

NETOP™

Live COMMUNICATOR™

Secure Unified Communication

Product White Paper

Live Communicator, Live Web-Call & Live Web-Chat in a hosted environment

Contents

1	Products and features	1
1.1	Messaging	1
1.2	Virtual meetings	1
1.3	Call center functionality	2
2	Products and components	3
2.1	Netop Live Communicator	4
2.2	Netop Live Web-Call	5
2.3	Netop Live Web-Chat.....	6
2.4	Network infrastructure	7
3	Software and hardware requirements	8

Netop Live Communicator Suite consisting of Netop Live Communicator, Netop Live Web-Call and Netop Live Web-Chat, provides secure and robust communication over the Internet. With instant messaging, secure Web chat, one-button push-to-talk customer service over the Web, and interactive video and audio, Netop Live Communicator Suite can be used collaboratively across the enterprise as well as to provide customer service. This technical paper gives a brief overview of product features and a description of the components and the communication; the intended audience is IT or network administrators from companies who run a hosted Netop Live Communicator Suite solution.

1 Products and features

Netop Live Communicator Suite includes these core features:

- Instant messaging among users on the corporate network.
- Virtual meetings with participants on the corporate network as well as external participants.
- Call center functionality with call routing for efficient handling of customer calls initiated from the Web.

The sections below give a brief overview of these features.

1.1 Messaging

The messaging interface includes a contacts list with a status indication for each. This enables users to see who are available before initiating a chat. External users can initiate a chat session from a Web browser without having to install any components.

Chat session participants can share their desktop, share select applications and share files. They can also choose to switch from text chat to audio and video communication.

All interactions are automatically logged and archived for compliance and audit purposes.

Features list:

- Presence panel and contact lists
- Text chat
- Audio and video conferencing
- Video and audio mail
- Secure Web-Chat
- Encrypted document and file sharing
- Desktop and application sharing
- Co-browsing
- Message logging and archive

1.2 Virtual meetings

Virtual meetings can be scheduled to start at a specific date and time, or can be started when the need arises.

Meetings always start out as text chat and the meeting organizer can then enable audio and video.

Depending on purpose, a meeting can be set up as a presentation with one speaker and up to 19 listeners or as an interactive meeting where up to five participants can speak and share their work. In a presentation mode meeting, all features are available to the meeting organizer who can use audio, video and share application or desktop. Unless the meeting organizer hands over control, meeting participants can listen and view only. In an interactive meeting, all participants have access to all features.

All meetings are logged so you always have a record of who was present, what were written and other actions.

Features list:

- Text chat
- Audio and video conferencing
- Desktop and application sharing
- Co-browsing

1.3 Call center functionality

The messaging interface also includes call center functionality which allows operators to answer customer queries made from a Web site. The contact is started as a chat session and can be extended to include audio and video if the participants so choose.

Operators see calls presented in a list with the first caller at the top of the list and can answer the customer call by double-clicking the customer call information.

The features list is identical to the list for messaging since the same application is used.

2 Products and components

The Netop Live Communicator Suite consists of these products:

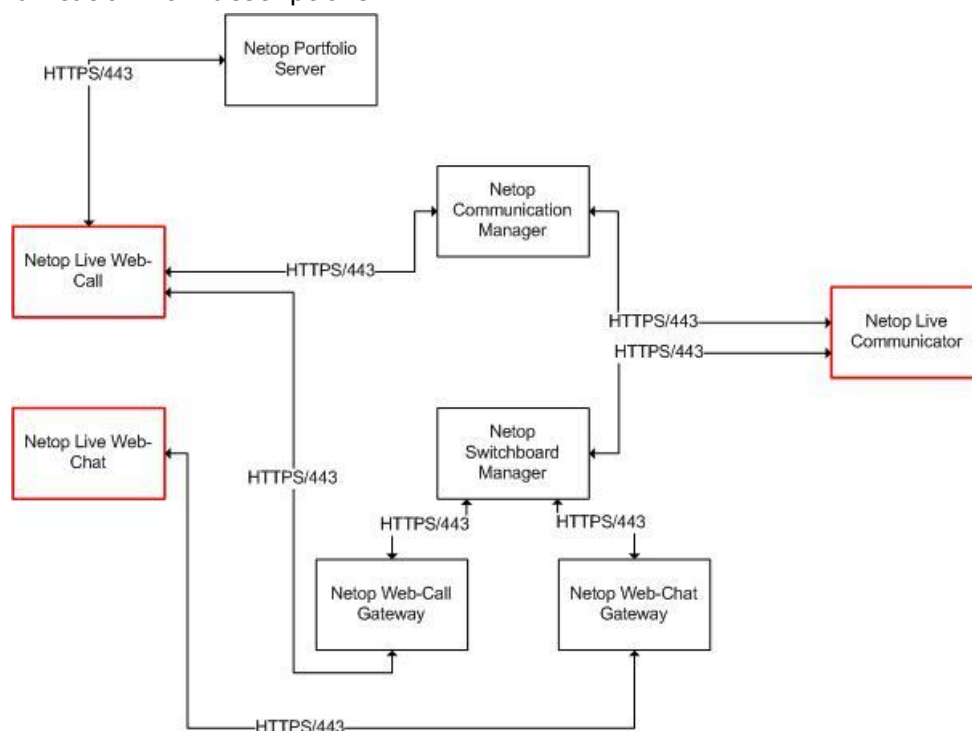
- Netop Live Communicator
- Netop Live Web-Call
- Netop Live Web-Chat

Netop Live Communicator is installed on users' computers. Netop Live Communicator provides classic instant messaging features like for example text chat, contact list, user details and message archive as well as interactive multimedia features like audio and video transmission, application sharing and file transfer. Netop Live Communicator is used by employees within a company and communication is possible only between users connected to the central communication server. Netop Live Communicator also can also receive calls from a Web site running Netop Live Web-Call or Netop Live Web-Chat.

Netop Live Web-Call provides access through a call button on a Web site to an interactive session with a call center operator using Netop Live Communicator. The session starts out as a chat session but can be extended with the Netop Live Communicator features mentioned above.

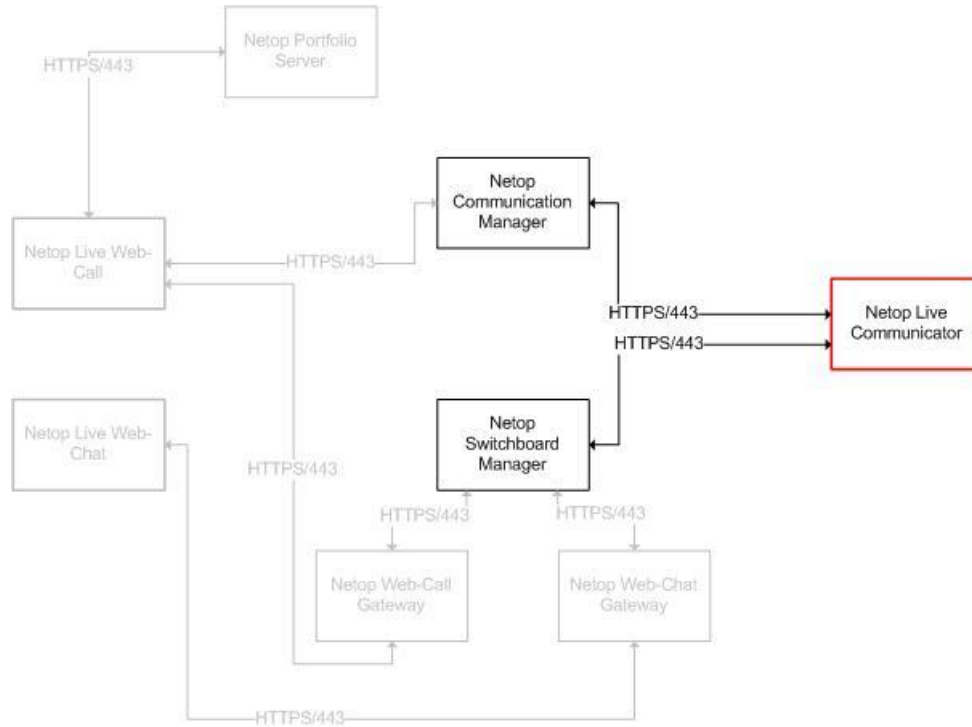
Netop Live Web-Chat also provides Web access through a call button to a call center operator using Netop Live Communicator but Netop Live Web-Chat requires no installation on the computer initiating the communication. As opposed to Netop Live Web-Call, Netop Live Web-Chat only provides text chat.

