

MK Network White Paper

Outlook 2003/Exchange 2003 network compression vs. ZipMail ZIP Compression

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1) About the test platform

Microsoft Outlook version 2003 SP1
Running on Windows XP SP2

Microsoft Exchange Server 2003 SP1
Running on windows Server 2003

Network Monitor used:
CommView 5.0 from TamoSoft
<http://www.tamos.com>

The latest Microsoft Outlook 2003, Microsoft Exchange 2003, Microsoft Windows 2003 server and Microsoft Windows XP SP2 versions, services packs and patches have been installed at the date of February 21, 2005 to be sure to use the very last available versions of Outlook and Exchange and of the Operating systems.

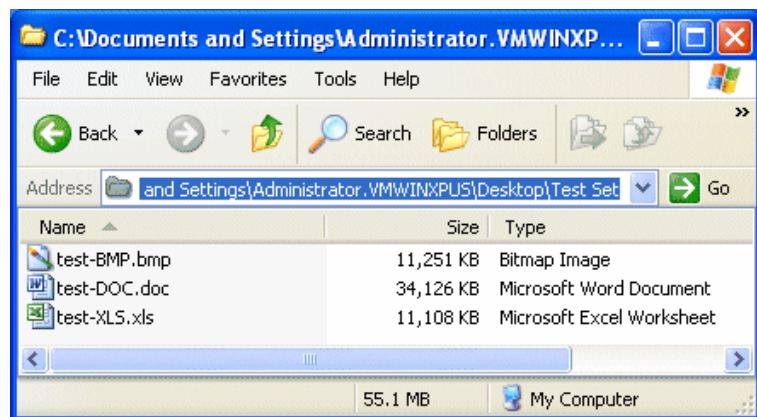
2) Purpose of the test

The purpose of this test is to measure:

- the amount of Kbytes transferred on the network
 - the amount of Kbytes stored into the Exchange database
- when sending a message containing given typical .DOC, .XLS and .BMP attached files. This, with the Outlook 2003/Exchange 2003 network compression and then with ZipMail compressing the attached files.

The files used for the tests had to be of a significant size and compressible enough to enable us to better see the respective effects of the Outlook 2003/Exchange 2003 network compression and of the ZipMail compression.

3) Our test set:



Our test set is made of 3 files.

We chose big enough files in order to be able to see the effect of the processes getting rid of minor side effects.

All the tests above have been done twice to confirm the results.

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4) Exchange 2003 /Outlook 2003 network compression - DOC file

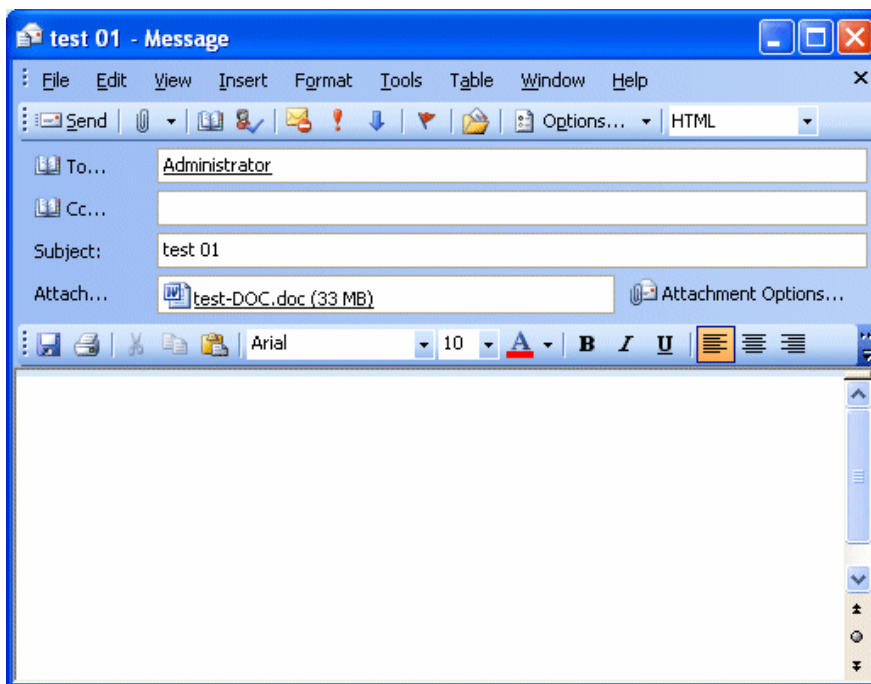
Let's compose and send a message containing an DOC file and measure the results.
This message will be sent by USER1 to USER2:

First let's have a look at the USER1 and USER2 mailboxes on the Exchange 2003 server:

Mailbox	Last Logged on By	Size (KB)	Total Items
USER1	MKNETWORK\USER1	2	2
USER2	MKNETWORK\USER2	1	0

They are almost empty.

Now let's create a message and attach our .DOC test file:

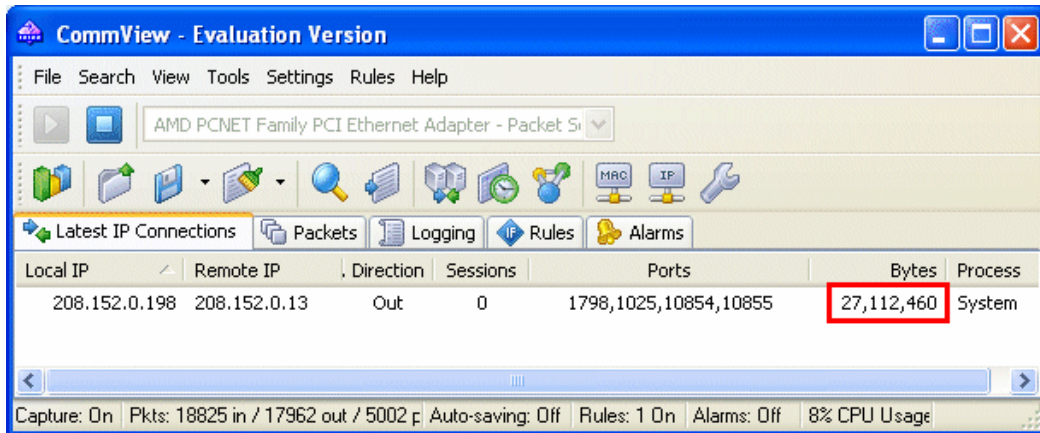


The network monitor is reset to zero just before pressing the "Send" button.

