



Evaluation: Open Text Connectivity Secure Server 1.0 vs. Attachmate Reflection for Secure IT Server 6.1 and SSH Communications Security SSH Tectia Server 6.0

EXECUTIVE SUMMARY

Open Text's Connectivity Secure Server outperformed secure shell servers from Attachmate Corp. and SSH Communications Security, delivering superior processing speed and scaling to support over 1,000 user downloads per server which enables it to deliver a cost of ownership unmatched by rival products tested.

Not all secure shell server solutions are created equal. Although many available secure shell server solutions provide a similar level of security, they vary greatly in terms of their throughput and their ability to scale up as the number of client connections increases.

In this round of tests, conducted in December 2008, Open Text's Connectivity Secure Server consistently outperformed Attachmate Corp.'s Reflection for Secure IT Server and SSH Communications Security's SSH Tectia Server.

In tests transferring a 36MB file from a server to a requesting client, Connectivity Secure Server completed the task 10X faster than SSH's Tectia Server and 24X faster than Attachmate's Reflection for Secure IT server.

THE BOTTOM LINE

- 1 Delivers the highest performance and maximum scalability of the three secure shell server products tested
2 Costs up to 12X less to support 1,000 concurrent SFTP file transfers than rival products tested
3 Completes 1,000 SFTP file transfer sessions from four PC clients on a single server, while Attachmate and SSH Tectia servers failed to scale properly
4 Imposes less overhead on host server CPU than other products tested
5 Uses 9X less server memory than other products tested to complete 36MB file transfer to client



In single-session and multi-session tests over a Fast Ethernet local area network, Open Text Connectivity Secure Server routinely outperformed the two other products tested. And in session-scaling tests, it was the only secure shell server tested that scaled to 1,024 sessions simultaneous successfully.

This has implications for cost of ownership, as it means that an enterprise supporting 1,000 simultaneous file transfers would deploy fewer Open Text servers compared to the other solutions. Based upon current tests, users would deploy a single Open Text server versus 16 servers for Attachmate's Reflection for Secure IT, which scaled to complete just 63 downloads with a single server, and three servers for SSH Tectia Server which completed 481 file transfers simultaneously.

From a cost-of-ownership standpoint, this shows marked differences between the products, as users would spend about \$5,600 to support 1,000 concurrent file downloads with the Open Text Connectivity Secure Server versus over \$60,000 for the Attachmate product.

Tests also showed that the Open Text Connectivity Secure Server efficiently handles secure shell operations, requiring about 43% less time to process 80 concurrent sessions across four PCs compared to products from Attachmate and SSH Communications Security.

Further, tests show that the Open Text solution consumes fewer host resources than other products tested.

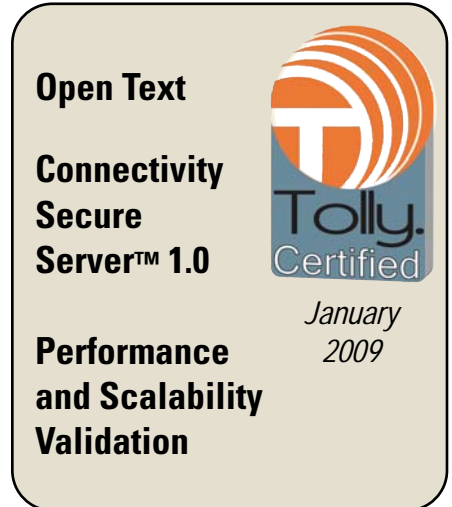
Finally, tests showed that the Open Text Connectivity Secure Server places less memory demand on host server CPUs than other products tested.