Based on the below illustration which includes the three products as well as the hosted communication servers, the following sections give a technical product overview as well as communication flow descriptions.



2.1 Netop Live Communicator

Netop Live Communicator users log on to a Netop Switchboard Manager Server that manages and broadcasts all the user-related data as well as the incoming call data. Netop Live Communicator communicates with Netop Communication Manager Server and Netop Switchboard Manager Server on TCP/IP port 443 and supports encryption.



Netop Live Communicator communication flow

This section describes the communication flow in a text chat between two participants where audio communication is subsequently added.

1. The Netop Live Communicator user who wants to chat with a colleague locates the relevant colleague in the contacts list and opens the chat window.
2. The user types a message and sends it.
3. The communication between the two users goes through the Netop Switchboard Manager where every action is logged.
4. The user initiates audio communication.
5. The Netop Switchboard Manager creates a session ID and ensures that both users use the ID.
6. Both users contact Netop Communication Manager using the session ID. Any text chat continues to go through the Netop Switchboard Manager while audio is handled by the Netop Communication Manager.

The session with Netop Communication Manager ends when one of the users ends the audio session. The session with Netop Switchboard Manager remains open until the users log out of Netop Live Communicator.

2.2 Netop Live Web-Call

Netop Live Web-Call supports Microsoft Internet Explorer version 6, 7 and 8, and Mozilla Firefox from version 2.0.0.0 to version 3.5.2.*.

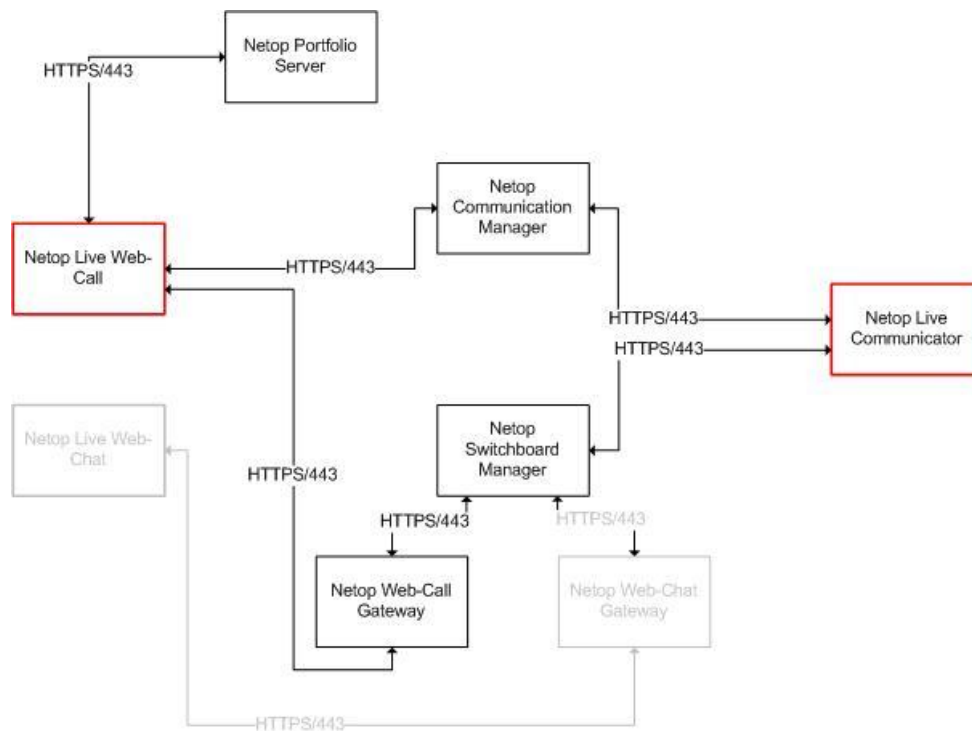
Netop Live Web-Call consists of a core component which is used on both browsers and two browser-specific modules that have been implemented as an Add-On for Internet Explorer and as a Mozilla Extension for Mozilla Firefox.

