A Killer App. for the Makers of Killer Apps. – Why Faster Problem Resolution is Key to your Software Business

Identify Software

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Introduction

According to a recent Gartner Benchmarking Report, 40% of the activities conducted by application development teams, on average, are associated with *support* of the application.

Any executive in charge of application development should be concerned by that figure. And every executive in a software business should be alarmed. It means that 40% of the time, your development team is not working on the next release, the next module, the next product the one that will keep your maintenance revenues flowing, drive new sales, and maintain your competitive lead.

In its 2004 Benchmark Study, the Service and Support Professional's Association (SSPA) reported that the percent of support cases closed at first contact continues to decline, while the length of time a case is open continues to increase. Alarming again. Escalation to a broader resolution team leads to skyrocketing personnel costs. Longer problem resolution times cause customer satisfaction issues and possibly delayed or lost revenues.

These distressing facts aren't all that surprising. While the software development process (presumably accounting for the other 60% of a developer's time) has undergone multiple paradigm shifts in the past few decades, the software support process continues to rely on the same manual, labor intensive, iterative approach.

Supporting applications means solving application problems. And, as any software veteran knows, the challenge is that the symptoms of a software problem rarely reflect the root cause. Finding the glitch is not easy when you don't know where to start looking. A single business transaction may kick off a sequence of complex processes, each of which may involve events that happen on up to a dozen potential servers. The root cause of the problem could be a software issue, a hardware fault, a configuration issue, or even an end-user's mistake. A recent survey, conducted by Dynamic Markets Ltd., found that 75% of the application problem resolution cycle time is attributed to determining the root cause of the problem.

Pinpointing the root cause can be especially difficult when problems happen at remote customer sites. Support team members typically go though a lengthy and costly process that includes endless conference calls, iterative attempts to gather information, costly trips to the customer site, and multiple attempts to recreate the problem. And although Gartner research also tells us that application faults are responsible for only 40% of all unplanned downtime, any veteran of software support knows that the vendor is guilty until proven innocent.

Clearly, a change in the application support paradigm for independent software vendors (ISVs) is long over due.

This paper examines the challenges of application problem resolution and support and suggests a new approach that accelerates resolution cycles, while reducing support costs and enhancing customer service levels.

"Before AppSight, tough customer problems pulled our developers away from their new product work for intolerably long stretches. Now that AppSight reveals the root causes, they can be instant heroes and get right back on task."

VP of Engineering,
Cerner Corp.

Challenges of Problem Resolution & Support

The sheer complexity of today's distributed applications, the large number of participants in problem resolution, and lack of technologies to automate the process, result in formidable challenges and costs along the support chain:

- **Information gathering** - As the cause of application problems can rarely be predicted, a tremendous amount of data must be gathered from the client and server side of the application, both inside and outside of the firewall. This is done by relying on inaccurate verbal descriptions by frustrated end-users, along with extremely limited visibility into server-side execution.

- **Recreating problems** - Problems need to be manually recreated time and again so that root cause can be identified. Replicating a real-life production environment in the lab and reproducing problem scenarios is extremely complex and time-consuming. More often than not, it is just impossible.

- **Finger pointing** - Since applications consist of many components, people from multiple teams are commonly engaged in problem resolution, attempting to guess whether the root cause is in the application, the database, the network, the operating system, the firewall, the application server, etc. On average, 6.5 people will "touch" a problem before it is resolved; this trial and error process is lengthy and frustrating, typically resulting in unconstructive finger pointing.

- **Root cause determination** - Even if a problem is recreated in the lab, the root cause may still be elusive. As any critical application consists of hundreds or thousands of moving parts, determining what is causing the application to fail using traditional debugging technologies is always a challenging and protracted task; one that involves multiple trial-and-error cycles. In every such cycle, the support person will take a guess at the cause of the problem and attempt to modify a single component of the application. Failure will lead to yet another cycle. This task could last days or even weeks, resulting in substantial costs and extreme user frustration.

Understanding the challenges of the support chain may shed some light on another interesting industry data point – if you break down

"Identify describes AppSight as a "killer app". While this particular beast is often talked about, in practice it has been a very long time since anyone has come up with one. However, there is a strong argument to suggest that Identify is right."

