Web Application Monitoring Service

The Value of Measuring End-User Experience from a Global Point of Presence

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Introduction

Organizations are increasingly depending on the web to communicate with their customers, prospects, and partners. As organizations expand their target markets to different geographies, they are seeking to ensure that they have visibility into the quality of the end-user experience for their web applications regardless of the business users' geographic location.

Many of these applications are being used as revenue generating tools for these organizations, and they need to understand not only how these applications are performing from the perspective of their IT departments, but also how they are performing from the perspective of business users.

The main characteristics of new web services are increased amount of dynamic and user generated content, changes in usage patterns, and a proliferation of composite applications and third-party services. This makes it increasingly difficult for organizations to gain full visibility into the quality of the end-user experience for their web applications. More importantly, end-user expectations for speed and availability of web applications are increasing, which in turn increases business risks for these organizations if they are not able to ensure an optimal level of quality of the end-user experience.

The Business Need for Web Application Monitoring

A recent NetworkWorld article titled "Poor application performance translates to lost revenue, research shows" showed that application performance issues are impacting corporate revenue by up to 9%. Organizations that are using Web applications as revenue generating tools need to understand how these applications are performing regardless of the physical location of their end-users. The article also shows that slow and not readily available Web applications can cause declines in customer satisfaction and damage brand reputation.

Many organizations are not aware of these business risks, as they do not have capabilities to measure application performance from the perspective of the business user. These organizations rely solely on monitoring their internal infrastructure, and they are not aware that their business users are not satisfied with the performance of their Web applications. As a result, they are losing customers and potential revenues while being unable to identify the root causes of these problems.

Different Approaches: Monitoring from Inside and Outside of the Corporate Firewall

Organizations that are trying to optimize performance of Web applications have to decide between two different technology approaches in order to achieve their goal. They can either monitor application and transaction response times by monitoring their internal infrastructure (Web and application servers, databases, etc.), or they can develop a network of geographically dispersed monitoring points and measure the quality of the end-user experience from outside of the corporate firewall.

Solutions for evaluating the end-user experience by monitoring internal infrastructure measure the time it takes for the server to respond to application requests and send this data into centralized repositories. However, this approach for measuring the quality of the end-user experience is based on an assumption that internal application delivery infrastructure is the only factor that impacts the quality of the end-user experience, which is not the case.

For example, the quality of the experience of an end-user who is accessing a certain Website from Boston might be very different than for the user who is accessing the same Website from Tokyo. Organizations taking this approach are not able to capture the impact that external parts of the application delivery chain – such Internet Service Provider (ISP) networks, third-party services, browsers, and operating systems – have on the quality of the end-user experience. This approach is also known as an, "inside-out approach," and even though it is effective in measuring the health of applications and Web servers and databases, it is not as effective in evaluating how Websites are performing from the end-users' perspective.

As an alternative to this approach, organizations can measure the quality of the end-user experience by creating a network of monitoring points outside of their firewall and have these software clients collect performance data about application response times, application availability, user session abandonment rates, and application usage patterns. Providers of these solutions also enable end-user organizations to understand if performance issues are caused by the network, server, end-user devices, or the application itself. This allows organizations to measure the quality of the end-user experience from a global point of view and to evaluate Website performance from the end-users' perspective regardless of the geographical location of their Websites' visitors.

It should be noted that advanced solutions for monitoring the end-user experience from outside of the firewall also include capabilities for monitoring protocols such as POP, SMTP and DNS. These solutions also monitor XML requests and are able to capture response times, so they can alert IT management teams about performance deviations from pre-defined thresholds.

Web Application Delivery Chain

Third-party services

One of the key trends in deploying and managing Web applications is the proliferation of third-party services such as Web analytics, Content Delivery Networks (CDN), e-commerce, and payment processing. This makes it increasingly difficult for organizations to manage the quality of the end-user experience for their Web applications, as they need to monitor not only the traditional application delivery infrastructure (servers, network, application design, end-user devices, and operating systems), but also the quality of services being delivered by third-party providers. This further increases the need for monitoring Website performance from a global perspective, as tools for monitoring internal application delivery infrastructure cannot measure the impact that these third-party services have on the quality of the end-user experience.

