

## ROI Considerations for Implementing ThinPrint

### Saving Costs and Resources with Print Optimization



Print Optimization with ThinPrint 8.6

The innovative ThinPrint technology covers more than just solving printing problem in distributed IT environments.

In the past ten years, ThinPrint technology has evolved from a software that fixes problems originating from inadequate printing support in server based environments, to a universal print management platform.

#### **Optimization:**

Making printing faster, making print jobs smaller, better mitigating the impact of printing on servers, clients and network components.

#### **Print Management:**

Unifying print technology, automatic printer assignment, and simplified printer driver management

#### **Print Accountability:**

Tracking print costs within the organization. Increased security when printing sensitive information.

#### **ThinPrint 8.6**

- Reduced helpdesk calls
- Simplified application server / virtual desktop setup
- Reduced administration / management time for the entire print system
- Reduced impact of printing on the overall infrastructure (bandwidth, computing resources etc.)
- Improved user experience
- Highest flexibility in choice of work location and hardware
- Increased security
- Innovative technology for faster, more flexible workflows

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## Executive Summary

ThinPrint's technology for distributed network environments goes further than just problem solving in obvious print problems. With its strategic print solution, ThinPrint shows that significant costs can be saved throughout the entire print process through the use of innovative technologies.

With many years of experience, ThinPrint has evolved from providing a solution for inadequate printing support in SBC environments to becoming a universal print management platform. ThinPrint provides significant improvements in print management for organizations of all sizes and in all industries. These improvements cover three major areas:

- **Optimization**

Making printing faster, making print jobs smaller, better mitigating the impact of printing on servers, clients and network components etc.

- **Print Management**

Unifying print technology, automatic printer assignment, and simplified printer driver management.

- **Print Accountability**

ThinPrint allows an overview of print trends and print costs within the organization and ensures more secure transmission and printing of sensitive information.

By carefully analyzing customer feedback, support tickets and other market feedback in a variety of industries - ThinPrint's major verticals are finance, health care and services - we found that our customers achieved significant benefits by deploying ThinPrint. Some of these are easily quantifiable for the purpose of this paper, while other indirect benefits that provide significant cost savings are harder to measure in financial terms.

The cost advantages of implementing ThinPrint can be most significantly measured when it comes to printing in relation to the following key points:

- Reduced helpdesk calls
- Simplified application server / virtual desktop setup
- Simplified application server / virtual desktop administration
- Reduced impact of printing on the overall infrastructure (bandwidth, hardware etc.)
- Increased user experience & productivity
- Increased flexibility in choice of location and hardware leads to savings in workplace costs in the office or remote office
- Increased security
- Innovative technology for faster and more flexible workflows

A full understanding of the potential cost savings impact of ThinPrint on an organization requires that hard and soft facts are taken into consideration and they need to be weighed against the individual IT targets of an organization.

A majority of cost savings in this study are realized through decreased administrative tasks in regards to printing, the mitigated impact of printing on the overall environment as well as the improved productivity and flexibility.

## Purpose

The purpose of this document is to allow existing as well as future customers to clearly evaluate which benefits are achievable with ThinPrint technology for their own organization. Readers should use this study to evaluate possible improvements to an existing environment. Additionally, the white paper makes the business case for a potential investment in ThinPrint technology.

## Methodology & Approach

To gather data for this white paper, we have analyzed existing support tickets submitted to ThinPrint's support department, feedback from customers via the consulting and sales department as well as findings from our own Research and Development. This data combined with assumed average costs for bandwidth, time, computing resources etc. allow us to provide a very accurate model to enable an organization to calculate their exact costs.