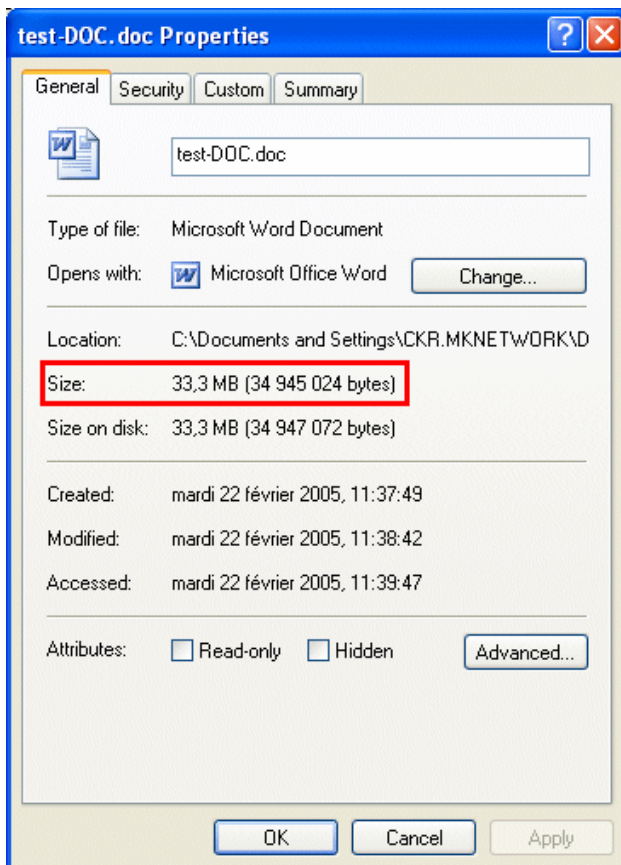
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Now let's send this message to USER2 and measure the network traffic:



Compared to the initial size of the file:



Network compression ratio is:
 $27,112,460 / 34,945,024 = 0.78$
(22% savings)

In the exchange database, the message is of course not compressed:

Mailbox	Last Logged on By	Size (KB)	Total Items
USER1	MKNETWORK\USER1	34,536	3
USER2	MKNETWORK\USER2	34,535	1

5) Exchange 2003 /Outlook 2003 network compression - XLS file

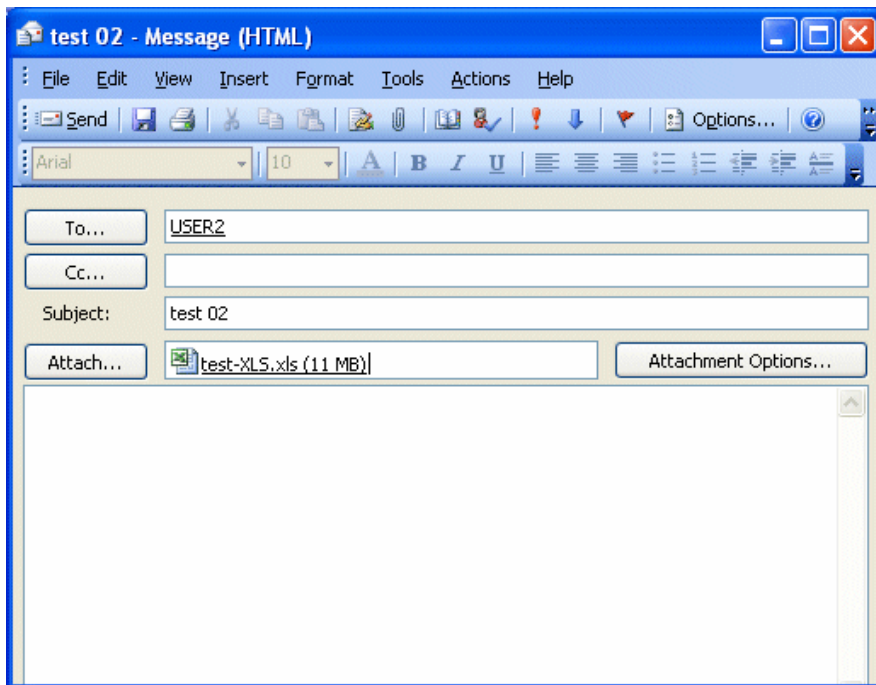
Let's compose and send a message containing an XLS file and measure the results.
This messages will be sent by USER1 to USER2:

First let's have a look at the USER1 and USER2 mailboxes on the Exchange 2003 server:

Mailbox	Last Logged on By	Size (KB)	Total Items
USER1	MKNETWORK\USER1	2	2
USER2	MKNETWORK\USER2	1	0

They are almost empty.

Now let's create a message and attach our .XLS test file:

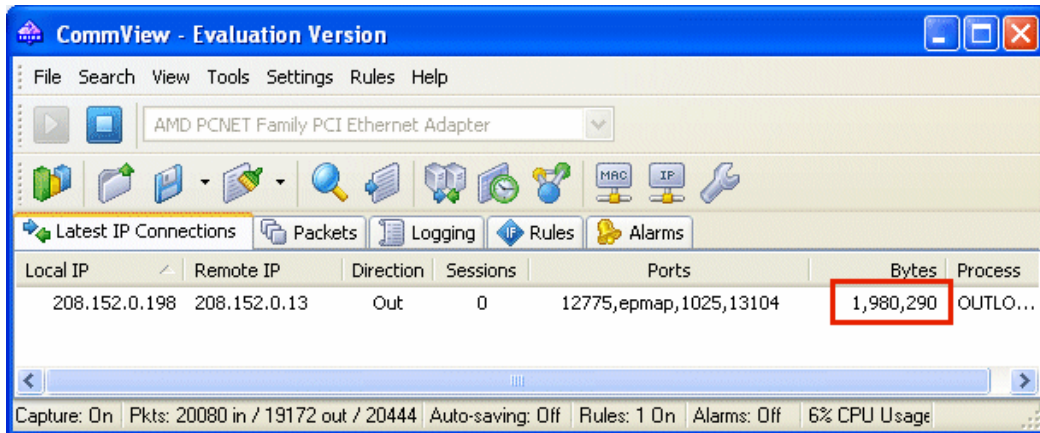


The network monitor is reset to zero just before pressing the "Send" button.

