

**Return on Virtualization™:**  
**Calculating the Economic Impact**  
**of Microsoft SoftGrid®**

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## Introduction

Application virtualization is touted as one of the most important technologies to hit corporate IT in decades. It promises to significantly reduce the time and costs of application management – traditionally the most resource-consuming and expensive portion of the infrastructure. More than 500 SoftGrid customers have realized this promise with SoftGrid. Now with the SoftGrid Return on Virtualization (ROV)<sup>™</sup> Calculator, any enterprise can evaluate the impact SoftGrid can have on their application deployment, support, updates and terminations. SoftGrid commissioned Forrester Consulting to help create the ROV Calculator and to ensure that it meets the Forrester Total Economic Impact (TEI)<sup>™</sup> fundamentals and principles of a sound business tool. This white paper discusses the rationale behind the calculator, the factors it considers, and provides a case study of a SoftGrid customer's ROV results.

## What is SoftGrid?

SoftGrid makes applications as easily and readily available as electricity. End-users can get any authorized application on any device, using any kind of bandwidth, anywhere in the world.

SoftGrid transforms Windows® applications from products that must be installed and managed locally into virtual services that are centrally managed and deployed on-demand – without any recoding – to any desktop, server or laptop. It includes SoftGrid ZeroTouch<sup>™</sup>, the front-end system that enables users to get universal access to all their approved applications from any computer anywhere via their web-browser and/or the standard Windows desktop environment.

SoftGrid's patented application virtualization technology enables applications to run in a protected "sandbox" environment without any installation or alteration to the host operating system, and without conflicting with any other applications. This eliminates the possibility of installation conflicts and, therefore, the regression testing typically needed prior to deployment of new applications, upgrades and patches. SoftGrid's on-demand streaming technology instantly sends only the code needed to run applications to the client machine – typically 20-40% – facilitating fast delivery with minimal bandwidth impact.

*For more information on SoftGrid, download the product overview at [www.softgrid.com/news/ecollateral.asp](http://www.softgrid.com/news/ecollateral.asp)*

## What is the SoftGrid ROV Calculator?

The SoftGrid ROV Calculator is a comprehensive tool for determining the cost savings gained by adding application virtualization and on-demand streaming to IT environments. It guides you through a comprehensive questionnaire regarding your business and technology environment to create a tangible, concrete analysis. Working with Forrester, SoftGrid built the calculator to be completely transparent. No numbers are hard-coded. Every single assumption and number in the calculator can be changed to reflect the reality of your operations.

The guiding principle behind the ROV Calculator is that one must examine every step in the "application management lifecycle" – namely deployment, update, support and termination – in order to determine its true costs to your organization. Our goal in designing it is to help enterprises easily determine the costs of each of these steps. All of the calculations are based on the time required to complete the tasks and the costs for people's time. The ROV Calculator determines the time and associated costs not only of IT staff, but also of end-users who experience downtime during the various processes.

## How does SoftGrid impact the Application Management Lifecycle?

The ROV Calculator captures how SoftGrid's virtualization and on-demand streaming technologies accelerate the entire application management process, from deployments and updates, through support and terminations:

### Deployment

Deploying applications is traditionally a very tedious, time-consuming process comprised of many different steps. The first step is imaging. IT must image test desktops with an image for each application set that a new application will affect. In server-based computing (SBC) environments, IT must do the same for siloed servers. If using electronic software delivery (ESD), they must also image the packaging station. They then install the new application into each test application set based on the test system image. Next they have to track the changes each application makes to the operating system and other application components, and then regression test to make sure nothing breaks. Not to be ignored is the documentation step, which is required to make sure IT can accurately repeat the installation. Next is packaging and distribution to the test users, and having those people do user acceptance testing – which is time-consuming for end-users and eats into their productivity. Finally, IT delivers, installs and tests application sets on the production clients, and then updates the core OS and application sets for future delivery.

With SoftGrid, packaging and user acceptance testing are significantly reduced, the latter because there is less to test against since there is no chance of conflicts. In addition, whole steps are completely eliminated, including installation and regression testing of all the deployment components, and dealing with conflict resolution. This results in significant time and associated cost reductions. And, with SoftGrid's dynamic delivery, applications are immediately available, with no need for future scheduling and no burden on IT.

