

Performance Improvement in CA XCOM Data Transport for Windows Release 11.6

This document describes performance improvement in CA XCOM Data Transport for Windows that is done in the solution R079389 (XCOM Build 15011). You can download the solution from support.ca.com.

Background

As a part of continuous performance improvement effort, XCOM source code has been profiled using a CPU sampling method to find out bottlenecks.

It has been observed that component tracing causes CPU I/O even after tracing is turned off. This has a side impact on the network I/O. The above-mentioned solution fixes the bottleneck for CA XCOM Data Transport for Windows Release 11.6 32-bit and 64-bit. A major performance improvement is seen in binary transfers. Record processing remains the bottleneck for the transfer involving text transformation. XCOM continues to produce traces for diagnostics as usual when tracing is turned on.

The following sections discuss the performance improvements before and after the patch, on Windows x86 64-bit.

Working Environment Used

- System configuration
 - Windows 8.1 Enterprise, 64-bit Operating System, x64-based processor
 - Processor: Intel® Xeon® CPU L7545 @ 1.87GHz 1.86GHz (2 processors)
 - RAM : 4.00 GB
- Tests are performed on virtual machines.
- Tests are run in real world environment. There is no control on network, and disk I/O.
- Transfers are performed between two Windows systems that are separated by low latency and high latency network.

Methodology

- An XCOM transfer is performed ten times consecutively. To minimize the cache effect, the file that is created as the result of each transfer is deleted, before starting a new iteration.
- Three different file sizes are chosen – 100MB, 501MB and 1GB.
- The tests are performed on XCOM Build 14072 and then repeated after the performance improvement XCOM Build 15011 has been applied.

Before You Begin

The following factors greatly influence the transfer performance:

- CPU
- DISK I/O
- Network I/O
- Memory

Removing/reducing one of the factors shifts our focus to the remaining factors. Benchmarking result may vary.

Example

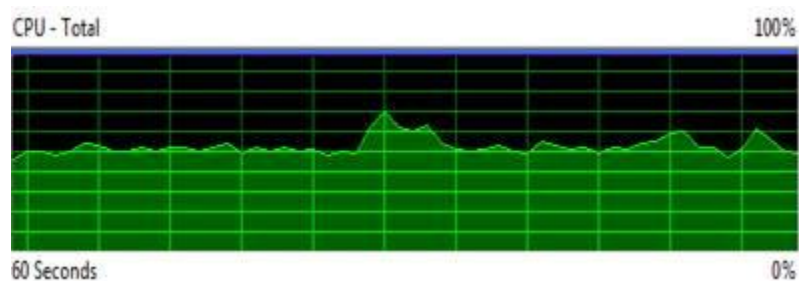
To remove disk I/O, a new utility (equivalent to DD command on Linux) is developed which emits the data on the standard input device. Reading from the standard input device removes the overhead of disk I/O. Similarly, doing local-loop transfers removes overhead of network I/O.

Case 1: Binary transfer with neither Disk- nor Network-I/O

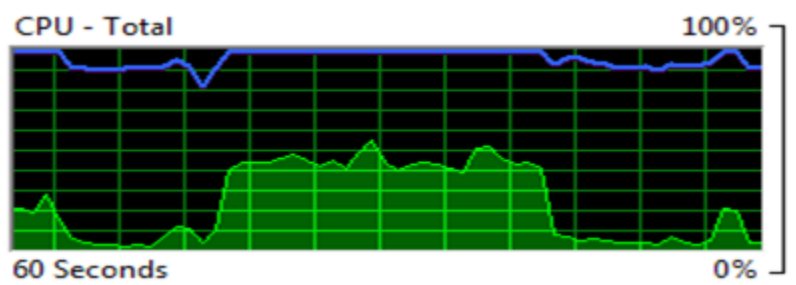
This is a local-loop binary transfer with the default parameters reading from stdin and writing to NUL device. As there is no disk I/O and network I/O involved, overhead of tracing can be seen. Here is the sample command-line transfer using the “dev_not_zero.exe” utility which emits the data to stdout piped into XCOM’s stdin.

