

A Forrester Total Economic Impact™ Study Prepared For Acme Packet

The Total Economic Impact Of Acme Packet's Session Border Controller

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FORRESTER

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TABLE OF CONTENTS

Executive Summary.....	2
Acme Packet's Session Border Controller Improves Security, Interoperability, And Reliability For Voice And Video Communications.....	2
Factors Affecting Benefits And Costs.....	5
Disclosures.....	6
TEI Framework And Methodology	7
Analysis.....	9
Interview Highlights.....	9
Costs.....	11
Benefits	15
Flexibility	25
Risk	26
Financial Summary.....	29
Acme Packet Enterprise Session Director: Overview	30
Appendix A: Composite Organization Description	31
Appendix B: Total Economic Impact™ Overview	32
Appendix C: Glossary.....	33
Appendix D: Endnotes.....	34

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Executive Summary

In June 2012, Acme Packet commissioned Forrester Consulting to examine the total economic impact and potential return on investment (ROI) enterprises may realize by deploying Acme Packet's Net-Net Enterprise Session Director (Net-Net ESD), an enterprise session border controller (SBC). The Net-Net ESD provides critical control functions that enable enterprises to deliver real-time communications across IP networks. The purpose of this study is to provide readers with a framework they can use to evaluate the potential financial impact of the Net-Net ESD on their organizations. The study presents the costs, benefits, risks and future options realized by "Rock Financial," a hypothetical 12,000-person multinational financial services firm that is a composite of six Acme Packet customers Forrester interviewed for the purposes of this study.

Acme Packet's Session Border Controller Improves Security, Interoperability, And Reliability For Voice And Video Communications

Our interviews with six existing Acme Packet customers and subsequent financial analysis found that organizations like the composite organization featured in this study can expect to experience the risk-adjusted ROI, costs, and benefits shown in Table 1. See Appendix A for a description of Rock Financial, the composite organization profiled in this study.

Table 1

Composite Organization Three-Year Risk-Adjusted ROI¹

ROI	Payback period (months)	Total benefits (PV)	Total costs (PV)	Net present value
401%	3.0	\$1,989,302	(\$397,227)	\$1,592,074

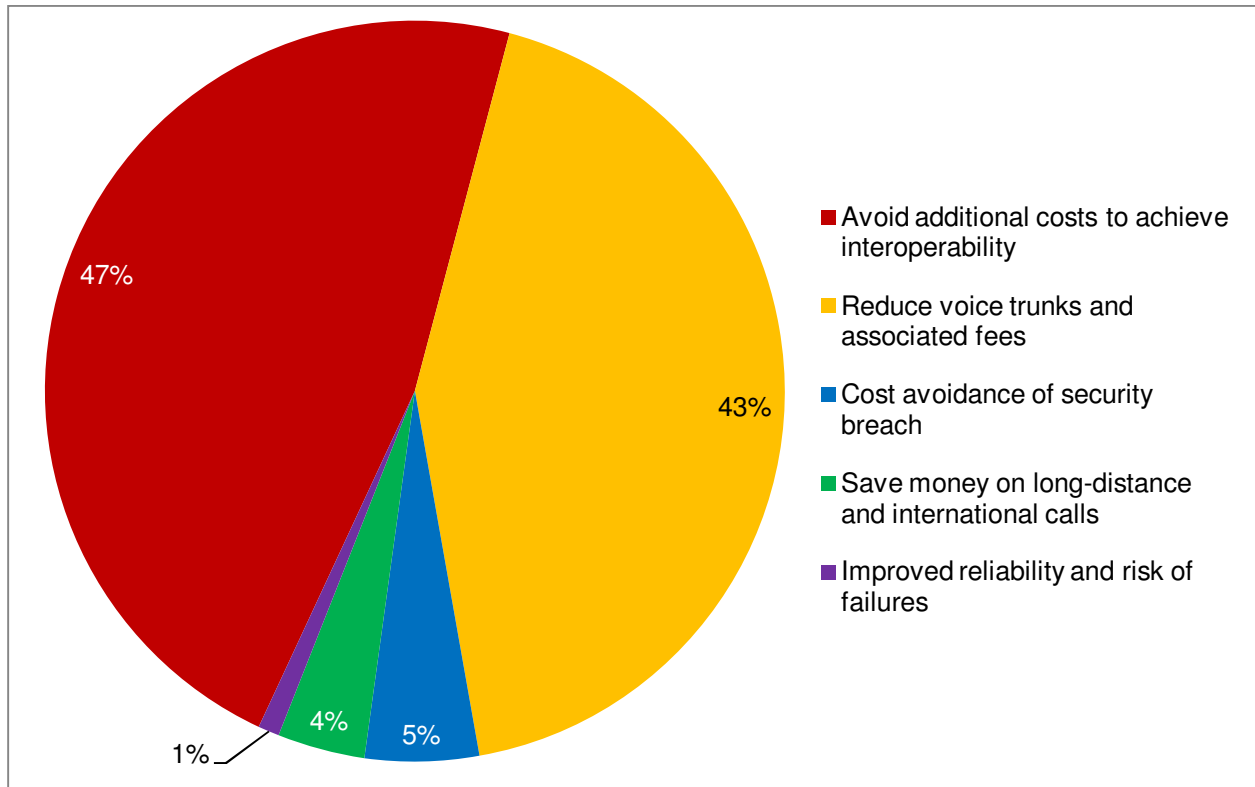
Source: Forrester Research, Inc.

- **Benefits.** Acme Packet customers and other organizations like Rock Financial, the composite organization, experienced several substantial benefits from implementing Net-Net ESD, in addition to the benefits typically associated with SIP trunking and IP telephony. Among these, the following benefits represent the most significant benefits experienced by Rock Financial. Forrester believes that organizations considering implementing Acme Packet enterprise session border controllers can expect to experience these same benefits:
 - **Avoid additional costs to achieve interoperability.** Net-Net ESD's extensive interoperability feature set (SIP header manipulation, protocol interworking, transcoding, NAT traversal, and other features) allows organizations to quickly connect a multivendor VoIP network to a service provider SIP trunk service. Customers like Rock Financial can be assured of their ability to connect a variety of existing IP communications systems to their selected SIP trunking service provider and therefore can save IT time and resources typically associated with equipment upgrades and integration. Forrester's research and customer interviews indicate savings more than \$1 million.

- **Reduce voice trunks and associated fees.** Customers implementing Net-Net ESD are also likely to see a 40% to 60% reduction in monthly service fees by replacing costly, underutilized T1/E1 TDM line services with lower cost and more efficient SIP trunks. Extensive discussions with Net-Net ESD customers suggest that the composite organization would save a total \$546,000 annually as a result.
- **Cost avoidance of security breaches.** Acme Packet's Net-Net ESD bolsters network privacy and protection against network security attacks, which can result in cost avoidance of repairing and remediating systems and operations affected by a security breach across the network. Forrester conservatively estimates this to be worth \$70,000 per year. In addition to these costs, there are also highly variable costs associated with loss of revenue, loss of employee productivity, costs due to telephony fraud, regulatory fines and legal fees, and loss of reputation resulting in possible stock plummets and customer losses. Because of the high degree of variability in quantifying these potential costs, which could range in the millions of dollars, Forrester has not included these losses in the benefits or ROI calculations but has provided a separate estimate shown in Figure 2.
- **Save on long-distance and international calls.** Net-Net ESD allows customers to route long-distance and international calls over their private IP network and eliminate tolls and take back and transfer fees. Based on discussions with customers, Forrester conservatively estimates that a company like Rock Financial can expect to save \$45,000 per year.
- **High reliability.** Net-Net ESD guarantees 99.999% reliability and service assurance for VoIP. It provides nearly an hour more of uptime and availability per year than other SBCs. The feedback from all six case studies indicated a high level of client satisfaction with the Net-Net ESD's reliability. The productivity gain for Rock Financial's 1,200 call center agents is worth \$12,311 per year. Rock Financial also avoids lost opportunities, damage to brand, and hits to customer satisfaction, which are likely more significant benefits but are more difficult to quantify.
- **Other benefits.** Customers like Rock Financial can also expect additional benefits not quantified in this study, including those related to:
 - Net-Net ESD's quality of service-based routing features ensures high-quality sessions and calls.
 - Net-Net ESD's session management feature enables automatic dial plan management.
 - Net-Net ESD's ability to scale and grow with the needs of the business.