- Bloor Research

the time spent on each stage of the problem lifecycle, you will find that, on average, delivering a solution takes only 20%. Root cause analysis represents 80% of the total problem resolution time.

How much do we pay for inefficient support processes?

- **Labor costs** - Due to the manual nature of the support process, considerable work hours are wasted gathering information, recreating problems, communicating, triaging, and analyzing problems. And, as many of the people engaged in problem resolution are also charged with other tasks, every minute spent on support means a loss in productivity and opportunity cost.

- **Travel Costs** - Without an effective way to capture problem information remotely, you may have to deploy a "SWAT" team to your customer's site for days or weeks at a time -- which is disruptive for them and very costly for you, both in terms of travel expenses and lost productivity.

- **Customer dissatisfaction** - Even more important than direct costs, poor service and long, iterative resolution cycles result in dissatisfied customers. This also damages an ISV's brand name and reputation.

A Solution for Application Problem Resolution

To address the myriad challenges of the application support process, a new breed of technologies is needed. These technologies must be coupled with a holistic approach that facilitates a true support solution.

Below is a summary of the requirements of such a solution:

- **Broad and deep problem resolution capabilities** - The solution must be capable of addressing all common problem types– functional, configuration, performance, and end-user errors–through recording of full problem data, from user actions down to the code execution trace and argument values. Recording all this data in the production environment is the only way to eliminate the need to recreate problems in the lab. The solution must work across the entire application landscape – J2EE, Microsoft .NET, Windows DNA; on clients and servers, locally and remotely.

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We did it all without travel costs, without taking our people away from the development work that moves us forward, and without the on-site disruption that can make us look bad with our customers and reduce their confidence."

Senior Architect,
Fujitsu Transaction Solutions

- **Fit to existing support processes** - A solution must provide a single product offering that addresses the entire process:
  - It should allow IT operations engineers to proactively monitor applications and identify problems as soon as they occur
  - It should enable help desk technicians to view user actions and system configuration
  - It should provide developers with visibility into application execution and performance down to the code level, so that any problem can be resolved as early as possible
  - It should facilitate deployment across the entire application landscape. As the root cause of problems may lie in any of the application components–Web servers, database servers, application servers, and clients–a support solution must allow flexible deployment across a large-scale environment

Identify's AppSight Black Box Technology

Since its inception in 1996, Identify® has established itself as a pioneer and leader in the application problem resolution software market. Identify's AppSight ™ accelerates the process of problem resolution in production applications, reduces support costs, and enhances customer service.

Broad and Deep Problem Resolution with Black Box Software Technology

AppSight is based on patented Black Box software technology, so named for the black box flight recorder concept in the aircraft industry. Black boxes on airplanes record myriad events during a given flight, monitoring a wide variety of intricate systems from fuel systems to hydraulics, electronics to communications, as well as their interoperability, all in real time. By recording and playing back the actual events of a flight, the black box enables the precise identification of the root causes of failures in a variety of critical systems.

Identify's AppSight Black Box software technology is predicated on the same principle. The AppSight Black Box is a lightweight software module that captures and records every aspect of an application problem. Seamlessly deployed on servers and clients,

Sample Problems AppSight Helps Resolve

- Application crashes
- Application hangs
- Business logic errors
- Inefficient application code
- Database access failures
- Web service call failures
- Component invocation errors
- Component incompatibility
- Application integration errors
- Application performance problems
- System performance problems
- System configuration errors
- Application configuration errors
- Resource access permissions problems
- Memory problems
- Installation failures
- Application migration and upgrade problems
- Problems caused by 3rd party applications
- User errors
- Customer modifications/ integrations

locally or at remote end-user sites, activated on-demand or run continuously, the Black Box records actual problems at multiple, synchronized levels, including user interactions, application configuration, application performance, application calls, and code-level execution flow – all while the application is running. Easy to deploy, the Black Box requires no changes to source code, executables, or systems.

With full problem information captured in one compact AppSight Black Box log, problem resolution cycles that once took weeks and included endless finger pointing can now be compressed to just a few hours, and sometimes minutes.

Application development and support teams can play back and analyze problem data recorded in the Black Box log using AppSight's set of easy-to-use, dedicated analysis views. Whereas a help desk technician may only wish to view user actions, a second-tier support person would typically drill down into application configuration and performance, and a developer would most likely play back recordings at the code level to view function calls, argument values, and exceptions. With AppSight's analysis views, each recording layer is always one click away, making root cause identification quicker and more efficient.