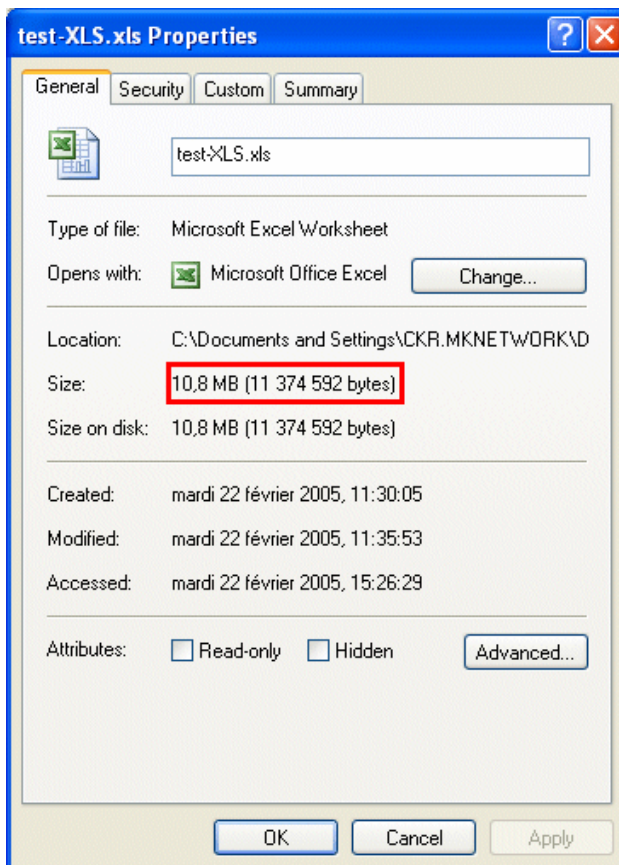
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Now let's send this message to USER2 and measure the network traffic:



Compared to the initial size of the file:



Network compression ratio is:
 $1,980,290 / 11,374,592 = 0.17$
(83% savings)

In the exchange database, the message is of course not compressed:

Mailbox	Last Logged on By	Size (KB)	Total Items
USER1	MKNETWORK\USER1	12,145	3
USER2	MKNETWORK\USER2	12,144	2

6) Exchange 2003 /Outlook 2003 network compression - BMP file

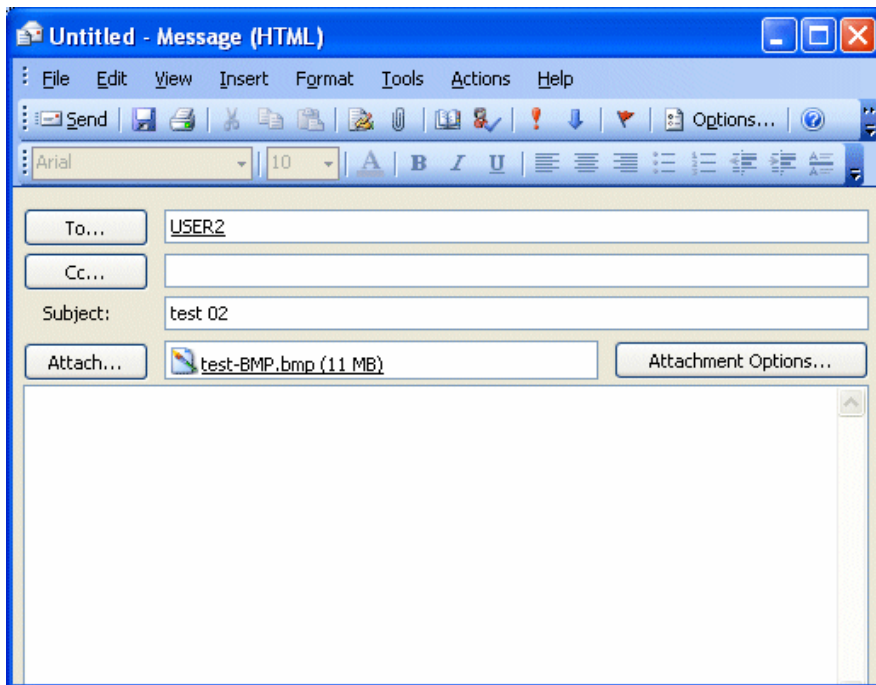
Let's compose and send a message containing a BMP file and measure the results.
This message will be sent by USER1 to USER2:

First let's have a look at the USER1 and USER2 mailboxes on the Exchange 2003 server:

Mailbox	Last Logged on By	Size (KB)	Total Items
USER1	MKNETWORK\USER1	2	2
USER2	MKNETWORK\USER2	1	1

They are almost empty.

