

# ROI of the AppSense Performance Suite

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Increasing performance and maximizing return on investment in Citrix MetaFrame environments

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AppSense® **Performance Suite**

Performance for the on-demand enterprise



## About this paper

**"This paper has received the 'No Bull' certification from Brian Madden. This certification ensures that this vendor's paper is realistic, accurate, and not full of hype. As a reader with limited time, you can trust papers with the 'Certified No Bull' logo from Brian Madden. More information is available at [www.brianmadden.com/certified](http://www.brianmadden.com/certified)."**

**"I have verified that this ROI study from AppSense is based on proper calculations and assumptions. If you're concerned about the spiraling cost of your Citrix MetaFrame or Microsoft Terminal Server environment, you can rest assured that the calculations in this document are valid based on the sample organization profiled."**

**"The numbers presented in the paper, while technically accurate, do not apply to all organizations. Therefore, AppSense has made their ROI calculator available for free at [www.appsense.com/roi](http://www.appsense.com/roi). I have reviewed the formulas on which the calculator is based, and they are true and accurate. You can take confidence in the fact that this online ROI calculator will provide you with accurate results."**

Brian Madden,  
Independent technology analyst, author, and consultant.  
March 2004.

## About Brian Madden

Brian Madden is a recognized expert in the server-based computing industry. He's written several best-selling books and hundreds of articles about Citrix MetaFrame and Microsoft Terminal Server. He speaks, teaches, and lectures on the topic throughout the world. You can find out more information and read all of his articles at [www.brianmadden.com](http://www.brianmadden.com).

## About AppSense

Founded in 1999, AppSense is a specialist in application performance management, providing software to help enterprises improve productivity and reduce IT costs by ensuring the highest possible performance, availability and security of critical IT systems. The company's mission is to provide software that enables complete management of application performance across all corporate systems, from Windows to Web services – and in future, UNIX and Linux systems. For further information, please visit AppSense @ <http://www.appsense.com> or contact [marketing@appsense.com](mailto:marketing@appsense.com).

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## Executive summary

This paper shows how the AppSense Performance Suite is able to increase the number of concurrent users per server by up to 46% in a sample organization of 2,500 Server Based Computing users as well as improving performance, security and usability of the application set. Calculate your own real-world savings using AppSense's free ROI tool found at [www.appsense.com/roi](http://www.appsense.com/roi).

Based on costings from Citrix<sup>1</sup>, adding a server to an existing farm costs between \$6,500 and \$7,000 including the costs of hardware and the base operating system (not including Client Access Licenses). The additional costs of management and maintenance for each server are in the order of 15-20% of the acquisition costs (or approximately \$1,500) per annum.

Comparing the total acquisition cost of a new server (including software and maintenance costs) of between \$10,000 and \$11,000 with the cost of the AppSense Performance Suite at just over \$3,000 per server shows an immediate return on investment. The additional benefits of reduced ongoing server management, maintenance and running costs with improved security and reduced exposure to viruses have further significant impact.

When all these factors are taken into consideration, the overall cost savings for the system (1,000 concurrent users supported on 20 servers) are shown to be \$857,000 over a three-year period or just over \$100 per user per annum.

The 'Performance Audit' program – a consultancy package consisting of the AppSense Performance Suite installation, 10 days of data collection from live servers and 2 days of data analysis – is available on request. Customers receive an extensive report packed with vital system and application performance information, highlighting possible performance, security and consolidation improvements. For further information or to arrange an AppSense Performance Audit, please contact [info@appsense.com](mailto:info@appsense.com).

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<sup>1</sup> Citrix – Ace Cost Analyzer, Mar 2004

## Introduction

Organizations are constantly seeking to minimize the costs associated with owning, deploying and managing applications. Already over 120,000<sup>2</sup> organizations are lowering costs and optimizing their available IT budget through a Server Based Computing (SBC) model based on Citrix MetaFrame and Microsoft Terminal Services technology. Since 1999, AppSense has provided solutions that dramatically accelerate the return on investment (ROI) of these SBC systems.