"Eighty percent of the time, the problem is a configuration issue within the customer's environment and is handled immediately by the Call Center with the help of AppSight. By using AppSight, we dramatically reduce the fault isolation time, which then reduces the overall time to resolution."

VP of Customer Support Svs, FileNet

Integrated into Existing Support Processes

When you need to record problem data from the application client-side, AppSight Black Boxes can be deployed over the Web using a fully customized support portal. The Black Boxes can be run in continuous mode or activated on-demand when problems occur. Black Box logs, which are highly compressed, self-contained files, can be attached to trouble tickets in a help desk system, thus allowing all application support tiers to communicate the information required for problem resolution and eliminating the need to recreate the problems in a lab.

For recording problems on the server-side, the AppSight Black Boxes monitor application execution and send an alert upon detection of application problems. The alert may be displayed in a systems management console, telling the Operations Engineer that a problem occurred and providing information on which application and component caused the problem. To capture all the data necessary for resolving the problem, AppSight Black Boxes can change recording levels on the fly. This is done either automatically when a problem occurs, or manually, when you know that the application is not working well. Recorded data is easily communicated to application development and support teams for rapid root cause identification.

Support-enabling Business Model

Realizing the unique requirements of application support, Identify has implemented a licensing model that facilitates strategic implementation of AppSight. Rather than "counting" your CPUs, AppSight's licensing is based on the number of people analyzing problems. Black Boxes can be deployed on any number of clients and servers, or even embedded into applications, at no cost. As it is impossible to predict on which computers problems will occur, this is the only viable licensing model for support.

Conclusion

While application technologies have been evolving over the past two decades and have become the lifeblood of every enterprise, very little has been done to deliver the technologies and processes required to support business-critical applications.

Today's application support and problem resolution processes are manual, and therefore highly inefficient. To resolve problems in production applications, an iterative process of information gathering, recreating of problem scenarios and debugging is carried out manually by multiple people from application development, IT operations, and the help desk. Hence, problems often take a long time to resolve, resulting in exorbitant downtime costs, dissatisfied users, and loss of reputation.

Identify's AppSight is based on patented Black Box software technology that captures, communicates, and pinpoints the root cause of problems in production applications. A comprehensive application problem resolution system, AppSight helps enterprises and software vendors accelerate problem resolution, reduce support costs, and enhance customer service.

Cerner

Industry/Market
Healthcare

Customer
Cerner, a leading healthcare solutions provider with 5100 employees and 1500 corporate clients worldwide, including major healthcare conglomerates operating scores of hospitals

Challenge
Maximize the trustworthiness and availability of Cerner's healthcare information solutions while reducing their development and support costs

Solution
Use AppSight Black Box software throughout the application lifecycle to produce more robust applications with lower QA costs, and resolve field problems faster, remotely, reducing costly client site visits

Results
• Saved Cerner's 40 QA team engineers over two hours per person, per day

• Cut root-cause analysis time by about 80% and significantly reduced the need for client site visits

• Transformed resolution time of an elusive problem from days or weeks of trial-and-error, to complete resolution in the span of a coffee break

Appendix

Case Study: Cerner

Healthcare solutions leader looks to AppSight to reduce costs, strengthen support, and foster well-being

As a world leader in healthcare software solutions, Cerner is replacing paper charts with intelligent, interactive electronic forms designed to improve patient care and business management by "eliminating error, variance, waste, delay, and friction". Because the lifeblood of modern medicine is information, and healthcare institutions increasingly depend on software solutions to manage and deliver it, downtime and application problems can bring patient care to a costly and hazardous halt.

Minimizing this downtime requires rigorous quality assurance. Until recently, Cerner took the industry-standard approach to the challenge, with industry-typical costs and results. Its QA group exercised each new application with de-bug scripts to find functional flaws and structural weaknesses. When an application misbehaved, team members would repeat the problem-causing scenario and methodically search through levels of architecture, layers of events, and myriad conditions and interactions to find the root cause. It was a manual, laborious, and costly process.

"Given the labor it takes to assure the software quality demanded in healthcare, where lives are literally at stake, we were immediately intrigued by Identify's Black Box technology," recalls Owen Straub, Cerner's VP of Engineering.