Now let's create a message and attach our .BMP test file:

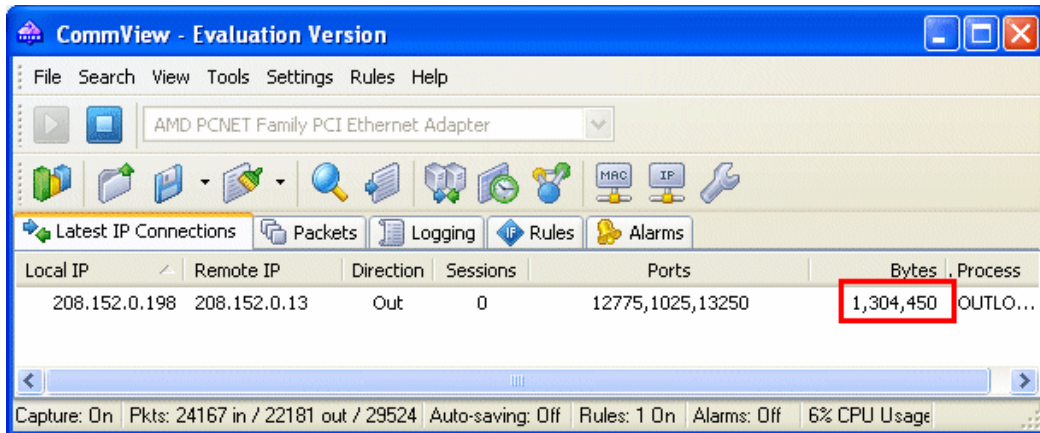


The network monitor is reset to zero just before pressing the "Send" button.

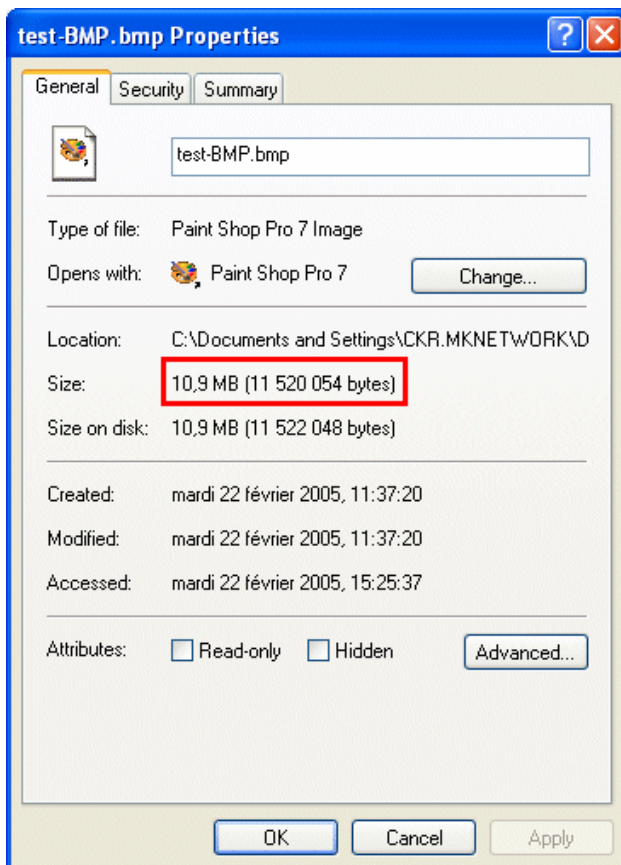
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Now let's send this message to USER2 and measure the network traffic:



Compared to the initial size of the file:



Network compression ratio is:
 $1,304,450 / 11,520,054 = 0.11$
(89% savings)

In the exchange database, the message is of course not compressed:

Mailbox	Last Logged on By	Size (KB)	Total Items
USER1	MKNETWORK\USER1	11,256	3
USER2	MKNETWORK\USER2	11,255	2

7) ZipMail ZIP compression - DOC file

Let's compose and send a message containing the same DOC file as in paragraph 2 and measure the results.

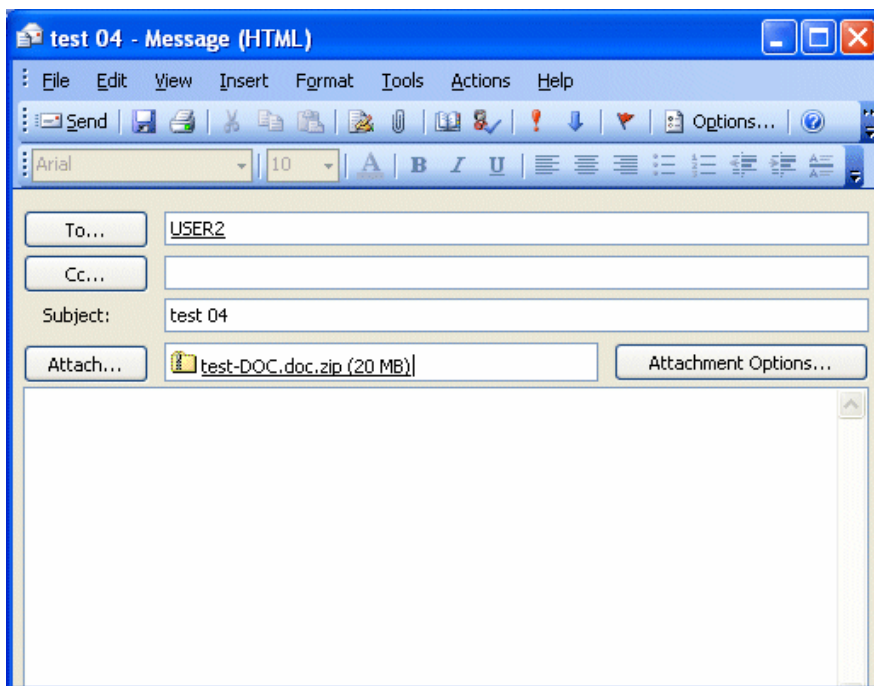
This message will be sent by USER1 to USER2:

First let's have a look at the USER1 and USER2 mailboxes on the Exchange 2003 server:

Mailbox	Last Logged on By	Size (KB)	Total Items
USER1	MKNETWORK\USER1	2	2
USER2	MKNETWORK\USER2	1	1

They are almost empty.