This report highlights the costs and benefits of deploying the AppSense Performance Suite across a sample organization. The findings described in this study are based on detailed Performance Audits conducted by our consultants and consultants from our Certified Solution Partners in nine organizations that are currently using the AppSense Performance Suite within their SBC environments.

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<sup>2</sup> Citrix Systems Inc. October 2003

## Key findings

Each of the organizations that contributed to this report identified the following benefits associated with deploying the AppSense Performance Suite:

- Server consolidation – the use of the AppSense Performance Suite allowed the organization to deliver more users per server, thus reducing the overall number of servers required.
- Increased productivity – the use of the AppSense Performance Suite improved both the stability of the servers and the productivity of the users accessing those servers.
- Enhanced security – the use of the AppSense Performance Suite reduced the risk of unauthorized applications and malicious code - such as virus attacks.

Based on the data collected, a representative mid-size organization of 2,500 SBC users was created (see Appendix A for a detailed description). The three-year costs for the AppSense Performance Suite totaled approximately \$60,000 and the benefits – cost savings and productivity improvements – totaled approximately \$917,000 (see Table 1) giving an overall saving of \$857,000.

**Table 1: Financial results – sample organization**

Item	Costs/Savings <sup>3</sup>
AppSense Performance Suite 3 year costs	\$60,000 <sup>4</sup>
Total 3-year hardware savings	\$36,000 (6 servers)
Total 3-year software savings	\$6,000 (6 OS licenses)
Total 3-year productivity savings	\$875,000
<b>Total 3-Year savings</b>	<b>\$857,000</b>

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<sup>3</sup> The figures have been rounded to the nearest \$1,000 for clarity

<sup>4</sup> Includes maintenance costs at 20% per annum

## Hardware and associated costs including software

The costs associated with server hardware and software for the sample organization totaled **\$718,000** over a three-year period based on the assumption that the user population did not increase or decrease. This figure does not include any of the additional costs associated with the application software to be hosted within the server farm.

To calculate the total figure, the following assumptions were made:

1. The 2,500 users in our sample organization equate to about 1,000 concurrent users (roughly a 2.5:1 ratio)<sup>5</sup>.
2. The users are primarily running Microsoft Office 2000 and various front office or back-office line-of-business applications (such as CRM and ERP systems).
3. At peak utilization there are 1,000 users or on average 50 concurrent users per server, requiring 20 servers. This loading represents the upper range of capacity established from customers interviewed as part of this paper.

The following are the estimates for server hardware, software and associated lifetime costs:

### Hardware costs:

Each two-way application server<sup>6</sup> typically costs \$6,000 given the following configuration:

- HP DL360 G3 Dual Intel Xeon 3.06Ghz 2Gb RAM
- RAID 1, 2 x18.2GB drives
- Dual power supplies, Network Interface cards
- HP 4 hour response support

**20 application servers: \$120,000**

### Software costs:

- Citrix 1000 MetaFrame XPe licenses with Subscription Advantage at \$29,000 per 100 users<sup>7</sup>.
- Windows 2003 Server licenses at \$1000 per server<sup>8</sup>.
- Windows 2003 Server Terminal Services client access licenses at \$30 each.

**Total software license costs: \$340,000**

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<sup>5</sup> Figures taken from "The Total Economic Impact of Citrix MetaFrame Server-Based Computing Solutions" report produced by the Giga Information Group May 2002.

<sup>6</sup> Figures from HP – January 2004

<sup>7</sup> Figures taken from Citrix – January 2004

<sup>8</sup> Figures taken from Microsoft – January 2004

### Three year lifetime costs:

The following estimates are representative of a three-year server life-cycle and are intended to reflect industry averages (as a percentage of total cost).<sup>9</sup>

- Server hardware: 15%
  - **\$54,000** (3 years @ \$18,000/year)
- Server software: 20%
  - **\$204,000** (3 Years @ \$68,000/year)

**Total life-cycle costs: \$258,000<sup>10</sup>**

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<sup>9</sup> Figures taken from "The Total Economic Impact of Citrix MetaFrame Server-Based Computing Solutions" report produced by the Giga Information Group May 2002.

## Server consolidation

A **46%** server consolidation is possible with the AppSense Performance Suite.