### Updates

Like deployment of new applications, updating applications traditionally requires everything from imaging systems and packaging, to regression and user acceptance testing on test and production systems, to delivery and installation. The eliminated steps, cost savings and time acceleration IT and end-users gain from SoftGrid during the update phase are just like those realized during deployment.

### Support

Help desks are deluged by end-users with application problems. When requests reach the top of the queue IT tries talking users through the issue over the phone. Often they have to take possession of the computer to troubleshoot it. Because problems with one application affect other applications and the operating system, i.e., if an end-user downloads software and it replaces a DLL in an existing application, it can be very time-consuming and difficult to pinpoint the problem. If IT can't determine and fix the problem in a reasonable timeframe, they will likely reimagine the entire desktop. During this whole process, the end-user's productivity is severely affected.

With SoftGrid, any problems with an application are isolated to the application itself; they do not become system-wide problems since no application can affect anything on the client. IT never has to manually troubleshoot application issues or take possession of the computer. In the case of a failed client, rather than reinstalling a user's application set, IT can simply flush the problem application from cache and refresh it so that the user gets a fresh application.

### Terminations

Terminating applications is such a time-consuming process that most enterprises don't have the time or resources to devote to it. They often don't terminate applications at all and, as a result, they don't reharvest those licenses.

Without SoftGrid, terminations require imaging the test and packaging systems, removing the application, tracking changes, regression testing to make sure that the uninstall process didn't pull out other applications' DLLs, user acceptance testing, testing a sample of production machines, and documenting the whole process.

With SoftGrid, terminating applications is as simple as eliminating the user's right to access the application. IT simply disables the application and/or rights to the application at the management console. Instead of enterprise-wide terminations taking hours or days, they literally take a couple of minutes.

In addition to impacting the four phases of the application management lifecycle, SoftGrid also makes a significant impact on server consolidation and associated power/HVAC costs for Terminal Services servers. Because any application can run alongside any other, Terminal Servers no longer need to be siloed. Many more applications can run on a single server, enabling IT to consolidate hardware, save capital costs and reduce server farm administration.

## How does the ROV Calculator Work?

The SoftGrid ROV Calculator breaks application management into five categories. Based on your inputs about your user and device communities, application volume and activity, method of delivery and tolerance for risk, it determines what each application management phase costs you today, which steps get eliminated or added by using SoftGrid, and what are the associated costs and savings.

### Inputs:

- **Topology:**

Topology consists of enterprise Windows users at headquarters and branch offices, and devices – both desktop and server-based computing. We consider how many devices are affected by application changes, and employ a concurrent use metric to further help determine peak load on various systems. Annual consumption numbers for items such as power and HVAC and the associated savings are calculated and displayed.

- **Applications:**

The application lifecycle is broken into deployment, updates, and termination. Support is calculated separately. The calculator operates on the premise that applications must co-exist, as an application set, on a computing device in order to ensure functionality. We assume that application sets must be tested for any additional application added, updated or removed in order to ensure there are no conflicts. In reality, because testing each of these steps is very time-consuming enterprises adhere to various levels of testing. We added a section called IT Testing Risk Factor so that you can tune the results to better reflect the level of testing your enterprise tolerates.

Based on your input on everything from the total number of applications and applications in each set, to your annual number of newly deployed, updated and terminated applications, as well as typical conflict resolution time, we calculate the costs of application management.

- **Execution Platform:**

The calculator considers execution platforms to be two types: locally executing (desktops, laptops) and Terminal Services. In this case, Terminal Services is a remote execution technology and not a delivery system. Again, we assume that application sets must co-exist on these two platforms (if your enterprise uses both) in order to provide functionality. As part of the calculations, we also look at the hardware used and savings possible from consolidation.

- **Delivery:**

Applications may be delivered in one or both of two methodologies: electronic software distribution (ESD) and manual installation. We consider the number of application sets and devices delivered by these methods.

