

End-user experience monitoring

Application downtime and poor end-user response time can be devastating for an IT organization. Costs rise, revenue and productivity fall, and corporate management sees red. It's especially frustrating when traditional indicators—service level and application performance measurements—show your IT system is working fine. You think the network and infrastructure are operating at 99% plus. But the people who actually use the system are telling you otherwise.

For IT organizations, good end-user experience has to be the litmus test for enterprise application performance. This is an increasing challenge, given the complexities of distributed computing environments. To be successful, you need to focus on the fundamentals: Who are your end users? How can you monitor their experience with the IT system? Can you translate these measurements into proactive troubleshooting? What tools and methods can help?

End-user experience: importance and impact

To insure that mission-critical business applications are working properly, you must know who is using them and how.

Who are your end users?

Many organizations now operate multi-tier and multi-functional networks, which connect end users to everything from web-based virtual storefronts to remote applications running over a dedicated network to intranet and LAN-based applications.

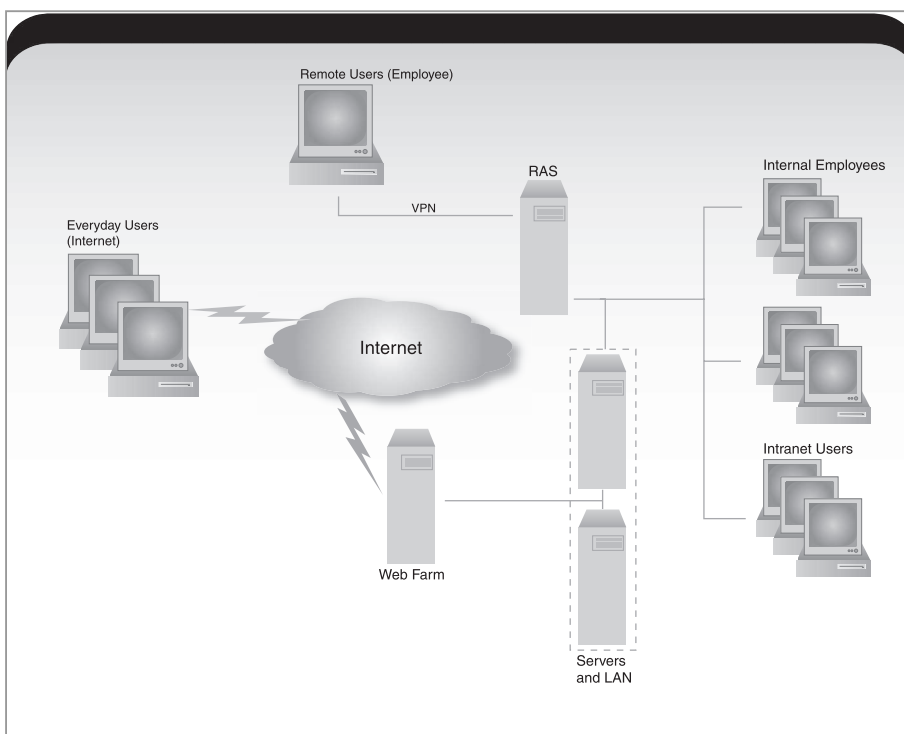
Such hybrid network infrastructures are typical. IT departments frequently make the mistake of focusing on one group of end users when there are usually multiple separate and distinct customer bases—the web user visiting the organization's web site, the remote user with a dedicated connection to the network, and the local user. Once you identify all the users, you can better prepare to manage and improve their experience.

Where do you go from here?

There are two ways to measure the round-trip transaction response time experienced by end users. Synthetic transaction (active) measurement involves simulating transactions from a designated machine at defined

intervals. Desktop (passive) monitoring involves deploying agents on desktops at the end user's location. These agents watch events or packets without slowing down the transaction. In both cases, since monitoring is conducted from a user location, the response time measurement accounts for all the intervening components of the infrastructure. Server, database and network monitors cannot do this effectively.

