



# ROOBROO – DESKTOP COLLABORATION PLATFORM

## ARCHITECTURAL OVERVIEW AND CONFIGURATION HIGHLIGHTS

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## ROOBROO – DESKTOP CONFERENCING MADE EASY!

### OVERVIEW

rooBroo is a full featured desktop collaboration platform. In addition to the standard conferencing requirements of Audio, Video and Desktop Sharing, the rooBroo platform offers several other features such as Presence Detection, Calendaring, File Sharing, Polling and several other features that often are required in collaboration scenarios. In addition the ability to complete record the session is also present in rooBroo and can be used for compliance or review purposes.

The application can be used on a one-on-one conference mode or in a small group mode for upto 15 participants. The application can also be used for web cast and other one-to-many meetings as well.

The application is typically offered in a PaaS model (Platform as a Service) where clients can either subscribe for the services or install the server application within their network as well.

### APPLICATION INTEGRATION

In addition to the deployment models mentioned in the overview, the application also lends itself to be integrated to other applications in a quick and simple manner.

To integrate any application with rooBroo is a simple process where the third party application needs to hit a URL with appropriate rooBroo credentials that will be provided. In cases where the third party application is a desktop app then the rooBroo client can be called from the application through a runner app (runRooBroo) which will call the client. The code snippets for enabling this integration shall be provided by rooBroo.

This simple integration approach makes it easy and faster for our client organizations to start using the product unlike the API approach where the client development team may need to do more work for integrating their application with rooBroo. Also this integration approach ensures that there zero code maintenance on their application with respect to rooBroo Integration.

### TOP LEVEL ARCHITECTURE

At the top level the rooBroo application consists of a server and a client package. The server itself has 6 modules, viz., Controller, Manager, Server, Proxy, Database and Web components. The components are interdependent and work together to make the rooBroo Server and interact with multiple instances of the rooBroo client to enable conferencing.

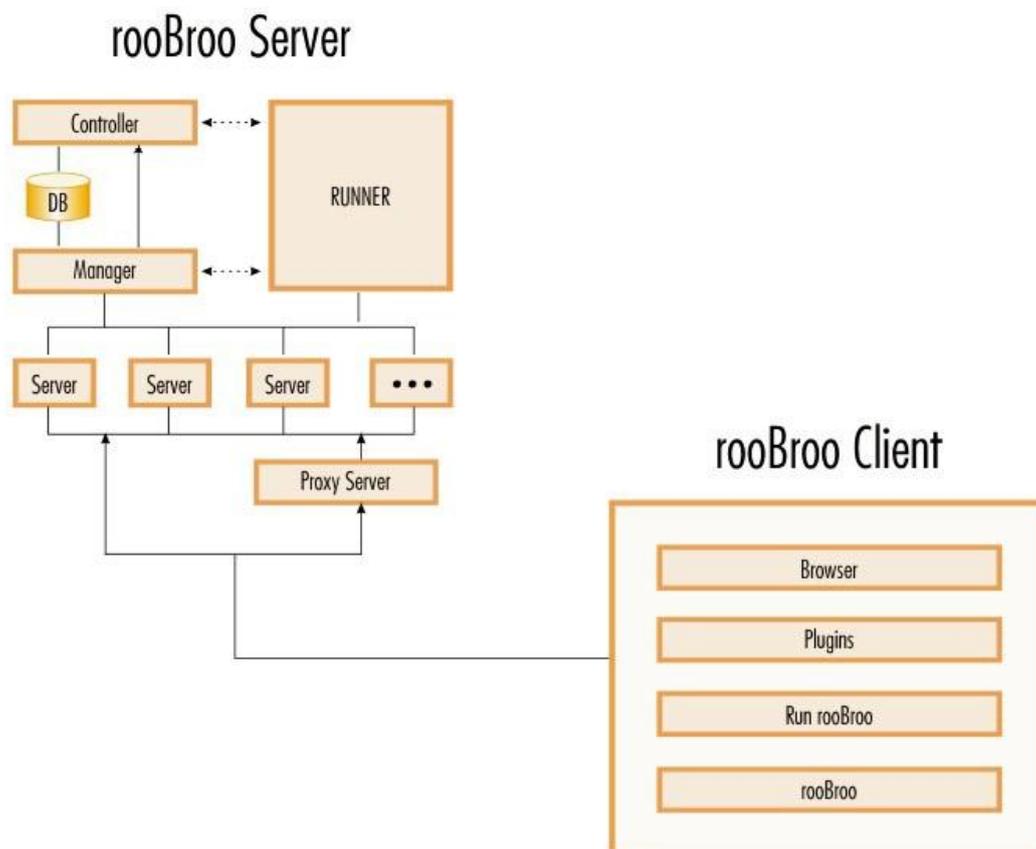
## THE ROOBROO SERVER COMPONENTS

The rooBroo server has three primary components – The controller, manager and the server.