- **Support:**

Support calculations are based on the number of application-related calls received by the support organization. The model assumes help desk employees are less expensive than second-level or administrative support escalation. We consider the number of calls per year and per user, and the amount of time it takes to resolve issues to determine support costs.

## Results:

The SoftGrid ROV Calculator helps you understand the time and cost impacts that application management has on your IT organization. It provides detailed savings data, focusing on the time requirements and associated costs of your current environment compared to those with SoftGrid-enabled environment. This includes server costs, if applicable; application management broken down by deployments, updates, support and terminations; and initial investment including hardware, implementation and licensing.

Your results detail the total cost of ownership for your existing overall environment and for a single user, both in one-year and three-year periods, and the savings possible with SoftGrid. In addition, you will see your total time-to-payment for the SoftGrid investment. Based on analyses of SoftGrid customer environments, we have seen on average:

- 30% reduction in application-related help desk call volume and time
- More than 80% overall reduction in application lifecycle costs
- 40% consolidation in servers, and significant consolidation in both application images and Terminal Server silos
- Four-fold increase in user uptime
- 4-10 month time-to-payment

In addition to these significant savings, SoftGrid also contributes to considerable savings to strategic IT initiatives above and beyond those addressed in the ROV Calculator, including branch office support, disaster recovery, managing roaming and hoteling users, OS migrations and application security.

## Real-world ROV Results: Northeastern University

The following SoftGrid customer example is intended to help you understand how the ROV Calculator works and the detailed results it delivers. While your IT infrastructure may resemble those of other enterprises, it is configured to the particular needs of your business. Because of this, the results you get from the SoftGrid ROV Calculator will also be unique to your business.

Northeastern University, cited for excellence three years running by *U.S. News & World Report* and ranked among the "Best National Universities," believes that ensuring faculty and students have the applications they need – even when requested at the 11th hour – is critical to providing quality education.

A long-standing SoftGrid customer, Northeastern purchased SoftGrid to use as the foundation of its "Northeastern On-Demand" initiative, enabling IT to deliver their environment whenever and wherever users want it, in the most cost-effective manner possible. Northeastern has 13,125 users and supports 800 applications. Currently, most of Northeastern's users are in the labs, where a large number of applications is needed to accommodate the different classes that use the facility.

The SoftGrid ROV Calculator determined that using SoftGrid will cut Northeastern's annual application management costs from \$868,587 to \$126,795, eliminate the 992 hours of regression testing previously required, and reduce the number of application-related OS images from 20 to just 5.

Impact on application management processes:

	Hours Without SoftGrid	Hours With SoftGrid	Cost Savings	Hours of User Downtime Saved
<b>Application deployment</b>	1,872	130	\$80,078	840
<b>Updates</b>	9,353	391	\$412,088	4,203
<b>Support</b>	4,333	2,426	\$67,750	1,907
<b>Termination</b>	346	1/3 of an hour	\$15,898	169

The following chart shows the savings that Northeastern have achieved with SoftGrid:

Total Cost of Ownership	Current State	With SoftGrid*
Total Cost of Ownership - 1 year	\$965,445.29	\$748,955.56
Total Cost of Ownership per user - 1 year	\$27.39	\$21.25
Total Cost of Ownership - 3 years	\$2,896,335.86	\$1,247,733.71
Annual Total Cost of Ownership per user over 3 years	\$27.39	\$11.80

Savings	
1 Year SoftGrid vs. current state savings	\$216,489.72 **
3 Year SoftGrid vs. current state savings	\$1,648,602.15 **

Time to Payback	
Current state vs. SoftGrid	8.7

\* Includes price of SoftGrid

\*\* It is important to note that these cost savings are based on the amount of time no longer needing to be spent on application management. This time may now be redeployed to other strategic areas.

## Behind Northeastern's Results

To understand how Northeastern came to these numbers, let's look at the breakdown for each application management process.

