WHITE PAPER: END-USER MONITORING

End-User Monitoring: Gaining Visibility into Hidden Business Risks

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Executive Summary

Challenge

The increasing reliance on web-based applications has had significant unintended consequences. As customers, partners and employees rely on IT-supported applications to acquire products and services, business managers now have limited visibility into the end-user experience, creating a blind spot that adds risk to their organization. Are essential services being delivered? Are transactions being fulfilled? Are critical applications compliant with service level agreements (SLAs)? Are end-user problems detected and resolved in a timely fashion? This new generation of web applications requires a new approach to management that closely links IT and the Business.

Opportunity

This paper discusses how organizations can regain visibility into the success of their online transactions and the quality of the end-user experience. The focus is on the meaningful insight that monitoring an online transaction at the individual user level provides into the nature, severity and business impact of poor application performance. Whether they are external customers, suppliers, or employees, end-user monitoring creates actionable, fact-based information that ensures web applications are fully serving their purpose—from the customer and business points of view.

Benefits

By monitoring critical end-user business transactions as they move through the web application infrastructure, IT can share critical intelligence with business stakeholders and better manage application performance and availability. In this way, the organization can work collaboratively to achieve common objectives: superior service delivery, end-user satisfaction and assurance of revenue streams.

SECTION 1

Introduction

Critical Business Transactions Are Moving Online

Leading organizations are migrating critical business functions to the web to reduce inefficiencies by removing the people and processes that separate customers from products or services. The advantages are clear: customers, partners, and employees can serve themselves, increasing revenue while reducing costs.

This increasing reliance on web-based applications has had significant unintended consequences. As customers, partners and employees rely on IT services, business managers now have limited visibility into the end-user experience, creating a blind spot that adds risk to their organization. Are essential services being delivered? Are transactions being carried out properly? Are critical applications compliant with service level agreements (SLAs)? Are end-user problems detected and resolved in a timely fashion? What is the cost of poor web application performance?

Traditional Management Tools Are Not Enough

To answer these questions and reduce the risks associated with online service delivery, organizations need more than traditional monitoring and analysis based on average performance metrics or help desk call tracking. They need to implement effective end-user transaction monitoring and management

This paper discusses the necessity of monitoring end-user transactions for effectively measuring SLA compliance and for conducting prioritized problem solving based on the business impact of poor performing transactions. The paper also describes how end-user transaction monitoring benefits multiple stakeholders in the organization. With effective monitoring in place, business managers benefit from superior service delivery, higher rates of end-user satisfaction and improved revenue streams. For IT, end-user monitoring provides an end-to-end transaction view that enables the IT team as a whole to work collaboratively to solve problems and achieve performance and availability goals from the user point of view.

SECTION 2

The Need for Real-Time Customer Transaction Data

Visibility into the online end-user experience is critical for both the business side and the IT side of an organization.

Business Needs to Know:

- WHICH end-users are affected by any slowdowns or transaction problems?
- WHAT is happening now? How many transactions have succeeded or failed? The scale of service problems cannot be simply measured in the number of help desk calls.
- HOW LONG does it take to complete a transaction? When an end-user complains that an application is slow, what does "slow" really mean?
- WHAT is the business impact from service problems? This includes reduced revenues, damage to brand and increased end-user frustration.

IT Needs to Know:

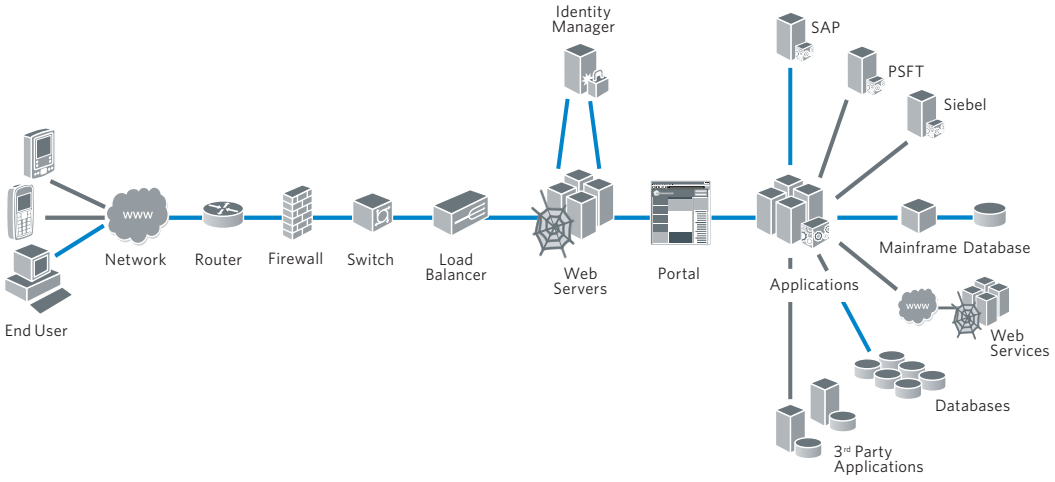
- WHAT exactly is the problem? Can we find out before the call center escalates the issue? Are we recording the right metrics so we can accurately analyze the problem?
- WHY is the problem happening? Can we see a specific impact across the infrastructure? Which tier?
- WHERE should we direct resources to solve the problem?
- HOW should we prioritize problems, based on business goals and SLAs?

Visibility into online transactions is complicated by the increasing complexity of today's heterogeneous, SOA-based web application environments. As illustrated in Figure A below, each individual transaction follows a complex path through a large number of applications, servers, networks and other elements across the application infrastructure and over the Internet. The applications themselves are increasingly complex, and each individual transaction involves multiple steps and procedures.

FIGURE A

Today's online transactions must traverse extremely complex environments that involve an increasing number of processes and technologies.

TYPICAL END-TO-END TRANSACTION



Multiply this complexity by the increasing number of end-users and application transactions, and it comes as no surprise that IT professionals are struggling to manage and control the delivery of essential business processes and the SLAs that govern them.

In a recent CA Wily Industry Benchmark Survey, respondents reported that the time required to identify incidents is a serious and persistent challenge, typically 5-10 hours. While most problems are solved in a day, fully 30 percent are not solved the same day. The respondents also stated that when problems are reactively identified by multiple end-user complaints, they take longer to resolve. And, when problems are reactively identified by multiple end-user complaints, they take longer to resolve.

FIGURE B

Many small issues can add up to a serious degradation in service.