### THE CONTROLLER

The primary role of the Controller is to oversee the manager license capacity. The Manager connects to the controller, providing its user name and password for authentication. After authentication the controller provides information to the manager about the max number of concurrent sessions that the manager is authorized to handle and other such license compliance information.

1. The Manager's license compliance data can be configured in controller's database.
2. The manager's user name can also be a MAC ID in security sensitive implementations and this can be configured in Manager Module.
3. Manager's service validity can be configured in controller database.
4. The Manager's credentials can be activated or deactivated in controller database.



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## THE MANAGER

The primary role of the manager is to manage the server side application logic. It uses proprietary protocol to communicate with the rooBroo client over TCP transport protocol with a few exceptions. Manager maintains a ‘heart beat’ with the controller to get its license and operational guidelines such as maximum number of concurrent connections. The manager has been architected with the provision of handing multiple applications with the same communication protocol as rooBroo.

1. The Manager can be configured either to enable the ‘heartbeat mode’ or work in a solo mode. In solo mode, it does not connect to the controller, but utilizes two utility applications – the License Generator and Valid License Checker for license compliance. The license has to be generated and imported to the manager for the manager to work in Solo mode.
2. The Manager works in conjunction with a properties file for configurable parameters.
3. The ‘Heart beat’ interval can be configured through manager module.
4. The manager can work with multiple databases – Presently supports, postgresSQL, Oracle and Access.

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## THE SERVER

The server provides for high scalability and supports a distributed architecture. The core activity of the server is to connect the clients with the Manager. Multiple instances of server are possible for each manager. In cases where the no of users or no of meetings are high, one can add one more server to manage the load. Typically, one instance of the server can handle about 10000 concurrent users.

1. The server configuration parameters are set through the use of a properties file.
2. The server does not use database nor connect with controller.

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## PROXY SERVER (OPTIONAL)

In addition to these essential servers, the server package can also include a proxy server. The proxy server facilitates the rooBroo client to connect with the Sever in case if client’s network is behind firewall. It works on SSL and HTTP ports. It is also capable of handling request from the client and connects to the server on behalf of client.

1. The Server IP and Port information is configured in a properties file.
2. The Proxy Server also supports non rooBroo requests forwarding to the web server. In this case web server IP and Port needs to be configured in properties file.

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## THE RUNNER

The runner app manages the execution of Server, Manager, Controller and also handles exceptions.

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## THE ROOBROO CLIENT

The rooBroo Client is the end user application that connects with other clients and enables the conference. The rooBroo Client has a host of features that are required in any collaboration scenarios.

The rooBroo server connects with a specific server. The configuration information such as the server name and the port are set a properties file at the client end.

The client has several modules which are described below.

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## AUDIO MODULE

This module enables users to communicate via voice.

Audio Module allows turning on / off the connected mike and the speaker. Users can adjust the volumes for both Microphones as well the speakers. Alternatively headsets could be used for a more smoother experience. The audio module also supports a test call feature to verify the audio equipment and configuration at the client side. Noise cancellation algorithm works to cut out the white noise.

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## VIDEO MODULE

The Video Module allows starting a video session between the connected users. The module supports multiple videos in a single session. Pixel density and various presentation configuration options are user selectable. Townhall mode of interaction is also supported besides 1-1 and multi-party.

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## CHAT MODULE

Text chat module allows a user to use text messages or chat with the entire group or an individual conference participant. The module supports emoticons as well.

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## WHITEBOARD MODULE

It is one of the most versatile features of rooBroo where a user can share pictures or draw images. The whiteboard provides all the features that most common drawing board have and in addition it also has several other things like Highlighter, Personalized Background image, Text Insertion, Zoom in / Zoom out and multi page option so that nothing goes beyond the window screen. There are many more features that could be explored. Annotation capability is supported for collaboration purposes.

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## DESKTOP SHARE MODULE

The Desktop Share module allows meeting user to view each others' desktops. Options to share either the entire desktop or only certain windows are also available in the module. In addition the module also allows documents to be shared. Certain types of documents such as presentation PPT files and PDF are paginated and imported to enable easy access to the various pages of the document.

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## MEETING ROOM MODULE

The meeting room is the core of the collaboration tool. The meeting room provides features for one to Invite new participants, promote as presenter, promote as active participant, remove participant, mute participant and other such functions.

The Meeting UI shows the active number of participants who have joined the meeting. Since the meeting participants can be a significant number, a filter has been provided to search whether the participant has joined the meeting or not. From the Meeting UI the presenter can also manage the audio, video and haring rights of the participants.