The Netop Live Web-Call graphical user interface is an explorer bar for Internet Explorer and a sidebar for Mozilla Firefox. When installed, the application is loaded each time the browser starts.

The Netop Portfolio Server is an interface between the customer database and the Netop Live Web-Call client. When Netop Live Web-Call starts, it requires the subscription list from the Netop Portfolio Server and, if the URL is registered, the Netop Live Web-Call graphical user interface becomes visible, using skin downloaded from the indicated location.

When the Netop Live Web-Call call button is pressed, a call request is made to the Netop Call Gateway. If the call is answered, an interactive conference starts. If the call fails, the Web user is offered an option of sending an email to the support team to report the issue or a potential software bug.

Communication is made over HTTPS on port 443 using POST request/response and goes through the Netop Communication Manager Server. Proxy settings are automatically imported from the browser.



Netop Live Web-Call communication flow

This section describes the communication flow in a successful Web-Call session; that is, a session where a Web user contacts a Netop Live Communicator user and a session is established.

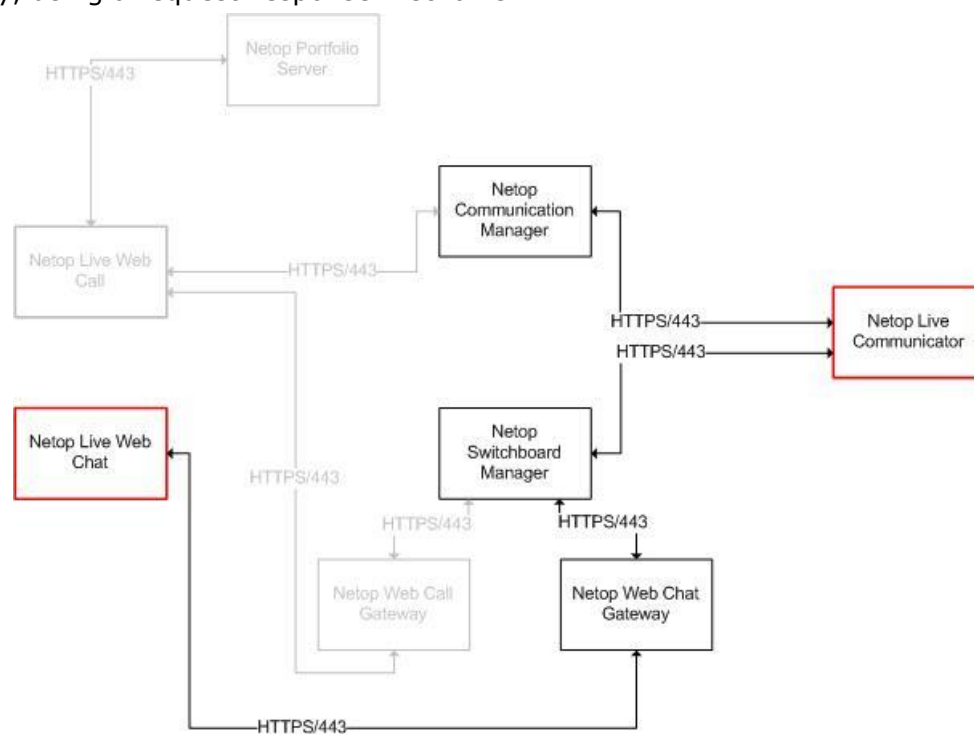
1. The Netop Live Web-Call user opens a browser.
2. The Netop Live Web-Call gets the list of call skins and Netop Web-Call Gateways from the Netop Portfolio Server.
3. The Netop Live Web-Call user accesses a Web site which in on the list and a call skin with a button displays on the site.

