



The Hidden Costs of Data Protection Problems: *A Guide to Valuing DPM Solutions*



April 2006



Data protection operations are usually considered an operating expense. While it is easy to think of *any* addition to the data protection infrastructure as added overhead, most data protection operations have identifiable problems, such as lost data and missed Recovery Time Objectives (RTO), and with those problems come costs. Enterprises that choose to ignore those problems, by not investing in their data protection management systems, continue to rack up hidden costs.

Most Bocada customers who select and install a data protection management (DPM) solution are typically driven by broad business needs rather than reducing costs. Commonly stated goals include:

- “We need to be able to clearly report on recoverability to meet audit requirements.”
- “We need to prove successful backups to each business unit.”
- “We need to reduce troubleshooting times by quickly pinpointing chronic and severe failures.”

But after testing and deploying a DPM solution, many IT departments come to realize the costs they have been bearing. These hidden costs can include:

- **Over-protected data.** Data that is protected far out of proportion to its value
- **Underutilized media.** Expensive tape libraries used to only a fraction of their capacity
- **Time wasted on translation.** Time spent sifting through extensive log files to find, translate and evaluate individual backup errors, many of which turn out to be trivial
- **Time spent on manual labor.** Manual generation of reports to satisfy internal data owners or audit requirements
- **Reactive rather than proactive troubleshooting.** Time spent on repetitive, reactive troubleshooting that could be better spent strategically improving the overall protection environment

This guide summarizes the most common, hidden and costly problems found in data protection environments. It is designed to aid you and your data protection team in taking an informed and critical look at your operations to learn where you may be able to trim costs using a DPM solution.

For each problem, an example cost calculation is included. These examples illustrate how you can turn operational benefits into hard dollar benefits: “NOT implementing a data protection solution is costing us \$XXX.” The formulas and parameters may not be applicable to your specific environment and you may need to develop your own. But by applying the underlying principles you can build a persuasive business case supporting positive return from a DPM solution.

About the calculations in this guide

Calculating the cost of a problem (and the savings to be realized by solving it) can be straightforward or very tricky depending on your organization, environment, and the procedures already in place. The need for documentation and regulatory reporting, the complexity of reports, the geographic distribution of clients and backup infrastructure, the criticality of data, the degree of homogeneity or heterogeneity in the environment — all of these factors play a part in determining the ultimate payback from a DPM solution. There is no one formula that fits all, and every sample presented in this document may not apply in your data protection environment. However, we have found that most IT departments have at least one of these problems, most have more, and all of them have the potential for savings from better managing their data protection environments.

A NOTE ON CALCULATIONS:

1. **Numbers cited** are for illustrative purposes only.
2. **Percentage figures** are representative of typical installations. Figures such as “percentage improvement” or “percent reduction” are results typically achieved with deployed Bocada DPM solutions.
3. **“Burdened” salary and hourly wage figures** are based on gross salary, plus the cost of benefits, perks, vacation and other employee-related expenses. An industry standard calculation for burdened salary and wages is gross salary times 1.5. Salaries/hourly wages vary widely and the numbers cited here should not be construed as industry norms.

Workflow

The cost of rote, repetitive or manual processes that could be automated. Eliminating them frees up skilled staff to focus on strategic activities and system improvements.

Problem/Cost	Sample Calculation												
<p>Manual processes for job tracking and auditing. Hours spent sifting through cryptic log files to gather information about successes and failures and evaluate error causes and severity.</p> <p><i>A DPM solution aggregates information from different backup products by scanning the matrix of backup servers, clients and targets across the enterprise. It presents a consolidated view of backup activity and error sources, retains the source data, and organizes the thousands of error codes into standardized categories and messages for easy review. It eliminates manually parsing logs to find backup errors and evaluate their impact.</i></p>	<table> <tr> <td>Number of backup administrators</td> <td></td> <td>5</td> </tr> <tr> <td>Percent of working hours devoted to log parsing</td> <td>x</td> <td>50%</td> </tr> <tr> <td>Burdened annual salary</td> <td>x</td> <td>\$90,000</td> </tr> <tr> <td>Cost, annually</td> <td>=</td> <td>\$225,000</td> </tr> </table>	Number of backup administrators		5	Percent of working hours devoted to log parsing	x	50%	Burdened annual salary	x	\$90,000	Cost, annually	=	\$225,000
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<p>Manual report creation and documentation. Time spent creating reports for data owners, or for auditors both internal and external.</p> <p><i>A DPM solution performs the entire task automatically. It creates specialized reports for multiple recipients, with role-based content and access based on the individuals' role in the organization. It includes built-in templates for automating the most-often-needed reports, and allows its internal database to be queried for creating custom reports.</i></p>	<table> <tr> <td>Average hours to create each report</td> <td></td> <td>40</td> </tr> <tr> <td>Number of reports required annually</td> <td>x</td> <td>12</td> </tr> <tr> <td>Burdened hourly wage</td> <td>x</td> <td>\$45</td> </tr> <tr> <td>Cost, annually</td> <td>=</td> <td>\$21,600</td> </tr> </table>	Average hours to create each report		40	Number of reports required annually	x	12	Burdened hourly wage	x	\$45	Cost, annually	=	\$21,600
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<p>Troubleshooting focused on isolated incidents. Large amounts of detective work to determine root causes of individual failures.</p> <p><i>A DPM solution presents all error information in a simple, color-coded visual interface organized by client, backup server, backup job, SLA, application, error type, backup level, operating system or location. It allows administrators to focus on the most critical errors, as well as to spot patterns of chronic, repeat failures. Administrators can drill down to find more information including the original error code from the vendor's backup application. The ability to immediately identify and locate errors drastically cuts troubleshooting time while the ability to prioritize troubleshooting efforts allows the team to drive down the overall failure rate.</i></p>	<table> <tr> <td>Number of failure incidents weekly</td> <td></td> <td>20</td> </tr> <tr> <td>Hours spent determining cause of each failure</td> <td>x</td> <td>1</td> </tr> <tr> <td>Burdened hourly rate for backup administrator</td> <td>x</td> <td>\$45</td> </tr> <tr> <td>Cost, annually</td> <td>=</td> <td>\$46,800</td> </tr> </table>	Number of failure incidents weekly		20	Hours spent determining cause of each failure	x	1	Burdened hourly rate for backup administrator	x	\$45	Cost, annually	=	\$46,800
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<p>Script building and maintenance. Revising and rewriting scripts, which are typically used to tie reports of disparate backup applications together, in order to gain one overall view of success and failure rates.</p> <p><i>A DPM solution automates all the tasks typically performed by scripting solutions.</i></p>	<table> <tr> <td>Average weekly hours spent maintaining scripts</td> <td></td> <td>12</td> </tr> <tr> <td>Weeks per year</td> <td>x</td> <td>52</td> </tr> <tr> <td>Hourly wage</td> <td>x</td> <td>\$45</td> </tr> <tr> <td>Cost, annually</td> <td>=</td> <td>\$28,080</td> </tr> </table>	Average weekly hours spent maintaining scripts		12	Weeks per year	x	52	Hourly wage	x	\$45	Cost, annually	=	\$28,080
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Workflow *(continued)*

Problem/Cost	Sample Calculation												
<p>Need for highly specialized knowledge specific to each backup application. Time and cost of training new hires on the nuances and intricacies of each backup application or filling highly specific positions requiring specific backup application experience.</p> <p><i>A DPM solution replaces the essential, detail-oriented learning associated with individual backup applications with a higher level view. New administrators needn't learn all the nuances, reporting functions and log file formats of each. Time-to-productivity is much shorter.</i></p>	<table> <tr> <td>Hours required to train each new hire</td> <td></td> <td>160</td> </tr> <tr> <td>Number of new hires per year</td> <td>x</td> <td>2</td> </tr> <tr> <td>Burdened hourly wage</td> <td>x</td> <td>\$45</td> </tr> <tr> <td>Cost, annually</td> <td>=</td> <td>\$14,400</td> </tr> </table>	Hours required to train each new hire		160	Number of new hires per year	x	2	Burdened hourly wage	x	\$45	Cost, annually	=	\$14,400
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Systeem/Hardware Costs

The cost of storage media, new tape libraries, servers and other additions to the backup infrastructure

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<p>Backup window overruns. Costs of rerunning backups, reconfiguring or rescheduling backup jobs, or purchasing new servers and libraries.</p> <p><i>A DPM solution reveals a complete picture of the backup windows and how they're used, as well as related parameters that can impact backup speed such as network and device throughput. Backups that are near the failure point because of window overruns can be seen and corrected before additional data triggers an actual failure. Without this visibility, the common solution is to assign more drives to the backups, which is costly and often doesn't address the true problem.</i></p>	<table> <tr> <td>Number of fatal window overruns annually</td> <td></td> <td>6</td> </tr> <tr> <td>Cost of new drives and tapes</td> <td>x</td> <td>\$10,000</td> </tr> <tr> <td>Cost</td> <td>=</td> <td>\$60,000</td> </tr> </table>	Number of fatal window overruns annually		6	Cost of new drives and tapes	x	\$10,000	Cost	=	\$60,000
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<p>Imbalanced system throughput and load. Less-than-optimal throughput, leading to bottlenecks that are typically solved by purchasing additional hardware.</p> <p><i>A DPM solution delivers a consolidated view of the volume, impact and source of data backed up over a specific time period. Administrators can drill down on data volumes and transfer rates to identify bottlenecks and load imbalances. Backup servers can be moved to less-utilized switches and backup times adjusted to balance the load over time.</i></p>	<table> <tr> <td>Annual outlay for backup systems and media</td> <td></td> <td>\$1,000,000</td> </tr> <tr> <td>Percent improvement possible but unrealized</td> <td>x</td> <td>5%</td> </tr> <tr> <td>Cost, annually</td> <td>=</td> <td>\$50,000</td> </tr> </table>	Annual outlay for backup systems and media		\$1,000,000	Percent improvement possible but unrealized	x	5%	Cost, annually	=	\$50,000
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System/Hardware Costs *(continued)*

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<p>Unnecessary data retention. Cost of tapes holding archived data that has outlived its usefulness, as well as the expense of vaulting them.</p> <p><i>A DPM solution tracks retention of data, including tapes stored offsite, their contents and their required retention period. It reveals when tapes are unnecessarily stored or stored longer than necessary. Some IT departments have also found they were storing tapes that had corrupted or useless data.</i></p>	<table> <tr> <td>Total number of tapes archived</td> <td></td> <td>5000</td> </tr> <tr> <td>Cost per tape (ex. LTO-2 @ \$40 each)</td> <td>x</td> <td>40</td> </tr> <tr> <td>Potential reduction</td> <td>x</td> <td>30</td> </tr> <tr> <td>Cost</td> <td>=</td> <td>\$60,000</td> </tr> </table>	Total number of tapes archived		5000	Cost per tape (ex. LTO-2 @ \$40 each)	x	40	Potential reduction	x	30	Cost	=	\$60,000
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<p>Inefficient utilization of resources. Backup servers that are largely idle or tape libraries being used to a fraction of capacity.</p> <p><i>A DPM solution quickly identifies underused or overused resources so managers can reduce unnecessary expenditures and reconfigure servers and libraries to optimal use. After installing such a solution, some enterprises have found that expensive tape libraries were being used to only 30% of their capacity.</i></p>	<table> <tr> <td>Annual outlay for backup systems and media</td> <td></td> <td>\$1,000,000</td> </tr> <tr> <td>Percent of unused capacity that could be recovered</td> <td>x</td> <td>20%</td> </tr> <tr> <td>Cost, annually</td> <td>=</td> <td>\$200,000</td> </tr> </table>	Annual outlay for backup systems and media		\$1,000,000	Percent of unused capacity that could be recovered	x	20%	Cost, annually	=	\$200,000			
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Systemic Costs

Costs of both labor and hardware related to data management and recovery that can have a major impact on cost of operations.

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<p>Backup failures. Costs of re-running backup jobs that tie up tape libraries and servers, forcing staff to readjust backup schedules while dealing with shrinking backup windows. Repeat backup failures ultimately result in irrecoverable data — a significant cost and risk for any enterprise.</p> <p><i>A DPM solution makes it easier to zero in on the root cause of failures and eliminate them. Companies that have these solutions have seen their backup success rates increase, from an initial 50% rate to 90% or more. The savings come in recovering the backup capacity that was previously wasted as well as the decrease in labor costs.</i></p>	<table> <tr> <td colspan="2">Sample calculation, cost of capacity</td> <td>Example</td> </tr> <tr> <td>Cost per backup</td> <td></td> <td>\$1200</td> </tr> <tr> <td>Backup jobs per month</td> <td>x</td> <td>500</td> </tr> <tr> <td>Lost capacity</td> <td>x</td> <td>35%</td> </tr> <tr> <td>Months per year</td> <td>x</td> <td>12</td> </tr> <tr> <td>Cost, annually</td> <td>=</td> <td>\$2,520,000</td> </tr> <tr> <td colspan="2">Sample calculation, labor cost</td> <td>Example</td> </tr> <tr> <td>Number of backup administrators</td> <td></td> <td>5</td> </tr> <tr> <td>Burdened annual salary</td> <td>x</td> <td>\$90,000</td> </tr> <tr> <td>Lost productivity</td> <td>x</td> <td>35%</td> </tr> <tr> <td>Cost, annually</td> <td>=</td> <td>\$157,500</td> </tr> </table>	Sample calculation, cost of capacity		Example	Cost per backup		\$1200	Backup jobs per month	x	500	Lost capacity	x	35%	Months per year	x	12	Cost, annually	=	\$2,520,000	Sample calculation, labor cost		Example	Number of backup administrators		5	Burdened annual salary	x	\$90,000	Lost productivity	x	35%	Cost, annually	=	\$157,500
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<p>Unnecessary consumption of backup services. Redundant backups of data that seldom changes, full backups when incremental backups would be a better strategy, or demands by data owners for protection that is disproportionate to the assets' value.</p> <p><i>A DPM solution delivers a full picture of data protection that is data-centric rather than backup-job centric. It reveals data assets that are receiving protection far outweighing its strategic value, or redundant protection that does not impact recoverability. Chargeback shows the true cost of data protection services and is an extremely effective strategy for aligning data protection efforts with data value.</i></p>	<table> <tr> <td>Current annual budget for protection operations</td> <td style="text-align: right;">\$1,000,000</td> </tr> <tr> <td>Percent reduction possible</td> <td style="text-align: right;">20%</td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td>Cost, annually</td> <td style="text-align: right;">= \$200,000</td> </tr> </table>	Current annual budget for protection operations	\$1,000,000	Percent reduction possible	20%	<hr/>		Cost, annually	= \$200,000																																											
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<p>Absorbing expanding volume of data under management. Excessive capital and operational expenditures on additional backup servers, tape libraries and tape sets, as well as additional hires and/or administrator hours.</p> <p><i>A DPM solution identifies underutilized tape libraries and manages backup windows better. Companies that have adopted these solutions have greatly increased the amount of data they can protect with the resources they already have, thereby delaying or eliminating additional expenditures.</i></p>	<table> <tr> <td>Current annual budget for protection operations</td> <td style="text-align: right;">\$1,000,000</td> </tr> <tr> <td>Percent growth in data</td> <td style="text-align: right;">x 30%</td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td>Increase over one year</td> <td style="text-align: right;">= \$300,000</td> </tr> <tr> <td>Current annual budget for protection operations</td> <td style="text-align: right;">+ \$1,000,000</td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td>Predicted outlay for backup based on data growth</td> <td style="text-align: right;">= \$1,300,000</td> </tr> <tr> <td>Percent reduction from using BackupReport</td> <td style="text-align: right;">x 20%</td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td>Cost, annually</td> <td style="text-align: right;">= \$260,000</td> </tr> </table>	Current annual budget for protection operations	\$1,000,000	Percent growth in data	x 30%	<hr/>		Increase over one year	= \$300,000	Current annual budget for protection operations	+ \$1,000,000	<hr/>		Predicted outlay for backup based on data growth	= \$1,300,000	Percent reduction from using BackupReport	x 20%	<hr/>		Cost, annually	= \$260,000																															
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<p>Risk of irrecoverable data. Expense of rebuilding and repopulating lost databases that were underprotected. The loss of income to the business due to downtime, or potential regulatory penalties, is difficult to calculate and could be substantial.</p> <p><i>A DPM solution improves on success rates and also delivers a true picture of data recoverability leading to a far greater likelihood of a successful first-pass restore. In addition, after DPM installation, some enterprises find orphaned servers which were receiving no protection at all. By bringing them back into the data protection management activities the data was protected from loss.</i></p>	<table> <tr> <td colspan="2">Sample calculation, basic application</td> <td style="text-align: right;">Example</td> </tr> <tr> <td>Hours required to recreate</td> <td></td> <td style="text-align: right;">80</td> </tr> <tr> <td>Hourly, burdened cost of IT worker</td> <td style="text-align: right;">x</td> <td style="text-align: right;">\$50</td> </tr> <tr> <td colspan="2"><hr/></td> <td></td> </tr> <tr> <td>Re-creation cost, single incident</td> <td style="text-align: right;">=</td> <td style="text-align: right;">\$4,000</td> </tr> <tr> <td colspan="2"> Complex database recreated from electronic sources</td> <td style="text-align: right;">Example</td> </tr> <tr> <td>Weeks required to recreate</td> <td></td> <td style="text-align: right;">4</td> </tr> <tr> <td>Number of IT personnel devoted to task</td> <td style="text-align: right;">x</td> <td style="text-align: right;">4</td> </tr> <tr> <td>Burdened weekly salary of IT worker</td> <td style="text-align: right;">x</td> <td style="text-align: right;">\$2,000</td> </tr> <tr> <td colspan="2"><hr/></td> <td></td> </tr> <tr> <td>Re-creation cost, single incident</td> <td style="text-align: right;">=</td> <td style="text-align: right;">\$32,000</td> </tr> <tr> <td colspan="2"> Complex database recreated from paper sources</td> <td style="text-align: right;">Example</td> </tr> <tr> <td>Weeks required to recreate</td> <td></td> <td style="text-align: right;">8</td> </tr> <tr> <td>IT personnel and data entry temps required</td> <td style="text-align: right;">x</td> <td style="text-align: right;">40</td> </tr> <tr> <td>Burdened weekly cost of each worker</td> <td style="text-align: right;">x</td> <td style="text-align: right;">\$2000</td> </tr> <tr> <td colspan="2"><hr/></td> <td></td> </tr> <tr> <td>Re-creation cost, single incident</td> <td style="text-align: right;">=</td> <td style="text-align: right;">\$640,000</td> </tr> </table>	Sample calculation, basic application		Example	Hours required to recreate		80	Hourly, burdened cost of IT worker	x	\$50	<hr/>			Re-creation cost, single incident	=	\$4,000	 Complex database recreated from electronic sources		Example	Weeks required to recreate		4	Number of IT personnel devoted to task	x	4	Burdened weekly salary of IT worker	x	\$2,000	<hr/>			Re-creation cost, single incident	=	\$32,000	 Complex database recreated from paper sources		Example	Weeks required to recreate		8	IT personnel and data entry temps required	x	40	Burdened weekly cost of each worker	x	\$2000	<hr/>			Re-creation cost, single incident	=	\$640,000
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About Bocada

Founded in 1999, Bocada Inc. pioneered development of software that validates data protection system performance against business goals. Our flagship product, Bocada Enterprise 4, powered by BackupReport® technology, provides objective insight on service level delivery and performance, helping companies reduce their exposure to unrecoverable data, increase the utilization and performance of their infrastructures, reduce the cost of their service delivery, and comply with regulations. More than 200 brand-name customers and partners worldwide trust Bocada, including Amgen, Cap Gemini, Ernst & Young, CocaCola, Commerzbank, Microsoft, SBC, Sprint, Unilever, and Xerox. Bocada is a private company funded by leading venture investors and headquartered in Bellevue, Washington.



10500 N.E. 8th Street, Bellevue, WA 98004

Tel: (425) 818-4400 | Fax: (425) 818-4455 | sales@bocada.com | www.bocada.com