AppSight knows all, shows all

Like the aviation black boxes that have revolutionized air safety, Identify's patented Black Box software technology has transformed application support by recording real-time, forensic logs of software and system events. The Black Box can capture every system event and condition, at every level, from user inputs and system configuration, to application code. Identify's AppSight™ application support system organizes these Black Box logs into coherent, time-synchronized views, and provides powerful tools that can analyze, correlate, and filter the data to reveal the root cause of each problem.

"Before AppSight, tough customer problems pulled our developers away from their new product work for intolerably long stretches. Now that AppSight reveals the root causes, they can be instant heroes and get right back on task."

"We found that employing AppSight in production virtually eliminates the need to recreate problems in the lab, saving us significant time and costs."

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VP of Engineering
Cerner

Cerner first used AppSight to accelerate its Quality Assurance process, and found that the more than 40 engineers in its QA group gained two hours per person, per day. Because Cerner's QA engineers also provide level-three customer support, they soon saw the difference between solving problems in the lab with AppSight and the challenge of troubleshooting field problems without it.

Zooming in on root causes

Cerner now embeds Identify's Black Box technology in its Cerner Millennium™ healthcare solutions platform. The Black Box is transparent to users and has no effect on system performance. But its effect on customer support is dramatic. Either running proactively and feeding log data into cyclical, FIFO buffers, or running on-demand when problems emerge, the Black Box captures field problems when, where, and how they happen. This enables Cerner's engineers to analyze customer Black Box logs with AppSight, swiftly pinpoint the root cause of a problem, and proceed directly to a solution—saving the hours, days, or even weeks involved with problem replication. "We found that employing AppSight in production virtually eliminates the need to recreate problems in the lab, saving us significant time and costs," says Straub.

For example, a Cerner client in radiology reported a baffling problem: a transcriptionist found that random paragraphs kept mysteriously disappearing from her transcriptions. In medicine, avoidably incomplete information poses great potential danger. The problem escalated to the point that the client wanted it fixed immediately. Cerner sent its level-3 SWAT team on-site, as stipulated in the client's service agreement. At a moment when the transcriptionist stepped away on a coffee break, the problem happened again, so the Cerner engineer activated the Black Box. Then, when the problem quickly recurred, the engineer was able to study the log and discover that the transcriptionist, in cleaning up raw transcription files, kept hitting a combination of keys that the relevant program interprets as "delete paragraph." With the root cause revealed, the fix was simple, and nearly instantaneous. Had Black Box technology not been used to trap this problem "in the wild," Straub estimates that replicating such an unforeseen and idiosyncratic problem "could have taken weeks."

FileNet

Industry/Market
Independent software vendor (ISV)

Challenge
How does the leader in enterprise content management solutions reduce the cost of supporting complex, business-critical applications at remote user sites?

Solution
Using Identify's AppSight Black Box software, FileNet, can automatically receive critical support data from customer sites and pinpoint configuration and performance problems.

Results
- Reduced fault isolation time by more than 25% in a three month period
- Reduced average time-to-resolution by 50%
- Reduced labor hours: fewer and shorter on-site visits for deployments, in some complex cases, 10x savings
- Increased customer satisfaction and loyalty due to improved ability to forecast time-to-resolution

Heroism to order

"Before AppSight," says Straub, "tough customer problems pulled our developers away from new product work for intolerably long stretches. Now that AppSight reveals the root causes, they can be instant heroes and get right back on task."

Along with reducing the duration of client site visits and dramatically shortening downtimes, AppSight has reduced the number of site visits needed because Cerner engineers can now solve more problems remotely.

AppSight creates a win/win situation: Cerner delivers superior product performance and better, timelier customer support while spending less money to do so. Cerner clients deliver superior patient care and gain business efficiencies while enjoying increased confidence in their information solutions and the company standing behind them.

Case Study: FileNet

Solving more problems more quickly, without increasing staff

FileNet Corporation (Costa Mesa, CA), helps organizations make better decisions by managing the content and processes that drive their businesses. FileNet's Enterprise Content Management (ECM) solutions allow customers to build and sustain competitive advantage by managing content throughout their organizations, automating and streamlining their business processes, and simplifying their critical and everyday decision-making.