This figure is based on the following assumptions:

1. There are on average 50 concurrent users per server.
2. The user's application set is a combination of Office 2000 and front and back-office line-of-business applications (CRM, ERP).
3. Each user will require 80MB of virtual memory<sup>11</sup>.

## Virtual memory savings

AppSense Optimizer saves 37MB of virtual memory per user<sup>12</sup> by optimizing the use of virtual memory in the application set delivered through the server farm<sup>13</sup>

**Total virtual memory savings per server: 1850MB**

## Server consolidation

This additional 1850MB of virtual memory (provided by Optimizer) will enable a further 23 concurrent users to access the server, which represents an increase of 46% in capacity.

These values were calculated by using:

Additional Users per Server = Total VM savings (1850MB) / required VM per user (80MB)

**Concurrent user increase per server: 46%**

With this efficiency gain, the current hardware (20 servers) could support an additional 460 users. Alternatively, the server farm could be reduced to 14 servers in order to support the existing 2,500-user population. This is calculated by using:

Current users/server (50) + potential additional users/server (23) = 73 users per server

Concurrent users (1000) / potential users per server (73) = 14 servers

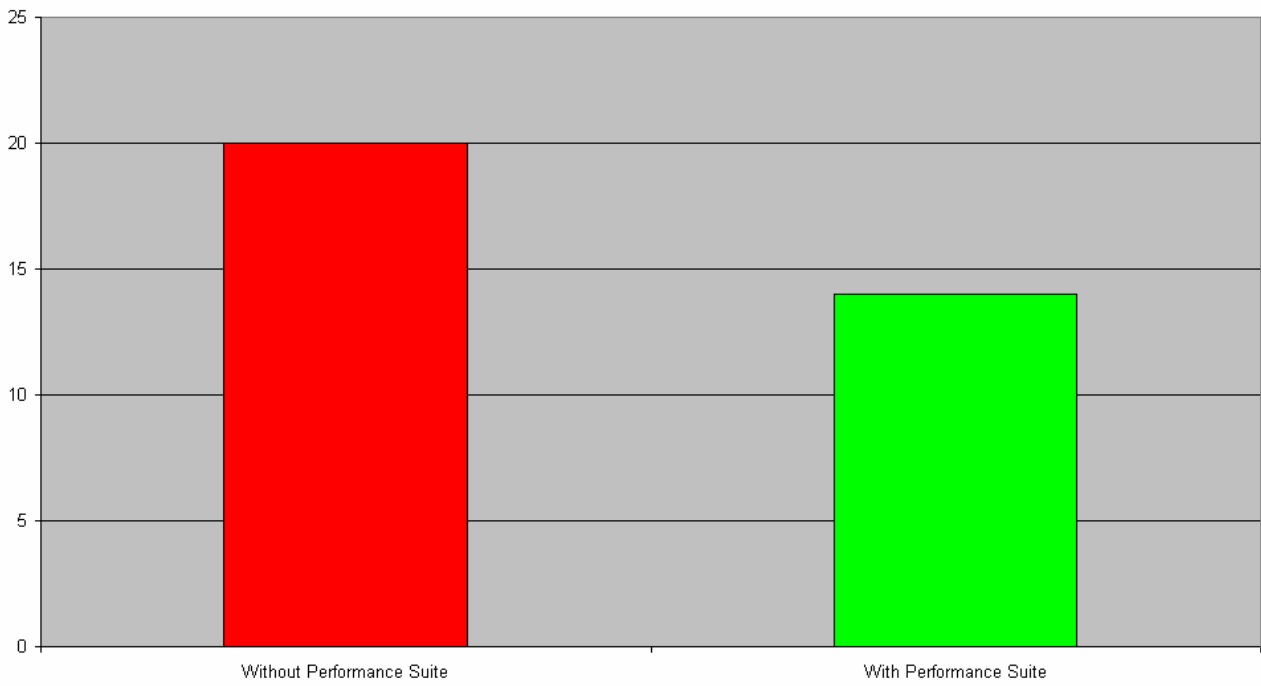
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<sup>11</sup>Figures taken from a customer "Application Performance Audit" report produced by AppSense Technologies, August 2003

<sup>12</sup> Assuming no additional users are introduced

<sup>13</sup> See Appendix B

**No. servers required for 1000 concurrent users**



## Productivity increases

### The cost of the application set

Based on the findings at several AppSense customers, the cost of an application taking processor resources away from other users can be very high. This is due to the very nature of the SBC architecture, and the fact that one user really can and does impact on the remaining users on the same server. Data from Performance Suite customers demonstrates that on average a server has 10 application instances that cause processor problems every day, over a 5-minute period for all other users on the same server.