Figure 1

Total Three-Year Risk-Adjusted Benefits

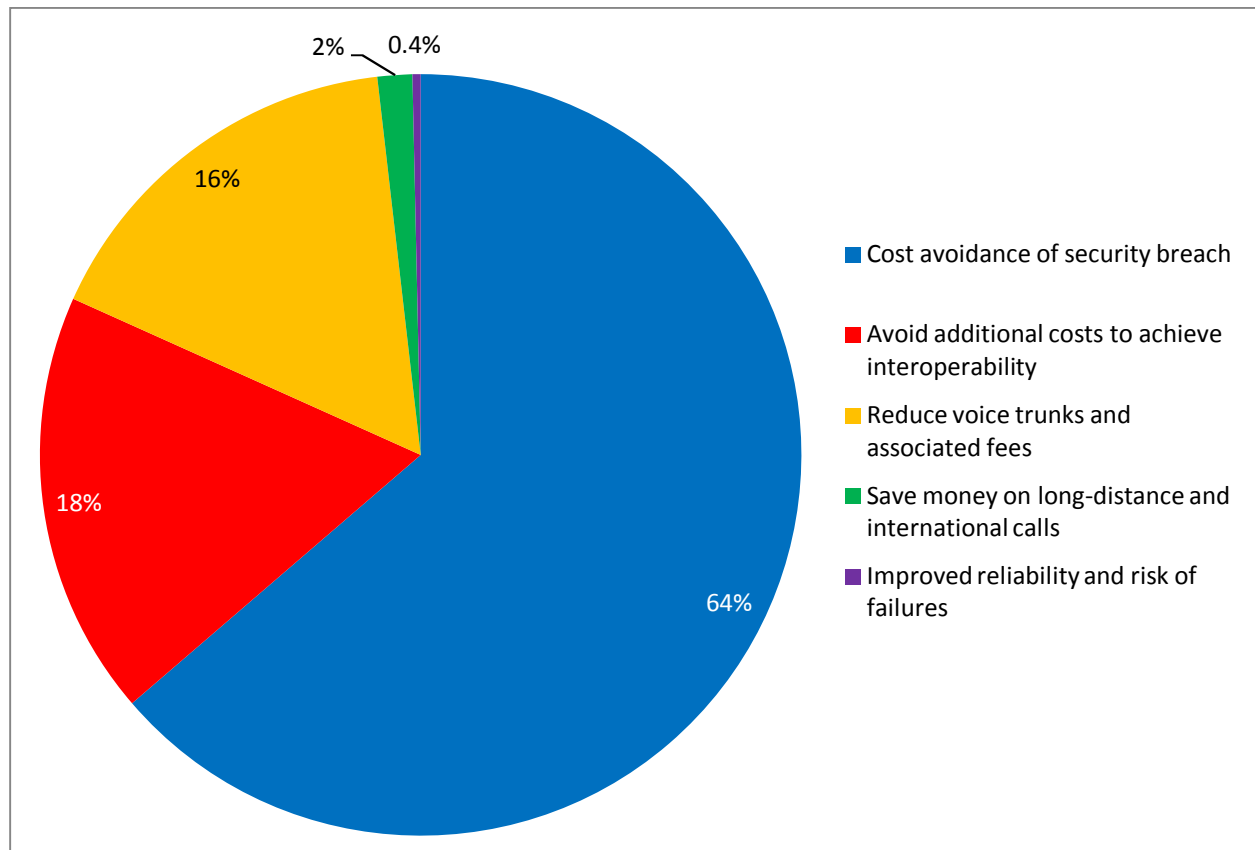


Source: Forrester Research, Inc.

If the additional potential costs of a single security breach were to be included in the total three-year benefits, then, as indicated in Figure 2 below, the cost avoidance of security breach would make up a significantly larger proportion of the overall benefits of Net-Net ESD.²

Figure 2

Total Three-Year Benefits Including Potential Additional Costs Of A Security Breach



Source: Forrester Research, Inc.

- **Costs.** Forrester learned that the key cost components are the Net-Net ESD hardware, Net-Net ESD license fees and support plan, implementation costs, internal administration and support costs, and professional services and training costs. The total PV of the risk-adjusted costs for the three-year period of analysis amounts to \$397,227.

Factors Affecting Benefits And Costs

Table 1 illustrates the risk-adjusted financial results that were achieved by the composite organization. The risk-adjusted values take into account any potential uncertainty or variance that exists in estimating the costs and benefits, which produces more conservative estimates. The following factors may affect the financial results that an organization may experience:

- **Cost and quantity of digital trunk lines.** The cost savings and efficiency gains associated with switching from digital T1/E1 TDM trunk lines to SIP trunks and consolidating trunks into central locations factor into the business case for session border controllers. Organizations with a greater number of underutilized T1/E1 trunk

lines to be converted will see more overall savings than an organization with fewer fully utilized T1/E1 trunk lines. The price differential between T1/E1 and SIP trunk services may also vary. Organizations that consolidate a large number of locally administered PBXes in a central data center and retire TDM gateways can also realize more savings than those that retain all PBXes and gateways.

- **Prevailing long-distance and international calling rates.** Net-Net ESD allows organizations to route long-distance and international calls over their internal IP network and eliminate any tolls or charges associated with these calls. Organizations where the prevailing rates associated with such calls are generally very high are likely to experience greater cost savings from routing calls over their internal WAN than those organizations being charged more modest rates.
- **Degree of network heterogeneity.** Net-Net ESD includes features that resolve interoperability issues common in heterogeneous premises-based communications systems and SIP trunk services that include disparate access technologies, signaling protocols, endpoints, media, and encoding. Customers with more heterogeneous environments and multivendor network strategies will then benefit from Acme Packet's session border controller more than those customers with more homogenous networks.
- **Need for security.** Voice and data security is a top concern for banks, investment firms, mortgage brokers, and other financial institutions not only because they face greater regulation in this regard, but also because they present greater targets due to the vast amounts of sensitive financial and customer information that flows across their networks and how frequently this information must be made accessible to its employees and even customers. Organizations that regularly deal with sensitive information, regardless of the industry they operate within, are more likely to be targets of threats to gain unauthorized access to this sensitive information. As a result, they are likely to benefit more than those organizations that would be less affected from information theft.

Disclosures

The reader should be aware of the following:

- The study is commissioned by Acme Packet and delivered by the Forrester Consulting group.
- Forrester makes no assumptions as to the potential return on investment that other organizations will receive. Forrester strongly advises that readers should use their own estimates within the framework provided in the report to determine the appropriateness of an investment in Acme Packet Net-Net Enterprise Session Director.
- Acme Packet 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.
- The customer names for the interviews were provided by Acme Packet.

