

A Forrester Total Economic Impact™
Study Commissioned By Akamai
September 2018

The Total Economic Impact™ Of Akamai Enterprise Application Access

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Executive Summary

Akamai Enterprise Application Access (EAA) is a cloud-based platform for accessing and securing enterprise applications. It provides data path protection, single sign-on (SSO) across all applications, identity access, application security, and management visibility and control into a single service.

Akamai commissioned Forrester Consulting to conduct a Total Economic Impact™ (TEI) study and examine the potential return on investment (ROI) enterprises may realize by deploying EAA. The purpose of this study is to provide readers with a framework to evaluate the potential financial impact of Akamai EAA on their organizations. To better understand the benefits, costs, and risks associated with this investment, Forrester interviewed four customers with years of experience using EAA.

Prior to using EAA, the customers had strong concerns about security and compliance, they managed and monitored firewall activity, and, in some cases, they restricted employees to only using enterprise applications when working inside a company office. In fact, all the executives Forrester interviewed began their journey using EAA for security purposes.

One executive told Forrester about his challenge before adopting Akamai EAA: “We had a VPN (virtual private network) appliance, but it had some high-profile security vulnerabilities, some of which required no authentication whatsoever. As a result, we decommissioned the VPN. The problem was that we didn’t give people remote access to applications that they needed for work. When executives traveled, employees attended conventions, or sales people were in the field trying to access customer information, they had no way to get access to information.”

Another executive interviewed described the impact of using Akamai EAA: “Our typical firewall was used to manage incoming server traffic and whitelist specific IP addresses on the firewall. With EAA, it’s the other way around. It’s not ingress traffic that we manage any longer, but egress traffic. Basically, we don’t have to manage all the firewall rules any longer.”

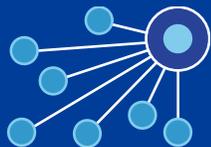
Key Findings

Quantified benefits. The following risk-adjusted present value (PV) quantified benefits are representative of those experienced by the companies interviewed:

- › **Reduced effort by the desktop support team worth \$228,293.** The simplified remote access to enterprise applications reduced the demand on the desktop support team by approximately 20%, including activities such as manually validating VPN logins and other antiquated techniques to ensure security and enable end users.
- › **Reduced effort by the security team valued at \$60,244.** The organizations realized various qualitative benefits to the security team, but this benefit is solely from the avoided daily 2-hour activity of monitoring firewall traffic for potentially malicious login activity.
- › **Avoided cost of physical assets for remote access of \$26,858.** One organization maintained 30 specially configured desktop devices that enabled the IT organization to work remotely. Other organizations used physical devices such as key cards that were replaced by the functionality within EAA.

Unquantified benefits. The interviewed organizations experienced the

Key Benefits



Reduced effort by security and desktop staff:

\$288,537



Avoided cost of physical security assets:

\$26,858



Total cost over three years:

\$103,211



ROI
206%



Benefits PV
\$315,395



NPV
\$212,184



Payback
<3 months

following benefits, which are not quantified for this study:

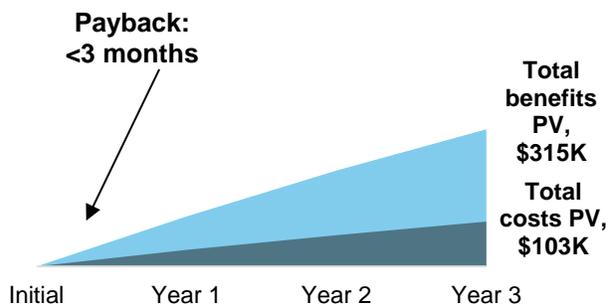
- > **Access to applications across device platforms without remote desktop protocol (RDP).** Akamai EAA provided a robust, fast, and easy way to access applications that allowed clients to avoid manually structuring the stack of technologies otherwise required.
- > **Ability to replace the functionality of global traffic manager products.** One organization was able to use a feature of EAA for load balancing and retire a traffic manager product that provided redundant capabilities.
- > **Value of providing remote access to unplanned applications.** Executives repeatedly shared that they purchased Akamai EAA for applications with specific purposes, but rapidly expanded to include access to a much a broader set of enterprise applications.
- > **Support for integrating mobile applications.** One organization was developing a mobile application that would access proprietary customer data and was able to increase security due to support.