## RESULTS

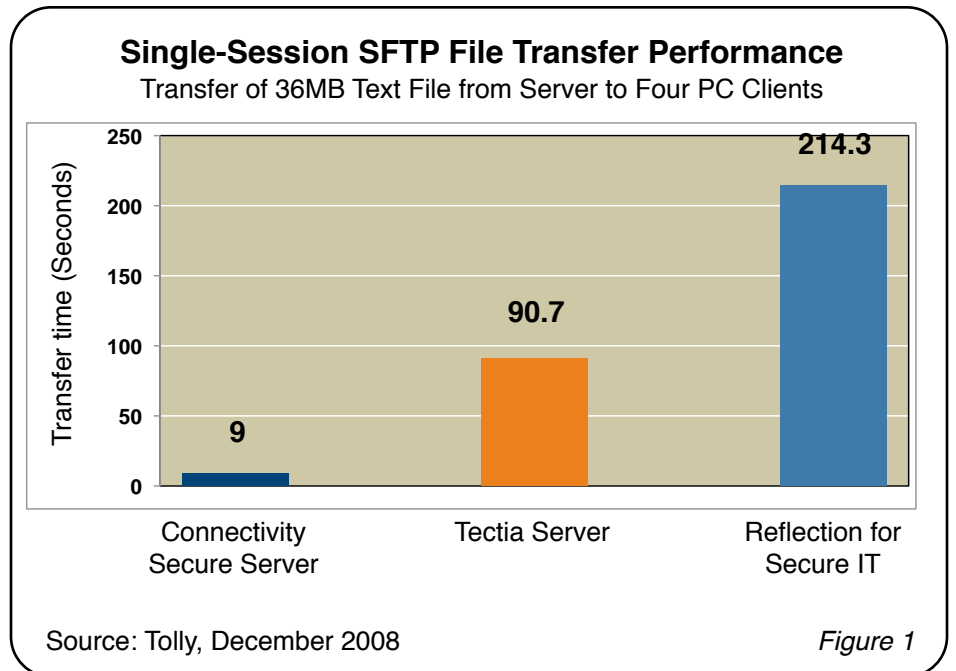
### Single-Session Secure File Transfer (SFTP) Performance

Tolly engineers measured the performance of transferring a single file from a server to each of four clients over a Fast Ethernet LAN via a Secure Shell (SSH) connection. This provides a performance baseline to understand the maximum performance offered by the products tested. Tests show that Open Text's

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Connectivity Secure Server delivered a 36.1-MB text file in 9 seconds, which was 10X faster than SSH Tectia Server and almost 24X faster than Attachmate's Reflection for Secure IT Server. (See Figure 1.)



## Multi-session SFTP File Transfer Performance

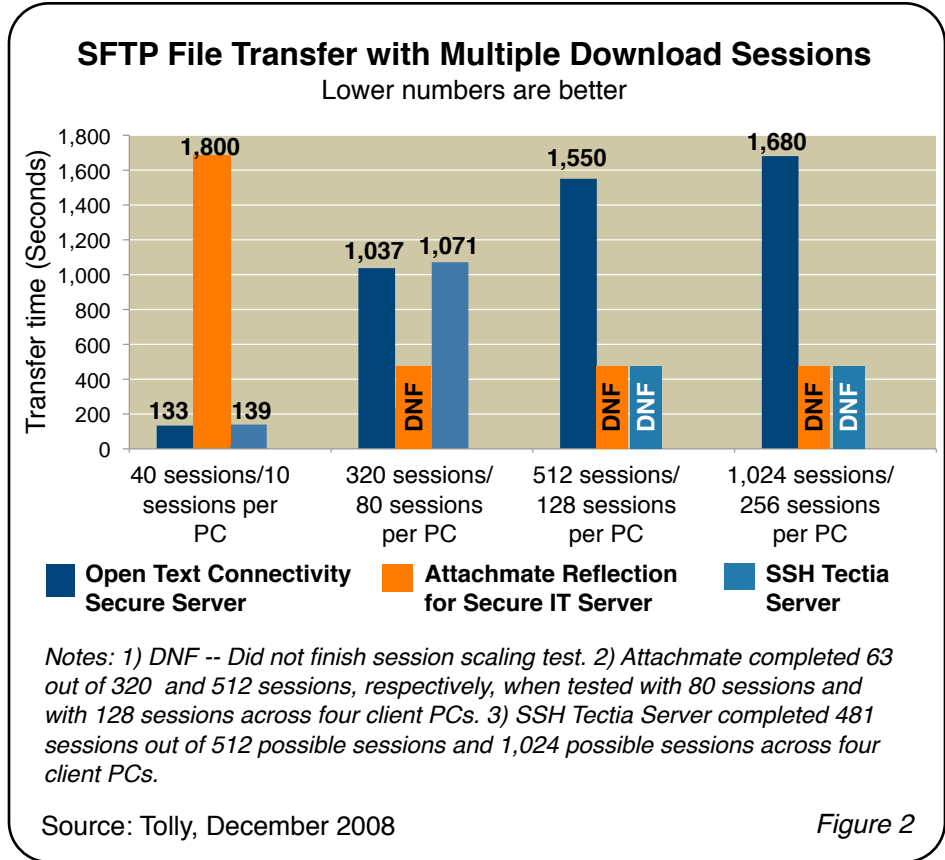
Tolly engineers measured the performance offered by the secure shell servers tested when handling multiple file-transfer sessions from four client PCs attached to a Fast Ethernet local area network. Tests focused first on two file-transfer sessions per PC (eight total) and then six file-transfer sessions per PC (for 24 total-download sessions).