- **Deployment:**

Without integrating SoftGrid into its PC environment, Northeastern must do everything from imaging systems and packaging, to regression and user acceptance testing on test and production systems, to delivery and installation. This amounts to 4,055 minutes per application. When they consider the 15 new applications introduced every year and the 20 application sets affected by each deployment, the total annual time spent deploying new applications is 7,850 minutes. Using the rate of \$0.77/minute for an IT administrator's time, the total annual IT deployment cost becomes \$86,094.18. In addition, end-users are affected by 51,030 minutes of downtime every year.

With SoftGrid, major chunks of the deployment process are simply eliminated, resulting in only 484 minutes to deploy a single application. There is no time spent on imaging test systems, regression testing, delivery and

installation or updating core images. The affect on total annual deployment is tremendous: Total cost is just \$6,016.72 and annual downtime for all users combined is only 590 minutes.

This chart shows the time and costs required for application deployment for a single application:

Administrative Time	Current State			With SoftGrid			
	Mins.	Param	Total	Mins.	Param	Total	
<i>Single Event</i>							
Image desktop test system	10	32	320	N/A			<i>Test system eliminated</i>
Image SBC silo test server	10	0	0	N/A			
Image packaging/sequencing station	10	1	10	2	1	2	
Install new application	15	32	480	15	1	15	
Track application changes	30	32	960	30	1	30	
Regression test applications – PC	5	128	640	N/A			<i>Regression testing reduced</i>
Regression test applications – SBC	5	0	0	N/A			
Document the installation process	60	1	60	60	1	60	
Application packaging cycle	360	1	360	240	1	240	
Distribute application packages	10	1	10	10	1	10	
Assign package to test users	5	1	5	1	1	1	
User acceptance testing	240	1	240	120	1	120	
Assign package to production server base	5	1	5	1	1	1	
Delivery and installation of applications – manual	15	0	0	N/A			<i>Installation eliminated</i>
Delivery and installation of application packages – ESD	5	3,938	19,688	N/A			
Delivery and launch of application – SoftGrid				1	3,938	3,938	
Test production system sample	5	1	5	5	1	5	<i>Image update eliminated</i>
Update core image	30	32	960	N/A			
<b>Total Implementation Time</b>			<b>4,055</b>			<b>484</b>	

This chart applies the data for a single deployment to the total number of deployment events Northeastern handles annually:

Total Administrative Time For Deployments	Current State	With SoftGrid
<i>Annual Desktop Management</i>	<i>Total</i>	<i>Total</i>
Total time to move single application into production	4,055	484
Number of new applications per year	15	15
Average number of applications sets affected per deployment	80	80
Total number of silos affected per deployment	0	1
Number of applications in primary silo	0	N/A
Average number of applications in secondary silo	0	
Total tested operating systems	5	
Number of tested application sets affected per deployment	32	
Number of tested application sets per year	480	
Number of tested applications per application set	4	
Number of tested applications per deployment	128	
Number of tested applications per year	1,920	
Average regression find rate	5%	
Average number of regressions found	1	
Average resolution time per regression	480	
Annual regression resolution time	480	
Single event regression testing time	640	
Annual regression testing time	9,600	
Annual number of deliveries	59,062.50	
Annual delivery success rate	97%	99%
Number of failures	53.16	590.63
Average recovery time per failure	960	1
Annual failure recovery time	51,030.72	590.63
<b>Total annual application deployment time</b>	<b>112,335.72</b>	<b>7,850.63</b>

Cost		
Admin cost per minute	\$0.77	\$0.77
Total number of admin minutes	112,335.72	7,850.63
<b>Total annual deployment cost</b>	<b>\$86,094.18</b>	<b>\$6,016.72</b>

End User Down Time		
Total user downtime	51,030.72	590.63

- **Updates:**

Northeastern handles 75 updates every year. They must go through the same steps as the deployment phase for each update. Without SoftGrid, Northeastern IT administrators spend 4,055 minutes updating a single application. Time required for annual updates totals 561,195 minutes, which translates to \$430,100.25. Users are unproductive for 255,150 combined minutes every year.

With SoftGrid, updating a single application across the enterprise takes just 274 minutes. By reducing and eliminating major portions of the process, including the multiple forms of regression testing, the annual time required for the 75 application updates is just 23,503.13 minutes. This translates to an annual cost of \$18,012.81. Annual combined end-user downtime is slashed to 2,953 minutes.

