



VNC
Virtual Network Consult



VNCtalk

Technical Documentation

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1 Introduction

1.1 About Zimbra

Zimbra is a comprehensive communication and collaboration environment, fully called Zimbra Collaboration. Zimbra includes e-mail, contacts, calendars, tasks, instant messaging, file storage and web document management components. There are two editions of Zimbra available – the Open Source edition including all the functionality mentioned above, and the Network Edition which features full enterprise-class administration capabilities, plus mobile and desktop synchronization (of mail, contacts and calendar).

1.2 About VNCtalk

VNCtalk specializes in providing services for real time communication. It is a utility software which is installed on Zimbra as a Zimlet. The VNCtalk Zimlet enables its users to perform text chat, text conference, video chat and video conference and online document collaboration between users using Zimbra Zimlet technology.

2 Objectives and features

VNCtalk will help the user to interact and communicate more effectively with other users inside an enterprise network using the Zimbra UI without the need of installing extra software. Only a modern browser like *Chrome* is needed to start using VNCtalk. The communication across the users is always secure using TLS encryption.

2.1 Benefits

- Easy to use
- Encryption of user data
- Tight integration into the Zimbra environment
- Easy integration in corporate environments
- Single and Group Conversations
- Web-based Audio and Video conferencing using WebRTC and XMPP-jingle
- Platform independence due to the nature of XMPP
- No need of extra software on client-side
- Convert a text conference into a video conference
- Multiple independent video streams
- Moderator function to selectively mute users
- Integrated document sharing based on *Etherpad*

2.2 Features

- 1:1 text chat
- 1:n text chat
- 1:1 video chat
- 1:n video chat
- Collaborative document creation (based on *Etherpad*)
- *LDAP* authentication for each user
- Automatic contact list population, based on Zimbra distribution lists

2.3 Features to come

- Screen sharing functionality
- File sharing *user2user* or *user2chatroom*
- Anonymous user login

2.4 Functional scope

2.5 System architecture Diagram

[graphic explanation and short text]

3 VNCtalk

3.1 Components

VNCtalk consists of the interaction of several components running on different servers. These servers need to be reachable over the Internet or over an internal network, e.g. using a VPN.

1. Zimbra Zimlet
2. XMPP server
3. Zimbra LDAP
4. VNCHybridAuth
5. Jappix mini
6. Jitsi
7. Etherpad
8. Screen sharing

The Zimbra Zimlet loads the mini chat client. It downloads the Javascript files directly from the XMPP server. Then the mini chat (based on the open source project Jappix Mini) connects to the XMPP server and provides the "1:n text chat (where $n \geq 1$)". We have enhanced the Jappix mini code to provide additional features like, additional multi-chat buttons and invite-person-to-chat buttons. Also a start video conference button was added. When a video conference is started, we use another component called Jitsi-Meet (which uses Jitsi-videobridge). Jitsi-Meet is the component which displays the video streams on the browser window and coordinates the call states (connect, stop, play, disconnect, and so on). The videobridge is like a network router but for video streams. Then we have a TURN/STUN server, which is used when clients are behind a NAT. This TURN server helps to forward video/audio traffic in complicate and not from the Internet accessible networks, like a NAT. Finally we use LDAP to authenticate the users and based on Zimbra distribution lists, we build the user groups for the XMPP roster. The Etherpad component is used to provide document collaboration.

Zimbra Zimlet

This is a small Zimlet installed in the Zimbra machine which only takes care of loading the mini chat application (Jappix Mini) from the XMPP server. In the future this Zimlet will save some user settings to personalize the chat application during runtime.

Additionally there is the VNCtalk Admin Zimlet, which provides the persistent configuration like XMPP server domain and ports.

- XMPP server domain
- The domain where to get the Jappix Mini JS files
- Port numbers

XMPP server

We use the Open Source XMPP server *prosody*. Prosody is written in Lua and it is very easy to extend using modules. Prosody is used to manage the chat and multi-chat communication. In addition prosody is capable to authenticate users using LDAP and use an hybrid authenticate module written by VNC. The roster groups are also statically

constructed using the Zimbra LDAP and distribution lists. Each time the distribution list changes, the prosody server needs to be restarted.

LDAP

We use the LDAP daemon provided by Zimbra, but prosody could also use any other LDAP server. The usage of a different LDAP server is not discussed here.