The cost associated with the user population running resource intensive applications is **\$613** per server per day. The detailed assumptions made are:

- Number of processor-intensive applications launched on each server per day is 10
- Each processor-intensive applications consumes 100% processor for 5 minutes
- The standard working day is 8 hours and total working days per year are 235, with the same costs per employee as highlighted above.
- The average employee cost per hour is \$15

Using these factors, the total cost to the business per year is calculated to be **\$149,930**.

### The cost of unauthorized applications

According to a survey released by research company Gartner Group, employees spend 56 hours (7 working days) per year using company resources for private purposes. However, based on extensive case studies with organizations that have already deployed the AppSense Performance Suite we can assume:

- On average, 33% of users will execute an unauthorized application
- Each of these users will execute 3 unauthorized applications per day
- Each of these unauthorized applications will run for 3 minutes (on average)
- The average support cost per hour is \$15

If we consider that there are also malicious code incidents as well as situations where the running of games or animations causes server damage that results in downtime and maintenance periods, it becomes all too easy to see a large cost associated with unauthorized applications.

We find that using the above (conservative) figures, the cost to this business is **\$141,705** per annum.

Therefore the total cost of the existing application set along with the cost of unauthorized applications equates to **\$291,635** per annum or **\$875,000** over a three-year period.

## Conclusions

A representative company using the AppSense Performance Suite can expect to achieve a total saving of **\$857,000** over three years on their existing user population. To put this figure in to context, it effectively equates to **\$857** per concurrent user or **\$342** for every user account.

These figures have already taken into account the purchase price of the AppSense Performance Suite at retail cost of \$3,295 per server plus 20% per annum for software subscription.

## **Appendix A – Description of the sample organization**

In this study we have created a sample organization, in order to illustrate the quantifiable costs of deploying the AppSense Performance Suite within a typical midsize enterprise or division of a larger firm.

The organization currently supports 2,500 users via its SBC architecture. The application set is considered as average to an organization of its size, with Office 2000, CRM and ERP being the main business tools, with Internet access and email also being delivered through the service.

## Appendix B - Sample Optimizer Report

This information is taken from a representative customer installation.

<i>Summary for \\SERVERA on 16/07/2003 at 10:26</i>	
<b>Memory saved by AppSense Optimizer</b>	<b>41354kb</b>
Number of applications analyzed	58
Number of components analyzed	172

