



Product White Paper

Communicator, Communicator Conference, Web Call & Web Chat
in a hosted environment

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Medianet Suite consisting of Communicator, Communicator Conference, Web Call and Web Chat, provides secure and robust communication over the Internet. With instant messaging, secure chat (internal and external), one-button push-to-talk customer service over the Web, and interactive video and audio, Medianet 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 Medianet Suite solution.

1. Products and features

Medianet Suite includes these core features:

- Instant messaging among users on the corporate network.
- Virtual meetings between a number of participants on the corporate network.
- 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 receive a shared desktop. If they have installed Web Call they can also choose to switch from text chat to audio and video communication and to share their desktop or a specific program.

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 with any number of participants can be scheduled or initiated on-the-fly. Once a meeting has been initiated, the meeting organizer can enable audio and video similar to what chat participants can do. Also, like in chat sessions, participants can share their desktop, share select applications and share files.

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

Medianet Suite consists of these products:

- Communicator
- Communicator Conference
- Web Call
- Web Chat

Communicator is installed on users' computers. 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. Communicator is used by employees within a company and communication is possible only between users connected to the central communication server. Communicator can also receive calls from a Web site where Web Call or Web Chat are implemented.

Communicator Conference is installed on users' or a meeting room computers. Communicator Conference 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. Communicator Conference is used for meetings within a company, or with external clients if Web Call or Web Chat are implemented on a Website.

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

Web Chat also provides Web access through a call button to a call center operator using Communicator but Web Chat requires no installation on the computer initiating the communication. As opposed to Web Call, Web Chat only provides text chat and desktop sharing from agent. 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.