TEI Framework And Methodology

Introduction

From the information provided in the interviews, Forrester has constructed a Total Economic Impact™ framework for those organizations considering implementing Acme Packet Net-Net Enterprise Session Director (ESD), an enterprise session border controller. The objective of the framework is to identify the cost, benefit, flexibility, and risk factors that affect the investment decision.

Approach and Methodology

Forrester took a multistep approach to evaluate the impact that Net-Net ESD can have on an organization (see Figure 3). Specifically, we:

- Interviewed Acme Packet marketing/sales/services personnel and Forrester analysts to gather data relative to Net-

Given the increasing sophistication that enterprises have regarding ROI analyses related to IT investments, Forrester's TEI methodology serves the purpose of providing a complete picture of the total economic impact of purchase decisions. Please see Appendix B for additional information on the TEI methodology.

Analysis

Interview Highlights

A total of six interviews were conducted for this study, involving representatives from the following companies in various stages of transitioning to voice over IP (VoIP):

1. A Fortune 500 American medical insurance company that provides health insurance, wellness and care management programs, financial services, information technology solutions, and pharmacy benefit management (PBM) services. The company serves more than 35 million people throughout North America who are served by more than 25,000 call center agents and nearly 75,000 full-time employees working from the company's multiple office centers.
2. One of the world's largest semiconductor manufacturers that also makes logic chips, microprocessors, microcontrollers, display components, and calculators. The company employs approximately 35,000 people in more than 100 offices around the world.
3. One of the US' five largest banks that provides consumer and commercial loans, deposits, and credit cards as well as merchant processing, mortgage banking, trust and investment management, brokerage services, insurance, and corporate payments. The company operates more than 3,000 banking offices and 5,000 ATMs across 25 states, and 60,000 employees.
4. A leading American insurer that provides insurance services for life, health, and injury as well as retirement savings products to more than 18 million members. The company employs more than 30,000 people and 6,000 contact center agents based in 50 to 60 centers around the US.
5. A major Chinese financial services company that provides life, property, health, and annuity insurance as well as banking and investment services and employs approximately 100,000 people across nearly 500 locations throughout China.
6. A large privately held construction company in Russia providing construction, overhaul, and reconstruction of oil and gas field surface facilities; transport facilities for oil, petroleum products, gas, and gas condensate; compressor stations; roads; and industrial and civil engineering facilities. The company is also in other businesses such as facility logistics support and the production of construction materials and equipment. The company employs nearly 45,000 people.

The six interviews uncovered several important insights:

- Each of the customers that Forrester interviewed was in various stages of VoIP implementation. Because of complexities involved in scaling VoIP for their business operations, and the importance of providing world-class telephony while reducing IT costs, these customers took a multiyear phased and measured approach to the transition from traditional public switched telephone network (PSTN)-based communications.
- All of the customers interviewed reported that the main driver for transitioning to VoIP and associated session initiation protocol (SIP) trunks was to reduce the monthly telephony service costs while maintaining the same

quality of service their various businesses depend on with traditional phone lines. This includes maintenance of all of the usual phone system options (voicemail, transfers, call groups, etc.).

- Customers stressed the need to preserve the high degree of reliability associated with the PSTN and avoid downtime, which can afflict SIP-based environments. Nearly all of these customers Forrester interviewed are in service industries, and reliably staying in touch with clients is an important part of daily business. A fail-safe phone system is an important part of establishing the trust necessary for customers.
- Maintaining the highest levels of network security was another area of utmost concern for the interviewees. There was near universal recognition among all of the customers Forrester interviewed of the risks of being susceptible to potential external threats such as denial-of-service and fraud attacks, session hijacking, eavesdropping, and man-in-the-middle attacks with the adoption of IP-based telephony. These organizations expressed concerns about conducting sensitive business over unmanaged and open SIP trunks and IP networks, given the highly confidential and regulated nature of their businesses and recognized the need for a proven network-level solution that offers protection from such threats.

Composite Organization

Based on the interviews with the six existing customers provided by Acme Packet, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas financially affected. The composite organization that Forrester synthesized from these results represents a 12,000-person multinational financial services firm that implemented Net-Net ESD, Acme Packet's enterprise session border controller (SBC), to control and manage session traffic as part of its transition to IP telephony. For the purposes of this study, this composite organization will be referred to as "Rock Financial." (See Appendix A for a detailed description of the composite organization.)

Framework Assumptions

Table 2 provides the model assumptions that Forrester used in this analysis.

Table 2

The discount rate used in the PV and NPV calculations is 10% and time horizon used for the financial modeling is 3 years. Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult with their respective company's finance department to determine the most appropriate discount rate to use within their own organizations.

Costs

The key cost categories associated with the Net-Net ESD are: 1) contracted price for hardware software and support; 2) internal implementation and testing; 3) Acme Packet professional services; 4) Net-Net ESD training; and 5) ongoing administration and support costs. The project is measured on a three-year basis. The following are the cost inputs to the financial analysis.

Contracted Price For Hardware, Software, And Support

While the requirements for Net-Net ESD depend on the size and scope of the installation, each implementation typically has an Acme Packet SBC, the Net-Net OS software, and an annual support plan. For an organization like Rock Financial, Acme Packet has provided a quote that includes two Net-Net ESD-3820 SBCs enabled for high-availability configuration and up to 4,000 sessions. Based on current list prices, the total upfront contracted price for hardware software and support is \$243,685 and \$29,232 for each subsequent year covered under the support plan.

Professional Services Costs

Each of the customers that Forrester interviewed relied on Acme Packet professional services teams during the implementation. Forrester believes that Rock Financial will similarly engage professional services consultants from Acme Packet for approximately 4 days on hardware installation, software configuration, and other implementation activities. Using data supplied by Acme Packet, Forrester calculates the total professional service costs to be \$7,400, which includes an estimated \$1,400 travel and lodging allowance for a single Acme Packet consultant.

Table 3

Professional Services Costs

Ref.	Metric	Initial	Year 1	Year 2	Year 3	Total
D1	Number of days	4				
D2	Cost per day	\$1,500				
D3	Estimated travel and lodging costs for one consultant	\$1,400				
Dt	Professional services costs	\$7,400	\$0	\$0	\$0	
	Spread	100%	0%	0%	0%	
Dto	Total (original)	(\$7,400)	\$0	\$0	\$0	(\$7,400)

Source: Forrester Research, Inc.

Internal Implementation And Testing Costs

Acme Packet customers mentioned that they allocated internal resources for the duration of the implementation of Net-Net ESD on internal setup, network integration, administration, and testing activities. The implementation time varied greatly depending on the scale and scope of the implementation and complexity of the existing network, but generally lasted approximately 60 days. Based on findings gathered from the interviews, Forrester estimates that Rock Financial to allocate two full-time equivalents (FTEs) for 60 days. Using a fully loaded compensation rate of \$100,000 per year or \$48 per hour per FTE, the internal implementation costs total \$46,154.

Table 4
Internal Implementation And Testing Costs

Ref.	Metric	Initial	Year 1	Year 2	Year 3	Total
E1	Number of FTEs involved	2				
E2	Implementation time (days)	60				
E3	Average fully loaded hourly salary	\$48.08				
Et	Internal implementation and testing costs	\$46,154	\$0	\$0	\$0	
	Spread	100%	0%	0%	0%	
Eto	Total (original)	(\$46,154)	\$0	\$0	\$0	(\$46,154)

Source: Forrester Research, Inc.

