

## Network Bandwidth Use

The Netviewer software solutions are designed to deliver web collaboration services for internal and external use. The software runs in Intranet as well as in Internet environments. Therefore, the network bandwidth required for handling a Netviewer session is an important figure to be considered by the IT administrators.

This White Paper provides data on the required bandwidth for Netviewer sessions.

## The Netviewer transmission concept in general

The Netviewer transmission concept is based upon an optimized method to grab the transferred screen. To minimize the required network bandwidth for the screen transfer, only those areas of the screen are updated that have been changing in the meantime. Additionally, the screen contents are compressed with the very efficient Netviewer HyCom compression algorithm.

There are three Netviewer products available: Netviewer Support, Meet and Netviewer Admin. The general transmission concept mentioned above is generic for all Netviewer products and therefore the bandwidth use is similar.

The appropriate Netviewer application and the required features depend on the use case (support, meeting, remote access, etc.). Therefore the use case respectively the required features are relevant for the following inquiries. The following types of data can have an impact on the required bandwidth:

- Desktop sharing (e.g. Microsoft PowerPoint presentation or web browsing)
- Video signal from web cams (up to 6 web cams with Netviewer Meet)
- Voice over IP (VoIP) signal (full-duplex with up to 6 participants with Netviewer Meet)
- Chat messages
- File transfer

The following chapters will highlight the different scenarios of a Netviewer session.

## Measurement fundamentals

The required network bandwidth for different session scenarios has been measured in the following test assembly:

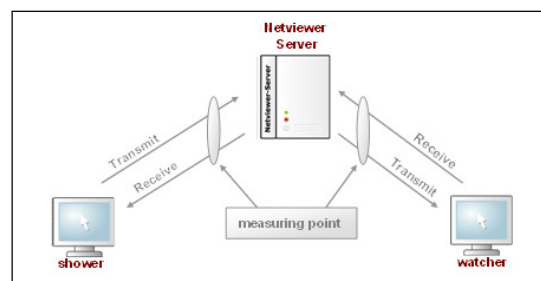


Figure 1

The Netviewer session is typically controlled by the session moderator in show mode. His or her screen is transmitted to one or more participants. The session participant in watch mode (one or more) can see the transmitted screen. The entire session traffic is transferred through the Netviewer server.

The measurements were performed directly at the Ethernet interface of the PC in show mode. The results of the measurement contain inbound and outbound TCP and HTTP traffic between the session participant in show mode and the Netviewer server. The outbound traffic on this side is higher than on the watching side.

By changing the direction of view each session partner is able to switch to show mode and transfer his screen to the other session participants. Therefore the following data may be relevant for all session participants.

The measuring data include IP and Ethernet header. There is only data traffic to the Netviewer server's IP address considered.

All PCs are running with Windows XP. The following data have been collected with Netviewer version 5.

All measurement data are presented in kilobits per second (kbps).

### Legend for the following charts

- |            |   |                      |
|------------|---|----------------------|
| Red line   | ➤ | Inbound (RX)         |
| Black line | ➤ | Outbound (TX)        |
| Green line | ➤ | Inbound and Outbound |

## Analysis of the Network Traffic

### Connection setup

When starting a Netviewer client program the process of authentication and authorisation on the Netviewer server will take place. This process produces only low network traffic.

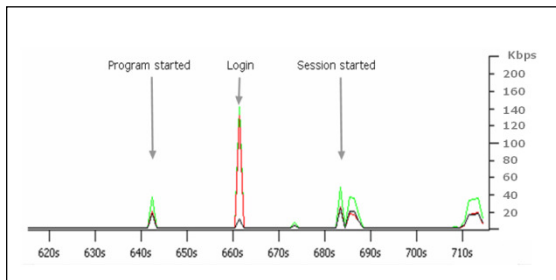


Figure 2

A maximum peak of approx. 140 kbps is utilized for login to the Netviewer server.

### Idle mode

The 'Idle mode' is defined as the status where the Netviewer session is established, but there is no session activity (no activity on the screen, no web cam, no VoIP, no chat).

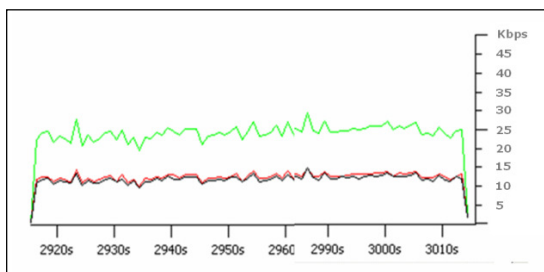


Figure 3

The idle traffic was measured with an average value of 12 kbps.

### Microsoft PowerPoint presentation

The following measurement shows the network bandwidth use during a Microsoft PowerPoint presentation. The slide was changed every 30 seconds.

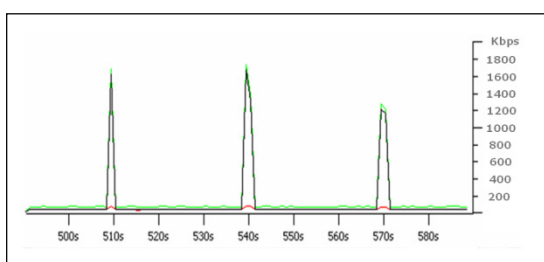


Figure 4

The transmitted data volume strongly depends on the complexity of the slides (charts, pictures etc.).