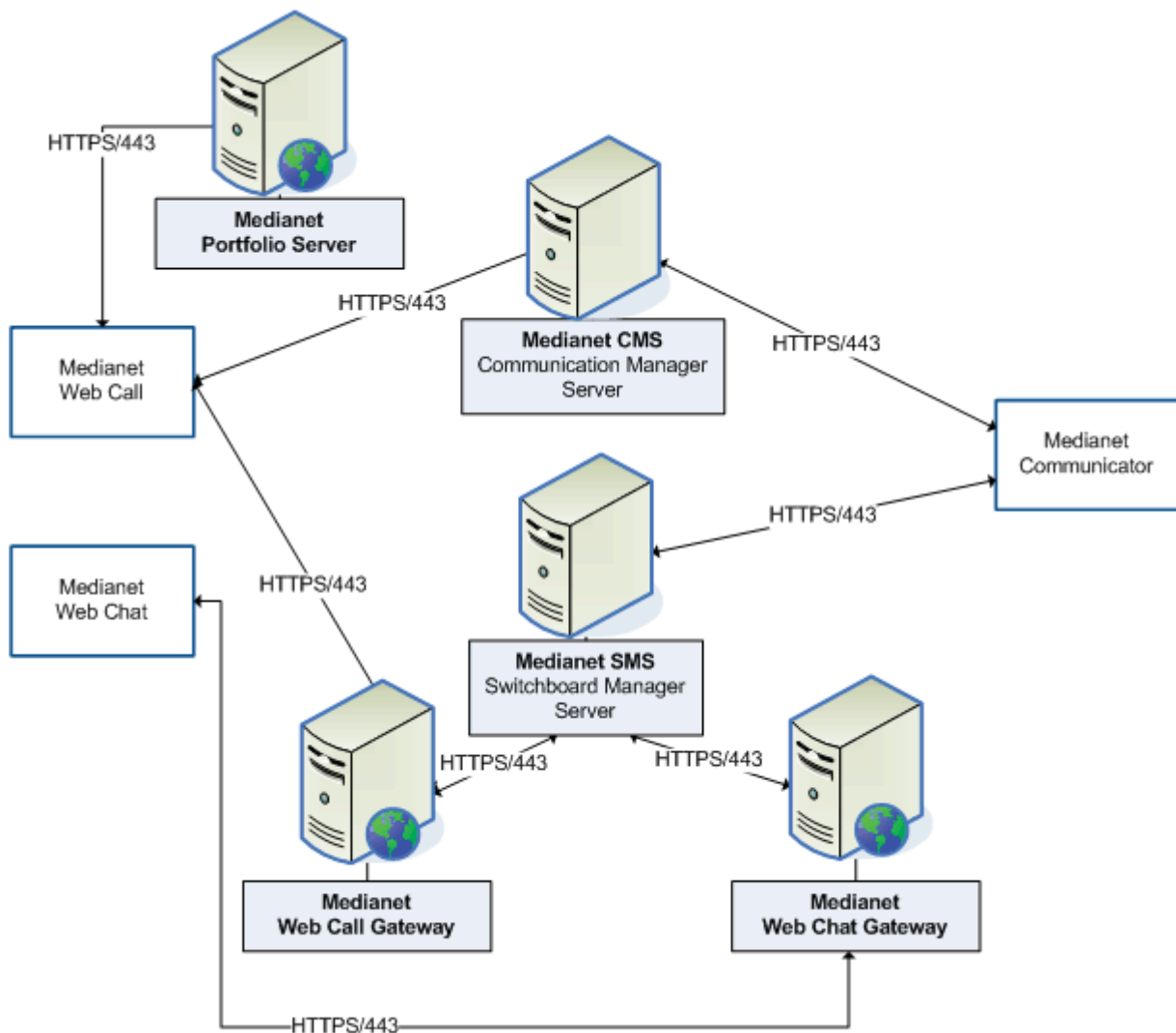


Illustration: Complete Medianet Suite setup

2.1 Communicator

Communicator users log on to a Medianet Switchboard Manager Server that manages and broadcasts all the user-related data as well as the incoming call data.

Communicator connects to Medianet Communication Manager Server and Medianet Switchboard Manager Server on TCP/IP port 443 and supports encryption.