Tests show that the Open Text Connectivity Secure Server completed file transfers over two client sessions in just 31.3 seconds. Compared to other products tested, the Open Text product was almost 14% faster with the two-downloads versus SSH Tectia Server and almost 4X faster than Attachmate Reflection for Secure IT Server.

The multi-session test also examined the effect of six file-transfer sessions per PC (or 24 file transfers occurring simultaneously) on the secure shell servers. The Open Text Connectivity Secure Server completed the file transfers in 82.3 seconds, or about 7% faster than the SSH Tectia Server and 47% faster than Attachmate Reflection for Secure IT Server.

### Effect of Session Scaling on File-Transfer Operations

Engineers observed the relative stability of the secure shell servers under test by subjecting the products to increasing loads of SFTP file transfers by requesting clients.



The aim was to observe the degradation in file-transfer time as client SFTP sessions scaled, first from 10 per PC (40 total), then to 20 per PC client (80 total), then 128 sessions per PC client (512 total) and, finally, 256 sessions per client (or 1,024 sessions total).

In addition to providing insight into the impact that scaling file-transfer sessions has on response times, the test also helps readers understand the scalability of the secure shell servers tested.

Tests showed that the Open Text Connectivity Secure Server delivered the fastest transfer time of the three secure shell servers tested and

scaled without any loss of sessions, unlike the Attachmate Reflection and SSH Tectia products.

Open Text Connectivity Secure Server was the only product tested that was able to scale to 1,024 file-transfer sessions and handle the concurrent transfer of 36MB files. The Open Text Connectivity Secure Server handled the task in 28 minutes, 11 seconds. The SSH Tectia server processed 481 downloads in 26 minutes, 50 seconds, falling short of the scalability goal.

The test did not include the Attachmate Reflection offering since it failed to complete the requisite number of file transfers in the

512-session scalability scenario.

The SSH Communications Tectia Server fell short of completing 512 sessions, capping out at 481 sessions, while the Open Text Connectivity Secure Server consistently delivered faster response times. (See Figure 2.)

The Attachmate Reflection for Secure IT Server failed to complete secure file transfers for session scalability scenarios of 320 sessions and higher. While the product did complete the 40-session scenario (10 client sessions per PC), it did so in 30 minutes, while Connectivity Secure Server completed the operation in 2 minutes, 13 seconds.

### Secure Shell Performance

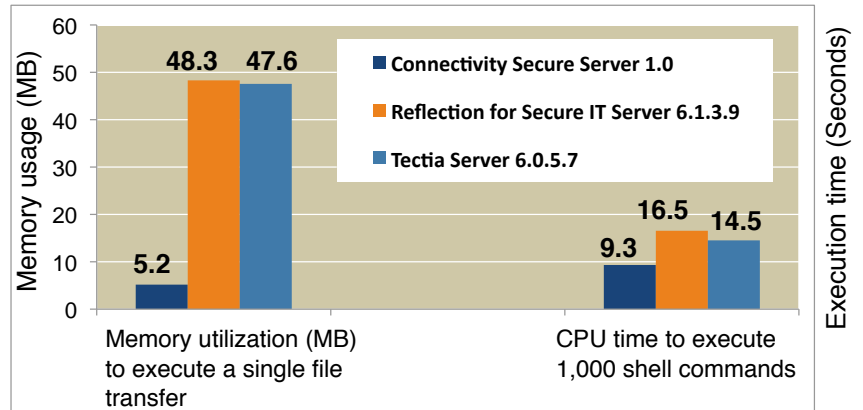
Tolly personnel determined the rate at which the Open Text Connectivity Secure Server and the other secure shell servers could execute 1,000 shell commands — in this case, the four PC clients instructing the server to change directories.