LITTLE ISSUES ADD UP

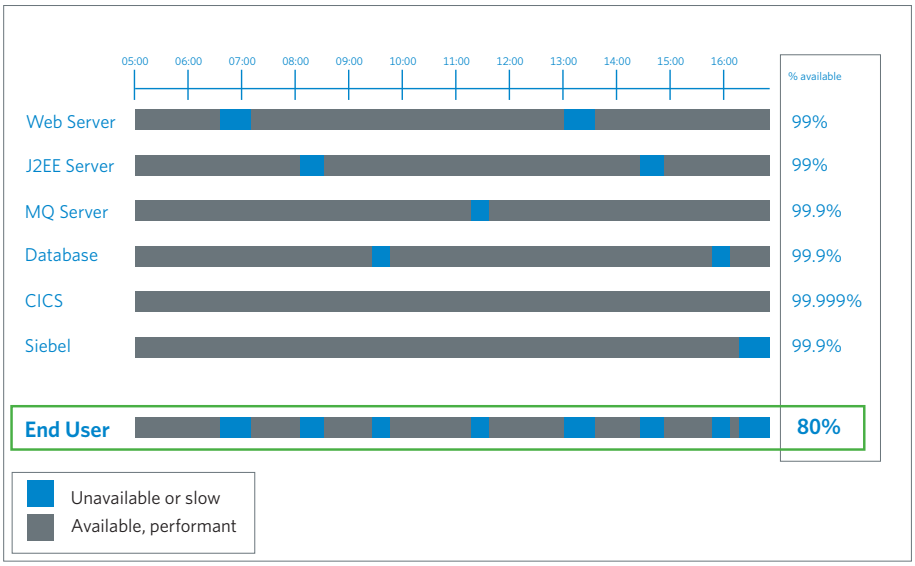


Figure B above highlights how visibility is hampered in a complex, composite application environment where multiple stakeholders are expected to contribute to application availability using multiple tools. In a traditional performance monitoring system where individual components are viewed as silos, each management tool might be able to report 99% or better availability. However, with the complexity of today's systems, a large number of little issues can quickly impact the end-user experience, even though individual areas report no significant problems.

This situation is fundamentally a matrix problem. How does IT ensure accountability in an environment where each person or area can, with justification, deny any responsibility for a problem? This lack of accountability can lead not only to unexpected service problems but also to confusion and finger-pointing when issues need to be identified and resolved.

With end-user transaction monitoring, you can measure the cumulative impact of performance problems across the infrastructure supporting the business process. Furthermore, the data collected will better enable IT to determine the scope of the problem and quickly resolve it—before the customer call center is flooded with complaints.

SECTION 3

Business Benefits

Regain Lost Customer Visibility

A specific example illustrates the business benefits of end-user transaction monitoring. In the days before web-based transactions, Warren, one of the premium customers of a brokerage firm, would drop by its retail location to execute a "buy stock" transaction. When working face-to-face, the broker knew immediately when Warren's transaction request had been submitted successfully, both from the business and the customer viewpoint.

With today's web-based transactions however, the physical brokerage is disconnected from the online process and the broker does not know the success or quality of the transaction. What happens if Warren is having a problem submitting his "buy" transaction and receives the message, "Please try again" after every attempt? Did the brokerage receive Warren's buy order? How long did it take to complete Warren's transaction? Did Warren receive the service level he expected? Because the brokerage application is now the first line of communication with customer, these are questions that IT and business stakeholders must know how to answer in every instance, whether there is a problem or not.

By monitoring all buy transactions through an end-user transaction monitoring solution, IT gains immediate visibility into critical factors that the business needs to know: who is experiencing the problem (Warren), the type of customer (premium), the transaction he is executing (buy), the type of problem he is experiencing (unable to submit request), and the business impact of the problem (lost trading commission).

Work Collaboratively with IT

With insight gained from an end-user transaction monitoring solution, IT then quickly communicates this information to the business which, in turn, proactively reaches out to Warren before he calls the support center. IT uses this information to identify the scope of the problem (*Are all premium customers affected?*), diagnose the problem (*Where is the performance bottleneck?*) and resolve the problem once the component is identified.

Traditionally, the business has not relied on IT to provide this type of real-time insight into user experiences. IT had a direct, one-to-one relationship with the business. Business people were the primarily users of IT systems and were IT's "customers." Further, IT translated business's requirements into the language of IT and it wasn't necessary for business to know that language—they only needed to know whether the systems they needed were up and running properly. While owning customer relationships might be an unfamiliar role for IT, monitoring all web-based transactions and gaining insight into the end-user experience enables IT to partner with the business and provide the critical end-user transaction visibility necessary to maintain the highest levels of customer satisfaction, employee productivity, and revenue streams.

SECTION 4

User-Based Service-Level Management

Measure Real User Experience

Properly designed and implemented, an effective end-user transaction monitoring solution provides a highly granular, user-based perspective for managing SLAs based on critical end-user activities such as login, account summary and buy transactions at the business process level. The ability to group users based on a variety of criteria and capture performance metrics down to the transaction component level makes it possible to accurately measure actual user experience against SLAs and report compliance in a business context that business stakeholders will understand.

In addition, a robust monitoring solution should be able to provide more than traditional "average performance" metrics, which ignore outliers and do not give an accurate representation of overall online end-user experiences. These metrics also fundamentally ignore the impact of incidents on individual users by only providing aggregate statistics and overall system health.