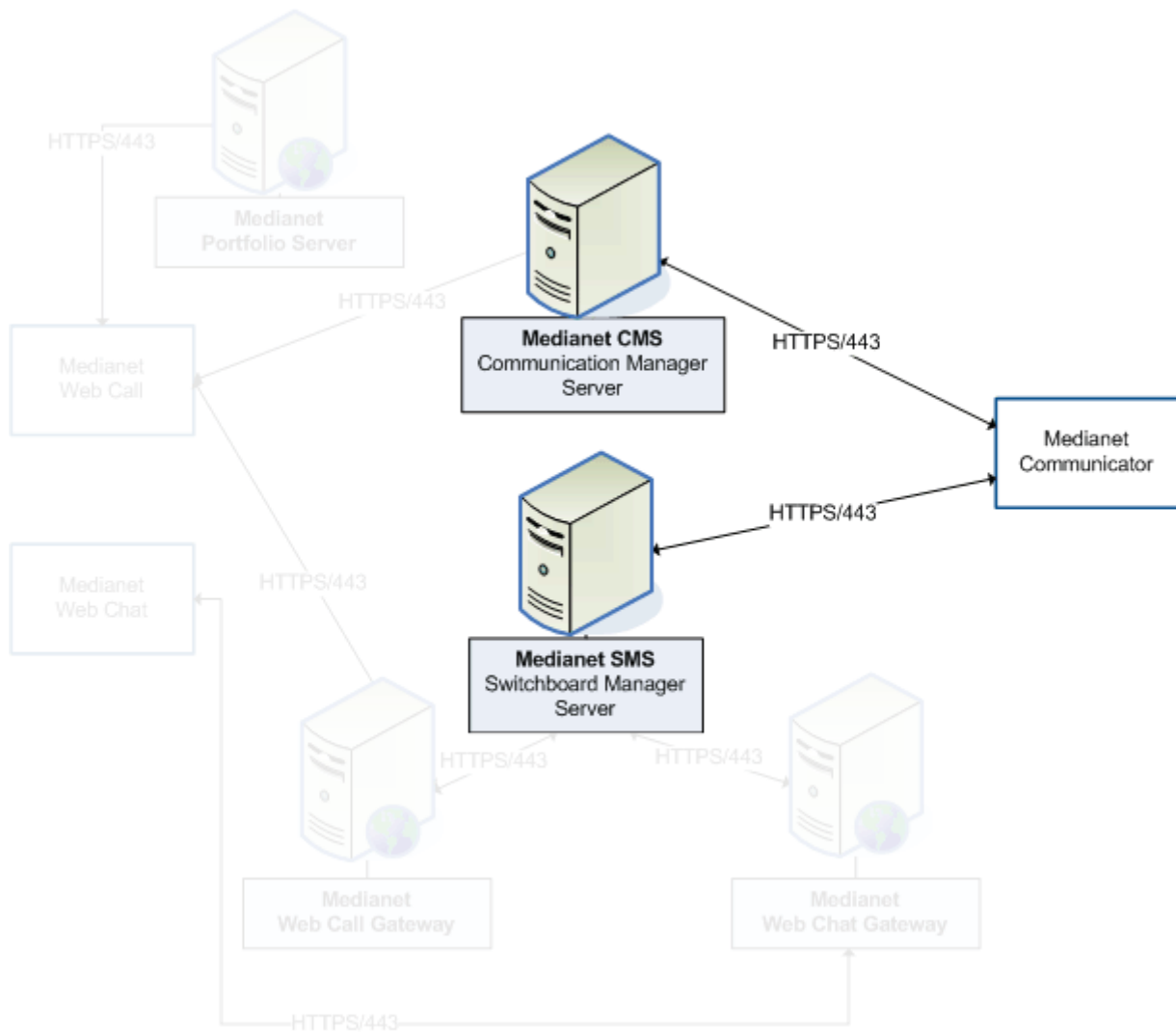


Illustration: Communicator setup

Communicator communication flow

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

1. The 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 Medianet Switchboard Manager where every action is logged.
4. The user initiates audio communication.
5. The Medianet Switchboard Manager creates a session ID and ensures that both users use the ID.
6. Both users contact Medianet Communication Manager using the session ID. Any text chat continues to go through the Medianet Switchboard Manager while audio is handled by the Medianet Communication Manager.

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

2.2 Communicator Conference

Communicator Conference users log on to a Medianet Switchboard Manager Server that manages and broadcasts all the user-related data as well as the incoming call data.

Communicator Conference connects to Medianet Communication Manager Server and Medianet Switchboard Manager Server on TCP/IP port 443 and supports encryption.