The maximum peak was measured with 2400 kbps.

### Web browsing

The next investigated scenario is browsing the web by the shower. Each 5 seconds a new page on [www.netviewer.com](http://www.netviewer.com) was shown.

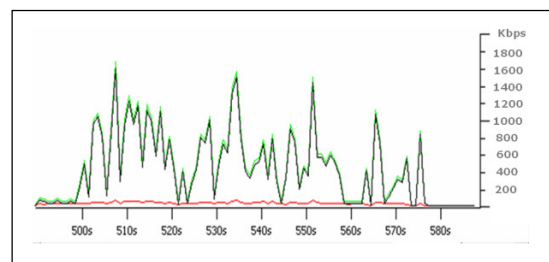


Figure 5

The bandwidth use when browsing the web depends on the navigation speed and the activity on the web pages (flash animations etc.).

The measured average value for this use case was 480 kbps.

### Video function within Netviewer

In addition to the transfer of screen data, the video signal from connected web cams (up to 6 web cams with one2meet five) can also be transmitted between the session participants within a Netviewer session.

The required bandwidth per web cam depends on the quality which can be adjusted in the 'Multimedia settings' of the Netviewer client.

There are three quality levels available: low, middle and high.

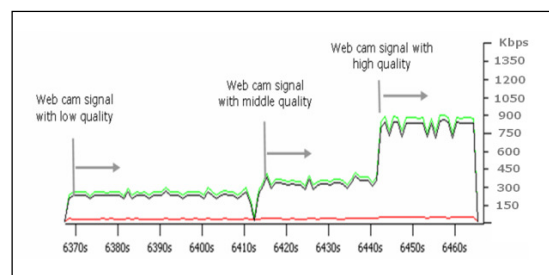
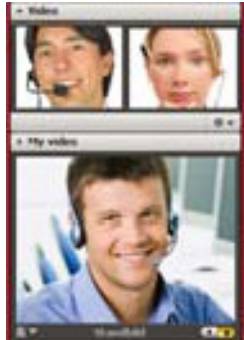


Figure 6

When adjusting the quality to 'low' approximately 240 kbps is required. With middle

quality the value raised to 344 kbps and with high quality to 880 kbps. The size of the video window is also significant for the bandwidth use.



← Small video windows

← Major video window

The small video windows require less bandwidth than the major ones. The following chart shows the network load caused by none, one and two web cams (middle quality, major window).

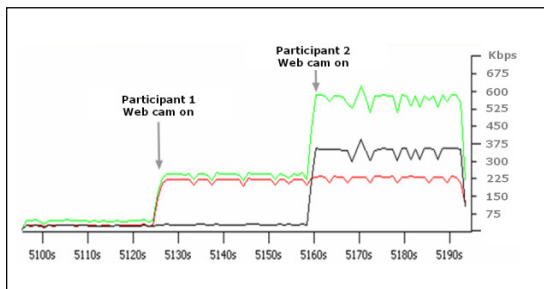


Figure 7

The network load rises with each web cam user. The above stated figures can be calculated per each web cam. Example: In an Netviewer Meet session with moderator and 3 participants the amount of bandwidth use for the web cam signals is about 1.3 Mbps.

### VoIP usage

Netviewer session participants can use the Voice over IP (VoIP) function to speak with each other. Full-duplex communication is possible with up to six participants (with Netviewer Meet); half-duplex communication is not limited.

The bandwidth use for the voice traffic rises with each VoIP participant.

Within the Netviewer protocol, the priority of the VoIP traffic is higher than the priority of the screen transfer.

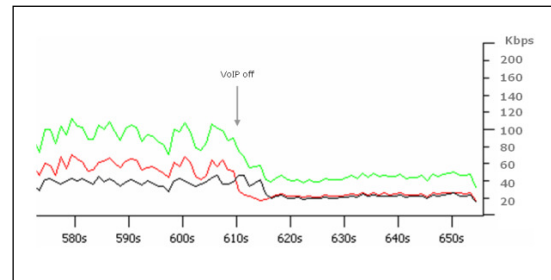


Figure 8

When activating the VoIP transmission the network load is about 50 kbps per client.

### Summary

The bandwidth use of a Netviewer session strongly depends on two factors:

- the used features within Netviewer
- the available bandwidth in general

The Netviewer clients adjust their bandwidth use to the available capacity provided through the different network components (Intranet, Proxy, Firewalls, Internet connection etc.). The above mentioned data are valid in an 'ideal network environment', which means unlimited network bandwidth and minimum network latency. In different network environments the used bandwidth can be much lower than the above mentioned values.

For the general network load calculation another topic has to be taken into consideration. Some activities during a Netviewer session produce very short peaks in the required bandwidth. The average bandwidth use is much lower. Thus the overall average bandwidth use is important when calculating the network traffic.

As the available network bandwidth of the session participants may differ, the session quality can be different from user to user.

For a simple Netviewer desktop sharing session without video and VoIP we recommend an average synchronous bandwidth of **50 kbps** per user.

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Reference to Server- and Client Version: G3 & G3.1

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