- `dev_not_zero.exe 32000 32000 | xcomtcp -f REMOTE_SYSTEM=127.0.0.1 LOCAL_FILE= REMOTE_FILE=NUL FILE_OPTION=APPEND CODE_FLAG=BINARY USERID=xx PASSWORD=xx XTRACE=0`

Before fix

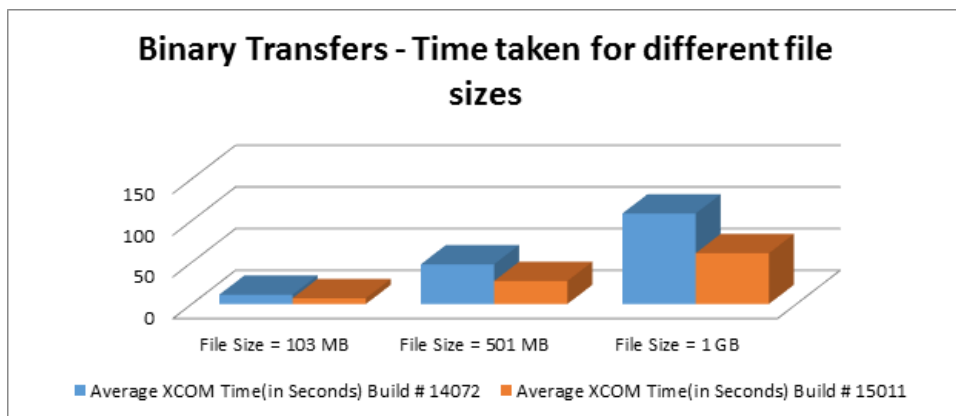


After fix



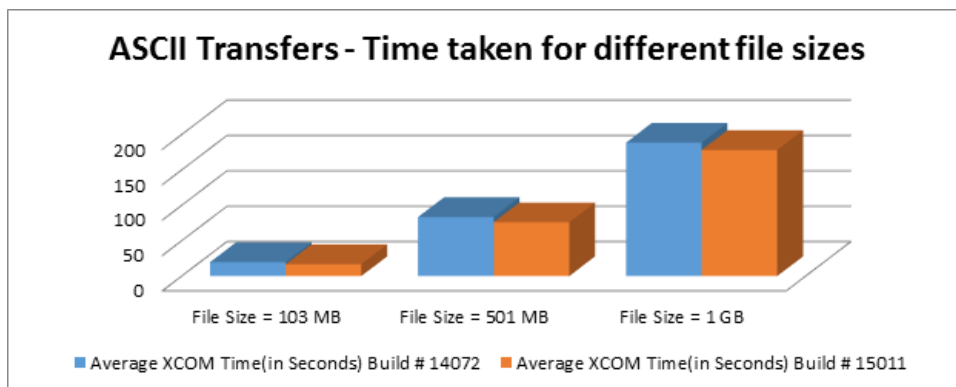
Observe that CPU utilization has been reduced after fix, which improves the transfer throughput. Let us introduce real disk I/O and network I/O and run some transfers. The following transfers are performed with the default XCOM global parameters.