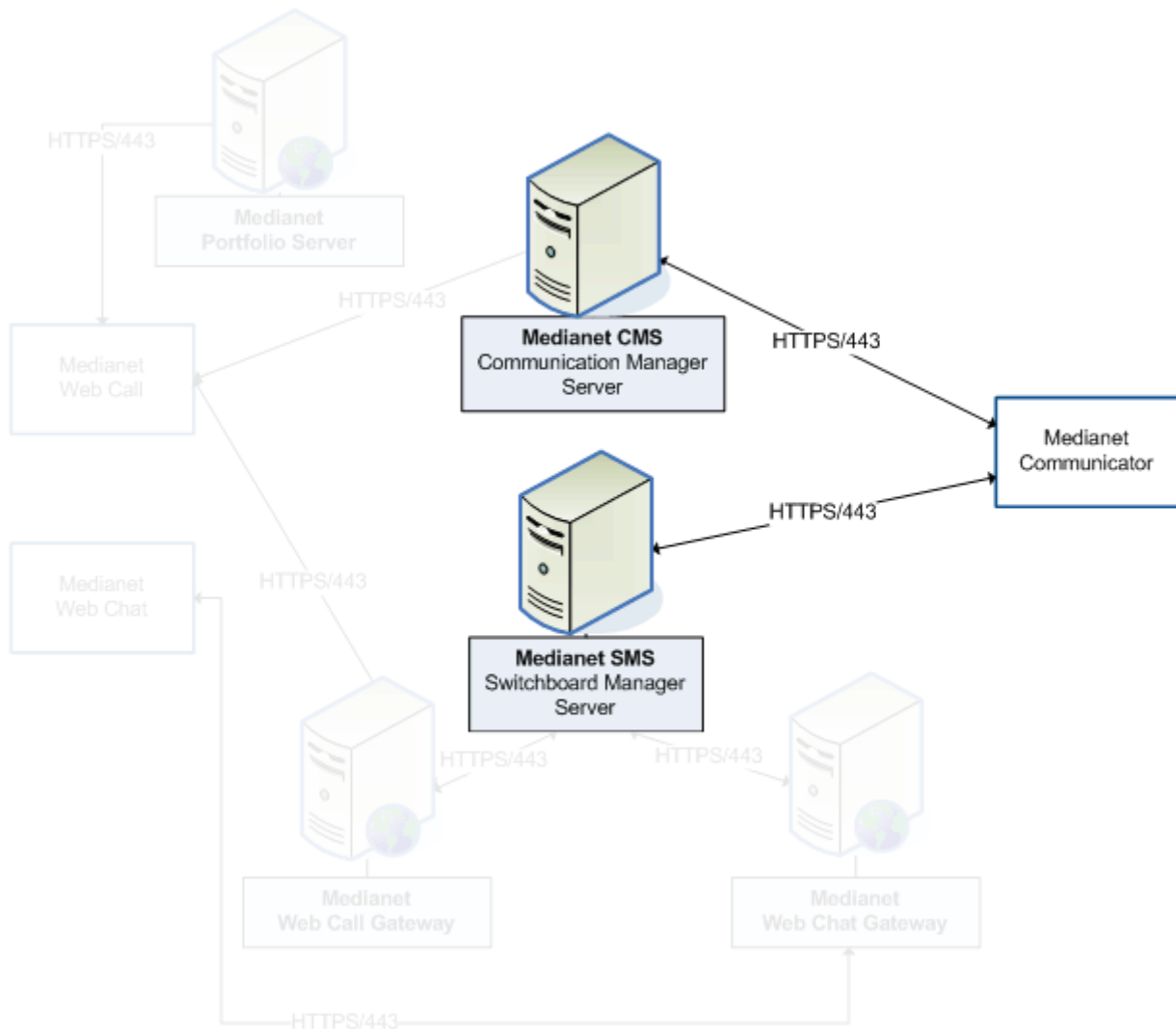


Illustration: Communicator Conference setup

Communicator Conference communication flow

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

1. The Communicator Conference user who wants to chat with a colleague/meeting room locates the relevant colleague/meeting room 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 Medianet Switchboard Manager where every action is logged.
4. The user initiates audio communication.
5. The Medianet Switchboard Manager creates a session ID and ensures that both users use the ID.
6. Both users contact Medianet Communication Manager using the session ID. Any text chat continues to go through the Medianet Switchboard Manager while audio is handled by the Medianet Communication Manager.

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

2.3 Web Call

Web Call supports Microsoft Internet Explorer 6 or later, and Mozilla Firefox version 3.5 or later.

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 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 Medianet Portfolio Server is an interface between the Medianet SMS server and the Web Call client. When Web Call starts, it requires the subscription list from the Medianet Portfolio Server and, if the URL is registered, the Web Call graphical user interface becomes visible, using skin downloaded from the indicated location.

When the Web Call call button is pressed, a call request is made to the Medianet 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 Medianet Communication Manager Server. Proxy settings are automatically imported from the browser.