Net-Net ESD Training Costs

Findings from Forrester's interviews also indicate the importance of IT training on the use and administration of Net-Net ESD. Like the customers that Forrester spoke with, Forrester believes that Rock Financial will also engage Acme Packet to train its IT team and leverage its expertise in session border controllers and IP telephony. Acme Packet offers web-based training at no cost for customers and a hands-on training course at its regional offices at \$2,500. Taking into account average travel and lodging costs and using fully loaded salary rates to factor in productivity lost, Forrester suggests Rock Financial should budget \$11,923 to send one FTE for a 5-day hands-on training course.

Table 5

Net-Net ESD Training Costs

Ref.	Metric	Calculation	Initial	Year 1	Year 2	Year 3	Total
F1	Cost of hands-on training		\$2,500				
F2	Number of FTEs attending		1				
F3	Number of days of training		5				
F4	Average travel and lodging costs per person		\$1,500				
F5	Average fully loaded hourly salary		\$48.08				
Ft	Net-Net ESD training costs		\$11,923	\$0	\$0	\$0	
Fto	Total (original)		(\$11,923)	\$0	\$0	\$0	(\$11,923)

Source: Forrester Research, Inc.

Ongoing Administration Costs

Forrester believes that Rock Financial will allocate a single network engineer at an annual salary of \$100,000 for 10 hours per month dedicated to regular administration and maintenance activities associated solely with Net-Net ESD (e.g., apply software patches). This engineer will ensure interoperability and continuous uptime.

Table 6

Ongoing Administration Costs

Ref.	Metric	Initial	Year 1	Year 2	Year 3	Total
G1	FTEs	1	1	1	1	
G2	Hours per month	10	10	10	10	
G3	Average fully loaded hourly salary	\$48.08	\$48.08	\$48.08	\$48.08	
Gt	Ongoing administration costs	\$5,769	\$5,769	\$5,769	\$5,769	
Gto	Total (original)	\$0	(\$5,769)	(\$5,769)	(\$5,769)	(\$17,308)

Source: Forrester Research, Inc.

Total Costs

Table 7 summarizes the costs Rock Financial would be presented with upon implementing Net-Net ESD over a three-year time frame.

Table 7

Total Costs

Ref.	Cost category	Initial	Year 1	Year 2	Year 3	Total	Present value
Ato	Contracted cost for hardware software and support	(\$243,685)	(\$29,232)	(\$29,232)	(\$29,232)	(\$331,381)	(\$316,381)
Dto	Professional services costs	(\$7,400)	\$0	\$0	\$0	(\$7,400)	(\$7,400)
Eto	Internal implementation and testing costs	(\$46,154)	\$0	\$0	\$0	(\$46,154)	(\$46,154)
Fto	Net-Net ESD training costs	(\$11,923)	\$0	\$0	\$0	(\$11,923)	(\$11,923)
Gto	Ongoing administration costs	\$0	(\$5,769)	(\$5,769)	(\$5,769)	(\$17,308)	(\$14,347)
	Total costs (original)	(\$309,162)	(\$35,001)	(\$35,001)	(\$35,001)	(\$414,166)	(\$396,205)

Source: Forrester Research, Inc.

Benefits

The customers Forrester interviewed for this study collectively described a range of hard and soft benefits from implementing Net-Net ESD. The most important and significant benefits of Net-Net ESD for these customers were related to bolstering the inherent security, interoperability, and reliability of SIP trunking as well as managing the flow of sessions across the internal network. Many of the customers Forrester spoke to had fairly stringent requirements around security, reliability, and interoperability and selected Net-Net ESD only after comprehensive analysis and tests of these capabilities in comparison with competing session border controllers. Customers also suggested how they were able to implement unified communications and experience the direct cost savings of SIP trunking and PBX consolidation only after Net-Net ESD was able to satisfy their concerns over the relative lack of sufficient security, quality of service, reliability, and interoperability inherent with VoIP. Therefore, Net-Net ESD was considered a major boon for these customers. In the words of an actual interviewee, "Acme Packet delivers more than what it promises."

Each of the customers Forrester interviewed adopted Net-Net ESD in a phased approach throughout their organization and realized increasing magnitudes of benefits over time. Forrester believes that the adoption of Net-Net ESD across all locations at Rock Financial will occur in phases until full adoption is reached in the third year after the initial implementation. As such, the financial benefits occurring in years one and two have been discounted by 50% and 25%, respectively. Readers of this study should consider their own planned deployment schedules of Net-Net ESD and evaluate the following benefits accordingly.

Cost Avoidance Of A Security Breach

Several customers expressed the role of Net-Net ESD in ensuring the privacy of their network and protecting against DoS/DDoS attacks and overloads. In the words of one particular customer, "We carefully evaluated [several other competing SBCs] and Acme Packet clearly won the battle when it came to security."

However, more noteworthy is the cost avoidance of experiencing and addressing a security breach across the network. While there is a lot of variability in quantifying this potential cost, driven by the nature and susceptibility of attack and the type of data/systems compromised, Forrester conservatively estimates that organizations, including Rock Financial, would need to allocate two senior IT professionals for 110 billable hours correcting the problems associated with the network breach per year, totaling \$140,000. Even if Net-Net ESD reduces the potential risk associated with security breaches by just 50%, the potential financial benefit totals to \$70,000 per year.

Table 8

Cost Avoidance Of A Security Breach

Ref.	Metric	Year 1	Year 2	Year 3	Total
A1	Average remediation costs	\$140,000	\$140,000	\$140,000	
A2	Percent decrease in risk of exposure to security breach due to effective protection from AP's SBC	50%	50%	50%	
At	Cost avoidance of security breach	\$70,000	\$70,000	\$70,000	
	Spread	50%	75%	100%	
Ato	Total (original)	\$35,000	\$52,500	\$70,000	\$157,500

Source: Forrester Research, Inc.

As mentioned before, this estimate is highly variable and readers of this study should evaluate the actual benefit their organization is likely to experience from the cost avoidance of recovering from a security breach. While Forrester has tried to remain conservative in its estimation of the cost to address a security breach, other industry sources estimate the average annual cost for an organization like Rock Financial to be \$415,748 with an average time to resolve a cyberattack of 18 days.³

However, even this higher estimate of \$415,748 doesn't take into account the potential impact a serious security breach could have on company revenues, loss of business, loss of employee productivity, costs due to telephony fraud, regulatory fines and legal fees, loss in stock value, and damage to company reputation, particularly for a financial services firm like Rock Financial. According to a Ponemon Institute report on the cost of cybercrime, the average cost of a data security breach is \$6.6 million.⁴ The average total cost per company ranged from more than \$613,000 per breach to nearly \$32 million. The report determined that the average cost of lost business due to a security breach is \$4.6 million. While none of the customers interviewed for this study experienced such security breaches in part because

of their investment in Acme Packet's Net-Net ESD, Forrester nevertheless believes that the potential domino effect of a security breach is an important factor that readers of this study should consider when evaluating the benefits of Net-Net ESD.