## Key Findings

- 65% reduction in administration cost: EUR 5.000 per 1000 users saved in administrative cost annually
- 10% increased user density: Saves EUR 15.000 in hardware, licenses & support per 1000 users
- 99% reduced print system downtime: Increase in service level agreement performance, reduced liability risks
- 90% reduced bandwidth cost: Saves 1000s of euros/year
- 5 seconds quicker printing saves EUR 2.750 a month for 500 users.
- Avoiding one 15 minute print system crash affecting 250 users saves EUR 2.812,50.
- One ADSL instead of one SDSL line saves more than EUR 350/month or EUR 4.250/year.
- Annual administrative savings for 500 users are more than EUR 6.200

## ThinPrint Product Family

The ThinPrint family of software products has the common goal of improving printing and simplifying print administration in distributed environments where printers are often hundreds of miles away from the application that allows them to print. At the center of this family is the ThinPrint Engine, which consists of the following components:

- A printer port called ThinPrint Port
- A universal printer driver called ThinPrint Output Gateway
- The ThinPrint AutoConnect service to ensure the correct assignment between users and printer objects and to automate printer creation in a session,

- A print job tracking service<sup>1</sup> which monitors all print jobs processed by the ThinPrint Engine and stores information about them in a SQL database
- The necessary user interfaces for configuration and maintenance

## ThinPrint Engine

Every ThinPrint environment requires at least one ThinPrint Engine, various engines have been developed, each for a certain environment. For environments without centralized print servers the following ThinPrint Engines are available:

- **ThinPrint Application Server Engine**  
Designed for Microsoft Windows based terminal servers with or without Citrix XenApp
- **ThinPrint RDP Engine**  
Designed for smaller Windows based terminal server environments
- **ThinPrint Desktop Engine**  
Designed for Microsoft based physical or virtual desktops

Environments utilizing a Microsoft Windows based print server can greatly benefit from the following ThinPrint Engine:

- **ThinPrint Server Engine**  
The ThinPrint Server Engine processes a print job created by another PC or server. This unique feature makes the ThinPrint Server Engine the centerpiece of an enterprise print environment. Since it can process print jobs from all types of other computers, such as smartphones and tablets, it does not matter what desktop- or application deployment strategies are in use today or in the future. As long as a shared printer is made available, the user and the network environment in general will benefit from ThinPrint features like V-Layer printing, which allows a user to take advantage of a universal printer, and still send a print job from a native printer driver on the print server. The universal printer driver supports all main features of existing printers and MFPs. The Virtual Channel Gateway, which enables a print job from the print server to be sent via the RDP/ICA connection of a user to a locally installed client printer, further increases the benefits that the ThinPrint Server Engine provides. Finally, due to its significance to enterprise printing, the ThinPrint Server Engine can be installed on clustered print servers.

A variation of the ThinPrint Server Engine for virtualized environments is the:

- **ThinPrint Engine for VMware View**  
This engine is installed on a central print server and provides the same core features as the ThinPrint Server Engine with the limitation that only print jobs from virtual desktops managed by VMware View Manager are processed.

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1 Included with the ThinPrint Server Engine and ThinPrint Application Server Engine

## ThinPrint Client

The second most important part of a ThinPrint environment is the ThinPrint Client. A variety of ThinPrint Clients has been developed by ThinPrint and its OEM partners. Deciding which ThinPrint Client is required and where it needs to be installed depends on which benefits ThinPrint shall provide. Printing without compression, encryption or using Driver Free Printing does not require a ThinPrint Client.

Every ThinPrint Engine can print via LPD directly to a LPR device while controlling the maximum bandwidth of the transmission. A ThinPrint Engine configured to print to a ThinPrint Client can also:

- Print via TCP, RDP or ICA
- Compress print jobs,
- Encrypt print data,
- Control bandwidth and
- Utilize client side printer settings

When the ThinPrint Engine and the ThinPrint Client both run on a Microsoft Windows desktop or server operating system Driver Free Printing can also be used on the server or desktop that is running the ThinPrint Engine.

## Additional ThinPrint Products

The following four other members of the ThinPrint product family work in conjunction with the ThinPrint Engine and the ThinPrint Client to provide additional benefits or support for more specific environments.

- **Host Integration Service:** One challenge is printing from a host system to the local printer of a user who is logged on to a remote desktop or terminal server. The ThinPrint Host Integration Service allows users with an active RDP/ICA session to print from a host system to any locally installed printer.
- **Queue Manager:** Another challenge is ensuring that print jobs print successfully especially when the connection between the printing and the receiving entity is not permanent or instable. The Queue Manager addresses this challenge by monitoring the printer queues of the ThinPrint Engine and managing retries and deletions of print jobs.
- **Connected Gateway:** A third challenge exists when the computer sending the print job cannot reach the computer that is supposed to be receiving the print job because of NAT, inbound firewalls or non-routable subnets. By reversing the direction of communication, the ThinPrint Connected Gateway overcomes that issue. Instead of the ThinPrint Engine opening a connection to the ThinPrint Client, both components open a connection to the ThinPrint Connected Gateway which is a service installed on a network segment that is accessible from either side.
- **ThinPrint Management Center:** A fourth challenge is to simplify the installation and administration of complex printing environments. With the ThinPrint Management Center locations, connections, print servers and driver pools can be easily defined with just a few clicks. Reading organization-wide printer information as well as print server installation occurs automatically. Database sup-

ported and graphic illustrations make it easy to maintain an overview of your print environment and offer a central administration platform, allowing any quick changes to the central print server environment.

## Analysis

To be able to provide an accurate analysis of the return on investment for the ThinPrint solution it is necessary to take a detailed survey of all components that are at some point involved in the printing process. That includes the obvious such as the number of users and printers. However, further information is required such as taking inventory of the operating systems in use, the network connections between data centers and users as well accounting for the time and cost of new IT developments in the near to mid-term future.

To give our customers a better understanding of what data is needed for a reliable and accurate ROI calculation, we provide a detailed listing of the most common variables below, however a 100% accurate analysis will require taking into consideration specific customer demands, regulatory requirements and IT design characteristics.

## What our Customers Say

In the continuous process of speaking with our customers before and after deployment, factors that customers identify as key ThinPrint values have materialized. These statements come from organizations of all sizes and industries.

- “ThinPrint is a solid company, with a great reputation and a global presence and offices in all major markets. This greatly simplifies international deployments and possible post sales support.”
- “ThinPrint has a general consulting approach beyond just installing their product.”
- “ThinPrint is the only company in this space that has close relations not only to the major platform vendors such as Microsoft, Citrix and VMware but also to a number of other participants in these markets such as thin client and printer add on manufacturers. This greatly helps with specific requirements for more complex projects.”
- “ThinPrint is the only vendor that provides one platform that ties into all our application delivery models. There is no better security for our investment.
- “We need to effectively manage and control our print environment that has become out of control.”
- “We don't have control of the remote sites, and can't dictate what printers they buy, but we still have to manage them.”
- “We need to reduce the cost of supporting the branches and remote offices.”
- “We have experienced print job latency issues in a WAN environment. ThinPrint's compression feature solves that problem and we do not have to purchase additional bandwidth.”
- “Certifying printer drivers for all of our printers is extremely time consuming. ThinPrint's Output Gateway keeps us from having to spend valuable resources performing that task.”

- “The ThinPrint printer mapping feature has enabled all of our employees to find their assigned printers wherever they are. This has eliminated a vast amount of help desk calls, thus saving us money.”

## Assumption of Software Costs

The cost of a ThinPrint license is based on list prices including Update Service & Support. For exact licensing of a particular environment please refer to [www.thinprint.com/productfinder](http://www.thinprint.com/productfinder).

The cost per user in an environment using centralized print servers with ThinPrint Server Engine is set at EUR 29.95 for a single user, for large projects, user prices may be lower.

## Assumption of Hardware Costs

Printer costs vary from a few hundred euros for a simple laser printer model to thousands of euros for MFPs with special features such as stapling, collating or plotters.

The cost for an additional server or a server removed from/reallocated in the environment can be as much as EUR 10.000 for hardware, storage and support based on Gartner figures.

## Assumption of Bandwidth Costs

Bandwidth cost is estimated at about EUR 30 for a 1.5 Mbit/sec business ADSL line per month. The cost for a 1.5 Mbit/sec SDSL line is estimated at upwards of EUR 400 per month.

Dedicated domestic or international connections need to be considered on an individual basis in order to correctly calculate the savings resulting from replacements with a more cost effective technology or a replacement with less data throughput for less money.

## Assumption of IT Environment Costs

- Average costs per administrator per hour: EUR 50
- Average costs per user per hour: EUR 25

Variable	Central Office	Branch Office	Home Office
Average replacement quota of printers per year	10%	10%	50%
Average time to find, test and deploy printer driver in hours	1	1.5	2
Average number of setting changes to printer queue per year	Once every other year	Once every other year	Once a year

Variable	Central Office	Branch Office	Home Office
Average time to perform setting changes on printer queue in minutes	9.6	19.2	21.2
Average time to resolve user print issue in minutes	19.2	38.4	42.24
Network Speed (Mbit/sec)	100	3	1.5
Average print job size (MB)	1.5	1.5	1.5
Average print jobs per user per day	3	3	3
Average number of log-ons per user per day	2	2	2

### Assumptions for Savings

- Average reduction of support calls when using ThinPrint: 75%
- Average reduction in time to deploy printer with ThinPrint: 90%
- Average reduction in time to change printer queues
  - Central Office: 25%
  - Branch Office: 25%
  - Home Office: 50%
- Average time savings per user per logon with ThinPrint in sec: 1
- Average print data reduction with ThinPrint: 80%

### Assumptions for “Soft” Factors

When introducing any kind of centralized architecture, especially in application delivery, virtual desktop, server based computing or cloud scenarios, it is key to provide a user experience that is as close to or better than what those using IT as a tool for their daily work are used to. As work and personal time often blend together, users will not accept any restrictions just because “it works best for the IT department”.

Restrictions or a decline in the service quality can lead to massive rejections of the new environment to the extent that these aversions create a loss of productivity that can overturn the entire project.

From a printing perspective it is key to keep this process simple, quick and free of restrictions. While it is possible to exactly calculate lost time due to delays while transmitting large print jobs, the more subtle consequences are too manifold to quantify for the purpose of this study.

Those designing a new environment should simply keep in mind that printing is one of the core office services and that a decline in service quality will have a severe impact beyond what is obviously calculable, this can include the goals and success of the project.

## Additional Cost Saving Potential

There are other areas that offer significant cost savings potential but can't be generalized enough to be applied within the framework of the ThinPrint ROI calculator

### Desktop OS Upgrades

When moving to a new Desktop OS (e.g. Windows XP to Windows 7) the IT staff will usually have to make sure that every printer driver that is used on the desktops is also available for the new OS. While this may only take a few minutes for most common printer models, finding a solution for printers that are no longer supported often results in 30 to 60 minutes of time spent finding workaround and/or significant hardware replacement costs. While simple printers may only cost a few hundred euros, more sophisticated equipment such as plotters or MFPs with sorting and collating features can easily cost thousands to replace.

Also, without using the ThinPrint V-Layer technology, all printer assignments for all users have to be reworked once the OS upgrade is complete. Depending on the environment's complexity that can take anywhere upwards of 5 or more minutes for each user.

A centralized print server and ThinPrint will completely eliminate these costs.

### Server OS Upgrades

New server OS versions often offer significant improvements especially for application delivery scenarios such as Citrix XenApp or Microsoft Remote Desktop Services. However, this scenario also requires compatibility checks for all printer drivers as well as workarounds or hardware replacements for every unsupported printer.

A centralized print server and ThinPrint completely eliminate these costs.

### Upgrading from x32 to x64 Technology

As described in the two previous scenarios, all printer driver will have to be tested for compatibility and printers that are no longer supported either need a time consuming workaround or a costly replacement.

### Strategy Changes

With ever changing developments and new technologies constantly emerging, an IT strategy that is fully researched and implemented today may not be up to the task in as little as three years anymore.

ThinPrint is the exception to this rule. From the early days of Windows Terminal Services and Citrix Metaframe we have continuously developed our solutions ahead of the curve to ensure full support of the next wave of technology. The ThinPrint Engine was available in x64 technology within weeks of the release of the first Windows Server version for x64, no other solutions is more closely woven into the fabric of virtual desktop solutions with the integrations of ThinPrint technology into VMware View and support for Citrix XenDesktop from the release of the first version. Through continuous development, ThinPrint customers benefit from the most innovative technology, allowing faster workflows and full flexibility for users when it comes to choosing their workplace and devices.

There are many more examples to prove an excellent security for the investment made into the ThinPrint technology. However it is more important to point out that the consistency and stability of the print environment saves almost all change management costs related to printing when making a strategy change or upgrade for the

application delivery strategy. The cost of integrating ThinPrint in your environment is minimal and the time (and thus cost savings) for rolling out the new environment are close to 100%.

### Security Costs

A 2007 Forrester Study<sup>2</sup> found that a low-profile breach in a non regulated industry already costs \$90 per breached record. A low profile breach in a regulated industry costs as much as \$155 per breach with a high profile breach in a highly regulated industry costing around \$305 per breached record.

As many of ThinPrint's customers come from high profile, highly regulated industries such as finance and health care the added security through SSL encrypted print jobs, the ability to monitor print usage based on ThinPrint Tracking Report Engine and the ability to restrict printing to certain printers or to fully disable printing for highly sensitive applications via the Dynamic Printer Matrix adds a significant protection against costly loss of data. According to a 2007 CSI/FBI study<sup>3</sup> the average cost per security breach was about \$350,000 in 2007.

## Calculations/Mathematical Models

Based on the assumptions above the ROI calculation can determine the return on investment based on four simple entries:

- The number of users in the environment
- The number of printers in the environment
- The number of print related incidents per user and year
- The split of users between a central office (i.e. large office with local technical support staff), branch office (i.e. remote location without local technical support) and home office users.

This data is sufficient to determine both the time/cost saving from an administrative point of view as well as those savings directly occurring for each user.

In order to determine the cost savings when moving from one system or platform to another, the number of users, printer models/drivers and printer queues are also necessary to determine how much time and money can be saved.

Necessary task	Without ThinPrint	With ThinPrint
Checking driver compatibility with new system from websites	10 minutes / printer	0
Checking for alternative drivers / test	20 minutes / printer	0
Percentage of all printers that won't be compatible with the new system	30%	0

<sup>2</sup> Calculating The Cost of a Security Breach, Khalid Kark, et. al. Forrester Research April 2007

<sup>3</sup> 2007 CSI/FBI Computer Crime And Security Survey, Robert Richardson et. al. Computer Security Institute, 2007

Necessary task	Without ThinPrint	With ThinPrint
Purchase new printers	3 week delay in project, 1 hours time spent on implementation per printer	0

## Conclusions

The ThinPrint ROI calculator shows an excellent return on investment based on just a few very simple factors.

Taking into account the savings from additional soft factors such as an increase in user acceptance, the security of the investment and the support for future strategies, it is that this solution is a must have for any project manager intending to implement or even considering any kind of centralized environment, ranging from a simple Remote Web Workplace scenario to a cloud based model.

On average our customers see significant reductions in administrative efforts and substantial increases in user productivity while also significantly lowering their infrastructure costs:

- 65% reduction in administration cost: EUR 5.000 per 1000 users saved in admin cost annually
- 10% increased user density: Save EUR 15.000 in hardware, licenses & support per 1000 users
- 99% reduced print system downtime: Increase in SLA performance, reduce liability risks
- 90% reduced bandwidth cost: saves thousands of euros per year
- 5 seconds quicker printing saves EUR 2.750 a month for 500 users.
- Avoiding one 15 minute print system crash affecting 250 users saves EUR 2.812,50.
- One ADSL instead of one SDSL line saves more than \$300/month or \$3600/year EUR 350/month or EUR 4.200/year
- Annual administrative savings for 500 users can be reduced by more than EUR 6.200

Based on our experience, most customers will see a positive return on investment in the first six to nine months following installation of ThinPrint technology.