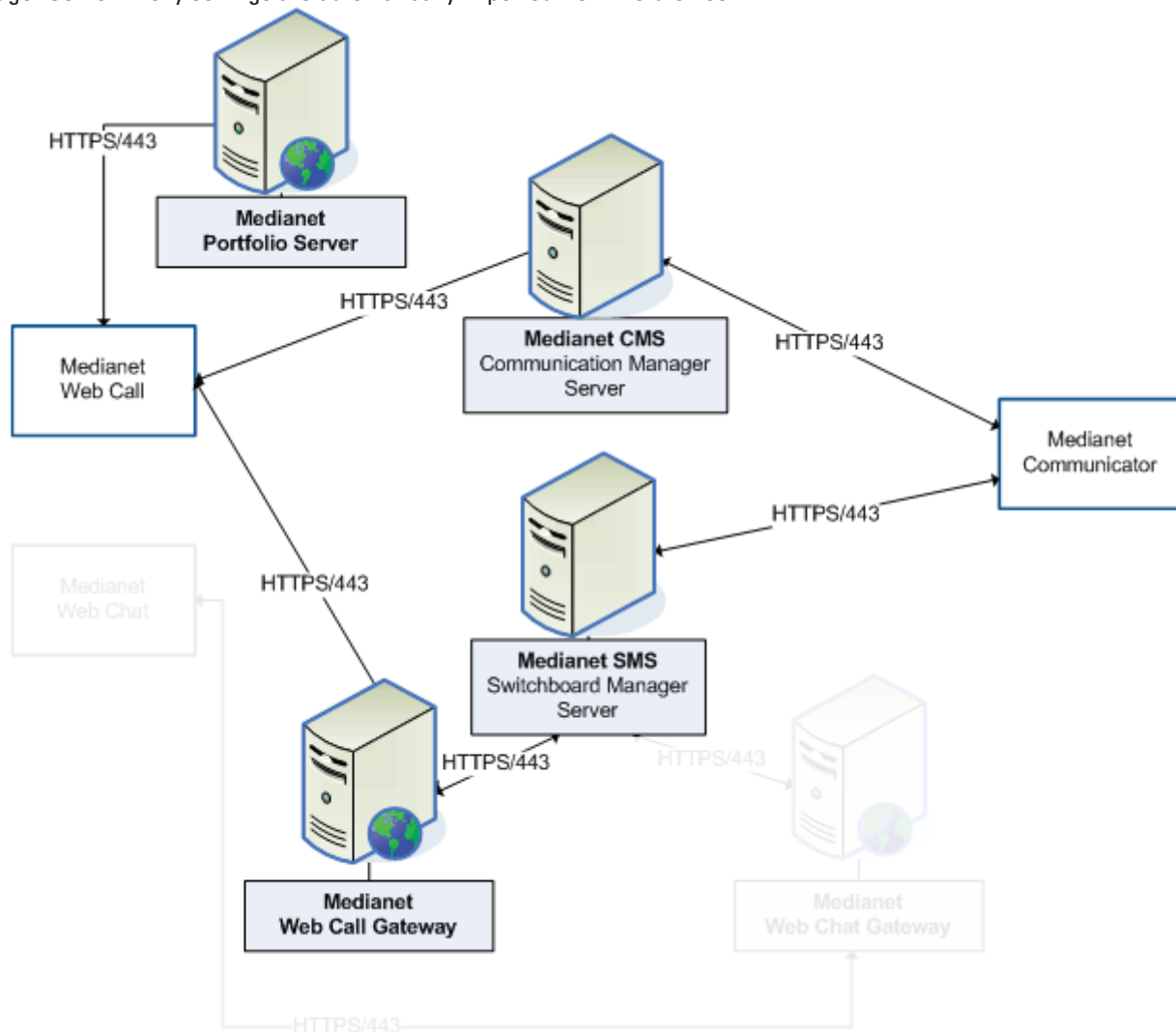


Illustration: Web Call setup

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 Communicator user and a session is established.