Forrester recommends that end users go through a comprehensive estimation process when calculating the cost of downtime due to a serious security breach, a complex exercise for most organizations. For a comprehensive assessment of the cost avoidance of a security breach, Forrester recommends customers determine the following for each business process:

- 1) revenue losses,
- 2) impact on cash flow,
- 3) productivity losses,
- 4) compliance and/or reporting losses,
- 5) penalties and loss of discounts,
- 6) impact on customers and strategic partners,
- 7) employee morale and employee confidence in IT, and
- 8) damage to reputation and goodwill.

For the purposes of this study, Forrester has developed a sample impact scenario of a serious security breach at Rock Financial. The risk identified for this scenario is a DDoS attack in the form of a flood of invalid VoIP registration requests, resulting in companywide service disruptions for 8 hours.

We assumed all 1,200 contact center employees at the company would be particularly affected by this 8-hour outage. To determine the financial impact of this, Forrester considers the productivity loss for all contact center employees, loss of business generated from 10% of the contact center employees who may normally be engaged in sales and business development activities, \$200,000 in possible customer service level fines and legal fees, and an estimated \$2 million from lost inbound sales opportunities and loss of potential new customers to competitors. For Rock Financial, the total approximate impact of a security breach could be more than \$4 million.

Table 9

Sample Impact Scenario Of A Security Breach

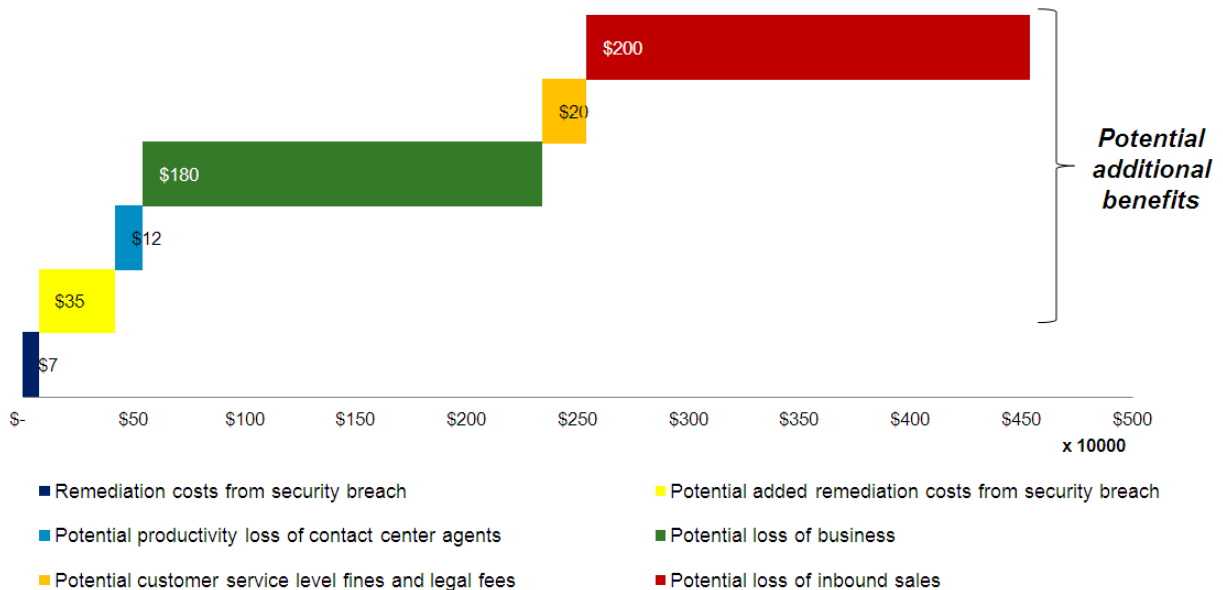
Ref.	Metric	Calculation	Estimate
G0	Potential added remediation costs		\$345,748
G1	Duration of outage		8
G2	Number of call center agents		1,200
G3	Hourly call center wage		\$13.00
G4	Percent of agents selling		10%
G5	Average daily deal value per agent		\$15,000
G6	Customer service fines and fees		\$200,000
G7	Lost inbound sales opportunities		\$2,000,000
Gt	Sample impact scenario of a security breach	$G0+(G1*G2*G3)$ $+(G2*G4*G5)$ $+G6+G7$	\$4,470,548

Source: Forrester Research, Inc.

Figure 4 below illustrates the magnitude of the impact scenario of a security breach for Rock Financial in relation to the cost estimate to just repair and remediate systems.

Figure 4

Sample Impact Scenario Of A Security Breach



Source: Forrester Research, Inc.

Avoid Additional Costs To Achieve Interoperability

Forrester interviewees also described Net-Net ESD to be vendor-neutral and able to resolve complex interoperability issues, including interoperability between their premises-based multivendor communications systems and between the premises and a service provider's SIP trunk service. Consequently, they were able to avoid expensive communication system upgrades and lengthy integration tests typically associated with competing SBCs. For Rock Financial, we estimate that the cost to upgrade three legacy H.323 PBXs to SIP capabilities was avoided, saving \$1 million.

In their evaluation tests and in comparison to other SBCs, Acme Packet customers deemed the solution "worked right out of the box" with their existing service providers and communications systems. The Acme Packet Net-Net ESD handles: mediating between different signaling, transport and encryption protocols, converting between incompatible codecs and translating signaling layer telephone numbers, addresses and response codes. Avoiding these expenses also would allow organizations to realize the benefits associated with the SBCs and SIP trunking more quickly since there would be no need for delays in the implementation necessary to address the interoperability concerns. For one of the customers, "This was a big decision criterion . . . if [we] went with another SBC, we would have had to do a lot more customization and development to integrate it into our network. It would not have been the turn-key solution that [Net-Net ESD] is for us and a lot more time, money, and resources would need to have been spent on development and testing."

All of the interviewees estimated needing to double the number of personnel needed for initial implementation by allocating an additional two IT FTEs for 60 days on building and testing the necessary solutions to offer the same level of interoperability that comes by default with Net-Net ESD. Additionally, interviewees described the need for ongoing

patching, upgrading, and regression testing, which according to Forrester's estimation would require one IT professional on a part-time basis. Forrester believes that Rock Financial and other customers will benefit not only from this cost avoidance, but also from not having to upgrade existing devices to ensure compatibility with the SBC and incur upgrade costs in excess of \$300,000. In total, Forrester estimates Rock Financial to save more than \$1 million.

Table 10

Cost Avoidance Of Interoperability

Ref.	Metric	Year 1	Year 2	Year 3	Total
B1	Number of IT FTEs involved	2.0	1.0	1.0	
B2	Number of days for IT build/test activities	60	0	0	
B3	Number of days per month for IT patching and upgrading	0	4	4	
B4	Hourly IT FTE rate	\$48.08	\$48.08	\$48.08	
B5	Average upgrade costs of legacy IP-PBX per site	\$348,000	\$0	\$0	
B6	Number of sites with legacy IP-PBXs	3	0	0	
Bt	Avoid additional costs to achieve interoperability	\$1,090,154	\$18,462	\$18,462	
	Spread	100%	100%	100%	
Bto	Total (original)	\$1,090,154	\$18,462	\$18,462	\$1,127,077

Source: Forrester Research, Inc.

High Reliability

Another benefit Net-Net ESD users described to Forrester was the PSTN-like reliability of their VoIP networks. Acme Packet's Net-Net ESD was judged to provide nearly 99.999% uptime and availability guarantees — better than other SBCs these users tested. In an effort to quantify this benefit for Rock Financial, Forrester estimated productivity loss due to the downtime its call center could experience with competing SBCs offering a lower SLA of 99.99% (“four nines”). Using a fully loaded call center hourly wage of \$13, Forrester believes Rock Financial's 1,200 call center agents would lose productivity for 47 minutes each year, totaling \$12,311. This does not include lost revenue opportunity and potential impact on customer satisfaction the downtime could have, which could be very significant for Rock Financial.