Costs. The interviewed organizations experienced the following risk-adjusted PV costs:

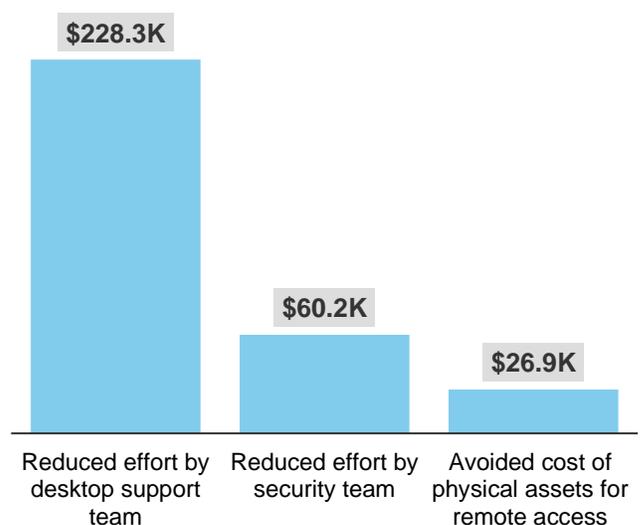
- > **Subscription cost for Akamai EAA of \$102,956 over three years.** This was the total subscription cost for 350 users per year.
- > **Cost to implement EAA of \$255.** Organizations told Forrester that the implementation was trivial and required “no more than 6 hours” by all staff who needed to contribute to the project.

Forrester’s interviews with three existing customers and subsequent financial analysis found that an organization, based on these interviewed organizations, experienced benefits of \$315,395 over three years versus costs of \$103,211, adding up to a net present value (NPV) of \$212,184 and an ROI of 206%.

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 interviews, Forrester has constructed a Total Economic Impact™ (TEI) framework for those organizations considering implementing Akamai EAA.

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 Akamai EAA can have on an organization:



DUE DILIGENCE

Interviewed Akamai stakeholders and Forrester analysts to gather data relative to EAA.



CUSTOMER INTERVIEWS

Interviewed four organizations using EAA 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 interviews using the TEI methodology and risk-adjusted the financial model based on issues and concerns of the interviewed organizations.



CASE STUDY

Employed four fundamental elements of TEI in modeling Akamai EAA'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 Akamai 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 Akamai EAA.

Akamai 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.

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

The EAA Customer Journey

BEFORE AND AFTER THE EAA INVESTMENT

Interviewed Organizations

For this study, Forrester conducted four interviews with Akamai EAA customers. Interviewed customers include the following:

INDUSTRY	INTERVIEWEE	PRIOR CHALLENGES
Consumer products company	Director, information security and compliance	Required onsite access for hundreds of employees and maintained a highly vulnerable “back channel” for sales reps to access customer data offsite. Executives had high concerns about security.
Technology services provider	Vice president, technology solutions	Used Akamai EAA to enable application services for its clients, including a proprietary, specialized solution for enterprise resource planning (ERP) among wholesale, soft-goods vendors.
Undisclosed (described anonymously as a company with high security requirements)	Consultant, reporting to the organization’s CIO	Needed highly secure and confidential access to applications. Using EAA fundamentally changed requirements to manage firewalls.
Software provider	CEO	Launched new company with employee application services based entirely on Akamai EAA. The organization avoided the cost of supporting high-security needs and the complexity of operations for a small, global startup.

Key Challenges

During interviews, the executives shared key challenges or problems that drove their need for an alternate solution. Those issues included:

- › **Supporting global employees without global infrastructure.** The consumer products executive told Forrester: “We had a publicly internet-accessible, but hidden, web page where people could log in and look up sales information. We really wanted to get away from having this system. It was just one password breach away from being compromised as it didn’t have two-factor authentication.”
- › **Running on disparate, out-of-date departmental applications.** One executive said: “We had an enterprise-level solution that was developed about 12 years ago. We also have several other applications that we will retire soon.” Another executive added: “We were using an ERP system that was 15 years old and had certain drawbacks and out-of-date functionality. It had reached the end of its shelf life, and we needed to plan for the future.”
- › **Avoiding need for enterprise directory service.** The software executive said: “A lot of small companies like us are not going to have active directory in-house. They will use internet services as a source of identity. We have Google email, and use Google as the authenticator. We have EAA for access, including Akamai’s partners for security assertion markup language (SAML) and web application firewalls (WAF).”

“We had a publicly internet-accessible, but hidden, web page where people could log in and look up sales information. We really wanted to get away from having this system. It was just one password breach away from being compromised as it didn’t have two-factor authentication.”

Director, information security and compliance, consumer goods company



- › **Providing remote access without using remote desktop protocol.** The services executive said: “We needed to mitigate our security risk without having to redesign our platform because otherwise we’d have to think about the timeline to move from a full client to a web application — and that would be a significant investment and take a significant amount of time.”
- › **Moving away from aging VPN technology for access.** The consultant said: “The organization was using a VPN, and it was causing problems. Namely, if an employee connected to the VPN with a compromised device, they would have wholesale access to the network.”
- › **Changing whitelisted IP addresses to support mobile employees.** The CEO told Forrester: “I was traveling around the country and giving product demos to clients. At each customer site, I had to identify my new IP address and call our office to have the team whitelist that IP address so that I could get access and conduct the customer demo.”

“Before EAA, we lived in a world of constant paranoia. We actively monitored all sites of social media and sites considered ‘dark web’ for any chatter or talk that could indicate an impending attack.”

Consultant, reporting to the organization’s CIO



Key Results

The interviews revealed several key results from the EAA investment. EAA:

- › **Reduced effort by the security team manually verifying identities.** The consumer products executive said: “One of the things that we would do is to verify users connecting over VPN. Whenever an employee would log in, at any time of the day, 24x7, one of our operators would call them to confirm that it was actually them. We were also able to avoid checking the daily logs to look for fraudulent activity or anything that had a security-issue vibe.”
- › **Retired physical assets with hard-coded security privileges.** One executive told Forrester: “We were able to decommission 30 laptops that were dedicated for remote access only. These laptops provided remote access for IT employees because we didn’t want to build a VPN from their personal computers that were unmanaged and potentially virus-infected.”
- › **Avoided beaches by anticipating malicious behavior.** The technology services executive told Forrester: “We never had any breaches because we are aggressive at locking accounts after only a few failed login attempts. What we found is that many attempts came from a dozen or so accounts, where those employees must have entered their email on some registration form or something. Most attempts were focused on those few accounts, which requires a little security awareness training for users to resolve.”
- › **Addressed other security concerns with increased productivity.** One executive added, “Using EAA increased the productivity of our security team, which was great because there is always so much to get done, but I can say that we reduced some risks significantly, and for the cost, it’s well worth it!”
- › **Provided features to isolate the risk of a compromised device.** The consultant told Forrester: “When an employee is logged in and goes to lunch, the protection is still there. It remains active 24 hours per day. If a machine becomes compromised, we can isolate the risk to only that device. We use a lot of access control so that groups of users can only see limited URLs or RDP sessions.”

“We are able to support users in any location and using any type of device. If someone is using a [specific operating system], tablets, computers, or phones, the solution just works.”

Chief executive officer, software provider



- › **Enabled device-agnostic application access.** The CEO said: “We are able to support users in any location and using any type of device. If someone is using a [specific operating system], tablets, computers, or phones, the solution just works.”

Composite Organization

Based on the interviews, Forrester constructed a TEI framework, a composite company, and an associated ROI analysis that illustrates the areas financially affected. The composite organization is representative of the four companies that Forrester interviewed and is used to present the aggregate financial analysis in the next section. The composite organization that Forrester synthesized from the customer interviews has the following characteristics:

- › Supported 350 employees through Akamai EAA.
- › Had 30 IT staff working in desktop support.

Analysis Of Benefits

QUANTIFIED BENEFIT DATA AS APPLIED TO THE COMPOSITE

Total Benefits						
REF.	BENEFIT	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Atr	Reduced effort by desktop support team	\$91,800	\$91,800	\$91,800	\$275,400	\$228,293
Btr	Reduced effort by security team	\$24,225	\$24,225	\$24,225	\$72,675	\$60,244
Ctr	Avoided cost of physical assets for remote access	\$10,800	\$10,800	\$10,800	\$32,400	\$26,858
	Total benefits (risk-adjusted)	\$126,825	\$126,825	\$126,825	\$380,475	\$315,395

Reduced Effort By Desktop Support Team

Each of the companies that Forrester interviewed reported improvements in desktop support. Although the exact nature of the support varied with the company's industry and business model, all experienced the benefit.