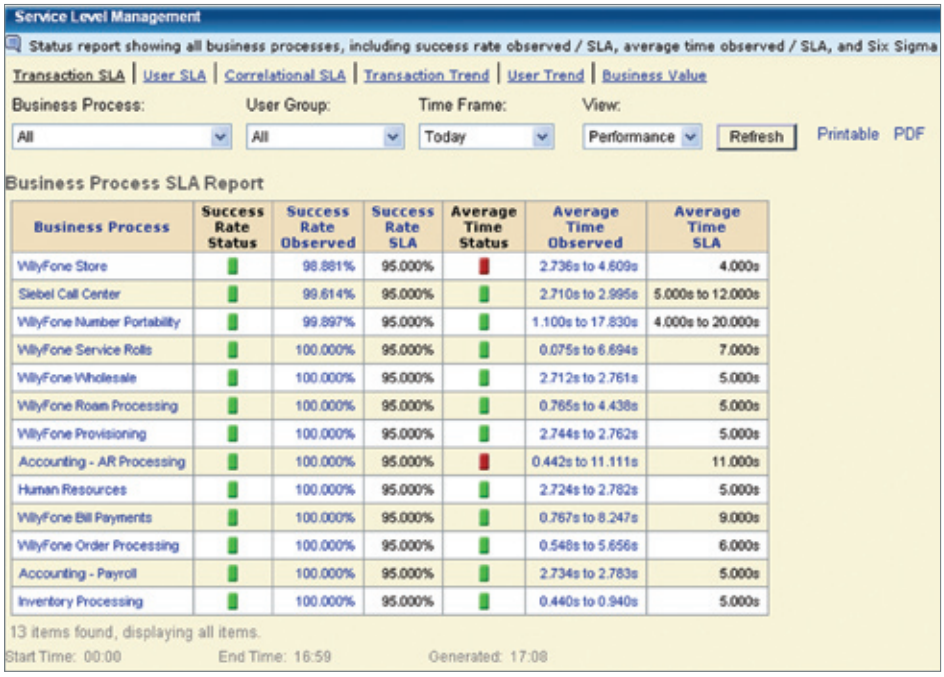
In short, an effective end-user transaction monitoring solution should support disciplined SLA management based on:

- Deep, end-to-end transaction visibility at both the business process and component level
- Correlation of end-user SLAs with system-wide SLAs/OLAs
- Flexible SLA reporting specific to different user groups
- Better understanding of the relationship between backend system downtime and the end-user experience
- Deep integration with an SLA management tool to model monitored business processes against established business SLAs
- Deep integration with a Service Desk to ensure trouble tickets are triggered and prioritized based on SLAs

FIGURE C

Example of scorecard showing business process success against service level agreements.

SLA SCORECARD



Business Process	Success Rate Status	Success Rate Observed	Success Rate SLA	Average Time Status	Average Time Observed	Average Time SLA
WilyFone Store		98.881%	95.000%		2.736s to 4.609s	4.000s
Siebel Call Center		99.614%	95.000%		2.710s to 2.995s	5.000s to 12.000s
WilyFone Number Portability		99.897%	95.000%		1.100s to 17.830s	4.000s to 20.000s
WilyFone Service Rolls		100.000%	95.000%		0.075s to 6.694s	7.000s
WilyFone Wholesale		100.000%	95.000%		2.712s to 2.761s	5.000s
WilyFone Roam Processing		100.000%	95.000%		0.765s to 4.438s	5.000s
WilyFone Provisioning		100.000%	95.000%		2.744s to 2.762s	5.000s
Accounting - AR Processing		100.000%	95.000%		0.442s to 11.111s	11.000s
Human Resources		100.000%	95.000%		2.724s to 2.782s	5.000s
WilyFone Bill Payments		100.000%	95.000%		0.767s to 8.247s	9.000s
WilyFone Order Processing		100.000%	95.000%		0.548s to 5.656s	6.000s
Accounting - Payroll		100.000%	95.000%		2.734s to 2.783s	5.000s
Inventory Processing		100.000%	95.000%		0.440s to 0.940s	5.000s

SECTION 5

IT Benefits

Enhance Existing Management Tools

An end-user transaction monitoring tool enables IT to enhance existing management disciplines by adding deep visibility into end-users' experiences, the health and availability of critical business processes, and the impact of the application infrastructure performance on SLAs. As a result, IT can work more closely with business, providing better data and consistent, comprehensive reports that demonstrate how IT is serving customers in alignment with business goals.