Table 11
High Reliability

Ref.	Metric	Year 1	Year 2	Year 3	Total
C1	Average annual downtime (min) with typical SBCs (four nines)	52.6	52.6	52.6	
C2	Average annual downtime (min) with Net-Net ESD (five nines)	5.3	5.3	5.3	
C3	Increased annual availability (min)	47.4	47.4	47.4	
C4	Increased annual availability (hours)	0.8	0.8	0.8	
C5	Number of call center agents	1,200	1,200	1,200	
C6	Hourly call center wage	\$13.00	\$13.00	\$13.00	
Ct	Improved reliability and risk of failures	\$12,311	\$12,311	\$12,311	
	Ramp	50%	75%	100%	
Cto	Total (original)	\$6,156	\$9,233	\$12,311	\$27,700

Source: Forrester Research, Inc.

Save On Long-Distance And International Calls

The interviews also uncovered that Net-Net ESD, through a feature referred to as “session routing,” allows customers to carry long-distance and international calls over their private IP network and eliminate tolls and take back and transfer fees. While many of the customers Forrester interviewed reported that the difference between TDM and SIP telephony services was nominal, the potential cost savings for other prospective customers could be quite high, depending on prevalent national and international PSTN toll and termination charges. For the purposes of this study, Forrester chose to be highly conservative in estimating the savings Rock Financial could experience with VoIP. Assuming only \$0.05 in average long-distance savings per call and \$0.03 in savings per call from take back and transfer fees, Forrester believes Rock Financial will save up to \$45,000 per year.

Table 12
Cost Savings Associated With Long-Distance And International Calls

Ref.	Metric	Year 1	Year 2	Year 3	Total
D1	Calls per month	75,000	75,000	75,000	
D2	Average long-distance savings per call	\$0.05	\$0.05	\$0.05	
D3	Monthly long-distance/int'l savings	\$3,750	\$3,750	\$3,750	
D4	Percent calls transferred	15%	15%	15%	
D5	Average "take back and transfer" fee	\$0.03	\$0.03	\$0.03	
Dt	Save money on long-distance and international calls	\$45,000	\$45,000	\$45,000	
	Ramp	50%	75%	100%	
Dto	Total (original)	\$22,500	\$33,750	\$45,000	\$101,250

Source: Forrester Research, Inc.

Reduce Voice Trunks And Associated Fees

Any SBC benefit analysis would not be complete without mentioning the cost savings associated with replacing costly, underutilized T1/E1 TDM line services with lower cost and more efficient SIP trunks. The 24 or 30 voice channels delivered by T1 and E1 trunks, respectively, are often underutilized and can be replaced by SIP trunks that are configurable with the number of channels required in each location. Each of the customers that Forrester interviewed reported a 40% to 60% reduction in monthly service fees upon replacing T1/E1 TDM trunk lines with SIP trunks. Forrester estimates that the composite organization would save approximately \$700 every month in service fees for each of the 65 T1/E1 TDM trunk lines replaced, totaling \$546,000 in annual savings once the transition is fully complete.

Table 13

Reduction In Voice Trunk Fees

Ref.	Metric	Year 1	Year 2	Year 3	Total
E1	Number of T1/E1 TDM Trunk PRI digital line services (24 channels per single T1 PRI)	65	65	65	
E2	Monthly savings from replacing each PRI with SIP	\$700	\$700	\$700	
Et	Reduce voice trunks and associated fees	\$546,000	\$546,000	\$546,000	
	Ramp	50%	75%	100%	
Eto	Total (original)	\$273,000	\$409,500	\$546,000	\$1,228,500

Source: Forrester Research, Inc.

While this benefit cannot fully be attributed to Net-Net ESD in particular, customers stressed that Net-Net ESD's security, interoperability, and reliability benefits satisfied the considerable concerns each company's IT and networking departments had about adopting VoIP technology and the increase in additional risks this technology presented to the business. Therefore, for each of the customers that Forrester interviewed, Net-Net ESD was considered a key enabler of SIP trunking.

Additional Benefits Not Quantified

In addition to the benefits described above, some customers that Forrester interviewed also reported other ancillary benefits. Because of the difficulty in accurately measuring and estimating the financial value of these benefits, Forrester decided not to quantify these benefits and to leave it to the reader to include in the final results if he or she so wishes:

- Net-Net ESD features quality-of-service-based routing to ensure high-quality sessions and calls, at least comparable to the PSTN. While none of the customers measured session quality in terms of jitter, latency, and packet loss, they did mention that call quality was very important for their business, especially to call center operations, and they concluded Net-Net ESD delivered voice quality of service (even with G.729 codec) that was adequate and met their standards.
- Some customers remarked that Net-Net ESD's session management feature made dial plan provisioning easier for them. They mentioned that administering employee moves, adds, and changes associated with office moves and highly mobile segments of the workforce were made easier with Net-Net ESD.
- Nearly all of the customers also reported that Net-Net ESD was highly scalable. Net-Net ESD provided these customers significant increases in bandwidth for signaling and media, which exceeded their needs in terms of concurrent sessions and number of calls per second. The interviewee with the largest scale of operations mentioned scalability was a big selection criterion and, after thorough testing of other SBCs, Net-Net ESD was the only solution that met their needs: "[Each of the other SBCs we tested] could not scale to where we are even right

now. We were running out of capacity . . . we were running out of routes. We were pushing the limit on every single platform that we had . . . we were so large and so big that those other SBC solutions were not going to meet our business needs long term.”

- Customers who must record calls spend a lot of money putting in place the infrastructure to capture calls from various trunk connections, PBXes, and ACDs. The Acme Packet Net-Net ESD features session replication using an IETF standard interface (SIPREC) that can help better manage the voice signaling and media streams so they are now recorded with less expensive infrastructure.
- Many call centers first process calls on IVRs to identify who callers are and what their intent is. In some cases, those transactions can be completed on the IVR, whereas in others they need to be transferred to an agent. The flexibility of Net-Net ESD allows for the first part of the call processed on the IVR to be handled with a higher bandwidth codec like G.711 to improve the accuracy of touchtone detection or speech recognition. Then, if a transfer to an agent is needed, the Net-Net ESD can change the codec to the lower bandwidth G.729 to save bandwidth. This mid-call codec renegotiation is attractive to large contact centers because of their large call volumes so the bandwidth savings add up.
- One interviewee also spoke about increases in available bandwidth as a result of Net-Net ESD's implementation. He mentioned that Net-Net ESD was able to provide enterprisewide bandwidth management across the network on a per session basis and therefore his organization was able to see a slight increase in available bandwidth. This would allow his organization to better take advantage of other forms of media like video and unified communications.

Total Benefits

Table 14 summarizes the benefits Rock Financial would be presented with upon implementing Net-Net ESD over a three-year time frame.