Now let's create a message and attach our .DOC test file using ZipMail:

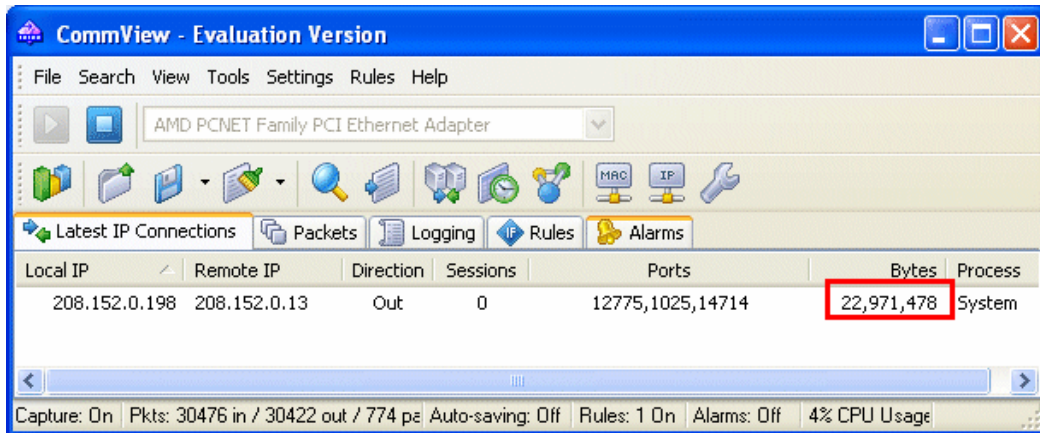


The network monitor is reset to zero just before pressing the "Send" button.

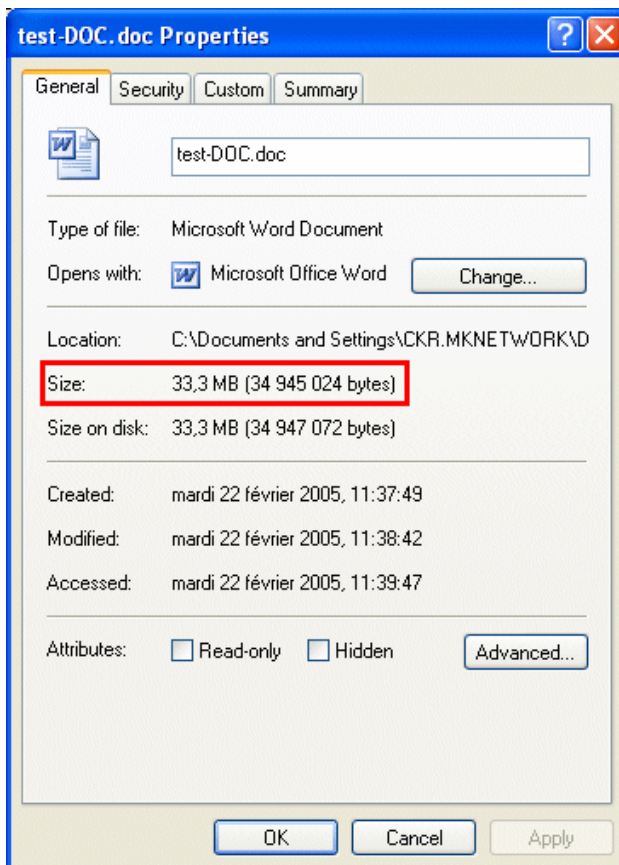
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Now let's send this message to USER2 and measure the network traffic:



Compared to the initial size of the file:



ZipMail compression ratio is:
 $22,971,478 / 34,945,024 = 0.65$
(35% savings)

In the exchange database, the message (in fact the attached file) is of course compressed:

Mailbox	Last Logged on By	Size (KB)	Total Items
USER1	MKNETWORK\USER1	20,422	3
USER2	MKNETWORK\USER2	20,421	2

8) ZipMail ZIP compression - XLS file

Let's compose and send a message containing the same XLS file as in paragraph 3 and measure the results.

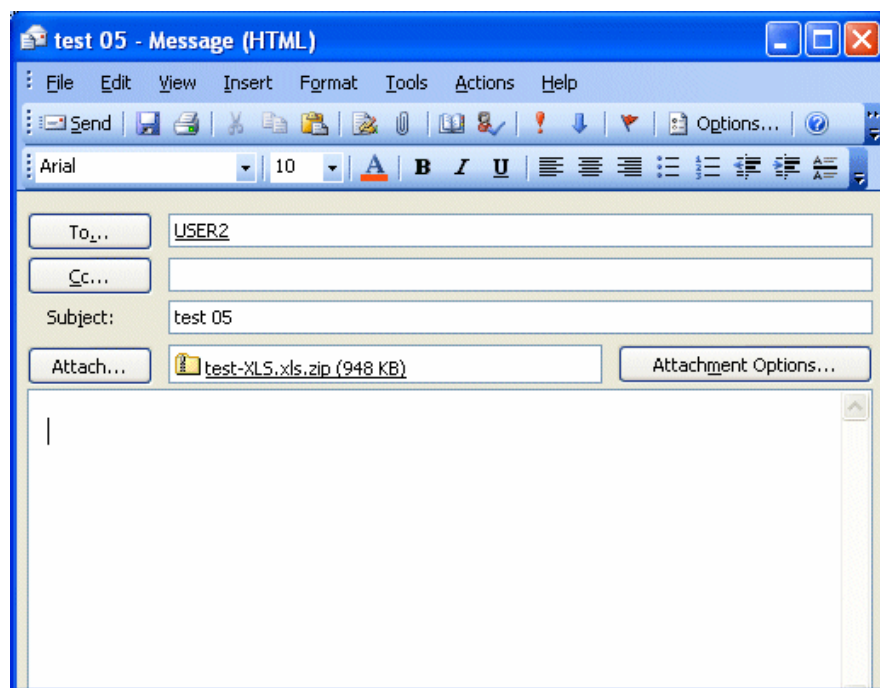
This message will be sent by USER1 to USER2:

First let's have a look at the USER1 and USER2 mailboxes on the Exchange 2003 server:

Mailbox	Last Logged on By	Size (KB)	Total Items
USER1	MKNETWORK\USER1	2	2
USER2	MKNETWORK\USER2	1	1

They are almost empty.