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## THE POLL MODULE

The Poll Module allows a user to conduct a poll by presenting a question to all the participants. The answer can either be a Single or Multiple Choice response. The polls are time based and once the time is over the results are displayed to the presenter. The poll results can also be saved in text format for future references. The polling results can also be shared with one or more active meeting participants in the meeting.

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## FILE TRANSFER MODULE

Using this tool, files can be transferred to all or selected participants in the meetings. The module functions such that a file transfer is performed even if the participant arrives late to a meeting or there is a network situation during the actual file transfer.

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## RECORD SESSION MODULE

All the activities during the sessions including text, video, audio, desktop sharing, application sharing, and drawing board are saved on the client's desktop using this module. The recorded file can be played back by a player built into the rooBroo application itself. Currently editing capabilities are not supported in the player.

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## ‘SYNC’ SERVICE

This module keeps the user’s screen in Sync with the presenter’s screen throughout the meeting. This ensures that all the participants in the meeting are on the ‘same page’ and avoids any confusion.

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## RUNROOBROO (CLIENT)

The runRooBroo module acquires the theme for the client. It also verifies and provides updates for the clients whenever available. It also manages the client application state and execution.

## WEB SERVER

The rooBroo application has an associated web application as well. The public domain website is at [www.rooBroo.com](http://www.rooBroo.com). The web app provides for easy access to rooBroo through the browser interface. A client user can sign in through the web site to launch the client application without the need for downloading and install the rooBroo Client.

This website has been developed in JSP and can be deployed on any java container such as Glassfish. The database configuration information is set through a properties file on the web server.

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## BROWSER PLUG INS

Plugs-in have also been developed which help in downloading and starting the rooBroo client on the user’s computer. Plug-ins for Firefox, Google Chrome, An ActiveX component for IE and applets for other browsers have been developed. All the plug ins are packaged along with the webapp and the order of preference of the plug ins can be configured. All plug ins are needed to be digitally signed to ensure security.

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## NETWORK PROTOCOLS USED IN ROOBROO

rooBroo uses client-server and peer to peer socket communication over TCP and UDP protocols. In certain client network, it also uses proxy authentication, http and https tunnelling as well as SOCK4/5 protocols. UDP sockets are used for audio wherever the network permits. Following are the transport channels which rooBroo uses.

1. Client to server TCP connection.
2. Client to server UDP socket.
3. Client to Client TCP connection.
4. Client to Client UDP connection.
5. Client to client redundant UDP and TCP connection for Audio RCU (redundant-concurrent).

Following are configuration points.

1. The fall back order of available transport channels for particular data types can be configured. This can only be configured in Client Module.
2. Any transport channel except 'client to server TCP connection' can be turned off
3. Proxy support can be enabled or disabled in the client module.
4. User can make HTTP/HTTPS tunnelling disable or enable in rooBroo module.
5. The peer to peer support can be set based on no of users in the meeting session.

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## SECURITY OVERVIEW

rooBroo supports Data security over networks as well as module accessibility at user, meeting, meeting type or app type levels.

As regards the Data security over network, rooBroo uses a combination of asymmetric and symmetric encryption methods. It generates key pair for asymmetric encryption and shares the public key with the server. Server generates symmetric encryption key dynamically and encrypts it with public key provided by participant. The server shares respective encrypted symmetric key with each participant. All the data is subsequently encrypted with 'dynamically generated symmetric encryption key'. The data encryptions can be enabled or disabled for a specific implementation. Also the encryption algorithm can be changed if desired.

Since rooBroo provides module access based on application type, user, user type, meeting or meeting type the implementer can configure rooBroo modules accessibility as required for a specific implementation. The Module's visibility is configurable from the database.

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## USER INTERFACE CONFIGURATIONS

rooBroo supports theme based user interface. The Theme can be configured based on user, user type, meeting and meeting type in the database. The view including the interface arrangement in a session can be configured for different meeting types or app types.

In addition a User's view can be configured and the the default UI placement set for each module in database at the level of meeting. This allows for a different meeting view for different meetings. This default view can be altered at the time of Meeting creation if so desired.

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## USER MANAGEMENT AND USER ACCESS CONFIGURATIONS

A rooBroo user can have one of several user types and user app type. Web applications give access based on user type and the rooBroo client acts based on the user app type.

1. The rooBroo user type can be configured in the database. If a new type and access needs to be created than relevant implementation needs to be done in the web application.
2. rooBroo Client responds based on the 'user app type'. This also can be configured in the database. If the new app type needs to be created then relevant changes needs to be done across the server as well as the client.