Composite applications

Additionally, applications are increasingly based on dynamic content, Java scripts, and are deployed as composite Web applications. Composite applications draw content from resources of multiple applications, making it even more difficult to manage their performance. More importantly, because of the complex design of these applications, it is more difficult to measure how different segments of the application design impact the quality of the end –user experience. Tools for monitoring the end-user experience from a global perspective are able to identify issues with the quality of the end-user experience for these applications and can pinpoint a part of the application infrastructure causing these problems.

User-generated content

A proliferation of social networking and Web 2.0 applications presents end-user organizations with an additional problem regarding Website management: how to monitor the performance of Web content that was generated by users of the Website. In order to grow their communities of users, organizations allow Website visitors to post their own content, such as streaming video and audio, as well as AJAX and Rich Media Applications (RMA). These applications are typically resource-intensive and more importantly, make it more difficult to predict the amount of storage resources they will require, as the Web management team has a very little control over creation of this content.

Tools for monitoring Web performance from the end-user perspective allow organizations to understand how user-generated content impacts overall application performance. Also, these tools allow organizations to capture end-user usage patterns, which helps organizations to make more educated decisions when optimizing utilization of their storage and server resources.

Capabilities Needed

Tools for active (synthetic) monitoring of application performance

One of the key goals for organizations deploying solutions for monitoring the performance of Web applications is to prevent performance issues before business users are impacted. In order to effectively execute on this proactive approach, organizations are endeavoring to continuously test and monitor their infrastructure so they can identify performance problems before they cause disruption of key business processes. Deploying tools for synthetic monitoring of the end-user experience allows organizations to periodically test the responsiveness of their application delivery network and to measure server and application response times. This type of approach allows organizations to not only identify problems with the quality of end-user experience, but also to pin-point parts of their infrastructure that are causing these problems.

Tools for monitoring application performance across application delivery chain

As Web environments become more complex, they introduce new risks for end-user organizations, as they have to deal with an increasing number of potential points of failure. This drives a need for improving visibility into application performance even further and for developing capabilities allowing organizations to understand not only when they experience issues with the quality of the end-user experience, but also to identify parts of the application delivery chain causing these problems. These capabilities are not limited to monitoring only Web and application servers, as they expand application visibility into all services and parts of the Web application delivery chain that can impact the quality of the end-user experience.

Tools for defining dynamic thresholds for performance of Web applications

As organizations attempt to manage more end-users with fewer IT staff, developing capabilities for defining baselines for acceptable levels of application performance becomes increasingly important. These tools are based on advanced Business Intelligence (BI) technologies and are able to analyze historical performance data in order to define minimum levels of performance of the application delivery infrastructure that current application performance should meet. More importantly, many of these tools have capabilities for ongoing learning and are able to automatically adjust performance baselines as they receive new performance data.

Tools for issuing alerts when performance falls below pre-defined thresholds

In addition to tools for defining performance thresholds, organizations are also developing capabilities that allow them to alert their IT management teams when performance of their applications falls under these baselines. Performance is being measured from a global perspective, and alerts are being issued every time users at a certain location experience performance problems (even if the Website is performing well when being accessed from 99% of other locations).

Typically, organizations can deliver these alerts through multiple messaging systems such as email, SMS, or notifications through their application performance management systems. This allows organizations to reduce the time needed to identify, troubleshoot, and repair problems with the quality of the end-user experience and to reduce risk of revenue loss and declines in customer satisfaction due to application performance issues.

Tools for comparing application performance to Service Level Agreements (SLA)

Traditionally, organizations have measured the performance of their networks against network-specific SLAs, such as unplanned network downtime and meantime to repair performance issues. However, organizations increasingly expect their service providers to provide SLAs around application availability and response times. Deploying tools for comparing actual application performance to application SLAs allows organizations to keep their service providers "honest" when it comes to the quality of the end-user experience.

Also, some users of Web monitoring solutions are offering their own SLAs to their customers, and these tools enable them to measure their own success in delivering their services. Having this capability in place becomes increasingly important as organizations outsource the management of their IT infrastructure and deploy Cloud services.