<i>Individual application details</i>		
1	K:\program files\BusinessObjects 5.0\BUSOBJ.EXE	5655kb
2	K:\program files\notes\nlnotes.exe	5164kb
3	K:\program files\CINFO\winn\cidesk32.exe	3968kb
4	J:\Program Files\Plus!\Microsoft Internet\IEXPLORE.EXE	3562kb
5	K:\program files\DIPViewer1\DIPViewer1.exe	3092kb
6	K:\Program Files\Rockwell\CCC\CCC.exe	3063kb
7	J:\WTSRV\System32\CPQMGMT\CPQWGMT.EXE	2007kb
8	K:\program files\TCS\SeriesFive\tcs.exe	1397kb
9	J:\Compaq\vcagent\vcagent.exe	1239kb
10	K:\Program Files\Clarify\efrontoffice\ClarifyClient\clarify.exe	1160kb
11	K:\program files\CINFO\winn\cvw32.exe	866kb
12	K:\Program Files\Microsoft Office\Office\MSACCESS.EXE	757kb
13	K:\Program Files\Microsoft Office\Office\excel.exe	740kb
14	J:\WTSRV\System32\termsrv.exe	642kb
15	J:\Program Files\Network Associates\Common Framework\FrameworkService.exe	567kb
16	J:\Program Files\Network Associates\VirusScan\Meshield.exe	567kb
17	J:\Program Files\Network Associates\VirusScan\VsTskMgr.exe	567kb
18	J:\WTSRV\system32\cpqmgmt\CqMgHost\CQMHOST.EXE	567kb
19	J:\WTSRV\system32\spoolss.exe	567kb
20	J:\Program Files\Network Associates\Common Framework\naPrdMgr.exe	531kb
21	J:\Program Files\Network Associates\Common Framework\UpdaterUI.exe	531kb
22	j:\wtsrv\system32\pstores.exe	531kb
23	K:\program files\TCS\RTA\RTA.EXE	531kb
24	K:\program files\E!PC\EXTRA.exe	459kb
25	J:\WTSRV\System32\GSW32.exe	219kb
26	J:\Program Files\Network Associates\Common Framework\McScript.exe	208kb
27	K:\program files\notes\nWEB.EXE	203kb
28	K:\Program Files\Microsoft Office\Office\PowerPnt.exe	130kb
29	K:\program files\notes\naldaemm.EXE	118kb
30	J:\WTSRV\Explorer.EXE	95kb
31	J:\WTSRV\system32\MSTask.exe	86kb
32	\??\J:\WTSRV\system32\winlogon.exe	75kb
33	J:\EPOAgent\naimas32.exe	75kb
34	J:\Program Files\AppSense Technologies\AuditingAgent\AUAgent.exe	75kb
35	J:\Program Files\AppSense Technologies\OptimizerAgent\OptimizerService.exe	75kb
36	J:\WTSRV\System32\ibrowser.exe	75kb
37	J:\WTSRV\system32\Ica PassThrough\wfica32.exe	75kb

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38	J:\WTSRV\System32\icabar.exe	75kb
39	J:\WTSRV\system32\pnsvc.exe	75kb
40	J:\WTSRV\system32\USRMGR.EXE	75kb
41	J:\WTSRV\System32\wfshell.exe	75kb
42	k:\Program Files\Adobe\Acrobat 5.0\Reader\AcroRd32.exe	75kb
43	K:\Program Files\Microsoft Office\Office\winproj.exe	75kb
44	K:\Program Files\Microsoft Office\Office\Winword.exe	75kb
45	K:\program files\notes\nwrdaemn.EXE	67kb
46	J:\WTSRV\System32\snmp.exe	59kb
47	J:\Program Files\Network Associates\VirusScan\SHSTAT.EXE	47kb
48	J:\WTSRV\System32\CpqRcmc.exe	44kb
49	J:\EPOAgent\naimag32.exe	39kb
50	J:\Program Files\Network Associates\VirusScan\SCAN32.EXE	39kb
51	J:\WTSRV\system32\ntvdm.exe	39kb
52	J:\WTSRV\System32\CPQNiMgt\CPQNIMGT.EXE	36kb
53	J:\WTSRV\System32\ctxxmlss.exe	36kb
54	J:\WTSRV\system32\lsass.exe	36kb
55	J:\WTSRV\System32\notepad.exe	36kb
56	J:\WTSRV\system32\services.exe	36kb
57	K:\program files\CINFO\winnt\sentnl32.exe	36kb
58	K:\program files\notes\nupdate.EXE	29kb

## Appendix C – About AppSense

AppSense is a specialist in application performance management, providing tools to help enterprises improve productivity and reduce IT costs by ensuring the highest possible availability, security and performance of critical IT systems.

The company's mission is to provide software that enables complete management of application performance across all corporate systems, from Windows to Web services – and in future, UNIX and Linux systems.

The company resells its products worldwide through its Certified Solution Partner program, into corporate, education, financial services, legal and government sectors. Customers include: Alstom, Royal & Sun Alliance, Deutsche Borse, Pink Roccade, National Blood Service, and the Federal Aviation Administration.

Founded in 1999, the company became a completely independent entity from its systems integration parent in March 2003. AppSense Technologies is a privately held Limited company with backing from: 3i, Credit Suisse First Boston, Granville Baird.

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