Table 14

Total Benefits

Ref.	Benefit category	Year 1	Year 2	Year 3	Total	Present value
Ato	Cost avoidance of security breach	\$35,000	\$52,500	\$70,000	\$157,500	\$127,799
Bto	Avoid additional costs to achieve interoperability	\$1,090,154	\$18,462	\$18,462	\$1,127,077	\$1,020,177
Cto	Improved reliability and risk of failures	\$6,156	\$9,233	\$12,311	\$27,700	\$22,476
Dto	Save money on long distance and international calls	\$22,500	\$33,750	\$45,000	\$101,250	\$82,156
Eto	Reduce voice trunks and associated fees	\$273,000	\$409,500	\$546,000	\$1,228,500	\$996,829
	Total benefits (original)	\$1,426,809	\$523,445	\$691,773	\$2,642,027	\$2,249,437

Source: Forrester Research, Inc.

Flexibility

Flexibility, as defined in Forrester's TEI methodology, is an investment in additional capacity or agility today that can be turned into future business benefits at some additional cost in the future. This provides an organization with the "right" or the ability to engage in future initiatives — but not the obligation to do so. There are multiple scenarios in which a customer might choose to adopt Net-Net ESD and later discover additional value that can be realized by further building on the existing platform and services in-house.

While customers interviewed for this study were unable to provide the data necessary for calculating the monetary value of flexibility options, Forrester believes that there are several such real options that can differ from one organization to another. Customers may decide, for example, to quickly expand IP telephony to any number of end users. Since Net-Net ESD makes it easy to increase the number of phone sessions at any time after initial implementation, an organization can quickly scale up its telephony network without the significant additional effort or cost associated with PSTN services. This provides the flexibility for an organization to grow and absorb acquisitions, for example.

SIP trunks make it easy for organizations to add or change services. For example, many organizations are realizing significant economies by accessing telephony conferencing services via SIP trunks instead of TDM services and using their private MPLS/IP networks to consolidate access from remote offices.

Additional examples of the flexibility benefits offered by Net-Net ESD include expansion of real-time communications to UC, videoconferencing and communications-enabled applications as well as reduction of siloed telephony environments. Organizations with multiple offices or locations often have separate individual networks with their own PBX, TDM gateway, and PSTN trunks. Organizations can see appreciable benefit from consolidating these siloed and

often redundant networks into a centralized corporate VoIP network, saving costs and resources from running duplicate equipment and incurring overhead.

Risk

Forrester defines two types of risk associated with this analysis: implementation risk and impact risk. "Implementation risk" is the risk that a proposed investment in Net-Net ESD may deviate from the original or expected requirements, resulting in higher costs than anticipated. "Impact risk" refers to the risk that the business or technology needs of the organization may not be met by the investment in Net-Net ESD, resulting in lower overall total benefits. The greater the uncertainty, the wider the potential range of outcomes for cost and benefit estimates.

Quantitatively capturing investment and impact risk by directly adjusting the financial estimates results in more meaningful and accurate estimates and a more accurate projection of the ROI. In general, risks affect costs by raising the original estimates, and they affect benefits by reducing the original estimates. The risk-adjusted numbers should be taken as "realistic" expectations since they represent the expected values considering risk.

The following implementation risks that affect costs are identified as part of this analysis:

- **Contracted cost for hardware software and support.** Forrester assumes this amount has been determined by contract, so no risk adjustment is applied.
- **Professional services costs.** The variability in the professional service costs lies in how long actual implementation will take. In certain cases where the existing network environment is highly heterogeneous and business operations involving telephony are more complex, implementation could take longer than estimated.
- **Internal implementation and testing costs.** Like the risks with professional services, the variability in the internal implementation and testing costs lies in how long implementation will take. In certain cases where the existing network environment is highly heterogeneous and business operations involving telephony are more complex, implementation could take longer than estimated.
- **Net-Net ESD training costs.** Net-Net ESD training costs could be higher for some customers whose IT networking staff members are more junior level and less familiar with SBCs and enterprise VoIP technologies or whose travel and lodging costs are higher than estimated in this analysis.
- **Ongoing administration costs.** Ongoing administration costs may be higher for some customers whose IT networking operations involve greater administrative support and oversight due to network complexity.

The following impact risks that affect benefits are identified as part of the analysis:

- **Cost avoidance of security breach.** The risk in realizing this benefit lies in the 50% decrease in risk of exposure to security break due to protection from Net-Net ESD. While the assumptions in the analysis are quite conservative, customers should consider how secure their existing networks are and potentially decrease this percentage if they don't expect as big a drop in risk of exposure.
- **Avoid additional costs to achieve interoperability.** Some customer networks may be more homogenous and interoperable with a specific carrier's SIP trunk service, in which case the time estimated to build, test, and

maintain IT solutions to address interoperability issues may be substantially lower than what has been stated above.

- **Improved reliability and risk of failures.** Readers of this study should evaluate the reliability offered by other competing SBCs and within their existing telephony network. Readers should decrease the potential benefit associated with Net-Net ESD in the case where there is little marked improvement in reliability and risk of failures.
- **Save money on long-distance and international calls.** Nearly all customers are likely to see this benefit, however, the magnitude of the savings depends heavily on prevailing rates for long-distance and international calls. As such, some customers may potentially see a slightly lower benefit than indicated earlier.
- **Reduce voice trunks and associated fees.** The savings associated with transitioning from T1/E1 TDM trunk lines to SIP trunks may be slightly lower for certain customers than what Forrester's research has uncovered. This will depend on each customer's trunk utilization, prevailing T1/E1 TDM trunk rates and any special discounts these users are getting.

Table 15 shows the values used to adjust for risk and uncertainty in the cost and benefit estimates. The TEI model uses a triangular distribution method to calculate risk-adjusted values. To construct the distribution, it is necessary to first estimate the low and high values that could occur within the current environment. The risk-adjusted value is the mean of the distribution of those points. Readers are urged to apply their own risk ranges based on their own degree of confidence in the cost and benefit estimates.

Table 15
Cost And Benefit Risk Adjustments

Cost	Low	High	Average
Contracted cost for hardware software and support	100%	100%	100%
Professional services costs	100%	125%	108%
Internal implementation and testing costs	100%	125%	108%
Net-Net ESD training costs	100%	105%	102%
Ongoing administration costs	100%	110%	103%
Benefit	Low	High	Average
Cost avoidance of security breach	30%	100%	77%
Avoid additional costs to achieve interoperability	75%	100%	92%
Improved reliability and risk of failures	50%	100%	83%
Save money on long-distance and international calls	80%	100%	93%
Reduce voice trunks and associated fees	57%	100%	86%

Source: Forrester Research, Inc.

Financial Summary

The financial results calculated in the Costs and Benefits sections can be used to determine the return on investment, net present value, and payback period for the organization's investment in Net-Net ESD. These are shown in Table 16 below.

Acme Packet Enterprise Session Director: Overview

According to Acme Packet, the Net-Net Enterprise Session Director (ESD) connects disparate IP communications networks while mitigating security threats, resolving interoperability problems, and ensuring reliable communications. It is designed to protect and control real-time voice, video, and unified communications as they traverse IP network borders. The product family is available in software and appliance configurations, highly scalable, and includes critical features:

- **Security.** The Net-Net ESD protects IP telephony and UC infrastructure, services and applications, ensuring confidentiality, integrity, and availability. It prevents fraud and service theft, and guards against malicious attacks as well as system overloads and other service impacting events.
- **Interoperability.** The Net-Net ESD provides extensive signaling and media control features to help businesses overcome interoperability challenges that commonly occur when interfacing with public IP network services. It also performs protocol interworking and dial plan management that enables integration across legacy telephony infrastructure and UC systems.
- **Reliability.** The Net-Net ESD ensures PSTN-like availability and service quality for IP communications. It enforces service quality, balances loads across trunks, and reroutes sessions around interface failures to optimize network performance, circumvent equipment and facility problems, and ensure business continuity.