Case 2: Binary transfer in low latency network

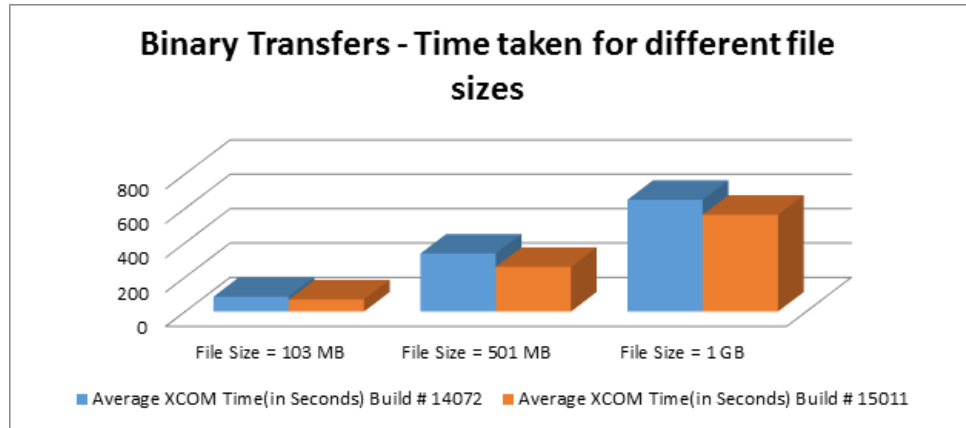


Case 3: ASCII transfer in low latency network

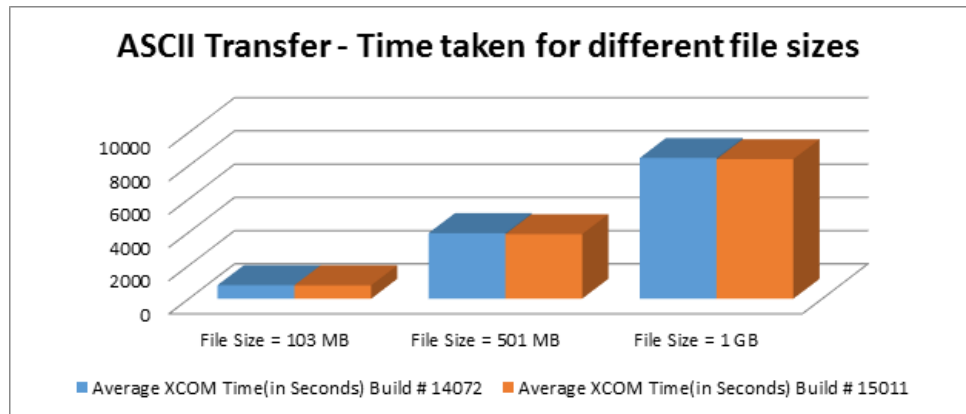
For ASCII transfer, record processing remains the major bottleneck.



Case 4: Binary transfer in high (200ms) latency network



Case 5: ASCII transfer in high (200ms) latency network



Case 6: ASCII transfer in low latency network with XCOM fine tuning parameters

To minimize the record processing overhead in the ASCII transfers, specify the following XCOM performance improvement parameters, before running the transfer.

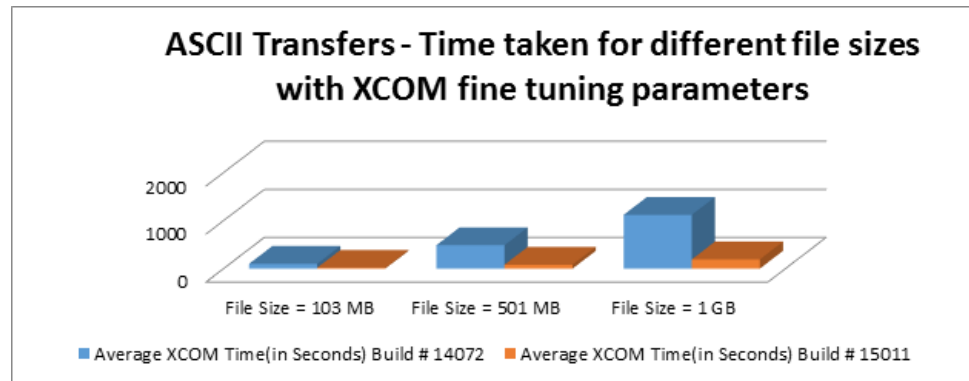
XCOM Global Parameters –

- STAT_FREQUENCY=9999
- TXPI_SEND_CHECK_FREQ=9999

XCOM Transfer Parameters –

- COMPRESS=NO
- CHECKPOINT_COUNT=0

Note: For more information about XCOM performance tuning parameters, see the *User Guide*.



Summary

With the default XCOM parameters, XCOM binary transfer throughput is significantly improved after applying the new patch. Significant performance improvement is also seen when XCOM fine tuning parameters are set for ASCII transfers.