Now let's create a message and attach our .XLS test file:

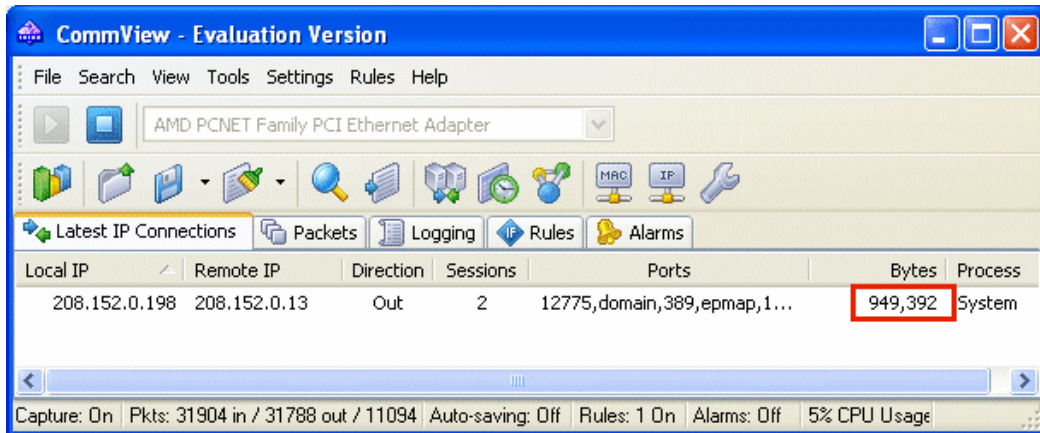


The network monitor is reset to zero just before pressing the "Send" button.

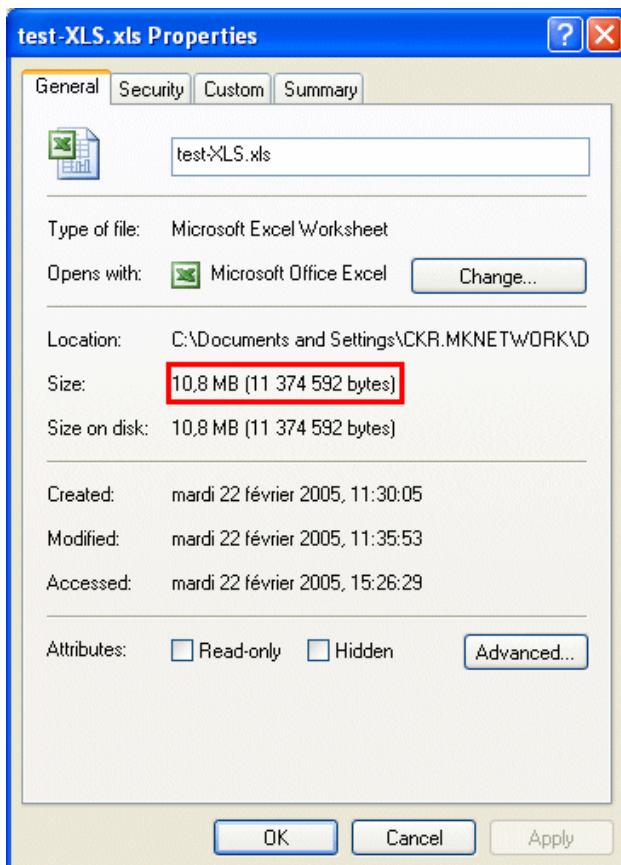
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Now let's send this message to USER2 and measure the network traffic:



Compared to the initial size of the file:



ZipMail compression ratio is:
 $949,392 / 11,374,592 = 0.08$
(92% savings)

In the exchange database, the message (in fact the attached file) is of course compressed:

Mailbox	Last Logged on By	Size (KB)	Total Items
USER1	MKNETWORK\USER1	954	3
USER2	MKNETWORK\USER2	953	2

9) ZipMail ZIP compression - BMP file

Let's compose and send a message containing the same BMP file as in paragraph 4 and measure the results.

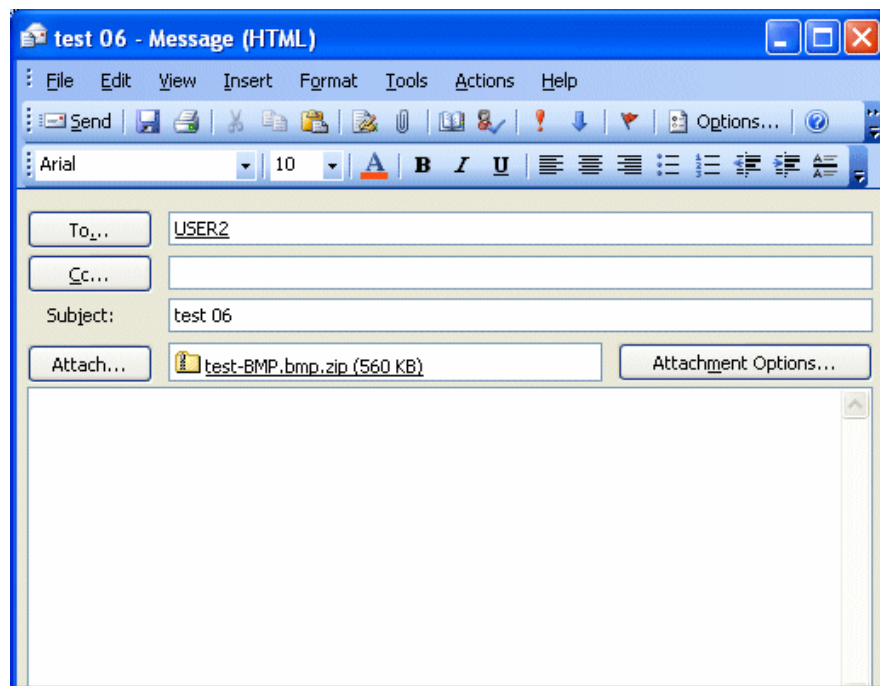
This message will be sent by USER1 to USER2:

First let's have a look at the USER1 and USER2 mailboxes on the Exchange 2003 server:

Mailbox	Last Logged on By	Size (KB)	Total Items
USER1	MKNETWORK\USER1	2	2
USER2	MKNETWORK\USER2	1	1

They are almost empty.