VNCHybridAuth

To provide authentication of users based on our own criteria and against different user databases (LDAP, MySQL, etc.) a hybrid authentication module was written. This module is called by prosody asking him to authenticate the user by providing *user*, *host* and *password*. If the authentication was successful the hybrid authentication module exits with 0, otherwise returns 1.

Jappix mini

This is an Open Source project which provides a simple XMPP mini chat written in Javascript for websites. VNC extended this project with additional features and components and so be usable in the ZCS environment.

Jitsi

“Jitsi Meet is an OpenSource (MIT) WebRTC JavaScript application that uses Jitsi Videobridge to provide high quality, scalable video conferences.” (<https://jitsi.org/Projects/JitsiMeet>)

Etherpad

Etherpad is a document collaboration software. With the help of Jitsi-meet Etherpad is used to provide to the users document sharing capabilities.

Screen sharing

This is provided by a Chrome extension.

3.2 DNS entries

This section lists the needed DNS entries for the XMPP and Zimbra/LDAP server.

FIXME

3.3 Supported Zimbra version

Zimbra 8.0 (Iron Maiden) and 8.6 (Judas Priest) are officially supported. Zimbra 7.0 (Helix) is not officially supported.

3.4 Limitations

The usage of the Chrome or Chromium browser is currently mandatory. Other browsers like Firefox, Opera or Safari are not supported and VNCtalk will not run on those browsers!

A functional webcam and microphone&headphones are also needed for videochats.

The available bandwidth to the user is also a limitation. If many users, e.g. more than 6 users, are using the videochat application at the same time, the complete uplink and downlink bandwidth of the Internet could be saturated, possibly affecting the quality of the conversation.

4 Repositories

This chapter describes in which Git repository which component is developed.

4.1 vnc-zimlet-chat

<ssh://www-data@redmine.vnc.biz/vnc-zimlet-chat>

This is the main Zimlet repository. Here are the files needed to develop the VNCtalk and VNCtalk-admin Zimlets.

To start developing or to start building the Zimlet: change to the branch respective to the release, e.g. `release_2.0.2`. Then if needed fork a new branch with the name of the new release, e.g. `release_2.0.3`, and start developing on this branch.

4.2 Prosody packaging

<ssh://www-data@redmine.vnc.biz/prosody-packaging>

It contains all prosody related customization.

- all the customization related to Jappix Mini, under the folder `./mini`.
- the prosody modules which we have developed and/or changed.
- the authentication provider code base which we had written for Prosody.
- the `vnctalkInstaller.sh` script
- the config files templates

4.3 Jitsi Meet

<ssh://www-data@redmine.vnc.biz/vnctalk-jitsi-meet>

JitsiMeet customization by VNC for VNCtalk Zimlet. We have not done any customization in Jitsi Video Bridge and Jifoco. So those can be directly downloaded from their respective websites and used.

4.4 Etherpad

FIXME

Etherpad is directly downloaded from the official repository. Inside the `config.js` file need to change the `etherpad_base` variable to the Etherpad URL.

4.5 Screen sharing

<ssh://www-data@redmine.vnc.biz/vnctalk-jitsi-meet>

JitsiMeet screen sharing customization by VNC for VNCtalk Zimlet

5 UML diagrams

- 5.1 Use case for administrators
- 5.2 activity diagram for administrators
- 5.3 Sequence diagram for administrators
- 5.4 Use case for users
- 5.5 activity diagram for users
- 5.6 sequence diagram for users
- 5.7 overall class diagram

6 System design

6.1 Necessary Requirements

Zimbra Requirements, which have to be installed/configured first

Third Party Requirements, which have to be installed/configured first

6.2 Entity relationship diagram

6.3 Data dictionary

[Table content]

7 Screenshots

[Add some screenshots with short text to describe the image - overview, not "manual-like"]

8 Changelog

[please insert link to the changelog]

9 Roadmap

planned improvements/features



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About VNC

VNC - Virtual Network Consult is a leading business cloud integrator and a specialist in commercial open source solutions. VNC provides services to organizations and businesses of all sizes - from small and medium businesses to globally operating corporations. Our services range from platform data center solutions to complex business applications such as the VNCportal, CRM-ERP, VNCmail+ and advanced Secure Communications Environments – mobile and suited to the needs of each client.

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