Appendix A: Composite Organization Description

Based on the interviews with the six existing customers provided by Acme Packet, Forrester constructed a composite company that we call “Rock Financial.” Forrester created a TEI financial framework and an associated ROI analysis for this composite company. This Forrester study illustrates the financial impact of Acme Packet’s Net-Net Enterprise Session Director by aggregating the findings from the customer interviews and portraying a composite organization that has benefited from integrating Acme Packet’s session border controller into their enterprise IP network.

Rock Financial is a privately owned US based financial services organization providing customized wealth advisory, trust, investment management, tax and estate planning, and private banking services. Headquartered in New York, the company has six main offices located throughout North America, Europe, and Asia and employs approximately 12,000 people globally, 10% of whom are involved in company’s customer service operations that handles approximately 75,000 calls per day. The following are additional details regarding the distribution of employees and trunks across each of the six offices:

Sites with legacy H.323 IP-PBXs:

- Headquarters (New York, US) — 3,500 users and 700 trunk lines.
- Regional office (San Francisco, US) — 2,500 users and 500 trunk lines.
- Regional office (Dallas, US) — 1,800 users and 360 trunk lines.

Sites already transitioned to SIP:

- Regional office (Bangalore, India) — 1,000 users and 700 contact center agents.
- Regional office (London, UK) — 1,000 users and 500 contact center agents.
- Regional office (Beijing, China) — 1,000 users.

Forrester created this composite company to reflect an organization interested in implementing an enterprise-class session border controller that takes into account the following concerns:

- Rock Financial’s CIO has a particular focus on profitability and prudent investment. As an internal service organization where margins are thin, cost efficiency is paramount without sacrificing quality and service levels. There is a strong impetus to decrease IT operational costs, of which charges associated with traditional TDM-based voice services is often considered a large cost sink. The CIO has a particular directive to substantially reduce charges for long-distance and toll-free services by transitioning to IP-based communications and enabling least cost routing over their internal WAN.
- While there is general agreement among Rock Financial’s senior leadership on the need to implement SIP trunking, there are significant concerns regarding the potential loss of security of the network against IP-level threats. Considering the highly sensitive nature of their daily business, Rock Financial is an extremely security-conscious organization and is wary of transmitting sensitive voice and data over IP networks without some

strong security measures that would guarantee session privacy and protect its network from malicious denial-of-service attacks.

- For Rock Financial's CIO, one of the key criteria for a successful and smooth SIP trunking deployment is full interoperability across the organization's many network components, including the SIP service provider, the unified communications and PBX systems, and edge devices such as IP endpoints. Because these components are from multiple vendors, it is imperative that these devices are able to "talk" to one another and can work together seamlessly. Additionally, NAT devices such as VPNs, gateways, and firewalls must also be fully interoperable and capable of reliably relaying voice and data over the network.
- Another imperative for Rock Financial's CIO is to maintain the same service quality and availability that the organization has come to expect with the legacy TDM-based network, which offered excellent uptime. Therefore, given the high cost of downtime, Rock Financial has high standards for ensuring high-availability access to service provider networks (PSTN and toll-free services), quality of service, and places high emphasis on the prioritization and regulation of traffic flows.
- Maintaining regulatory compliance is another priority for Rock Financial because financial regulation laws require that over-the-phone finance related activities are well documented. Any move to SIP trunking must not introduce risk of noncompliance or additional costs and challenges in ensuring compliance.

Appendix B: Total Economic Impact™ Overview

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.

The TEI methodology consists of four components to evaluate investment value: benefits, costs, risks, and flexibility.

Benefits

Benefits represent the value delivered to the user organization — IT and/or business units — by the proposed product or project. Often product or project justification exercises focus just on IT cost and cost reduction, leaving little room to analyze the effect of the technology on the entire organization. The TEI methodology and the resulting financial model place 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. Calculation of benefit estimates involves a clear dialogue with the user organization to understand the specific value that is created. In addition, Forrester also requires that there be a clear line of accountability established between the measurement and justification of benefit estimates after the project has been completed. This ensures that benefit estimates tie back directly to the bottom line.

Costs

Costs represent the investment necessary to capture the value, or benefits, of the proposed project. IT or the business units may incur costs in the form of fully burdened labor, subcontractors, or materials. Costs consider all the

investments and expenses necessary to deliver the proposed value. In addition, the cost category within TEI captures any incremental costs over the existing environment for ongoing costs associated with the solution. All costs must be tied to the benefits that are created.

Risk

Risk measures the uncertainty of benefit and cost estimates contained within the investment. Uncertainty is measured in two ways: 1) the likelihood that the cost and benefit estimates will meet the original projections, and 2) the likelihood that the estimates will be measured and tracked over time. TEI applies a probability density function known as “triangular distribution” to the values entered. At minimum, three values are calculated to estimate the underlying range around each cost and benefit.

Flexibility

Within the TEI methodology, direct benefits represent one part of the investment value. While direct benefits can typically be the primary way to justify a project, Forrester believes that organizations should be able to measure the strategic value of an investment. Flexibility represents the value that can be obtained for some future additional investment building on top of the initial investment already made. For instance, an investment in an enterprise wide upgrade of an office productivity suite can potentially increase standardization (to increase efficiency) and reduce licensing costs. However, an embedded collaboration feature may translate to greater worker productivity if activated. The collaboration can only be used with additional investment in training at some future point in time. However, having the ability to capture that benefit has a present value that can be estimated. The flexibility component of TEI captures that value.

Appendix C: Glossary

Discount rate: The interest rate used in cash flow analysis to take into account the time value of money. Although the Federal Reserve Bank sets a discount rate, companies often set a discount rate based on their business and investment environment. Forrester assumes a yearly discount rate of 10% for this analysis. Organizations typically use discount rates between 8% and 16% based on their current environment. Readers are urged to consult their respective organization to determine the most appropriate discount rate to use in their own environment.

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.

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 net present value of cash flows.

Payback period: The breakeven point for an investment. The point in time at which net benefits (benefits minus costs) equal initial investment or cost.

Return on investment (ROI): A measure of a project's expected return in percentage terms. ROI is calculated by dividing net benefits (benefits minus costs) by costs.

A Note On Cash Flow Tables

The following is a note on the cash flow tables used in this study (see the example table below). The initial investment column contains costs incurred at “time 0” or at the beginning of Year 1. Those costs are not discounted. All other cash flows in Years 1 through 3 are discounted using the discount rate (shown in Framework Assumptions section) at the end of the year. Present value (PV) calculations are calculated for each total cost and benefit estimate. Net present value (NPV) calculations are not calculated until the summary tables and are the sum of the initial investment and the discounted cash flows in each year.

Appendix D: Endnotes

¹ Forrester risk-adjusts the summary financial metrics to take into account the potential uncertainty of the cost and benefit estimates. For more information on Risk, please see the “Risk” section of this document.

² For the composite organization, the total estimated impact of a security breach could be more than \$4 million. See description of “Cost avoidance of a security breach” in the Benefits section of the document.

³ Source: “Second Annual Cost of Cyber Crime Study: Benchmark Study of U.S. Companies,” Ponemon Institute, August 2011.

⁴ Source: “Second Annual Cost of Cyber Crime Study: Benchmark Study of U.S. Companies,” Ponemon Institute, August 2011.