Active tools generate synthetic transactions from dedicated "robot" PCs, so service level measurements are taken from designated computers of known and constant configuration. The advantage is you can capture diagnostic data at the time a service level exception occurs, without having to recreate the problem to identify the cause. With passive



Positive end-user experience is vital for all users, remote and local, whether using web or traditional interfaces.

measurements, independent agents are deployed on many representative desktops in a corporate network to validate the end-user experience for Windows, web and other applications such as SAP. You learn as much as possible about end-user experiences based on actual user response times, rather than calculated simulations. The challenge is capturing real-life measurements while being as unobtrusive as possible. Otherwise, you get distorted results.

The heterogeneous nature of distributed client/server environments makes it more difficult to develop a comprehensive, enterprise-wide approach for quantifying end-user experiences. Additionally, the complexity of client/server environments introduces new variables into the equation that further complicate the gathering of application-specific information. This slows down activities such as diagnosing and locating bandwidth utilization and latency problems. Complexity arises from:

- intricate network segmentation
- heterogeneous networking environments using devices from multiple vendors
- multi-tier client/server architectures
- geographically dispersed infrastructures
- several network protocols and operating systems deployed within the same enterprise.

Dealing with this complexity involves monitoring and resolving application and network problems. However, end-user satisfaction should drive service level management, and diagnosis of network latency and bandwidth utilization.

Imagine, for example, that you are the CIO of a large corporation with a far-flung IT infrastructure. On the afternoon of the last day of each month, your director of finance has the important task of entering into the sales processing system last-minute revenue figures for deals that just closed. On a particular month, he or she uses the application and soon becomes frustrated with the slow response time. The network support team checks all systems and discovers no “perceived” problem with an easily identified root cause. The afternoon turns to evening and the problem persists.

Because the right tools aren’t in place to monitor end-user service levels, no one forecasts the potential poor application performance. As a result, IT staff spend countless hours on the end-user workstation, network and multiple servers to locate the problem. Meanwhile, the bottom line suffers.

Let’s replay the scenario with an end-user experience monitoring tool already deployed. The entire situation could have been averted. The tool alerts IT of the impending performance degradation well in advance, based on established service-level criteria, allowing adequate time for diagnosis and prevention. The new result: As far as the end user is concerned, the performance problem never happens.

3 Ways to Manage Performance Goals

Management Method	Description	Effectiveness
SLA (Service Level Agreements)	Provides guidance and quantifiable network component performance objectives to the IT organization.	Does not address poor end user response time. It is possible to experience 99% network component uptime with continued poor end-user performance. Although the SLA is met, the end user still experiences poor performance.
APO (Application Performance Objectives)	Provides guidance and quantifiable application performance objectives to the IT organization.	Does not address poor end-user response time. 99% application uptime may satisfy the negotiated APO, but does not address positive end-user experience.
EUE (End-User Experience)	Provides guidance and quantifiable service level criteria for acceptable response times.	Gives best measure of EUE. Does not concern itself with measurable uptimes or performance statistics from SLAs or APOs. Instead focuses on the end-user experience as it relates to established pre-defined response time thresholds.

Managing from the end user's perspective

Know your application performance objectives

Before adding new applications, network components or end users to the existing network infrastructure, many organizations attempt to determine the potential impact of the changes. Usually the focus is on evaluating the application or component itself, including service levels and performance objectives. This leaves out end-user experience, the truest measurement of business infrastructure performance.

Emphasis on EUE means improving response time rather than just network or application uptime. EUE becomes the trigger for subsequent corrective actions, such as reconfiguring or updating network components to accommodate increased network latency, or making code changes to an application to accommodate an increased number of users. The value of this approach is that it creates a common method for addressing and managing poor performance, regardless of the root cause in the network component or application.

Evaluate your critical business transactions

Shaping the end user's view starts with a well-defined understanding of what a critical business transaction is. Without a clear definition of an organization's key business transactions, IT departments end up expending needless resources capturing unrepresentative transaction information for non-critical applications.