Tests show that Connectivity Secure Server completed the task in 3 minutes, 25.7 seconds, or 10% faster than the SSH Tectia offering and 20% faster than Attachmate Reflection for Secure IT Server.

### Effect of Session Scaling on Secure Shell Operations

This test sought to demonstrate the impact that multiple concurrent SSH file-transfer sessions have on task completion time.

### Secure Shell Server Memory and CPU Utilization



Source: Tolly, December 2008

Figure 3

For this test, 20, 40 and 80 sessions were used and were split evenly among four PC clients (5, 10 and 20 on each PC, respectively).

Again, Open Text’s Connectivity Secure Server completed the task in less time than the other products. With 20 sessions active across four PC clients, the Open Text solution completed the shell operations in 3 minutes, 33.3 seconds, or up to 25% faster than the competing products tested. Other scenarios in the shell test show that the Open Text product completed the task up to 43% faster than rival products tested.

What’s interesting to note is that as Open Text’s Connectivity Secure Server scaled from serving 20 file-transfer sessions to 40 file transfers, it used just 12% more time, and then from 40 file-transfers to 80 file-transfer downloads it used 25% more time. Attachmate’s Reflection server, by contrast, needed 13%

more time to process 40 file transfers and 43% additional time to make the jump to 80 file transfers.

### Server Transaction Time

In this test, Tolly personnel measured the amount of time required to execute a set of shell commands (changing directories) on the server. The Open Text server used 9.3 seconds of CPU time to process the shell task, which is up to 43% less time that the other products tested.

### Server Memory Utilization

Tolly personnel recorded the amount of memory used by the host server CPU processing a file transfer. Testers recorded the “working set peak.” The working set of a process is the amount of virtual memory in use by the application’s code base and the data that is allowed to remain resident in RAM.

Tests show that the Open Text's Connectivity Secure Server used 5.2MB of RAM for 9.31 seconds to handle a 36MB file transfer. The Tectia server used 47.6MB of RAM for 14.5 seconds, and the Attachmate Reflection product used 48.3MB of RAM for 16.5 seconds. This demonstrates that Open Text's Connectivity Secure Server places less demand on the server CPU. (See Figure 3.)

### Cost-of-Ownership Analysis

Session scalability test results provide insight into the true costs associated with deploying the products tested.

Since Open Text Connectivity Secure Server was the only product tested to scale successfully to 1,000 sessions per server, it would cost only about US\$5,150 (hardware, software and support) to deploy in an environment where support for 1,000 simultaneous file-transfer sessions is required. By contrast, Attachmate Reflection server only scaled to 63 session downloads per server, users would need 16 servers at a cost of US\$62,000 (See Figure 4). SSH Tectia Server, which scaled to 481 session downloads, would need three servers to support 1,000 file-transfer downloads at a cost of US\$12,628.

In hardware costs alone, users would spend anywhere from 2.5X to 12X more by deploying the SSH Tectia or Attachmate solutions, respectively.

### Cost of Ownership for Supporting 1,000 Concurrent SFTP Session Downloads

Lower numbers are better

	Connectivity Secure Server	Attachmate Reflection for Secure IT Server	SSH Tectia Server
Number of servers required	1	16	3
Cost per server (Dell PowerEdge R200, Pentium D E2200, 2.66-GHz, 2GB RAM and 160GB HDD, Windows Server 2003 R2 Standard Edition)	US\$2,855	US\$45,680	US\$8,565
SSH server software licenses	US\$1,595 (Requires one license)	US\$12,112 (Required 16 licenses at \$757 each.)	US\$2,763 (Required three licenses at \$921 each.)
Setup (Eight hours of initial setup plus two hours per server @ \$50 per hour)	US\$500	US\$1,200	US\$700
Ongoing costs: (Labor support @ four hours per year per server @ \$50 per hour)	US\$200	US\$3,200	US\$600
<b>Total capital and operational expenditures</b>	<b>US\$5,150</b>	<b>US\$62,192</b>	<b>US\$12,628</b>

Notes: Attachmate and SSH Tectia pricing was derived from an average of prices obtained from three North American resellers during December 2008. Calculations for Attachmate TCO were based on 16 servers since testing showed Reflection for Secure IT could only handle 63 concurrent sessions. SSH Tectia required three servers to support 1,000 sessions since it scaled to only 481 sessions per server. All prices in U.S. dollars.