1. The Web Call user opens a browser.
2. The Web Call gets the list of call skins and Web Call Gateways from the Medianet Portfolio Server.
3. The Web Call user accesses a Web site which is on the list and a call skin with a button displays on the site.
4. The user clicks the call button and the login information window opens.
5. The user types user details and clicks the continue call button.
6. The Web Call client contacts the Medianet Web-Call Gateway for the Web site it came from.
7. The Web Call Gateway identifies the Communicator call recipient; this could be an individual or a group.

8. Medianet Web Call Gateway asks Medianet Switchboard Manager if the Communicator user or users are available to answer the call.
9. The Web Call client is told to connect to Medianet Communication Manager and wait for the call to be picked up.
10. The Communicator client recipient rings.
11. Communicator and Web Call communicate through Medianet Communication Manager
Communicator logs all activity using the Medianet Switchboard Manager.

2.4 Web Chat

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

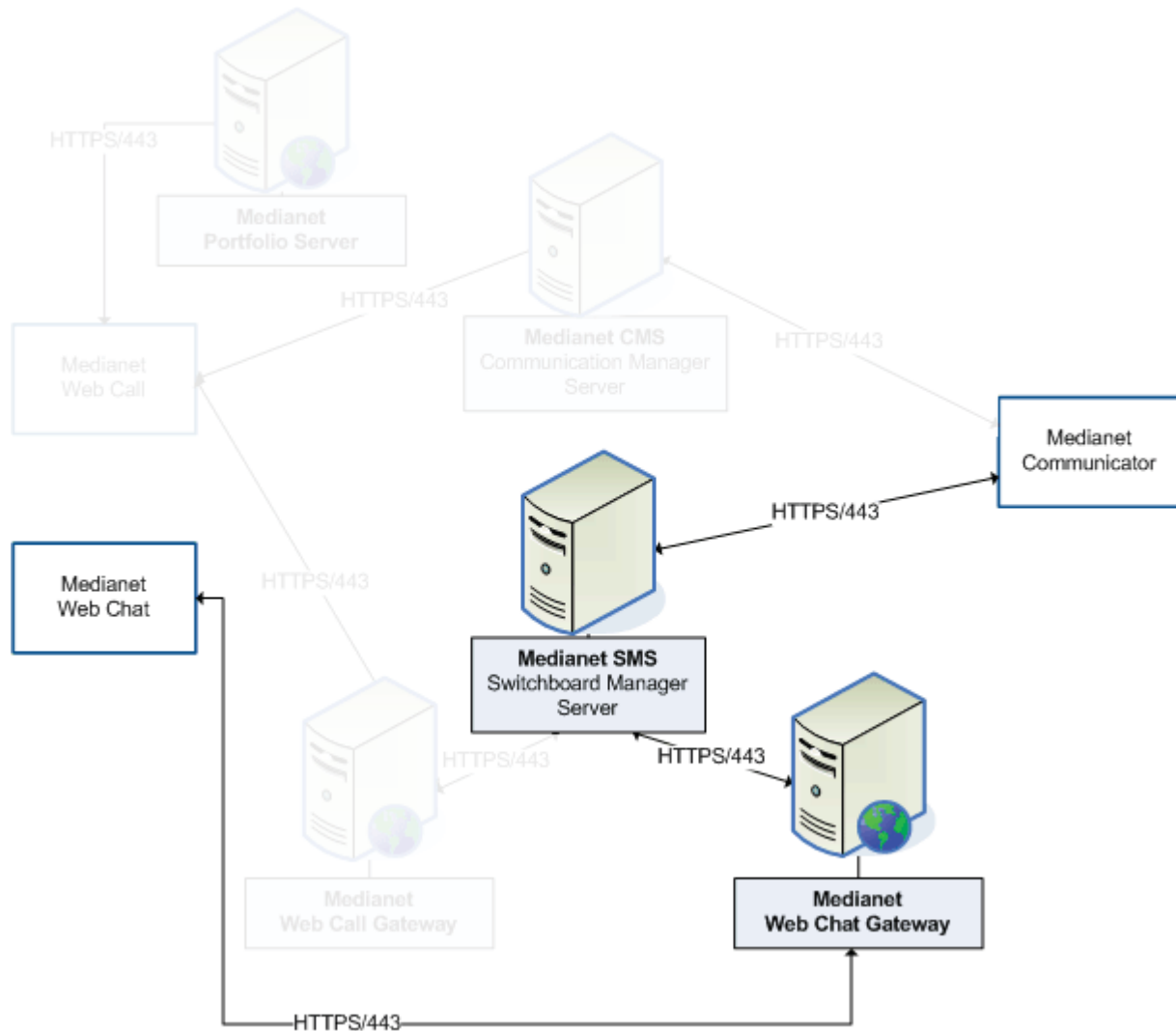


Illustration: Web Chat setup

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

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

2.5 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 2 videos = Recommended speed = 128K + (384K*2) = 896K 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 Medianet 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
Communicator & Communicator Conference		
Microsoft Windows XP service pack 2 or later ³ Internet connection ⁴ Outlook 2007 (for Outlook integration)	Chat only: 1 GHz PC with minimum 256 MB RAM Advanced multimedia functionality For 1-to-1 connections: 2.0 GHz multimedia PC (or equivalent) with minimum 1024 MB RAM For 5-way conferencing: Intel Core Duo 2 2.0 GHz multimedia PC (or equivalent) with minimum 2048 MB RAM. Headset or speaker and microphone combination Web camera recommended: Logitech Fusion Tested alternatives: Creative, Phillips and Intel USB 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.	443: Call inquiries + call transfer (internal) 443: Communicator connection (internal) Port 443: SSL Secure Connection Port HTTPS (external / internal)