Consider a business transaction as an action or a set of actions performed by the end user that accomplishes a specific and significant task for the business. With the definition in place, we can begin to differentiate critical from non-critical transactions.

Detecting poor performance of critical business transactions requires a monitoring solution to be in place already with established transaction definitions and service level performance thresholds. An IT department with well-identified critical business transactions understands not all transactions require monitoring.

Let's apply a synthetic transaction (active) monitoring solution to our earlier example. Entering revenue into the sales processing system certainly counts as a critical business transaction and requires monitoring. By recording end-user actions, customizing user-defined events, monitoring real-time service alerts and reporting performance over time, a supporting IT department could determine the performance trend of the sales processing system and alert the CIO of potential EUE issues earlier.

Understand the end user's view

Although a robust network infrastructure tends to support positive EUE, the key is to understand the network from the standpoint of the end user. Client performance issues are often blamed on network or application problems, but the source may be the client machine where the problem cropped up.

Desktop monitoring helps an IT organization interpret poor performance from the standpoint of the end user reporting the problem. This, in turn, provides a unique view into the latency issues from the client machine and helps end users understand that performance problems are not always network- or application-based.

The value of diagnosis and prediction

Diagnosing poor infrastructure performance helps IT organizations avoid future problems. A rigorous troubleshooting methodology provides additional assurance of meeting service levels and satisfying end users.

Desktop monitoring provides a diagnostic starting point for latency troubleshooting. The moment an unmet service level threshold is triggered, IT organizations can execute a health check of the business infrastructure to look for specific network and application failures.

IT organizations also can use trend analysis to better predict client performance. Predetermined transactions, identified by specific start-and-stop events, measure performance behavior. Built-in reporting functionality captures this information and shows the evolution of trends over time. This trend analysis helps determine the potential time and place of failures, based upon historical patterns.

A proactive performance management plan

ClientVantage from Compuware is one industry-leading tool that meets the challenge of monitoring end-user experience. It nonintrusively monitors, captures, reports and pinpoints application failures and service-level violations in Windows and web-based production environments, all in real time. ClientVantage captures the critical point-in-time data IT teams need to dramatically shorten recovery time from performance problems. IT professionals can monitor and manage service levels to increase the efficiency of distributed applications without altering the applications themselves.

The ClientVantage wizard gets you started with end-user experience monitoring within minutes, not hours or days. With ClientVantage, you can:

- measure synthetic transactions
- monitor end-user response times for critical applications
- script transactions easily using the event wizard
- notify key personnel of service level violations on the spot
- zero in on resource performance
- schedule synthetic transactions
- customize your view of the production environment
- provide browser-based performance reporting.

Measure synthetic transactions

ClientVantage synthetic transaction monitoring lets users gauge the response times of key business application transactions against established service level thresholds. ClientVantage records the end-user functions required to complete a single business transaction and saves them in automated scripts. The scripts are based on actual client transactions and are executed from key locations across the network. ClientVantage replays recorded transactions on designated stand-alone machines based on a schedule you define.

