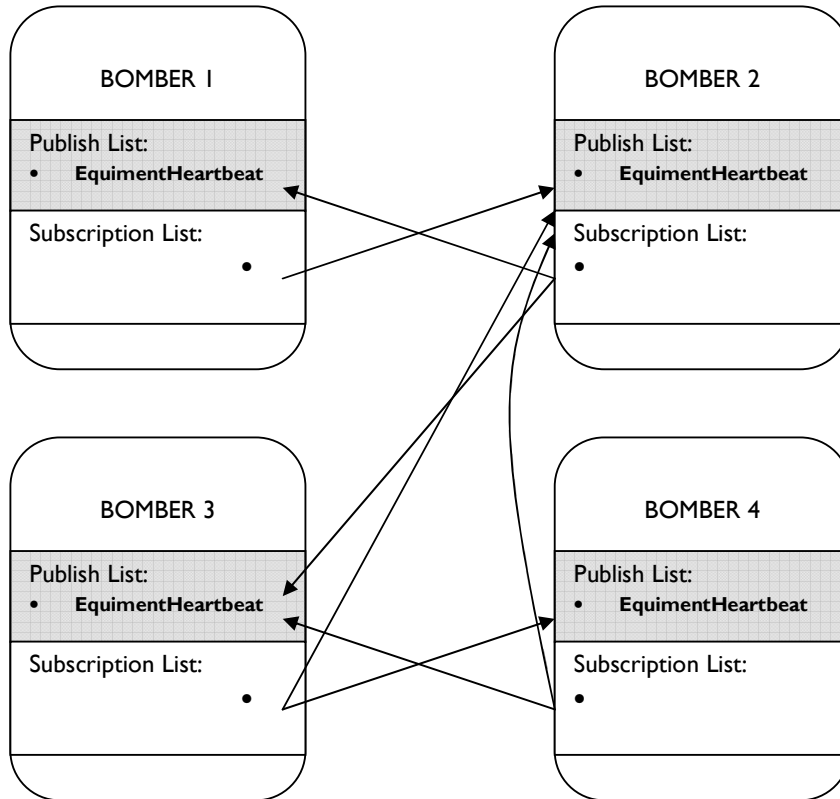
Basic simulation scenario:



```
<Client clientName="bomber.1" queueFullOperation="STOP" queueSize="50">
  <PublishList>
    <MessageSchema>
      http://webstds.ipc.org/2541/EquipmentHeartbeat.xsd
    </MessageSchema>
  </PublishList>
  <SubscriptionList>
    <Publisher publisherName="bomber.2">
      <MessageSchema>
        http://webstds.ipc.org/2541/EquipmentHeartbeat.xsd
      </MessageSchema>
    </Publisher>
  </SubscriptionList>
</ReceiveList/>
</Client>
<Client clientName="bomber.2" queueFullOperation="STOP" queueSize="50">
  <PublishList>
    <MessageSchema>
      http://webstds.ipc.org/2541/EquipmentHeartbeat.xsd
    </MessageSchema>
  </PublishList>
  <SubscriptionList>
    <Publisher publisherName="bomber.1">
      <MessageSchema>
        http://webstds.ipc.org/2541/EquipmentHeartbeat.xsd
      </MessageSchema>
    </Publisher>
  </SubscriptionList>
</ReceiveList/>
</Client>
```

3.2.2 Example Domain Configuration 2

Complex simulation scenario.



```
<Client clientName="bomber.1" queueFullOperation="STOP" queueSize="50">
  <PublishList>
    <MessageSchema>
      http://webstds.ipc.org/2541/EquipmentHeartbeat.xsd
    </MessageSchema>
  </PublishList>
  <SubscriptionList>
    <Publisher publisherName="bomber.2">
      <MessageSchema>
        http://webstds.ipc.org/2541/EquipmentHeartbeat.xsd
      </MessageSchema>
    </Publisher>
  </SubscriptionList>
</ReceiveList/>
</Client>
<Client clientName="bomber.2" queueFullOperation="STOP" queueSize="50">
  <PublishList>
    <MessageSchema>
      http://webstds.ipc.org/2541/EquipmentHeartbeat.xsd
    </MessageSchema>
  </PublishList>
  <SubscriptionList>
```

```

    <Publisher publisherName="bomber.1">
      <MessageSchema>
        http://webstds.ipc.org/2541/EquipmentHeartbeat.xsd
      </MessageSchema>
    </Publisher>
    <Publisher publisherName="bomber.3">
      <MessageSchema>
        http://webstds.ipc.org/2541/EquipmentHeartbeat.xsd
      </MessageSchema>
    </Publisher>
  </SubscriptionList>
  <ReceiveList/>
</Client>
<Client clientName="bomber.3" queueFullOperation="STOP" queueSize="50">
  <PublishList>
    <MessageSchema>
      http://webstds.ipc.org/2541/EquipmentHeartbeat.xsd
    </MessageSchema>
  </PublishList>
  <SubscriptionList>
    <Publisher publisherName="bomber.2">
      <MessageSchema>
        http://webstds.ipc.org/2541/EquipmentHeartbeat.xsd
      </MessageSchema>
    </Publisher>
    <Publisher publisherName="bomber.4">
      <MessageSchema>
        http://webstds.ipc.org/2541/EquipmentHeartbeat.xsd
      </MessageSchema>
    </Publisher>
  </SubscriptionList>
  <ReceiveList/>
</Client>
<Client clientName="bomber.4" queueFullOperation="STOP" queueSize="50">
  <PublishList>
    <MessageSchema>
      http://webstds.ipc.org/2541/EquipmentHeartbeat.xsd
    </MessageSchema>
  </PublishList>
  <SubscriptionList>
    <Publisher publisherName="bomber.2">
      <MessageSchema>
        http://webstds.ipc.org/2541/EquipmentHeartbeat.xsd
      </MessageSchema>
    </Publisher>
    <Publisher publisherName="bomber.3">
      <MessageSchema>
        http://webstds.ipc.org/2541/EquipmentHeartbeat.xsd
      </MessageSchema>
    </Publisher>
  </SubscriptionList>
  <ReceiveList/>
</Client>

```

BOMBER-MISSION is now ready to use !!

Notes: