

A Forrester Total Economic Impact™  
Study Commissioned By Dell EMC  
August 2017

# The Total Economic Impact™ Of The Dell EMC Elastic Cloud Storage (ECS) Solution

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## ABOUT FORRESTER CONSULTING

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## Quantified Benefits



Capex cost avoidance savings:  
**\$309,793**



Opex labor savings:  
**\$417,656**



Labor savings — maintenance  
of modernized applications:  
**\$447,633**



Data center savings:  
**\$313,905**

(above are risk- and PV-  
adjusted)

## Executive Summary

Dell EMC Elastic Cloud Storage (ECS) is a software-defined object storage system designed for both traditional and next-generation workloads with scalability, flexibility, and resiliency. Dell EMC commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and objectively examine the potential return on investment (ROI) enterprises may realize by deploying its Elastic Cloud Storage solution. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of the Elastic Cloud Storage solution on their organizations.

To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed four Dell EMC ECS customers with an average of 15 months experience using the ECS solution. For this TEI study, Forrester has created a composite *Organization* to illustrate the quantifiable benefits and costs of investing in Dell EMC ECS. Based on characteristics of the interviewed customers, the *Organization* is a global, midsize enterprise in the business of manufacturing, distribution, and services. It is headquartered in North America and Europe with multisite operations globally. It has been using ECS for three years to more efficiently manage its object storage needs. For more information, see the section titled *Composite Organization*.

### Key Findings

**Quantified benefits.** The composite *Organization* experienced the following risk-adjusted present value (PV) quantified benefits totaling **\$1,488,988** (see the Financial Analysis section for more details):

- › **Capex cost avoidance savings (\$309,793).** This includes capital expense savings from taking advantage of multitenancy, multiprotocols, and disk efficiency; further, no backup infrastructure is needed.
- › **Opex savings due to Dell EMC ECS (\$417,656).** Features and functionality of Dell EMC ECS include the automation of several storage processes that save labor costs.
- › **Labor savings in modernization of applications (\$447,633).** Using ECS allowed customers to build on their investment by modernizing legacy applications, which simplifies maintenance of applications and reduces costs.
- › **Data center savings (\$313,905).** Interviewed customers were able to reuse primary tier 1 storage that was replaced by ECS, allowing them to defer purchasing of tier 1 storage. In addition, customers reported significant power and cooling savings when they replaced legacy disk storage with ECS.

**Unquantified benefits.** The composite *Organization* experienced the following benefits, which are not quantified in this study:

- › **Digital transformation.** Dell EMC Elastic Cloud Storage (ECS) helps customers with their digital transformation by freeing up primary storage, modernizing legacy applications, and accelerating cloud-native application development. It provides one object storage for all data.



**ROI**  
**82%**



**Benefits PV**  
**\$1.49 million**



**NPV**  
**\$671K**



**Payback**  
**7 months**

› **Hadoop Distributed File Systems (HDFS).** ECS allows archived data to be accessed on-demand by various applications. ECS supports accessing data lakes via the protocol defined by the Hadoop Distributed File Systems (HDFS).

› **Regulatory factors.** ECS allows organizations to choose the physical location of their data to eliminate residency and compliance risks. A common regulatory or legal factor is the geographical hosting location of data.

**Costs.** The *Organization* experienced the following present value costs:

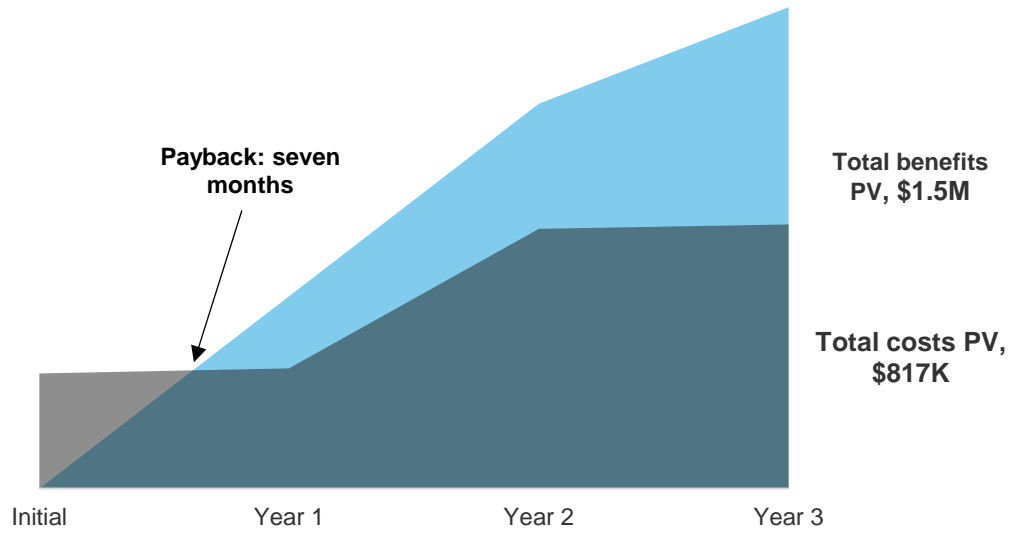
› **Labor to deploy and maintain Dell EMC ECS (\$68,994).** This includes labor to perform technical development, pre-planning, implementation, and supporting and maintaining the Dell EMC ECS solution.

› **Dell EMC ECS fees (\$748,035).** Fees include Dell EMC ECS hardware, software licenses and maintenance, and professional services.

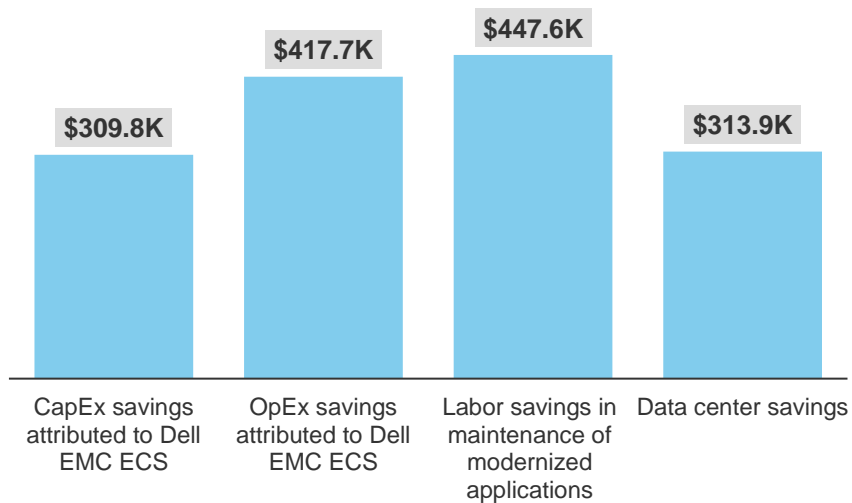
Forrester's interviews and subsequent financial analysis found that the *Organization* experienced benefits of \$1,488,988 over three years versus costs of \$817,029, adding up to a net present value (NPV) of \$671,959, with a **payback period of seven months and an ROI of 82%**.

If risk-adjusted costs, benefits, and ROI still demonstrate a compelling business case, it raises confidence that the investment is likely to succeed because the risks that threaten the project have been taken into consideration and quantified. The risk-adjusted numbers should be taken as "realistic" expectations, as they represent the expected value considering risk. Assuming normal success at mitigating risk, the risk-adjusted numbers should more closely reflect the expected outcome of the investment.

## Financial Summary



## Benefits (Three-Year)



The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

## TEI Framework And Methodology

From the information provided in the interview, Forrester has constructed a Total Economic Impact™ (TEI) framework for those organizations considering investing in the Dell EMC ECS solution.

The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision. Forrester took a multistep approach to evaluate the impact that the Dell EMC ECS solution can have on an organization:



### **DUE DILIGENCE**

Interviewed Dell EMC stakeholders to gather data relative to the Elastic Cloud Storage solution.



### **CUSTOMER INTERVIEWS**

Interviewed four organizations using the Elastic Cloud Storage solution to obtain data with respect to costs, benefits, and risks.



### **COMPOSITE ORGANIZATION**

Designed a composite organization based on characteristics of the interviewed organizations.



### **FINANCIAL MODEL FRAMEWORK**

Constructed a financial model representative of the interview using the TEI methodology and risk-adjusted the financial model based on issues and concerns of the composite *Organization*.



### **CASE STUDY**

Employed four fundamental elements of TEI in modeling the Dell EMC ECS solution's impact: benefits, costs, flexibility, and risks. Given the increasing sophistication that enterprises have regarding ROI analyses related to IT investments, Forrester's TEI methodology serves to provide a complete picture of the total economic impact of purchase decisions. Please see Appendix A for additional information on the TEI methodology.

## DISCLOSURES

Readers should be aware of the following:

This study is commissioned by Dell EMC and delivered by Forrester Consulting. It is not meant to be used as a competitive analysis.

Forrester makes no assumptions as to the potential ROI that other organizations will receive. Forrester strongly advises that readers use their own estimates within the framework provided in the report to determine the appropriateness of an investment in the Dell EMC ECS solutions.

Dell EMC reviewed and provided feedback to Forrester, but Forrester maintains editorial control over the study and its findings and does not accept changes to the study that contradict Forrester's findings or obscure the meaning of the study.

Dell EMC provided the customer names for the interviews but did not participate in the interviews.

# The Elastic Cloud Storage (ECS) Solution Customer Journey

## BEFORE AND AFTER THE ELASTIC CLOUD STORAGE (ECS) SOLUTION INVESTMENT

For this study, Forrester conducted interviews with four ECS customers. Interviewed customers are described as follows (each requesting anonymity):

INDUSTRY	REGION	INTERVIEWEE	NUMBER OF DATA CENTERS
Search engine services	Headquartered in India	Head of IT and telecom operations	11
IT services	Headquartered in Europe	Principal product manager	4
Financial services	Headquartered in US	UNIX and Microsoft technologies manager	2
Human resources software	Headquartered in US	Storage engineer	3

## Composite Organization

The *Organization* is a global, midsize enterprise in the business of manufacturing, distribution, and services. It has both business-to-consumer (B2C) and business-to-business (B2B) customers. It has multisite operations globally and has been using ECS for three years to more efficiently manage its object storage needs.

The *Organization* and other customers have the option of deploying ECS as an appliance, software-only, or the cloud managed by Dell EMC. The ECS appliance provides customers with a similar experience to the cloud: It can scale like the cloud, and customers can add servers as with the cloud.

Before its investment in cloud-based ECS, the *Organization* was using on-premises storage media — network attached storage (NAS) and storage area network (SAN) — in its three data centers for its unstructured data storage needs. The data centers had storage media including virtual tape and physical tape, all copied to a disaster recovery data center.

## Key Challenges And Goals

The *Organization* had the following challenges and goals, which were shared by the interviewed customers:

Challenges:

- › **Downsizing budgets.** IT costs soared, especially for storage hardware and maintenance.
- › **Slow time-to-market.** There were long lead times to deploy applications.
- › **Application modernization.** Eventually all applications would need to be modernized.

“Our object storage needs will double and triple in size in the next few years, and our intent is to have Dell EMC ECS grow with us.”

*Storage engineer, IT services*



**Forrester question:** “How much are you saving on a per gigabyte basis with ECS?”

**Answer:** “Our old storage was costing us \$2.60 per gigabyte, and ECS costs us around \$0.45 cents per gigabyte.”

*UNIX and Microsoft technologies manager, financial services*



## Goals:

- › **Business transformation.** It wanted to drive IT and business transformation.
- › **Acceleration of cloud-native applications.** With ECS as a foundation for a low-cost storage tier and next-generation file, the *Organization* hoped to enable the businesses to grow with cloud-native applications on its own private infrastructure.
- › **A reduction in time-to-market.** For the *Organization's* next-generation mobile applications, it wanted to achieve a cloud-like experience.
- › **Freed-up primary storage.** Using ECS as a low-cost storage tier, the *Organization* to move inactive data to that tier, which could free up primary storage capacities for other workloads
- › **Modernization of existing applications.** Using ECS, the *Organization* hoped to allow customers to build on their investment by modernizing legacy applications, which would simplify maintenance of applications and reduce costs.

## Key Results

The interviews revealed several key results attributed to the Dell EMC ECS solution investment as follows:

- › ECS provides value for the *Organization* as it seeks a platform architected to support rapid data growth, enabling it to globally manage and store distributed content.
- › Interviewed customers were using ECS as a low-cost storage for inactive data, which allowed them to reduce primary storage capacities.
- › Once ECS was in place as a low-cost storage tier, the interviewed customers could build on their investments by modernizing legacy applications, which simplified the maintenance of those applications and reduced costs.
- › The protocol of an application doesn't matter with ECS. ECS is a platform that gives multiple protocols. The *Organization* did not have to design its platform for ECS.

"I see ECS as our platform for long-term retention. It can be a cloud tier, lowest class tier for archive and replacement for tape, and it can be the same system for Hadoop for cloud-native applications."

*Storage engineer, IT services*





# Financial Analysis

## QUANTIFIED BENEFIT AND COST DATA

### Total Benefits

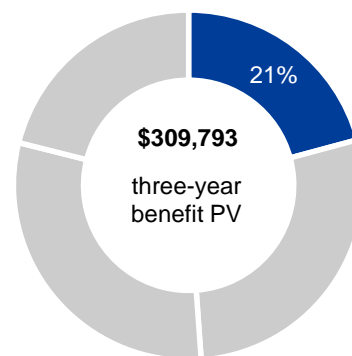
REF.	BENEFIT	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Atr	Capex savings from ECS	\$178,500	\$178,500	\$0	\$357,000	\$309,793
Btr	Opex savings from ECS	\$127,500	\$191,250	\$191,250	\$510,000	\$417,656
Ctr	Labor savings in modernization of applications	\$180,000	\$180,000	\$180,000	\$540,000	\$447,633
Dtr	Data center savings	\$168,288	\$171,218	\$25,839	\$365,345	\$313,905
	Total Benefits (risk-adjusted)	\$654,288	\$720,968	\$397,089	\$1,772,345	\$1,488,988

## Capex Savings From ECS

Before its investment in cloud-based ECS, the *Organization* was using on-premises storage media (NAS and SAN) in its three data centers for its unstructured data storage needs. The data centers had storage media including virtual tape and physical tape copied to a disaster recovery data center. The *Organization* was able to save or avoid capital expenses in four categories.

- › **Multitenancy.** ECS provides an efficient object store that will be shared by many applications and groups within the *Organization*. This built-in multitenancy makes it easy to provide a shared storage utility, keeping both production and development work separate. Otherwise, the legacy storage environments would continue to be separate — production and development.
- › **Multiprotocol.** ECS allows archived data to be accessed on-demand by various applications. ECS supports accessing data lakes via the protocol defined by the Hadoop Distributed File Systems (HDFS). This represents cost avoidance, as each appliance is doing multiple protocols for the *Organization*.
- › **Disk efficiency.** ECS uses a combination of triple mirroring and erasure coding to write data in a distributed fashion to be resilient against disk and node failures. ECS supports replication between sites that increases availability and resiliency by protecting against sitewide failures.
- › **No back-ups needed.** ECS provides built-in backup and disaster recovery through geo-replication of data. With Dell EMC ECS, data protection and traditional backup and recovery don't apply; therefore, the *Organization* avoids the cost of the backup and recovery stack. Object storage is already in a protective format and is policy-driven: If someone changes the file, it creates a new object or version.

The table above shows the total of all benefits across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the composite *Organization* expects risk-adjusted total benefits to be a PV of nearly \$1.489 million.



Capex savings — 21% of total benefits

**Modeling and assumptions.** The combined four categories of savings allowed the *Organization* to avoid the Year 1 expense cost of three additional ECS clusters (appliances) — one per data center with 250 TB of data at a cost of \$70,000 each or \$210,000 total. In addition, with its upgrade and expansion of Dell EMC ECS storage in Year 2, it could avoid buying three more ECS appliances at an additional \$210,000 savings.

**Risks.** Forrester considered the following potential when assigning a risk adjustment:

- › Other organizations may experience slower rollout and adoption of the benefits of ECS.
- › There may be variations in experiencing the benefits of multitenancy and multiprotocol.
- › Readers' variable rates of storage growth may produce different results.

To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year risk-adjusted total PV of \$309,793.

Impact risk is the risk that the business or technology needs of the organization may not be met by the investment, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for benefit estimates.

### Capex Savings From ECS: Calculation Table

REF.	METRIC	CALC./SOURCE	YEAR 1	YEAR 2	YEAR 3
A1	Cost avoidance of additional Dell EMC ECS appliances	Six at \$70,000 each	\$210,000	\$210,000	\$0
At	Capex savings from ECS	A1	\$210,000	\$210,000	\$0
	Risk adjustment	↓15%			
<b>Atr</b>	<b>Capex savings from ECS (risk-adjusted)</b>	At-15%	<b>\$178,500</b>	<b>\$178,500</b>	<b>\$0</b>

### Opex Savings From ECS

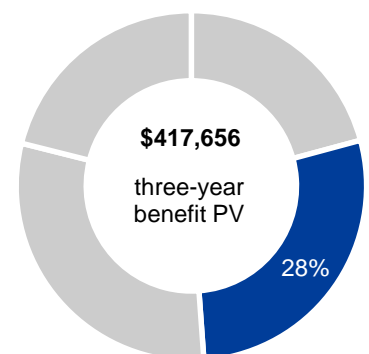
Features and functionality of Dell EMC ECS include the automation of several storage processes. It allows storage administrators to avoid the highly manual legacy tasks of provisioning storage; creating redundant array of independent disks (RAID) sets, logical unit numbers (LUNs), and file systems; making sure users do not top-load a file system; and ensuring storage is backed up.

Dell EMC ECS automates these processes and saves the *Organization* one full-time equivalent (FTE) in Year 1, and, with the Year 2 upgrade and expansion, 1.5 FTEs in Years 2 and 3.

**Modeling and assumptions.** Forrester assumed an industry average fully loaded cost of \$150,000 for the storage administrator.

**Risks.** Forrester considered the following potential risks when assigning a risk adjustment:

- › Other organizations may see delays in attrition of redundant headcount, resulting in delays in achieving the savings.
- › Readers' labor costs may be less than \$150,000 (fully loaded), therefore reducing the labor savings benefits.



Opex savings — 28% of total benefits

- › Other organizations may experience slower rollout and adoption of the automation functionality of ECS.

To account for these risks, Forrester adjusted this benefit downward by 15%, yielding a three-year risk-adjusted total PV of \$417,656.

### Opex Savings From ECS: Calculation Table

REF.	METRIC	CALC./SOURCE	YEAR 1	YEAR 2	YEAR 3
B1	FTE savings due to automation	FTEs	1	1.5	1.5
B2	Cost per storage administrator	fully loaded	\$150,000	\$150,000	\$150,000
B3	Labor savings	B1*B2	\$150,000	\$225,000	\$225,000
Bt	Opex savings from ECS	B3	\$150,000	\$225,000	\$225,000
	Risk adjustment	↓15%			
<b>Btr</b>	<b>Opex savings from ECS (risk-adjusted)</b>	<b>Bt-15%</b>	<b>\$127,500</b>	<b>\$191,250</b>	<b>\$191,250</b>

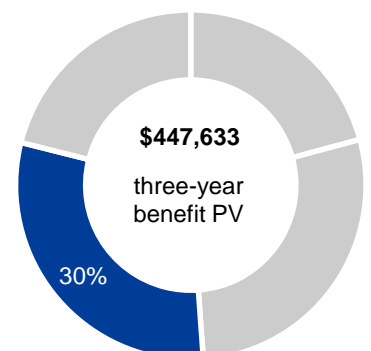
## Labor Savings In Modernization Of Applications

Using ECS allows customers to build on their investment by modernizing legacy applications, which simplifies maintenance of applications and reduces costs.

According to Dell EMC, ECS supports multiple object protocols, such as S3, OpenStack SWIFT, Dell EMC Atmos, and CAS, along with file-based NFS and HDFS. This allows application developers increased flexibility when building cloud-native applications. Broad multiprotocol support eliminates the need for cloud gateways and reduces the effort required to modernize legacy applications.

Eventually, almost every application will need to be modernized. For applications that use large amounts of unstructured data, an effective way to do this is to change how the application uses storage. The interviewed customers confirmed that moving an application from traditional NAS to ECS can provide several benefits, as follows:

- › ECS provides an efficient object store that can be shared by many applications and groups within an organization. This built-in multitenancy makes it easy to provide a shared storage utility.
- › ECS lets applications access massive amounts of data through a single global namespace. Rather than worrying about where to find a particular file, developers just supply an object name and let ECS handle the rest.
- › ECS provides built-in backup and disaster recovery through geo-replication of data. Because multiple copies of data can be stored in different places around the world, applications anywhere can access that data quickly.
- › ECS allows direct HTTP access to data via the internet. It also provides searchable metadata attached to every object, making it easier for applications to find that data they need.



Labor savings in modernization of applications — 30% of total benefits

- › ECS allows developers to provision the storage they need when they need it without waiting for storage administrators. This minimizes delays and improves time-to-market for new applications.

Getting the benefits above requires modifying an application to use ECS rather than traditional NAS, which typically takes two to four weeks of work.

**Modeling and assumptions.** Using ECS allows customers to build on their investment by modernizing legacy applications, which simplifies maintenance of applications and reduces costs. Interviewed customers reported a 10% annual labor savings in maintenance of applications ranging from \$150,000 to \$250,000 annually. Forrester will use an average of \$200,000 before risk adjustments.

**Risks.** Forrester considered the following potential risks when assigning a risk adjustment:

- › Since this is an estimate, it has been risk-adjusted.
- › Readers of this study may have different savings outcomes.

To account for these risks, Forrester adjusted this benefit downward by 10%, yielding a three-year risk-adjusted total PV of \$447,633.

#### Labor Savings In Modernization Of Applications: Calculation Table

REF.	METRIC	CALC./SOURCE	YEAR 1	YEAR 2	YEAR 3
C1	Labor savings	Interview averages	\$200,000	\$200,000	\$200,000
Ct	Labor savings in modernization of applications	C1	\$200,000	\$200,000	\$200,000
	Risk adjustment	↓10%			
<b>Ctr</b>	<b>Labor savings in modernization of applications (risk-adjusted)</b>	<b>Ct-10%</b>	<b>\$180,000</b>	<b>\$180,000</b>	<b>\$180,000</b>

## Data Center Savings

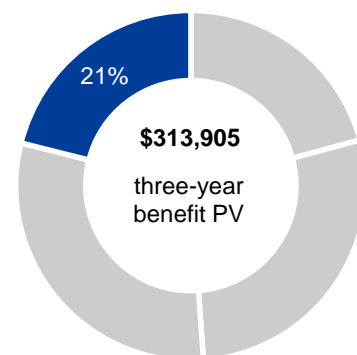
Interviewed customers reported data center savings in two categories:

- › Interviewed customers were able to reuse primary tier 1 storage that was replaced by ECS, allowing them to defer purchasing of future tier 1 storage. This is a Year 1 and Year 2 benefit coinciding with the initial ECS investment, as well as the upgrade and expansion. Each year the benefit averaged \$175,000.
- › Customers reported significant power and cooling savings when they replaced legacy disk storage with ECS.

**Modeling and assumptions.** For the *Organization*, power and cooling savings totaled \$74,231 over three years. This estimate assumes a cost per KWH for power of \$0.14 and a cost per KWH for cooling of \$0.10.

**Risks.** Forrester considered the following potential risks when assigning a risk adjustment:

- › We risk-adjusted the tier 1 deferred savings by 15% because it is an average.



Data center savings— 21% of total benefits

- › We have risk-adjusted the power and cooling savings downward by 15% to reflect regional KWH rate differentials.

To account for these risks, Forrester adjusted these two benefits downward yielding a three-year risk-adjusted total PV of \$313,905.

Data Center Savings: Calculation Table					
REF.	METRIC	CALC./SOURCE	YEAR 1	YEAR 2	YEAR 3
D1	Deferred purchase of tier 1 storage	Customer average	\$175,000	\$175,000	\$0
D2	Power and cooling costs — legacy disk	Interviews	\$27,947	\$32,139	\$36,960
D3	Power and cooling costs — ECS	Interviews	\$4,961	\$5,705	\$6,561
D4	Power and cooling savings with ECS	D2-D3	\$22,986	\$26,433	\$30,399
Dt	Data center savings	D1+D4	\$197,986	\$201,433	\$30,399
	Risk adjustment	↓15%			
<b>Dtr</b>	<b>Data center savings (risk-adjusted)</b>	<b>Dt-15%</b>	<b>\$168,288</b>	<b>\$171,218</b>	<b>\$25,839</b>

## Unquantified Benefits

**Unquantified benefits.** The composite *Organization* experienced the following benefits, which were not quantified for this study:

- › **Digital transformation.** Dell EMC Elastic Cloud Storage helps customers with their digital transformation by freeing up primary storage, modernizing legacy applications, and accelerating cloud-native application development. It provides one object storage for all data.
- › **Hadoop Distributed File Systems (HDFS).** ECS allows archived data to be accessed on-demand by various applications. ECS supports accessing data lakes via the protocol defined by the Hadoop Distributed File Systems (HDFS).
- › **Regulatory factors.** ECS allows organizations to choose the physical location of their data to eliminate residency and compliance risks. A common regulatory or legal factor is the geographical hosting location of data.

## Flexibility

The value of flexibility is clearly unique to each customer, and the measure of its value varies from organization to organization. There are scenarios in which a customer might choose to implement Dell EMC's ECS solution and later realize additional uses and business opportunities. There are two future flexibility options that the *Organization* is considering:

Flexibility, as defined by TEI, represents an investment in additional capacity or capability that could be turned into business benefit for a future additional investment. This provides an organization with the "right" or the ability to engage in future initiatives but not the obligation to do so.

- › **Future use cases for ECS.** When additional ECS use cases are identified that will generate unstructured content, it's easy to add to existing ECS appliances. The burden of building the ECS environment, going through procurement process, and getting the operational expertise in place is a sunk cost. The next application use cases require minimal additional investment.
- › **Faster time-to-market.** ECS can be scaled quickly for multiple use cases. Future application use cases require minimal additional investment and are delivered faster (faster time-to-market).

Flexibility would also be quantified when evaluated as part of a specific project (described in more detail in Appendix A).

## Total Costs

REF.	COST	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Etr	Labor to deploy and maintain Dell EMC ECS	\$24,230	\$18,000	\$18,000	\$18,000	\$78,230	\$68,994
Ftr	Dell EMC ECS fees	\$331,367	\$0	\$504,168	\$0	\$835,535	\$748,035
	<b>Total costs (risk-adjusted)</b>	<b>\$355,597</b>	<b>\$18,000</b>	<b>\$522,168</b>	<b>\$18,000</b>	<b>\$913,765</b>	<b>\$817,029</b>

### Labor To Deploy And Maintain Dell EMC ECS

This cost includes the labor to perform technical development, preplanning, implementation, and supporting and maintaining the Dell EMC ECS solution:

- › **Implementation costs.** The following time, effort, and tasks went into planning the implementation. A Microsoft Windows Server senior administrator and storage administrator spent seven man-weeks of time to gain an understanding of the ECS platform; to document several change control forms and access forms; to traverse from one network to another (which required changing firewall rules across all the networks); and to learn how to migrate data from the legacy storage to ECS, test the migration, and finetune any issues.
- › **Ongoing maintenance — labor.** The *Organization's* technical staff spends an average of 4 hours per week maintaining the ECS.

**Modeling and assumptions.** Implementation labor included seven man-weeks at a cost of \$20,192 (at a fully loaded cost of \$150,000 per technical FTE). Ongoing maintenance is \$15,000 annually (\$72.12 per hour) in each of the three years of our analysis.

**Risks.** Forrester risk-adjusted the implementation and ongoing maintenance costs downward by 20% to reflect the variability of experience held by technologists doing the migration.

The table above shows the total of all costs across the areas listed below, as well as present values (PVs) discounted at 10%. Over three years, the *Organization* expects risk-adjusted total costs to be a PV of \$817,029.

Implementation risk is the risk that a proposed investment may deviate from the original or expected requirements, resulting in higher costs than anticipated. The greater the uncertainty, the wider the potential range of outcomes for cost estimates.

### Labor To Deploy And Maintain Dell EMC ECS: Calculation Table

REF.	METRIC	CALC./SOURCE	INITIAL	YEAR 1	YEAR 2	YEAR 3
E1	Deployment costs	Interviews	\$20,192	\$0	\$0	\$0
E2	Ongoing maintenance — labor	4 hours/week at \$72.12 per hour	\$0	\$15,000	\$15,000	\$15,000
Et	Labor to implement and maintain Dell EMC ECS	E1+E2	\$20,192	\$15,000	\$15,000	\$15,000
	Risk adjustment	+20%				
<b>Etr</b>	<b>Labor to deploy and maintain Dell EMC ECS (risk-adjusted)</b>	<b>Et+20%</b>	<b>\$24,230</b>	<b>\$18,000</b>	<b>\$18,000</b>	<b>\$18,000</b>

## Dell EMC ECS Fees

The *Organization* decided to invest in an in-house cloud with configured, tested and supported ECS appliances that can scale across multiple sites.

Dell EMC charges each customer a price per terabyte over a three-year term based on volumes of terabytes. This fee includes maintenance, software, hardware, and professional services.

For the *Organization* the initial configuration includes five nodes with 10 drives per node. Each of the three appliances have 400 TB (raw) with a total of 1,200 TB (raw). The configuration includes use of customer-supplied racks and external 10 Gigabit Ethernet (GbE) switches.

In Year 2, the *Organization* decided to upgrade and expand to 30 drives per node. Each appliance now has 1,200 TB (raw) for a total of 3,600 TB. In addition, the *Organization* has invested in an additional 100 drives for a total of 800 TB (raw).

**Modeling and assumptions.** The fees in the table below are provided by Dell EMC and confirmed by interviewed customers.

**Risks.** Forrester did not risk-adjust the Dell EMC ECS fees, which were actual price quotes from Dell EMC.



**7 month payback**  
Time to recover the  
initial investment in  
Dell EMC ECS

**Dell EMC ECS Fees: Calculation Table**

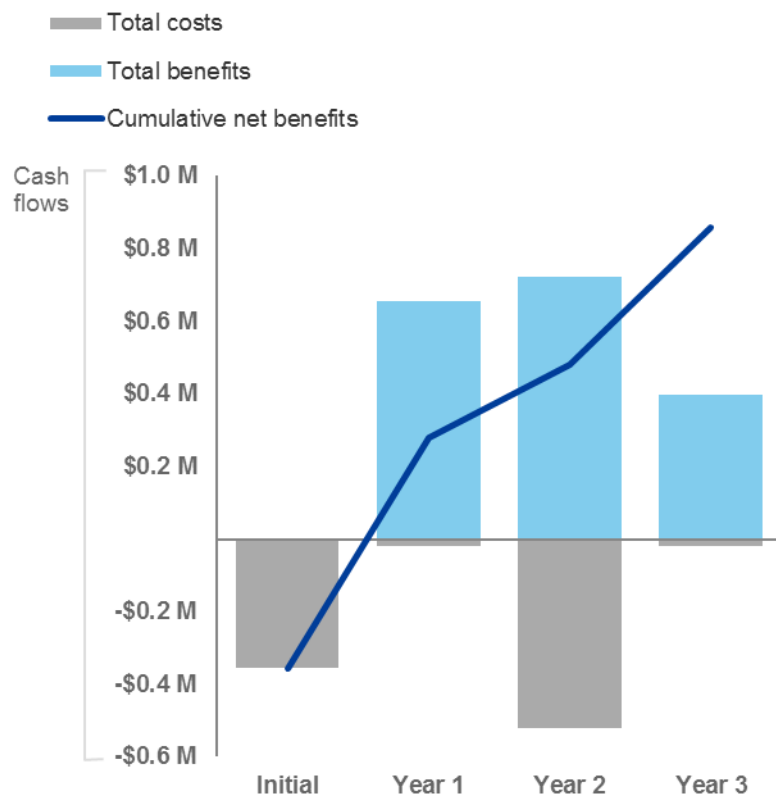
REF.	METRIC	CALC./SOURCE	INITIAL	YEAR 1	YEAR 2	YEAR 3
F1	ECS hardware and software	Dell EMC	\$222,885	\$0	\$366,900	\$0
F2	Maintenance — hardware and software (36 months)	Dell EMC	\$66,866	\$0	\$132,084	\$0
F3	Dell EMC professional services	Dell EMC	\$41,616	\$0	\$5,184	\$0
Ft	Dell EMC ECS fees	F1+F2+F3	\$331,367	\$0	\$504,168	\$0
	Risk adjustment	0%				
<b>Ftr</b>	<b>Dell EMC ECS fees (risk-adjusted)</b>	<b>Ft+0%</b>	<b>\$331,367</b>	<b>\$0</b>	<b>\$504,168</b>	<b>\$0</b>



# Financial Summary

## CONSOLIDATED THREE-YEAR RISK-ADJUSTED METRICS

### Cash Flow Chart (Risk-Adjusted)



The financial results calculated in the Benefits and Costs sections can be used to determine the ROI, NPV, and payback period for the composite *Organization's* investment. Forrester assumes a yearly discount rate of 10% for this analysis.



These risk-adjusted ROI, NPV, and payback period values are determined by applying risk-adjustment factors to the unadjusted results in each Benefit and Cost section.

### Cash Flow Table (Risk-Adjusted)

	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Total costs	(\$355,597)	(\$18,000)	(\$522,168)	(\$18,000)	(\$913,765)	<b>(\$817,029)</b>
Total benefits	\$0	\$654,288	\$720,968	\$397,089	\$1,772,345	<b>\$1,488,988</b>
Net benefits	(\$355,597)	\$636,288	\$198,800	\$379,089	\$858,580	<b>\$671,959</b>
ROI						<b>82%</b>
Payback period						<b>7 months</b>

If risk-adjusted costs, benefits, and ROI still demonstrate a compelling business case, it raises confidence that the investment is likely to succeed because the risks that threaten the project have been taken into consideration and quantified. Assuming normal success at mitigating risk, the risk-adjusted numbers should more closely reflect the expected outcome of the investment.

# Dell EMC Elastic Cloud Storage Solution

The following information is provided by Dell EMC. Forrester has not validated any claims and does not endorse Dell EMC or its offerings.

Dell EMC Elastic Cloud Storage (ECS) is a multipurpose, software-defined cloud-storage platform.

This third-generation object-based solution from Dell EMC delivers enterprise-class smart storage built for the next generation of applications and workloads.

## Why Elastic Cloud Storage?

Software-defined object storage designed for both traditional and next-generation workloads with unmatched scalability, flexibility, and resiliency.

**Scalable:** Scale infinitely for both small and large files with strong global consistency.

**Flexible:** Deploy ECS on your terms as an appliance, software-only, or the cloud managed by Dell EMC.

**Enterprise-ready:** Get enterprise-class object, file, and HDFS storage in a secure and compliant system.

**Cost-effective:** Enjoy public cloud capabilities with lower total cost of ownership (TCO), reduced storage overhead, and small data center footprint.

**Intelligent:** Enable real-time data ingestion and analytics with a simplified cloud storage architecture.

## Flexibility

Deploy ECS on your terms — as a turnkey storage appliance, as a software-only solution designed to run on industry-standard hardware, through public cloud solutions via Virtustream, or as a Dell EMC-hosted ECS-as-a-Service.

**Appliance:** Bring the cloud home with a fully configured, tested, and supported ECS Appliance that can scale to Exabyte across multiple sites.

**Software:** Deploy Elastic Cloud Storage on existing industry-standard hardware, as software only with no starting point to entry.

**Cloud:** Enjoy all the cloud storage benefits while maintaining on-premises control with ECS Dedicated Cloud (ECS DC) Service.

## ECS Solutions By Use Case and Industry

ECS brings all the benefits of a public cloud to your own data center while keeping your cost under control. It can be used for a wide variety of workloads such as deep archive, geo-protection of Hadoop, internet of things, and many more.

- › Geo-protected archive
- › Big data analytics
- › Internet of things
- › Object storage
- › Storage for next-generation applications
- › Service providers
- › Healthcare and life sciences
- › Media and entertainment
- › Surveillance

# Appendix A: Total Economic Impact

Total Economic Impact is a methodology developed by Forrester Research that enhances a company's technology decision-making processes and assists vendors in communicating the value proposition of their products and services to clients. The TEI methodology helps companies demonstrate, justify, and realize the tangible value of IT initiatives to both senior management and other key business stakeholders.

## Total Economic Impact Approach



**Benefits** represent the value delivered to the business by the product. The TEI methodology places equal weight on the measure of benefits and the measure of costs, allowing for a full examination of the effect of the technology on the entire organization.



**Costs** consider all expenses necessary to deliver the proposed value, or benefits, of the product. The cost category within TEI captures incremental costs over the existing environment for ongoing costs associated with the solution.



**Flexibility** represents the strategic value that can be obtained for some future additional investment building on top of the initial investment already made. Having the ability to capture that benefit has a PV that can be estimated.



**Risks** measure the uncertainty of benefit and cost estimates given: 1) the likelihood that estimates will meet original projections and 2) the likelihood that estimates will be tracked over time. TEI risk factors are based on "triangular distribution."

The initial investment column contains costs incurred at "time 0" or at the beginning of Year 1 that are not discounted. All other cash flows are discounted using the discount rate at the end of the year. PV calculations are calculated for each total cost and benefit estimate. NPV calculations in the summary tables are the sum of the initial investment and the discounted cash flows in each year. Sums and present value calculations of the Total Benefits, Total Costs, and Cash Flow tables may not exactly add up, as some rounding may occur.



### PRESENT VALUE (PV)

The present or current value of (discounted) cost and benefit estimates given at an interest rate (the discount rate). The PV of costs and benefits feed into the total NPV of cash flows.



### NET PRESENT VALUE (NPV)

The present or current value of (discounted) future net cash flows given an interest rate (the discount rate). A positive project NPV normally indicates that the investment should be made, unless other projects have higher NPVs.



### RETURN ON INVESTMENT (ROI)

A project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits less costs) by costs.



### DISCOUNT RATE

The interest rate used in cash flow analysis to take into account the time value of money. Organizations typically use discount rates between 8% and 16%.



### PAYBACK PERIOD

The breakeven point for an investment. This is the point in time at which net benefits (benefits minus costs) equal initial investment or cost.