This chart applies the time it takes to update a single application to the total number of update events Northeastern handles annually:

Total Administrative Time for Updates	Current State	With SoftGrid
<i>Annual Desktop Management</i>	<i>Total</i>	<i>Total</i>
Total Time to move single application into production	4,055	274
Number of updates per year	75	75
Average number of applications sets affected per update	80	80
Total number of silos affected per change	0	1
Number of applications in primary silo	0	N/A
Average number of applications per secondary silo	0	
Total tested operating systems	5	
Number of tested application sets per deployment	32	
Number of tested application sets per year	2,400	
Number of tested applications per application set	4	
Number of tested applications per deployment	128	
Number of tested applications per year	9,600	
Average regression find rate	5%	
Average number of regressions found	4	
Average Resolution Time per Regression	480	
Annual Regression Resolution Time	1,920	
Single event regression testing time	640	
Annual regression testing time	48,000	
Annual number of deliveries	295,312.50	295,312.50
Annual delivery success rate	97%	99%
Number of failures	265.78	2,953.13
Average recovery time per failure	960.00	1.00
Annual failure recovery time	255,150.00	2,953.13
<b>Total annual application update time</b>	<b>561,195.00</b>	<b>23,503.13</b>

Cost	Current State	With SoftGrid
Admin cost per minute	\$0.77	\$0.77
Total number of admin minutes	561,195.00	25,503.13
<b>Total annual update cost</b>	<b>\$430,100.25</b>	<b>\$18,012.81</b>

End-User Downtime	Current State	With SoftGrid
Total user downtime	255,150.00	2,953.13

- **Terminations**

IT departments know that terminating applications is very time-consuming, too time-consuming for most to handle, but many are surprised at just how much time they would take and how much time SoftGrid saves. Between imaging the test and packaging systems, removing the application, tracking changes, regression testing to make sure that the uninstall process didn't pull out other applications' DLLs, user acceptance testing, testing a sample of production machines, and documenting the whole process, Northeastern would spend 3,360 minutes terminating a single application and 20,766 minutes on total annual terminations (3). This translated to \$15,915 per year and 10,206 minutes in annual user downtime.

SoftGrid cuts out just about every step in the traditional termination process. Northeastern no longer has regression test or deal with conflict resolutions. Northeastern simply has to assign the package to the production server and update the SoftGrid client. IT simply disables the application and rights at the central management console and sets the client machine to remove the application from cache. It takes just one minute to terminate a single application and 22 minutes to handle annual terminations, for a negligible cost of \$17.39. Total combined application-related user downtime is virtually eliminated, at just 19.69 minutes for Northeastern's entire user base.

This chart details the total annual time and cost for terminating applications, using the single termination data as its basis:

Total Administrative Time for Terminations	Current State	With SoftGrid
<i>Annual Desktop Management</i>	<i>Total</i>	<i>Total</i>
Total time to terminate a single application	3,360	1
Number of terminations per year	3	3
Average number of applications sets affected per update	80	80
Total number of silos affected per change	0	1
Number of applications in primary silo	0	N/A
Average number of applications per secondary silo	0	
Total tested operating systems	5	
Number of tested application sets per deployment	32	
Number of tested application sets per year	96	
Number of tested applications per application set	4	
Number of tested applications per deployment	128	
Number of tested applications per year	384	

Average regression find rate	5.00%	N/A
Average number of regressions found	1	
Average resolution time per regression	480	
Annual regression resolution time	480	
Single event regression testing time	640	
Annual regression testing time	1,920	
Annual number of terminations	11,812.50	3,937.50
Annual delivery success rate	97%	99%
Number of failures	10.63	39.38
Average recovery time per failure	960	0.50
Annual failure recovery time	10,206	19.69
<b>Total annual application termination time</b>	<b>20,766.00</b>	<b>22.69</b>
<b>Cost</b>	<b>Current State</b>	<b>With SoftGrid</b>
Admin cost per minute	\$0.77	\$0.77
Total number of admin minutes	20,766.00	22.69
<b>Total annual termination cost</b>	<b>\$15,915.08</b>	<b>\$17.39</b>
<b>End-User Downtime</b>	<b>Current State</b>	<b>With SoftGrid</b>
Total user downtime	10,206.00	19.69