An effective end-user transaction monitoring product provides IT with the following benefits:

Higher End-User Success Rates

Real end-user monitoring enables IT to track all critical user transactions on a 24/7 basis and set proactive alerts that warn of out-of-bounds performance conditions before customer SLAs are compromised. Once alerted, support can prioritize the problems based on the business process, number and type of user impacted, and quickly direct the problems to the correct department for resolution before additional users experience the same problem.

Higher Availability and Performance

Real-time transaction monitoring enables IT to detect problems that affect customers before the support center gets swamped with user calls. IT operations can quickly understand who is impacted, what the cost to the business is, and why the problem arose. In addition, IT can build a history of performance for baselining and for predicting future problems. Based on this information, applications can become highly available and better performing over time.

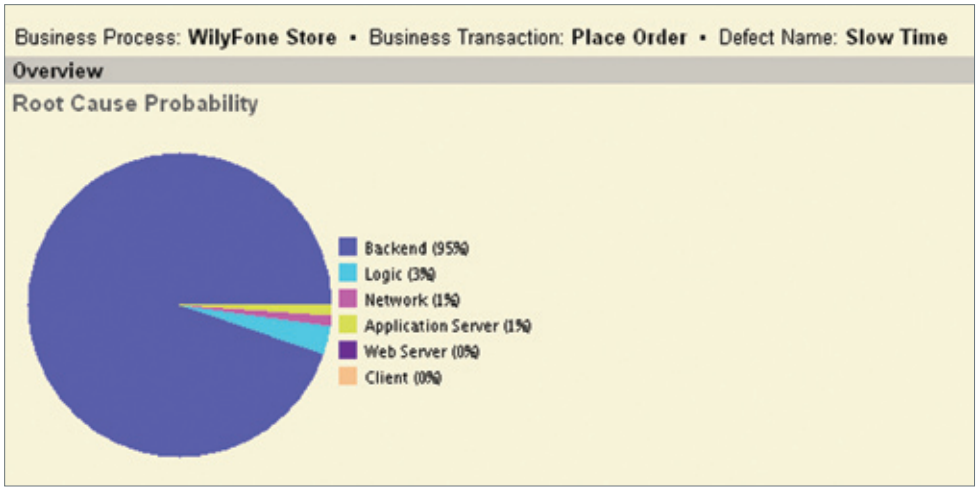
Greater Productivity

End-user and business transaction monitoring provides the Business and IT with a common view, tool set and language to better understand and enhance the customer experience. The IT team can provide the business with the information necessary to proactively reach out to affected users while the different IT groups can collaborate on problem solving using a single set of performance data. The ability of a robust end-user monitoring solution to instantly diagnose the problem tier streamlines and accelerates the resolution process.

FIGURE D

Monitoring key business processes from the end-user viewpoint aids problem diagnosis.

AUTOMATIC DIAGNOSIS



Furthermore, an end-user transaction monitoring solution improves collaboration among IT stakeholders, delivering the following key benefits for each area of IT management.

FIGURE E

Every team within IT can benefit from end-user monitoring.