4. The user clicks the call button and the logon information window opens.
5. The user types user details and clicks the continue call button.
6. The Netop Live Web-Call client contacts the Netop Web-Call Gateway for the Web site it came from.
7. The Netop Web-Call Gateway identifies the Netop Live Communicator call recipient; this could be an individual or a group.
8. Netop Web-Call Gateway asks Netop Switchboard Manager if the Netop Live Communicator user or users are available to answer the call.
9. The Netop Live Web-Call client is told to connect to Netop Communication Manager and wait for the call to be picked up.
10. The Netop Live Communicator client recipient rings.
11. Netop Live Communicator and Netop Live Web-Call communicate through Netop Communication Manager

Netop Live Communicator logs all activity using the Netop Switchboard Manager.

2.3 Netop Live Web-Chat

The client is an HTML page that runs in the client browser. Netop Live Web-Chat communicates with the Netop Communication Manager Server through the Netop Call Gateway, using a request-response mechanism.



Netop Live Web-Chat communication flow

This section describes the communication flow in a successful Web-Chat session; that is, a session where a Web user contacts a Communicator user and a session is established.

1. The user opens a chat-enabled Web site and clicks the link.
2. The logon information window opens.
3. The user types user details and clicks the call button.
4. Netop Live Web-Chat contacts the Netop Web-Chat Gateway for the URL that the call came from.

5. Netop Web-Chat Gateway identifies the Netop Live Communicator call recipient; this could be an individual or a group.
6. Netop Web-Chat Gateway asks Netop Switchboard Manager if the Netop Live Communicator user or users are available to answer the call.
7. The Netop Live Web-Chat user is told that he is in a queue, waiting for his call to be picked up.

When the Netop Live Communicator user picks up the call, the communication is handled by the Netop Switchboard Manager which is communicating with Netop Web-Chat Gateway. The Netop Live Web-Chat user communicates with the Netop Web-Chat Gateway.

2.4 Network infrastructure

Due to the nature of real-time communications, image and voice quality will be negatively affected by network latency. Latency should therefore be kept to a minimum. We recommend a maximum latency between 60 ms and 80 ms between server infrastructure and clients.

Internet bandwidth requirement (full-duplex, that is, both up-stream and down-stream) is as listed in table below. Minimum Internet connection speed requirement must be added if several application features are in use simultaneously. Example 1: Audio and Video is used = Recommended speed = 128K + 384K = 512K full duplex.

Example 2: For a 5 way conference all using audio and 1 video = Recommended speed = (128K*5) + 384K = 1024K full duplex

Feature	Chat	URL Share	File Transfer	Application Share ¹	Audio	Video ²
Minimum Internet connection speed	28.8K	28.8K	28.8K	56K	56K	128K or 256K depending on video resolution.
Recommended Internet connection speed	56K	56K	56K	512K	128K	384K

For application share in particular it is difficult to give solid and accurate figures since the *nature* of the share more or less defines the connection requirements. For example, if you are sharing a video, the connection load is high and constant, if you are sharing a presentation the load is high in peaks only, on change of slide, and if you are sharing a document the load is low and constant. So if you are typically using application share to show videos or demanding applications, you should go for a high speed connection.

¹ Number applies on a max resolution of 1280x1024, higher resolutions will demand more bandwidth

² Resolutions was 160x120 and 320x240, higher resolutions will demand more bandwidth and will be more CPU intensive see hardware requirements

3 Software and hardware requirements

The following sections list the minimum software and hardware and software requirements for Netop Live products and components.