Case Study:

Company XYZ is a Web retailer with more than $200 million in annual sales. The company's goal was to grow its business by more than 30% year-over-year, and for that reason they introduced a new market plan that would allow the company to increase sales for EMEA and APAC markets. The launch of the market campaign resulted in a significant increase in revenues from EMEA, but the revenue growth in APAC was lower than what the company originally anticipated.

The company's approach for monitoring the Website was based on combination of tools for server monitoring and Web analytics. The IT management tool showed that the company was more than able to support increases in Web traffic, and it also showed that the Website availability was very close to 100%. The Web analytics tool showed a significant increase in the number of visitors from the APAC region, but the conversion rates for visitors from this area were significantly lower than those of customers in North America and EMEA.

After the conclusion of the market campaign, the company deployed a solution that would allow them to monitor the performance of their Website from a global perspective. After deploying this solution, they found that due to network latency issues, blocking of some of their content and some configuration issues, the performance of their Website in certain parts of the Asia region was up

to 5 times lower than in the rest of the world. For that reason, many visitors of their Website in Asia would end their sessions before they reached a checkout page.

After evaluating this information, the company took action to improve the design of their Website and adjusted their application delivery mechanisms to the requirements of local ISPs in this market; this resulted in significant increases in conversion rates.
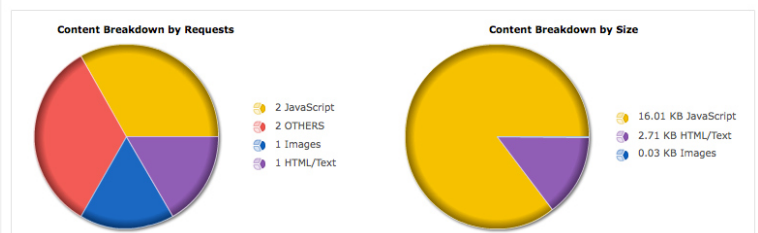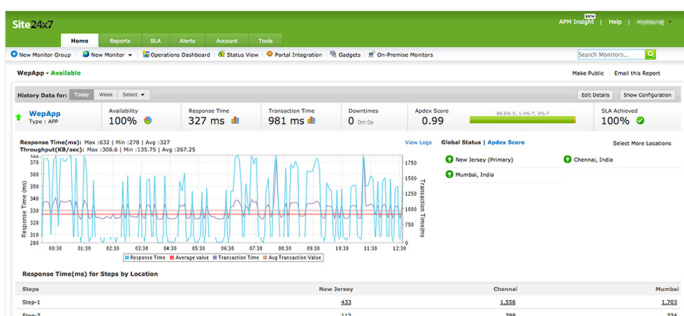
Recommendations

- Monitor the quality of the end-user experience for Web applications from outside of the corporate firewall
- Deploy tools for monitoring application performance across the application delivery chain
- Deploy tools for comparing the quality of the end-user experience to SLAs
- Provide an executive dashboard for measuring the business impact of Web applications performance issues.

Capabilities of Site24x7.com

Site24x7.com provides capabilities for monitoring Web performance from outside of the firewall, measuring each segment of the Web application delivery chain. The solution allows organizations to not only measure speed and availability of their web applications, but also allows them to measure their performance against SLAs.

With a global monitoring network, Site24x7 helps customers determine if a problem is localized to specific networks or something that affects all their customers. The web application monitoring capability simplifies multi-step web transaction management and ensures end users are able to complete transactions such as online purchase through a shopping cart, login checks, etc.

Site24x7 also allows organizations to evaluate the impact that some commonly used protocols such as DNS, POP and SMTP have on the quality of the end-user experience.

About Site24x7

Site24x7 is a web infrastructure monitoring service that helps to monitor the uptime and performance of websites, online applications and servers. The monitoring is done from 40+ locations across the world, thus giving you a global perspective of the end-user experience. Site24x7 supports monitoring HTTP, HTTPS, SMTP, TCP, IMAP, SSL, Ping, FTP, SFTP, DNS and other internet facing network services.

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