EMPOWER YOUR IT TEAM

ROLE	ADVANTAGE	BENEFIT
Application Managers	Increasing efficiency by assigning the problem to the right person.	When end-users have issues, application managers can drill down immediately to root cause component. They can also measure the performance and impact of application outages and quality lapses.
Systems Managers	Prioritizing problem resolution and increasing efficiencies.	When end-users have issues, systems managers can drill down instantly into the system that served their requests. Managers can also dispatch end-user problems to the right set of systems managers immediately.
Help Desk Managers	Enhancing service with real-time, user-specific data.	When a user calls, the help desk manager can immediately look up any application issues the user has had in the past, based on their name or other identifiers. Additionally, an end-user monitoring tool can proactively open tickets before users call.
Network Managers	Improving network problem resolution based on the end-user perspective.	When network performance fluctuates, end-user monitoring lets network managers know exactly which transactions and which users are being affected and determine whether the network is at fault.

SECTION 6

How CA Wily Can Help

CA Wily Customer Experience Manager (CEM) is a leading real-time end-user transaction monitoring product. Supporting multiple applications, procedures and technologies across the infrastructure, this product helps optimize the end-user experience by allowing IT teams to:

- DETECT AND AGGREGATE transaction errors and performance problems
- PRIORITIZE incidents based on business impact
- QUICKLY dispatch problem for resolution
- ESTABLISH, TRACK AND REPORT on SLAs

Optimizing the User Experience with CEM

CEM can detect when an end-user experiences a performance problem or transaction error. Alerts can be generated based on specific errors and thresholds for groups of end-users, business transactions, or groups of end-users for a particular business transaction. Once a transaction violates a threshold, CEM will capture it and aggregate similar defective transactions into an incident.

CEM calculates the business impact from incidents based on the criticality of a specific business transaction, the importance of the users involved, and the severity of the problem. Once a certain business impact level is reached, CEM automatically triggers evidence collection from CA Wily Introscope®, the industry-leading application performance management tool, as well as routers, switches, and other infrastructure components. This snapshot of evidence aids problem resolution since it is done immediately and in the context of the end-user's problems.

Based on SLAs set for end-user transactions, such as number of users impacted or rate of defects, an incident in CEM will automatically create a helpdesk ticket. With out-of-the-box integration with CA Unicenter Service Desk® the ticket is created at the specified request area in Service Desk complete with a URL link to CEM and Introscope triage and diagnostic information in the application infrastructure supporting the transaction. The help desk representative can immediately access critical information about the nature, severity and business impact of the incident and provide root-cause information to application support specialists.

The specialist can then drill down into CEM's SmartChart to quickly troubleshoot the problem. SmartChart graphically depicts CEM's predictive analysis of the infrastructure tier most likely to have caused the problem based on the number and variability of defects in each tier for each business transaction. If necessary, the specialist can drill-down with one click to further isolate issues based on time spent in the client, network, web server, application server, logic, and backend.

Additionally, CEM has the ability to report critical end-user activities within a business context. CEM's ability to monitor critical business processes such as the buy transaction enables business managers to regularly run reports and analytics to more accurately measure end-user success and accurately report SLA compliance to executive leadership.

Furthermore, CEM can group end-users based on URL strings or HTTP header attributes—such as customer code, phone type, location, robot, etc.—and then produce SLA reports for each of these groups.

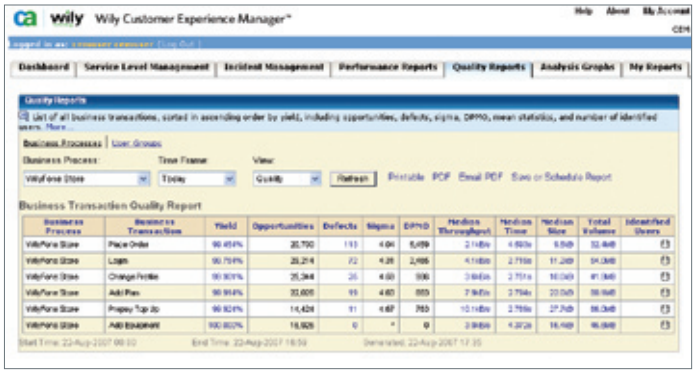
Support Corporate Initiatives

To help with continuous improvement and reduction in variance as required by quality initiatives such as Six Sigma, CEM presents end-user experience data through a percentile distribution or "box whisker" graph. Average-performance metrics ignore outliers and do not give an accurate representation of overall online end-user experience. However, percentile distribution metrics provide detailed analysis of transactions within a business process using statistics such as min, max, median, and Six Sigma quality metrics such as yield and defects per million transactions. These metrics provide a true representation of the end-user experience, helping you to focus your resources on reducing variance while delivering a consistent, online experience to customers, suppliers, partners and employees.