Now let's create a message and attach our .BMP test file:

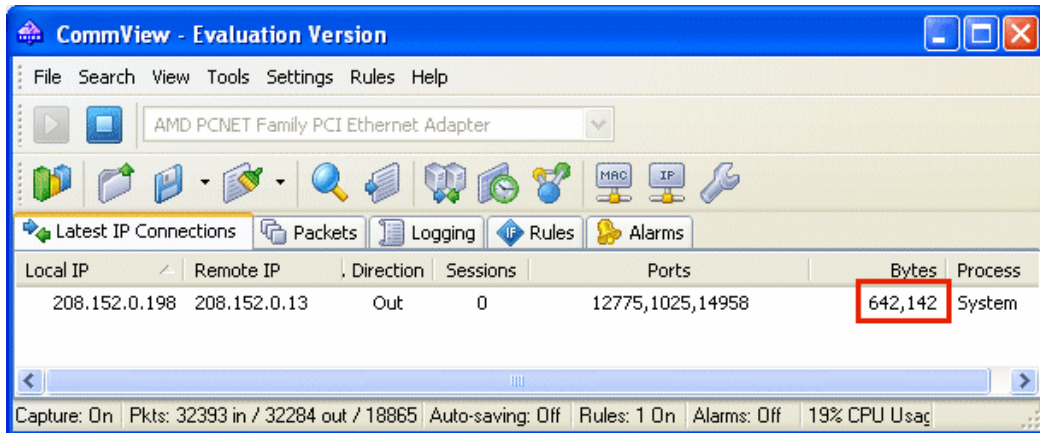


The network monitor is reset to zero just before pressing the "Send" button.

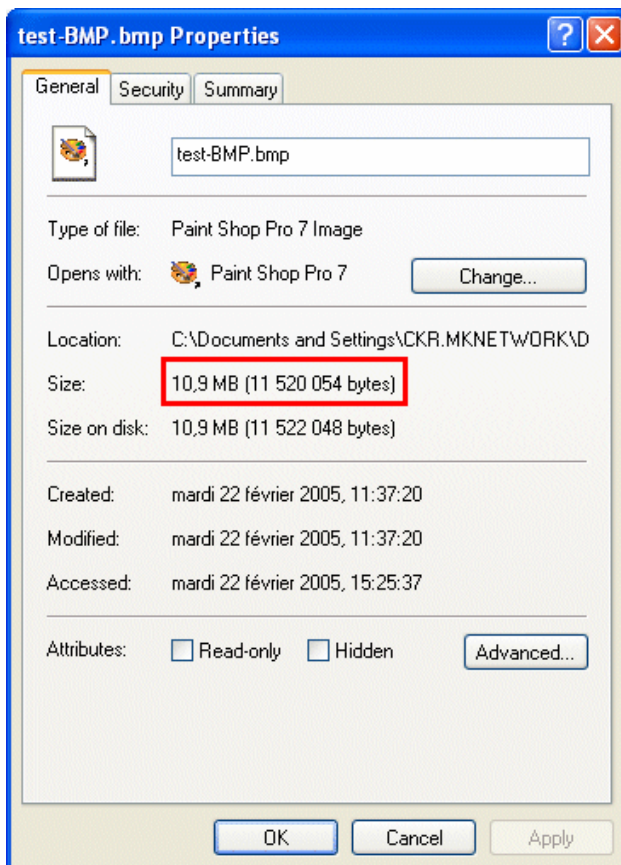
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Now let's send this message to USER2 and measure the network traffic:



Compared to the initial size of the file:



ZipMail compression ratio is:
 $642,142 / 11,520,054 = 0.05$
(95% savings)

In the exchange database, the message (in fact the attached file) is of course compressed:

Mailbox	Last Logged on By	Size (KB)	Total Items
USER1	MKNETWORK\USER1	566	3
USER2	MKNETWORK\USER2	565	2

10) Comparative results

		Outlook 2003/Exchange 2003 Compression Results			
Files	Original size of the files in Bytes	Network		Database	
		Size in Bytes	% of savings	Size in Bytes	% of savings
DOC	34 945 024	27 112 460	22%	34 945 024	0%
XLS	11 374 592	1 980 290	83%	11 374 592	0%
BMP	11 520 054	1 304 450	89%	11 520 054	0%
Total	57 839 670	30 397 200		57 839 670	

		ZipMail Compression Results			
Files	Original size of the files in Bytes	Network		Database	
		Size in Bytes	% of savings	Size in Bytes	% of savings
DOC	34 945 024	22 971 478	34%	22 971 478	34%
XLS	11 374 592	949 392	92%	949 392	92%
BMP	11 520 054	642 142	94%	642 142	94%
Total	57 839 670	24 563 012		24 563 012	

Compared to the Outlook 2003/Exchange 2003 network compression, ZipMail delivers **19% savings** on your network bandwidth .

When using ZipMail, the amount of data in your Exchange database is **2.35 times smaller** than with the Outlook 2003/Exchange 2003 network compression.

ZipMail provides **58% savings** on your Exchange disk space!

11) 2 interesting Microsoft TechNotes

These Microsoft TechNotes contains interesting information:

<http://support.microsoft.com/default.aspx?scid=kb;en-us;825371>

It is interesting to see that Microsoft remains extremely careful about the possible server overload due to the activation of the compression:

...Even though the compression algorithms that are used by Exchange make compression cheap in terms of processor cycles when you compare them to other compression schemes, compression is still an expensive operation. Therefore, packets that are under a specific size do not justify the high cost to compress the data...