Note that these are minimum **requirements** and that performance can generally be improved with upgraded software and hardware.

Recommended software	Recommended hardware (minimum)	Port requirements
Netop Live Communicator		
<p>Microsoft Windows XP service pack 2 or later Internet connection ³ Outlook 2007 (for Outlook integration) ⁴</p>	<p>Chat only: Pentium III 1 GHz PC with minimum 256 MB RAM</p> <p>Advanced multimedia functionality</p> <p>For 1-to-1 connections: 2.0 GHz multimedia PC (or equivalent) with minimum 1024 MB RAM</p> <p>For 5-way conferencing: Intel Core Duo 2 2.0 GHz multimedia PC (or equivalent) with minimum 2048 MB RAM.</p> <p>Headset or speaker and microphone combination</p> <p>Web camera recommended: Logitech Fusion</p> <p>Tested alternatives: Creative, Phillips and Intel USB</p> <p>Recommended microphone/speakers and headset: Any headset that can be connected to a pc (typically mini-jack connection) may be used; we recommend headsets with noise and echo-cancellation.</p>	<p>443: Call inquiries + call transfer (internal) 443: Netop Live Communicator connection (internal)</p> <p>Port 443: SSL Secure Connection Port HTTPS (external / internal)</p>

³ Use of Proxy servers is not recommended as it might delay real-time communication between the Netop Live Communicator client and the servers that could cause connection disconnects and latency resulting in poor audio and video quality.

Recommended software	Recommended hardware (minimum)	Port requirements
Netop Live Web-Call		
Microsoft Windows XP service pack 2 or later Microsoft Internet Explorer 6.0 (SP2) or later or Firefox 2.0 ⁵ Internet connection	Chat only: 1 GHz PC with minimum 256 MB RAM Advanced multimedia functionality: 2 GHz multimedia PC with minimum 1024 MB RAM Headset or speaker and microphone combination Web camera	Initialization Port 443 and 80: SSL Secure Connection Port HTTPS (external) Communication Port 443: SSL Secure Connection Port HTTPS (external)
Netop Live Web-Chat on PC		
Microsoft Internet Explorer 6.0 or later or Firefox 2.0 or Opera 8.0 or later	1 GHz multimedia PC with minimum 256 MB RAM	Port 443: SSL Secure Connection Port HTTPS (external)
Netop Live Web-Chat on MAC		
Firefox 2.0 or later or Opera 9.2 or later or Safari 3.0 or later	Not specified	Port 443: SSL Secure Connection Port HTTPS (external)
Netop Live Web-Chat on Linux		
Firefox 2.0 or later or Opera 9.2.2 or later	Not specified	Port 443: SSL Secure Connection Port HTTPS (external)

⁴ In Outlook 2000 and Outlook XP the MAPI will prompt the user for the default mail profile when Netop Live Communicator is started. In Outlook 2003 and 2007 the default profile will automatically be selected.

⁵ Firefox 2.0 supported in Netop Live Web-Call release 3.1.1.0 or later (Netop Live Web-Call for Firefox).

About Netop

Netop develops and sells software solutions that enable swift, secure and seamless transfer of video, screens, sounds and data between two or more computers over the Internet. The company has three business areas, **Administration**, **Education** and **Communication**.

Netop's unique and cost-saving Administration solutions make life easier for IT professionals with Remote Control and IT Asset Management. With the market-leading solutions for Education classroom management and corporate e-learning, Netop helps students and teachers to achieve optimum results through virtual education. Netop Communication solutions including unified communications let customers, partners and colleagues meet easily and safely in the virtual space via video conferencing, instant messaging, voice and file sharing over the Internet.

Netop employs 152 people and has subsidiaries in the United States, Great Britain, China and Switzerland. The company sells its solutions to public and private clients in more than 80 countries. Netop Solutions A/S shares are listed on the Copenhagen Stock Exchange and are part of the SmallCap+ index. In 2008 Netop Solutions had a total revenue of DKK 92.1m. For more information, see <http://www.netop.com>.