FIGURE F

CEM can automatically generate and distribute SLA, quality and performance reports in PDF via email.

BUILT-IN REPORTING



CEM's ability to fit into your processes and interact with existing systems enables your organization to successfully implement ITIL processes. CEM's capabilities are essential for effective implementation of ITIL's Service Desk and Incident Management disciplines, which require live data on customer experiences, transaction quality, transaction success/failure rates, as well as evidence collection and business impact analysis for rapid problem solving.

FIGURE G

CEM empowers IT to ensure superior end-user experience.

KEY CA WILY CEM CAPABILITIES

CAPABILITY	FUNCTION
Support for Off-the-Shelf Web Applications	Works with web-based applications from leading vendors, including Siebel, Oracle®, Microsoft® and others.
Support for Custom Web-Based Applications	Works with any web-based application using HTTP(s), Web Services, or XML, whether built on Java, .NET, mainframe or other technology.
Monitor Transactions at the End-User Level	Understand exactly which end-users were impacted by login ID, user name and user group affiliation.
Calculate Business Impact Analysis	Calculates the business impact of poorly performing transactions, enabling efficient, business-prioritized IT problem solving.
On-Demand Evidence Collection	Automatically collects evidence from hardware, software, network components and deep diagnostics tools like CA Wily Introscope at the time of an end-user impacting event to facilitate problem analysis.
Capture Page Content	Captures all end-user inputs when a transaction performance or quality problem occurs that may be critical to resolving non infrastructure-related problems.
SLA Management	Generates SLA compliance reports by business process, business transaction, or end-user groups.
Zero Risk Installation	Installs as a passive network listener and does not introduce latency or overhead into the infrastructure.

SECTION 7

Conclusion

Moving critical business functions to the web has many advantages but also some significant, unintended consequences. Because IT now provides services directly to customers, employees, and trading partners through the web, business stakeholders have lost touch with their customers and lack the visibility they need to ensure end-user satisfaction and the attainment of revenue goals. IT must embrace a new reality—that they are in many ways closest to the end-user experience and that they need to adopt an effective end-user monitoring strategy. By monitoring critical end-user business transactions as they move through the web application infrastructure, IT can share critical intelligence with business stakeholders and better manage application performance and availability. In this way, the organization can work collaboratively to achieve common objectives: superior service delivery, end-user satisfaction and assurance of revenue streams.

The CA Advantage

CA Wily CEM is a critical component of CA's Application Performance Management suite of industry-leading products to manage the performance and availability of applications, portals and service-oriented architectures (SOAs).

Because CEM integrates with virtually any tool or process, it contributes to CA's larger vision of Enterprise IT Management (EITM), enabling organizations to unify and simplify IT management across the enterprise.

To find out more about Customer Experience Manager or other products from CA Wily Technology, email **wily-info@ca.com**, visit **www.wilytech.com**, or contact one of our worldwide offices.

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CA, one of the world's largest information technology (IT) management software companies, unifies and simplifies the management of enterprise-wide IT for greater business results. Our vision, tools and expertise help customers manage risk, improve service, manage costs and align their IT investments with their business needs.

CA Wily Technology is the market-leading provider of Enterprise Application Management solutions. By delivering end-to-end visibility into customer transactions in real time, products from CA Wily Technology enable companies to successfully manage the health and availability of their critical Web applications and infrastructure. CA's collaborative management approach allows enterprises to rapidly detect and diagnose application slowdowns and failures, and better assess the impact of application performance on business success. This means better customer service, more stable revenue streams, and higher IT productivity.

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