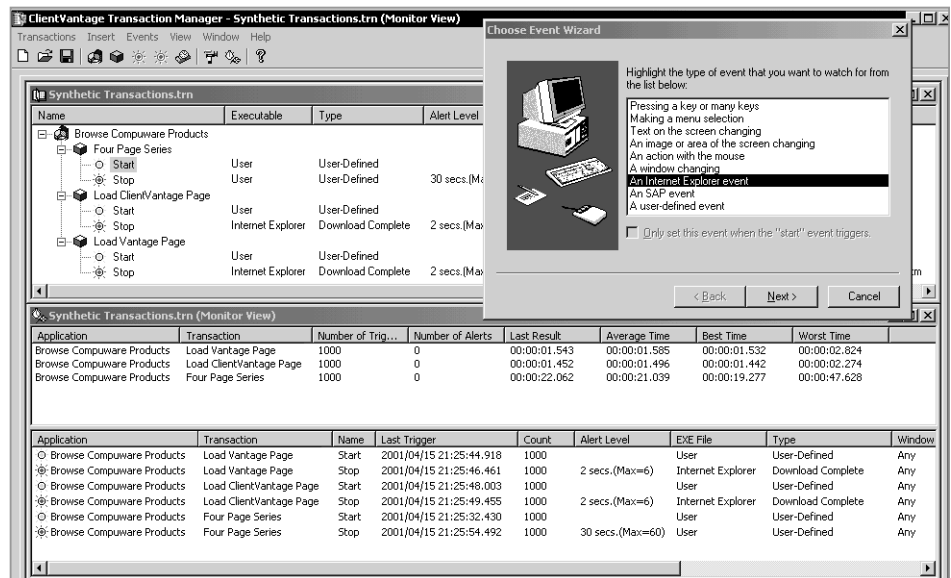
ClientVantage captures the diagnostic data at the time when response times exceed thresholds. Detailed diagnostic reports help pinpoint the root cause of delays. Team members get right to the detail needed to fix application slowdowns and bottlenecks in less time—or prevent them altogether.

Monitor end-user response times for critical applications

ClientVantage delivers performance data that directly relates to the end user and monitors any transaction, including Windows, web, TN3270 and Citrix. ClientVantage lets IT professionals monitor key business transactions at the time end users experience them and at all levels—application, database, network and operating system—without affecting actual transactions.

Script transactions easily using the event wizard

The event wizard walks a user through the process to define the exact starts and stops of events and the service levels for each transaction. Independent desktop agents are placed on end-user machines to monitor operating system resources and response times simultaneously. ClientVantage then gathers response time measurements, sends them to a centralized repository and creates reports—providing a global, graphical view of real-time system activity and true end-user data.



The ClientVantage Transaction Manager is the central location for defining and tuning transaction definitions. This example shows how to define transaction starts and stops.

Notify key personnel of service level violations on the spot

ClientVantage notifies support personnel immediately when service level violations occur via pager, e-mail, SNMP traps or the web. Using the rules-based notification feature, ClientVantage configures alerts to work with any support team's communication process.

Zero in on resource performance

ClientVantage's resource monitoring lets IT organizations better understand how critical resources—such as CPU, memory or disk space—perform on a particular workstation. With this information, team members can respond faster to factors affecting application performance and availability.

Schedule synthetic transactions

ClientVantage enables you to schedule which business transactions to monitor, based on your organizational timeframes. Team members can monitor end-user response times during peak operational times, or plan to monitor around scheduled downtime or system maintenance.

Customize your view of the production environment

The VantageView Visualizer maps service level and troubleshooting information from ClientVantage and other Vantage products according to roles in the production environment. IT staff can adapt views of the production environment—applications, servers, network links, clients—to correlate and display the important events for their specific environments and job responsibilities. The Visualizer highlights when and where critical events occur, providing the thorough detail needed to dig down to the root cause and resolve problems quicker.

Provide browser-based performance reporting

ClientVantage's browser-based performance reporting shows response-time trends easily from virtually any location. The browser helps filter and customize data to highlight specific performance issues and uncover tendencies in resource allocation. Transaction performance reports also integrate network and server performance data to help pinpoint causes of problems. Data is available both online and in hardcopy, with full graphing capabilities.

Front-to-back performance management

ClientVantage is part of the Vantage product suite for improving application performance by identifying, troubleshooting and resolving performance problems. With continuous monitoring of end-user response times, servers and databases, and network application traffic, Vantage identifies performance slowdowns—before customers are affected. Its ability to determine the precise nature and causes of performance bottlenecks accelerates problem recovery and moves you from fingerpointing to pinpointing. The only true front-to-back performance management solution, Vantage also predicts the time and source of future network and application performance problems.

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