And about the problems caused by the network compression in matter of network problem analysis:

Sometimes you may not want to use any compression at all. If you are trying to troubleshoot connectivity problems and you are using Network Monitor to view the packets that are being sent over the network, RPC compression may make analysis difficult because you only see the compressed data in the trace.

And this one is about problems encountered by Microsoft Outlook Web Access users when compression is switched on in organizations having Exchange 2003 servers mixed with servers running previous versions of Exchange servers.

<http://support.microsoft.com/?scid=kb;en-us;842108&spid=1773&sid=global>

It seems that the issue is solved by a special patch + Exchange 2003 SP1 but this TechNote demonstrate that Exchange 2003 compression is a very complex system process, deeply embedded in the Exchange software, compared to ZipMail automatically zipping files on-the-fly on the client side before they are attached to the message.

12) Additional comments

- The Outlook 2003/Exchange 2003 network compression is by definition only for the network flow only. Files are absolutely not compressed in the Exchange databases, wasting huge amount of precious disk space on your Exchange servers.

- The Outlook 2003/Exchange 2003 network compression consume CPU and memory on the Exchange servers (see the above Microsoft TechNote). This because the network compression is a software process running on the Exchange server (and also on the Outlook client).

Hundreds of simultaneous communications having to be compressed consume a very significant amount of CPU power and memory on the Exchange server.

Compared to this, ZipMail does 100% of the compression job on the client. The ZipMail ZIP compression is so fast that it is almost not perceptible by the user (frequently it takes less time to compress + send a big attached file than to send the same attached file not compressed, particularly for users connecting on a saturated network/server as well as for remote users.

Once an attached file is compressed with ZipMail, it is a ZIP file forever. That is not the case with the Outlook 2003/Exchange 2003 network compression. If you forward a message containing attached files to another user, the Exchange server will consume again the same amount of CPU and memory to compress it on the network.

And it is the same if you send an attached file to 100 recipients. The server will consume in total 101 times the amount of CPU and memory needed to compress the file on the network!!!

If your database is on the server, each time you want to open an attached file, your will consume the amount of CPU and memory needed by the Exchange server to compress the file on the network.

If your Exchange server hosts hundred or thousands of users it makes a huge amount of wasted CPU cycles and memory!

- The Outlook 2003/Exchange 2003 network compression does not apply (by definition) (or can cause technical issues, see the above Microsoft TechNote) in mixed environment. You need to be full Outlook 2003 / Exchange 2003. That's not the case with ZipMail that is available for any version of Microsoft Outlook from Outlook 97 to Outlook 2003 (same setup package), for Microsoft Outlook Express, for any Webmail or Web application and even for all of the version of Lotus Notes form 4.6 to 7!!!

- The Outlook 2003/Exchange 2003 network compression makes network diagnostic and protocol analysis difficult or impossible (see the above Microsoft TechNote).

- When sending/receiving messages to/from the internet, the Outlook 2003/Exchange 2003 network compression does not apply.

- Contrary to the ZipMail ZIP Compression, Network compression does not help the users to respect the limit in term of maximum ingoing / outgoing message size.

Exchange 2003 message volume restrictions apply to the real size of the message. So if the real size of the message is 11 Mbytes and if the limit for ingoing or outgoing messages is set to 10 Mbytes, even if the message is compressed on the network to 5 Mbytes, it will be rejected.

That's not the case with ZipMail.

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- The Outlook 2003/Exchange 2003 network compression is a complex system process with possible side effects. Associated technical risks and cost of managing the Outlook 2003/Exchange 2003 network compression are significantly higher than for ZipMail that is a very simple client process not implied with any Outlook/Exchange system processes.

- ZipMail is the only Outlook compression product on the market for which compatibility is not an issue.

This is the reason why:

Contrary to any other Outlook compression products you may find on the market, ZipMail does the compression BEFORE the files are attached.

This is a major and fundamental technical difference that guarantees, by design, that compatibility with any further Outlook processes is not even a question.

Other products let the users attach their files to the message and only perform the compression later, when the message is saved or sent.

Depending on the configuration of the Outlook client, this could result with major technical issues.

For instance, attached files being spooled on the Exchange server database while the user finishes writing his message. Then, as the compression occurs at the time the user saves or sends the message, and as the compression is local to the Outlook Client computer, the spooled files needs to be retrieved from the Exchange server in order to be compressed locally (and then sent again to the server), wasting your network bandwidth and user's time.

No such things with ZipMail since the files are compressed BEFORE to be attached.

This explains why, by design, ZipMail is not subject to Outlook versions and service pack compatibility issues, simply because it is not triggered by internal Outlook events!

This is the reason why the same version of ZipMail works with any version of Microsoft Outlook, from Outlook 97 to Outlook 2003! (the same version of ZipMail even works with Microsoft Outlook Express!!!)

- ZipMail has no hidden costs – Immediate Return on Investment is for real

Because ZipMail provides transparent ZIP compression and decompression, it does not require any user teaching.

ZipMail does not need to be managed. Once installed it instantly starts reducing your needs for Outlook/Exchange bandwidth and disk space with no need for fine tuning and no unwanted technical side effects.

Volume reduction benefits propagate to Exchange archives and backups.

Because of the reduction of your messaging traffic and storage, the overall performance of your Outlook/Exchange organization is improved.

If most of your corporate email traffic is made of attached files (it is commonly admitted that typical corporate email traffic is made of 85-95% of attached files) you can even switch the Outlook 2003/Exchange 2003 network compression off (because ZIP files cannot be compressed again by the Outlook 2003/Exchange 2003 network compression). Doing so, you will prevent your Exchange servers to waste their CPU cycles doing network compression for nothing.

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13) Where to go from here?

See for yourself, try it for real!

You can get fully functional evaluation copies of ZipMail from our web sites:

<http://www.outlook-compression.com>

or

<http://www.mk-net-work.com>

Please contact us if you have any questions or if you would like to start a serious "Pilot Program" evaluation of ZipMail at your organization.

sales@outlook-compression.com

Our consultants will provide you with anything you need, including fully functional evaluation packages and free unlimited assistance.