- **Support:**

Because, without SoftGrid, problems with one application affect other applications and the operating system, it can be very time-consuming and difficult to pinpoint an end-user problem. Northeastern estimates that it handles 13,000 end-user support calls per year, with 80% resolved by the help desk and 20% resolved by the more expensive administrative and second-level support staff, before they used SoftGrid. Help desk staff spent 104,000 minutes and administrative/second-level staff spent 156,000 minutes per year resolving issues. The associated annual cost was \$168,608.16, and 260,000 minutes in end-user downtime.

Since SoftGrid isolates the problems of a single application, supporting end-users is easier and less time-consuming. Northeastern's volume of calls went down to 9,100, while its annual help desk resolve time was cut by nearly two-thirds. Help desk staff spend 36,400 minutes and administrative/second-level staff spend 109,200 minutes per year resolving issues. The associated annual cost is \$100,858.33. End-user downtime is cut to 145,600 combined annual minutes.

The following chart illustrates the annual support savings Northeastern can realize with SoftGrid:

<b>Statistics</b>	<b>Current State</b>	<b>With SoftGrid</b>
<i>Description</i>	<i>Unit</i>	<i>Unit</i>
Total users	13,000	13,000
Average number of calls per year per user	1.0	0.7
Number of calls per year	13,000	9,100
Average help desk resolve percentage	80%	80%
Average help desk resolved issues	10,400	7,280
Average help desk resolve time (minutes)	10	5
Average admin resolve percentage	20%	20%
Average admin resolved issues	2,600	1,820
Average admin resolve time (minutes)	60	60
<b>Administrative time</b>	<b>Current State</b>	<b>With SoftGrid</b>
<i>Description</i>	<i>Minutes</i>	<i>Minutes</i>
Total help desk resolve time	104,000	36,400
Total admin resolve time	156,000	109,200
<b>Total annual support time</b>	<b>260,000</b>	<b>145,600</b>

<b>Cost</b>	<b>Current State</b>	<b>With SoftGrid</b>
Help desk employee cost per minute	\$0.47	\$0.47
Total number of help desk minutes	104,000	36,400
<b>Subtotal: Help desk cost</b>	<b>\$49,049.50</b>	<b>\$17,167.38</b>
Admin cost per minute	\$0.77	\$0.77
Total number of admin minutes	156,000	109,200
<b>Subtotal: Admin cost</b>	<b>\$119,558.51</b>	<b>\$83,690.96</b>
<b>Total lifecycle support cost</b>	<b>\$168,608.16</b>	<b>\$100,858.33</b>
<b>End-User Downtime</b>	<b>Current State</b>	<b>With SoftGrid</b>
Total user downtime	260,000	145,600
Total user downtime per month	21,666.67	12,133.33
Average user downtime per user per month	1.67	0.93

## Conclusion

Application virtualization has a profound impact on an enterprise's entire application management lifecycle, from deployments and updates through support and terminations. The Forrester TEI-compliant SoftGrid ROV Calculator makes it easy to quantify the time and cost impacts that SoftGrid can have on your organization. The SoftGrid ROV Calculator is intended to provide an overall understanding of the effect that SoftGrid can have on your business. For a more detailed, thorough analysis, please contact your SoftGrid representative, call us at +1 877.763.8737 or email [softinfo@microsoft.com](mailto:softinfo@microsoft.com)

## About Forrester TEI

Total Economic Impact™ (TEI) is Forrester Research's methodology for calculating financial impact of a project. It helps determine the value of IT solutions by balancing cost with business benefits, flexibility and risk. Costs and benefits are discounted to today's dollar. Flexibility focuses on how the project will enable the deployment of future projects that will have a positive financial impact on the company. Risks require discounted costs and benefits to provide a range of less-than-optimal results. Risk-adjusted ROI adjusts all project costs higher and financial benefits lower to provide a more conservative view of the technology project's overall value.