Using Akamai EAA enabled a composite organization to reduce the volume of issues coming into the help desk by 20%. Assuming a desktop support team of six people, the organization was able to avoid hiring 1.2 employees, which it managed through normal attrition. Given an average burdened salary of \$85,000, the organization reduced costs by \$102,000 per year.

Because the exact results of this benefit will depend on the size and complexity of support for the desktop support team, Forrester risk-adjusted this benefit downward by 10% to account for readers who may realize lesser results. The benefit yielded a three-year risk-adjusted total PV of \$228,293.

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 \$315,395.

Reduced Effort By Desktop Support Team: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
A1	Total desktop support group		6	6	6
A2	Reduced impact on desktop support team after implementing EAA		20%	20%	20%
A3	Avoided need to hire additional staff (rounded FTE years)	A1*A2	1.2	1.2	1.2
A4	Average burdened salary		\$85,000	\$85,000	\$85,000
At	Reduced effort by desktop support team	A3*A4	\$102,000	\$102,000	\$102,000
	Risk adjustment	↓10%			
Atr	Reduced effort by desktop support team (risk-adjusted)		\$91,800	\$91,800	\$91,800

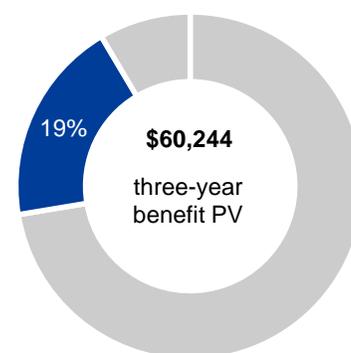
Reduced Effort By Security Team

In addition to the reduced effort of the desktop support team, the security team avoided specific tasks. Each of the organizations reported an impact on the security team, mostly that the team was freed from mundane monitoring tasks to solve more strategic security issues.

Forrester isolated a single benefit that was universal: The composite organization no longer needed to review firewall login attempts. Each day, the security team previously spent an average of 2 hours monitoring firewall login attempts to look for potentially malicious behavior.

As stated previously, using Akamai EAA eliminated the need to monitor firewalls. Simply avoiding this task equated to 0.3 full-time equivalents (FTEs) at an average burdened salary of \$85,000. The annual cost savings before adjusting for risk was \$25,500 per year.

The exact results realized by readers will vary. To account for this risk, Forrester adjusted this benefit downward by 5%, yielding a three-year risk-adjusted total PV of \$60,244.



Reduced effort by security team: **19%** of total benefits

Reduced Effort By Security Team: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
B1	Avoided activity equivalent to 2 hours per day of staff time (rounded)	2 hours*260 days/2,080 hours	0.3	0.3	0.3
B2	Average burdened salary		\$85,000	\$85,000	\$85,000
Bt	Reduced effort by security team	B1*B2	\$25,500	\$25,500	\$25,500
	Risk adjustment	↓5%			
Btr	Reduced effort by security team (risk-adjusted)		\$24,225	\$24,225	\$24,225

Avoided Cost Of Physical Assets For Remote Access

Several organizations used various types of physical devices to ensure security before implementing EAA. One of the organizations maintained 30 desktops for IT professionals to work remotely. The devices were configured specifically for a secure connection, and the company did not allow any other devices to have remote access to enterprise data.

Retiring the 30 devices saved the organization \$400 per year for each device, resulting in a total savings of \$12,000 before adjusting for risk.

Although the exact approach of readers in handling security will vary, our analysis indicates that most organizations have additional security activities that will result in a similar benefit. As such, Forrester adjusted the benefit downward by 10%, resulting in a three-year, total PV benefit of \$26,858.