Source: Tolly, December 2008

Figure 4



Software licensing is straightforward with Open Text as users pay for a single server license, but those costs escalate rapidly with the Attachmate and SSH Tectia solutions as users must pay for 16 and three licenses, respectively.

## Test Setup & Methodology

Tolly personnel examined three products: Open Text Connectivity Secure Server 1.0, Attachmate Corp. Reflection for Secure IT Server 6.1.3.9 and SSH Communications Tectia Server 6.0.5.7.

The test bed consisted of a single PC server (3-GHz Intel CPU with 2GB RAM, running Windows Server 2003 SP2) hosting the SFTP server applications under test, connected to up four client PCs (2.8-GHz Intel CPU, with 2 GB RAM, running Windows XP SP2). WinSCP, an Open Source client program, was used as the SFTP client. The server was connected to a Fast Ethernet test network with a 3Com Corp. EtherFast 10/100 auto-sensing, eight-port workgroup hub.

This testbed was used throughout the testing for other scenarios as well. See Figure 5.

### Single-Session SFTP File Transfer

From the client PC, engineers launched WinSCP (Ver. 4.06, Build 358) and established a single GET session to fetch a 36.1MB test file

from the SFTP server under test. (The test file was a text-based log file derived from an Open Text HostExplorer program.) A custom script created on the client PC recorded the time taken for the transfer as "time of the last write to file — time of file creation." Engineers recorded the time required to transfer the file and complete the task. The test was run three times and the results averaged.

### Multiple-Session SFTP File Transfer Performance

SFTP performance was measured by downloading the same 36.1MB file from the server to four clients using multiple SSH connections. The time to transfer was measured by subtracting "Time of file creation" from "Time of the last write to file" for each file. The transfer times for each file transfer were then combined and an average calculated.

A PuTTY SFTP (PSFTP) program was used as the SFTP client; PuTTY is a client program for use with SSH, Telnet and Rlogin network protocols. PuTTY was used because it creates less performance drag on the client PCs, providing a more accurate file transfer measurement.

From the client PC, engineers launched a single GET request to the server under test from each of the four client PCs using PSFTP. A custom script running on the client PC recorded the time taken for the transfer as "time of the last write to

file - time of file creation". Engineers recorded the file transfer times on all clients, and averaged the times across three test iterations. The test was run first with two client sessions per PC and then six client sessions per PC. The test was run three times and the results averaged.

### Effect of Session Scaling on File-Transfer Operations

The stability of the SFTP servers under test was measured by launching increasing numbers of simultaneous SFTP sessions to the client. The subsequent time of each transfer from the server to the client was measured by subtracting "Time of file creation" from "Time of the last write to file" for each file.

The test covered 10 sessions per PC (40 total), 80 sessions per PC (320 total sessions), 128 sessions per PC (512 total sessions) and 256 sessions per PC (for 1,024 total sessions). Each scenario was run three times and the results were averaged.

The same testbed was used as had been utilized in the other tests.

From a client PC, engineers launched multiple GET requests to the server under test from each of the four client PCs using PuTTY SFTP. A custom script running on the client PC recorded the time taken for the transfer as "time of the last write to file - time of file creation". Testers recorded the file-transfer times on all four clients, across the multiple SFTP sessions, and averaged them.

## Secure Shell Performance

This test measured the time required for a client to complete 1,000 operations (changing directories) on the SSH server.

Engineers used Open Text's HostExplorer with built-in scripting functionality and Open Text's Connectivity Secure Shell installed on all client PCs.

From one client PC, engineers launched a custom test script that executed 1,000 shell operations on the SFTP server under test. The script executed 1,000 shell operations to "change directory" on individual test folders (named 1 through 1,000) created for test purposes, and reported the total time taken to execute the 1,000 operations. The test folders (1 through 1,000) were pre-populated on the server, prior to the test. The test was run three times and the results averaged.