³In Outlook 2000 and Outlook XP the MAPI will prompt the user for the default mail profile when Communicator is started. In Outlook 2003 and 2007 the default profile will automatically be selected.

⁴Use of Proxy servers is not recommended as it might delay real-time communication between the 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
<p>If separate speakers and microphone are used, a microphone with echo-cancellation is recommended, for example ClearMic from GlobalMedia.</p> <p>Use of Communicator under Citrix presentation Server 4.5 has been tested and is supported.</p> <p>Use of the Communicator in a MS Terminal Server has not been tested and is not yet recommended.</p>		
Web Call		
<p>Microsoft Windows XP service pack 2 or Vista</p> <p>Microsoft Internet Explorer 6.0 (SP2) or later or Firefox 3.5 or later</p> <p>Internet connection</p>	<p>Chat only: 1 GHz PC with minimum 256 MB RAM</p> <p>Advanced multimedia functionality: 2 GHz multimedia PC with minimum 1024 MB RAM</p> <p>Headset or speaker and microphone combination</p> <p>Web camera</p>	<p>Initialization</p> <p>Port 443 and 80: SSL Secure Connection Port HTTPS (external)</p> <p>Communication</p> <p>Port 443: SSL Secure Connection Port HTTPS (external)</p>
Web Chat on PC		
<p>Microsoft Internet Explorer 6.0 or later or Firefox 2.0 or Opera 8.0 or later</p>	<p>1 GHz multimedia PC with minimum 256 MB RAM</p>	<p>Port 443: SSL Secure Connection Port HTTPS (external)</p>
Web Chat on MAC		
<p>Firefox 2.0 or later or Opera 9.2 or later or Safari 3.0 or later</p>	<p>Not specified</p>	<p>Port 443: SSL Secure Connection Port HTTPS (external)</p>
Web Chat on Linux (Ubuntu Distro)		
<p>Firefox 2.0 or later or Opera 9.2.2 or later</p>	<p>Not specified</p>	<p>Port 443: SSL Secure Connection Port HTTPS (external)</p>