Avoided Cost Of Physical Assets For Remote Access: Calculation Table

REF.	METRIC	CALC.	YEAR 1	YEAR 2	YEAR 3
C1	Number of devices no longer required		30	30	30
C2	Cost per device per year		\$400	\$400	\$400
Ct	Avoided cost of physical assets for remote access	$C1 \times C2$	\$12,000	\$12,000	\$12,000
	Risk adjustment	↓10%			
Ctr	Avoided cost of physical assets for remote access (risk-adjusted)		\$10,800	\$10,800	\$10,800

Unquantified Benefits

In addition to the benefits outlined above, the interviewed executives shared other benefits that did not have specific financial implications. Specifically, the companies benefited in the following ways:

- › **Gaining access to applications across device platforms without RDP.** The technology services executive said: “Our customers were able to have access on all devices, especially tablets today, without installing the RDP client. Previously, they might go to the web browser link, and it wouldn’t always launch the client properly.”
- › **Replacing the functionality of global traffic manager products.** Although the organization did not reduce costs, the interviewee said: “We replaced Akamai’s global traffic manager (GTM) with EAA. We installed the connectors on both sites, and EAA balances the traffic.”

Flexibility

The value of flexibility is clearly unique to each customer, and the measure of its value varies from organization to organization. There are multiple scenarios in which a customer might choose to implement EAA and later realize additional uses and business opportunities, including:

- › **Value of providing remote access to unplanned applications.** The consumer products executive told Forrester: “One of the things that we didn’t originally consider was the number of internal functions that we would be able to present externally. It wasn’t our original intent, but today we allow remote access to our website, back-office tools, [and] reporting servers. Once we saw the value, we threw everything at it!”

The executive continued: “I recommend that companies considering Akamai EAA sit down and create an inventory of all the applications that they might choose to present. This helps in getting an accurate quote. We ended up with about three times the number of applications using EAA than we originally planned, and as our use increased, our per-unit pricing with Akamai decreased. We could have saved money if we’d planned it out in advance.”

- › **Support for integrating mobile applications into EAA.** The consultant told Forrester: “One group of the company was preparing to launch a mobile application, but they never looked into the security issues. We had to advise them that a mobile application entered a whole new world for security. We were able to work with Akamai and ensure that EAA could support our mobile launch.”

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.

Analysis Of Costs

QUANTIFIED COST DATA AS APPLIED TO THE COMPOSITE

Total Costs							
REF.	COST	INITIAL	YEAR 1	YEAR 2	YEAR 3	TOTAL	PRESENT VALUE
Dtr	Subscription cost for Akamai EAA	\$0	\$41,400	\$41,400	\$41,400	\$124,200	\$102,956
Etr	Cost to implement	\$255	\$0	\$0	\$0	\$255	\$255
	Total costs (risk-adjusted)	\$255	\$41,400	\$41,400	\$41,400	\$124,455	\$103,211

Subscription Cost For Akamai EAA

The organization paid for 350 users, which cost an average of \$84 per user per year. In addition, the organization paid an annual platform fee of \$12,000. As a result, the total cost was \$41,400 per year.

All four of the organizations told Forrester that their primary objective in purchasing Akamai EAA was security. They did not significantly weigh the cost of the product nor did they build a business model to justify the purchase. They bought EAA to achieve security goals, and the benefits that they realized were incidental to this core objective (see *Unquantified Benefits* and *Flexibility* sections on page 9).

Forrester did not risk adjust the pricing of EAA, resulting in a total PV cost over three years of \$102,956.

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 composite organization expects risk-adjusted total costs to be a PV of \$103,211.

Subscription Cost For Akamai EAA: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
D1	Akamai platform fee			\$12,000	\$12,000	\$12,000
D2	Number of users			350	350	350
D3	Cost per user per year			\$84	\$84	\$84
Dt	Subscription cost for Akamai EAA	$D1+(D2*D3)$		\$41,400	\$41,400	\$41,400
	Risk adjustment	↑0%				
Dtr	Subscription cost for Akamai EAA (risk-adjusted)			\$41,400	\$41,400	\$41,400

Cost To Implement

Implementing Akamai EAA required a trivial amount of effort. For example, one executive said that he implemented the tool himself in less than 2 hours. Another executive reported that about 10 people on his team touched EAA for various reasons, but that, in total, the amount of time invested was no more than 6 hours.

Forrester included this cost into the study to show the nominal and largely irrelevant effort required by customers. Forrester did not risk-adjust this cost, yielding a three-year risk-adjusted total PV of \$255.