Assisting FileNet's worldwide customer base of over 4000 installed systems is Vice President of Customer Support Services (CSS), Robert Roach. Roach's 120 Global Call Center personnel support over 80 products and field approximately 9000 customer calls a month. Roach found that, historically, it took his team 15 times more effort to find a system-level problem than to fix it.

"Our customers are large financial organizations that have 24-by-7 mission-critical production needs. Any downtime results in loss of business totaling millions of dollars a day," said Roach. "Faster resolution of critical issues eases the impact on the customer and

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- Robert Roach VP of CSS

builds their confidence in our products and services, leading to a higher level of customer satisfaction."

AppSight cuts problem resolution time by 50%

In order to improve customer service and satisfaction, CSS would need to improve overall efficiency in its fault isolation process. Using Identify's AppSight™ Black Box software, Roach hoped to reduce fault isolation time by 25% and reduce average time-to-resolution by 50% or more.

The benefits went far beyond. Typical system-level problems, such as erroneous configuration and component integration failures, were discovered in less time and without deploying support personnel to the field. In addition, the Call Center was able to concentrate more time on solving problems rather than finding them. Roach commented, "We solve more problems quicker without increasing our staff when we use AppSight and this directly affects customer satisfaction and impacts favorably on the cost."

Pinpointing configuration problems

The CSS organization receives and triages calls as they come in. "Eighty percent of the time, the problem is a configuration issue within the customer's environment and is handled immediately by the Call Center with the help of AppSight," said Roach.

Out of six typical escalations, CSS saved 1040 hours of labor using the AppSight Black Box. "With AppSight, we experience excellent results in reducing our labor hours associated with fault isolation," said Roach. For example, the Black Box isolated a complex customer production error in five hours—normally, it would have taken Roach's team hundreds of hours. "We encounter these types of escalations on average six to 10 times a year," said Roach.

Eliminating costly SWAT Team field deployments

If a problem requires escalation, Roach sends his "SWAT Team"—a special group of senior support engineers on a four-hour standby—into the field at no additional cost to the customer. In the field, the SWAT Team found that 30% of the problems were due to network issues where a quick fix could have been done, had the customer relayed accurate information. Other times, after hours of tracing,

Fujitsu

Industry/Market
Retail point of sale (POS) solutions

Customer
Fujitsu Transaction Solutions Inc. (Frisco, TX), a lifecycle solutions provider of hardware, software, and services for consumer transaction environments in North America. Customers include Canadian Tire, ChevronTexaco, Loblaws, Nordstrom, Payless ShoeSource, Regal Cinema, REI, Staples, Stop & Shop, and The TJX Companies

Challenge
Lower support costs and improve the reliability of GlobalSTORE , Fujitsu's Windows -based retail application. In particular, minimize the difficulties of supporting myriad, site-by-site customized variants

Solution
Use Identify's AppSight Black Box technology to efficiently capture a complete, diagnostic picture of problems in real time—plus the detailed system context in which they occur, in order to pinpoint and solve problems more quickly

Results
• Realized ROI within the first year

• Enabled remote solution of an intermittent problem...

the SWAT Team would find that customer changes to the system had caused the problem.

Using AppSight, Roach's team was able to catch the network and system issues without deploying the SWAT Team, saving his organization time and money. With the Black Box's ability to capture problems at remote sites, the Call Center and SWAT Team were able to solve system-level problems without escalating them through the CSS organization. "By using AppSight, we dramatically reduce the fault isolation time, which then reduces the overall time to resolution," said Roach.

FileNet customers realize benefits

Since FileNet deployed AppSight in its CSS organization, feedback from customers has been very positive. In fact, several FileNet customers have noticed that their system-level problems have been isolated faster, thus saving them time and money. Feedback from CIO-level customers has also been positive, as they are happy to see FileNet using innovative tools. "Overall, we reduced fault isolation in Customer Support Services by more than one-fourth in a three-month period and overall average time-to-resolution by 50% or more," said Roach.

Case Study: Fujitsu

AppSight drives down downtime, drives out costs

They say no good deed goes unpunished. This seemed to hold true for Fujitsu Transaction Solutions Inc.—until the company discovered AppSight.

Fujitsu's good deed was making its GlobalSTORE® POS solution for retailers outstandingly easy for its users to customize. By empowering retailers to take control of their own IT systems, Fujitsu helps them lower the cost of operation, realize greater added value, and support and extend the relationship style that makes each retailer distinct in the eyes of its customers.