## Effect of Session Scaling on Secure Shell Operations

This test measured the time for the secure shell server to complete shell operations as the number of client-requested sessions scaled from 5 sessions per PC client (20 total), then 10 sessions (40 total) and finally, 20 sessions per PC (80 total sessions).

Testers evaluated the time needed for each client to complete 1,000 directory switching operations on each server under test. The test was

run three times and the results were averaged.

## Server Transaction Time

Testers measured the amount of time that the CPU spent executing a file transfer between the server and each of four client PCs.

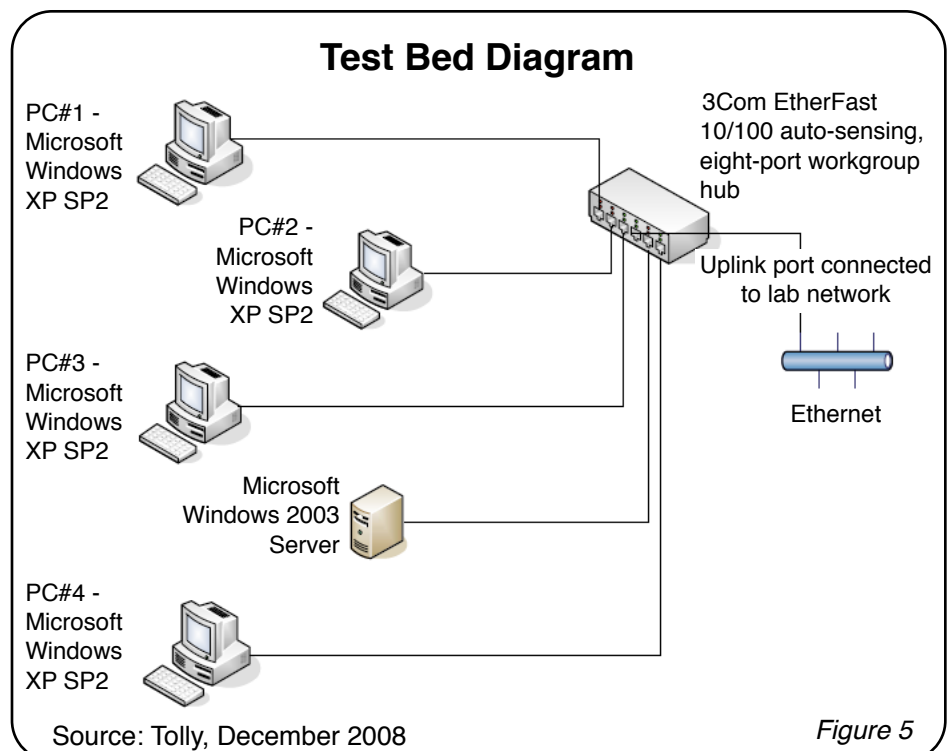
Engineers used the Microsoft-developed Process Monitor freeware tool to create a filter that measured only processor bound activity related to SFTP transfers.

With Process Monitor filters active, testers launched four simultaneous SFTP file-transfer sessions fetching the test file from the server under test to each of the four client PCs using PuTTY. Testers then recorded

the CPU time to execute the file transfer. The test was run three times and the results averaged to obtain a final result.

## Server Memory Utilization

Testers measured the amount of memory (called the working set) that was used by the server during an SFTP file transfers to each of four PC clients simultaneously. Measurements were taken in kilobytes (KB) and tests were run three times and the results were averaged. The testbed was the same as in other test case.





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## About Tolly...

Founded by Kevin Tolly, and headquartered in Boca Raton, Fl., The Tolly Group companies have been delivering world-class IT services for 20 years.

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Visit Tolly on the Internet at: <http://www.tolly.com>

## Interaction with Competitors

In accordance with Tolly's Fair Testing Charter, Tolly personnel invited representatives from Attachmate Corp. and SSH Communications Security to participate in reviewing the Test Methodology and commenting on their product's specific results. Both companies reviewed the test plan and decided not to participate.



For more information on the Tolly Fair Testing Charter, visit: <http://www.tolly.com/FTC.aspx>

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