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.

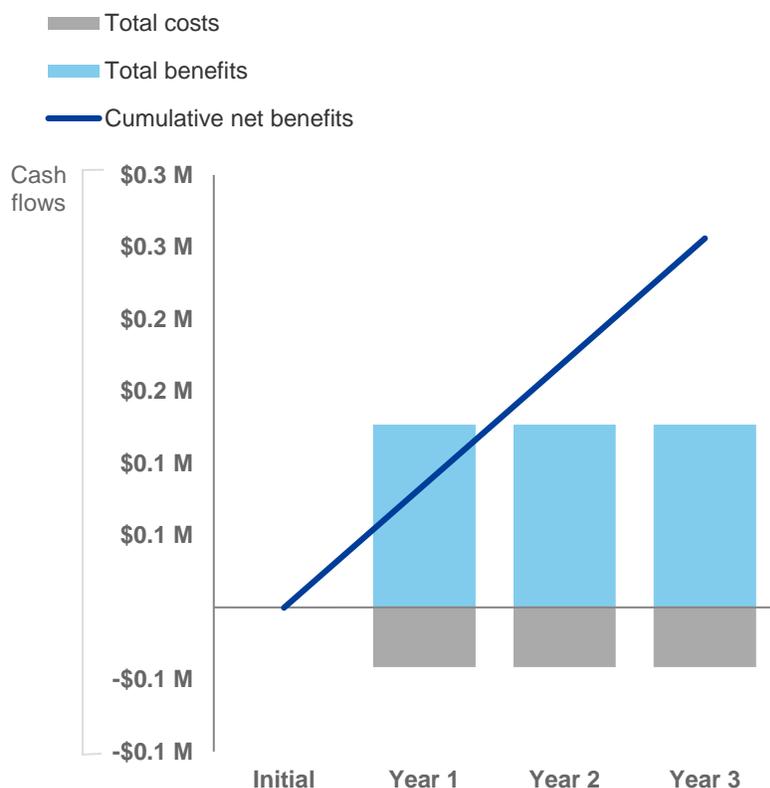
Cost To Implement: Calculation Table

REF.	METRIC	CALC.	INITIAL	YEAR 1	YEAR 2	YEAR 3
E1	Total of 6 hours of staff time in equivalent FTEs (rounded)		0.003			
E2	Burdened annual salary		\$85,000			
Et	Cost to implement	$E1 * E2$	\$255			
	Risk adjustment	↑0%				
Etr	Cost to implement (risk-adjusted)		\$255			

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	(\$255)	(\$41,400)	(\$41,400)	(\$41,400)	(\$124,455)	(\$103,211)
Total benefits	\$0	\$126,825	\$126,825	\$126,825	\$380,475	\$315,395
Net benefits	(\$255)	\$85,425	\$85,425	\$85,425	\$256,020	\$212,184
ROI						206%
Payback period						<3 months

Akamai EAA: Overview

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

Akamai's Enterprise Application Access (EAA) is a cloud service that delivers simple, secure, and convenient access to all applications without providing users access to the entire network. Applications are accessible to employees, contractors, developers, and vendors while being hidden from the internet and from public exposure. EAA is simple and quick to configure, manage, and maintain. IT organizations get a centralized managed solution that does not rely on traditional remote access technologies (VPNs, virtual desktop infrastructure [VDI], RDP, or proxies) or required hardware or software to deploy and maintain.

EAA makes accessing applications fast and intuitive for end users and reduces support calls for poor application performance, VPN connectivity issues, and device incompatibilities for IT. EAA optimizes applications and presents them in any browser on any user device and with enterprise-grade SSO and intelligent multifactor authentication (MFA), security is no longer a burden for users or IT.

EAA is easy to deploy, provision, and monitor through a single dashboard. You get a centralized managed solution that provides complete auditing and reporting of app access and activity. It provides one-click integrations for Active Directory, security assertion markup language (SAML) providers, multiple content delivery networks (CDNs), forward proxies, security information and event management (SIEM) tools, and other infrastructures, eliminating custom scripting and integration. Scaling and deploying applications across public and private infrastructures is easy with built-in high-availability capabilities, server load balancing, and automatic application routing.

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.