The punishment? A potential nightmare in product support. When GlobalSTORE customers call Fujitsu to resolve problems with a system in use for some time, Fujitsu doesn't find the system it installed, but

"impossible" to solve otherwise, even on site

• Reduces need for customer site visits, lowering support costs significantly, accelerating development projects, and enhancing customer confidence

• Provides objective diplomatic verification when GlobalSTORE is not the source of customer problems

"We realized 75% of our ROI for AppSight just in solving one problem alone."

- Tom Messina, Senior Architect

a latter-day variant that may be in different, and not fully-documented states of evolution across a multi-store chain.

Recording reality

"We start with a very strong and reliable platform," says Fujitsu Senior Architect Tom Messina, "and we have a reliable process for tracking service packs and versions and so on. But with a system so complex and flexible, at some point down the road, neither our engineers nor our customers will know every detail and implication. This imperfect knowledge can make facing problems rather dark and discouraging."

So when Fujitsu learned of Identify's AppSight™ application support system, the company was immediately interested. AppSight uses patented Black Box technology to capture a complete, real-time record of enterprise application system events, conditions, and configuration—just as the flight recorder or "black box" in every aircraft captures a real-time record of each flight. And just as the flight recording provides invaluable diagnostic information when an aircraft misbehaves, AppSight's Black Box logs provide invaluable diagnostic information when problems arise with an enterprise application and/or the system on which it runs.

Eliminating trials—and errors

AppSight's Black Box logs replace the time-honored, time-consuming approach to application problem-solving: speculating on the unknown cause and then attempting to replicate the problem behavior through trial and error. According to industry analysts, such problem replication represents 80% of the lifecycle cost of supporting enterprise applications. Eliminate this sinkhole, and the gains can be huge.

Fujitsu is a case in point. Before adopting AppSight for GlobalSTORE support, they did a careful, detailed ROI projection and concluded that the solution would pay for itself within the first year. Reality has proven better yet.

"One of our customers was experiencing a very intermittent problem causing POS terminals to crash," says Messina. "Before AppSight, a problem like this would have required us to send people out to the field for several weeks, at a loaded cost of, say, $150 per person, per hour. But by using AppSight, we were able to deploy the Black

"Our mantra is to relentlessly drive costs out of customer IT operations. We see AppSight as a key enabler for doing just that."

- Tom Messina,
Senior Architect

Box in the live store environment, running it remotely from our Wake Forest, NC, location."

"Even with Black Box, it took us several weeks to solve the problem because it was so intermittent. But without Black Box, it might have been simply impossible. AppSight helped us narrow the problem down to one component, and then one class in the component. We did it all without travel costs, without taking our people away from the development work that moves us forward, and without the on-site disruption that can make us look bad with our customers and reduce their confidence, "Messina continued. "We realized around 75% of our ROI on AppSight just in solving this one problem alone."

Finding causes instead of pointing fingers

AppSight's benefits for Fujitsu include quickly capturing system configuration information—minimizing the downside of extensive user customization—and providing objective evidence in instances where Fujitsu's own offerings are not the source of an apparent GlobalSTORE problem. "It's great for everyone involved," says Messina, "when you can eliminate fingerpointing and focus on resolving the problem, whatever its source happens to be.

"At present, Fujitsu pushes the AppSight Black Box modules out to a customer implementation on an as-needed basis. Fujitsu plans to integrate AppSight into its next release of the GlobalSTORE platform.

"Our mantra is to relentlessly drive costs out of customer IT operations," says Messina. "We see AppSight as a key enabler for doing just that."

About Identify Software

Identify® is the leader in application problem resolution software, helping hundreds of enterprises and software vendors speed application delivery, increase application quality, performance, and availability, and reduce application support costs. The company's AppSight Application Problem Resolution System leverages unique, patented Black Box Application Flight Recorder technology to capture, communicate, and determine the root cause of application problems, thereby dramatically accelerating problem resolution processes across the application lifecycle. Founded in 1996, Identify is a global organization, with operational headquarters in New York and offices in Israel and throughout the U.S., Europe, and Asia Pacific.

For more information about Identify, please visit www.identify.com, e-mail info@identify.com, or call 800.364.5467.