Apdex: A Trusted Approach to User Experience Alerting

Apdex is an industry standard to measure users' satisfaction with the response time of an application or service. It's a simplified service-level agreement (SLA) solution that gives application owners and IT operations more accurate alerting and better insight into how satisfied users are. Unlike traditional metrics like average response time, which can be skewed by a few very long responses, Apdex eliminates alert noise and saves IT ops considerable time.

New Relic uses Apdex to ensure that its alerts are reporting on true performance degradation based on the end-user experience and application components data. In this document, we'll explore why Apdex is a trusted approach to managing user experience, providing the following for developers, IT operations, and application owners:

1. A single metric that captures user experience across diverse applications with a consistent score in the range of 0 to 100

2. A consistent method of measuring user satisfaction across different transactions and applications

3. Accurate alerting based on true performance degradation (which helps eliminate alert noise)

4. An easy way to set and manage user experience

5. Enhancements based on the insights gathered from monitoring millions of applications

Benefits of Apdex

After analyzing the volumes of data New Relic collects through its software-as-a-service (SaaS) platform, we found that most web traffic response times fit an Erlang distribution.
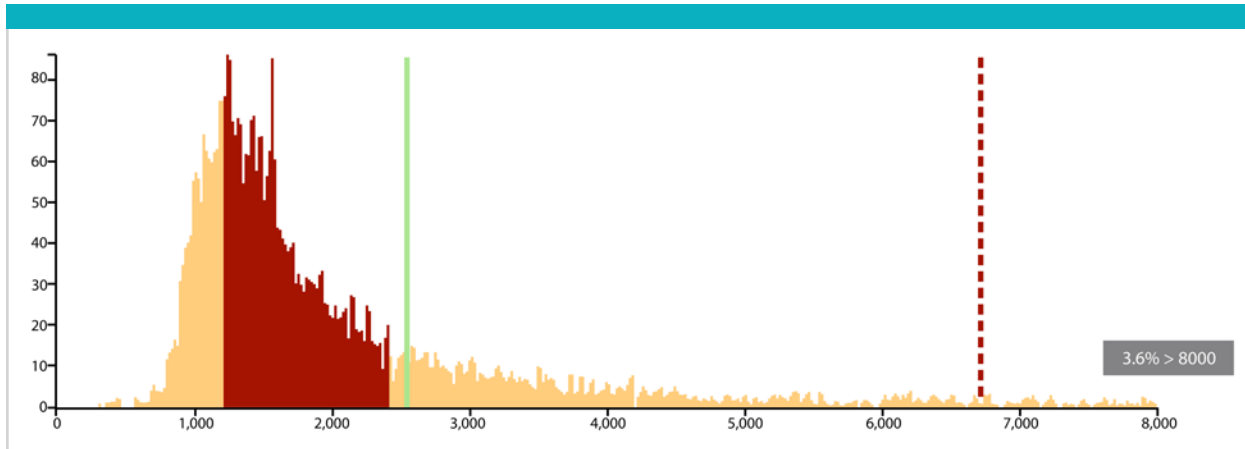
Our team tried various statistical techniques to model performance degradation with an Erlang distribution, and the result: Apdex came out on top. New Relic uses Apdex to monitor user satisfaction because of its simplicity, lack of false alerts, and ability to accurately identify performance degradation.

Easy to understand

Using Apdex, we can classify traffic performance into three buckets: Satisfied, Tolerating, and Frustrated. New Relic computes Apdex every two minutes for the entire application and for every Key Transaction that has been configured. All you have to do get started using Apdex is set your response time threshold, or "T value." New Relic recommends setting your T value to the 85 percentile based on analysis done by our data scientists.
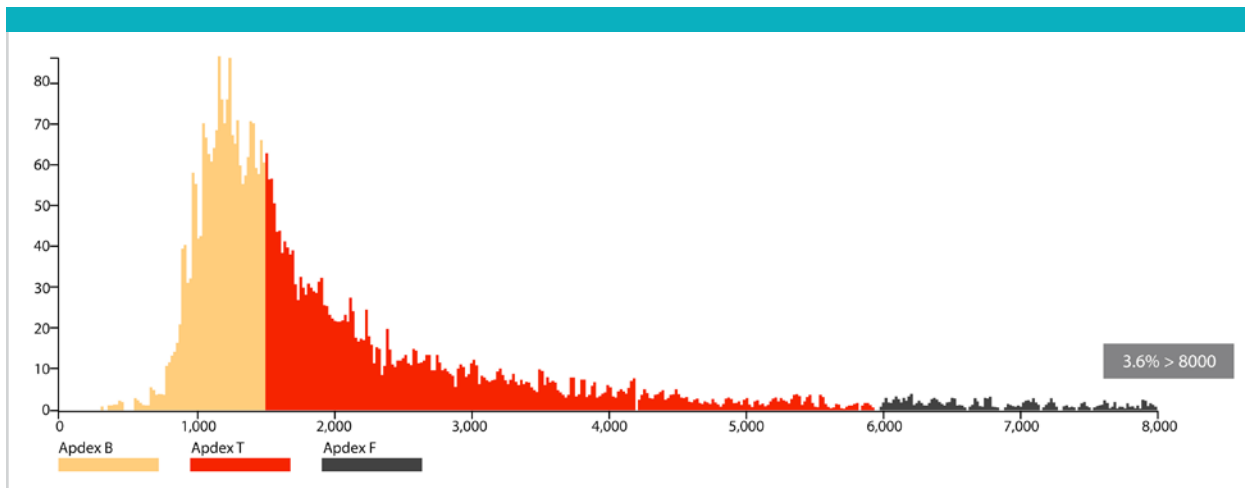
No false alerts

Another thing that's great about Apdex is its ability to suppress outliers, and only fire alerts based on true performance degradation. For example, in the time series plot below you can see a spike in response times that would give concern around 12:04, but otherwise there's nothing remarkable.
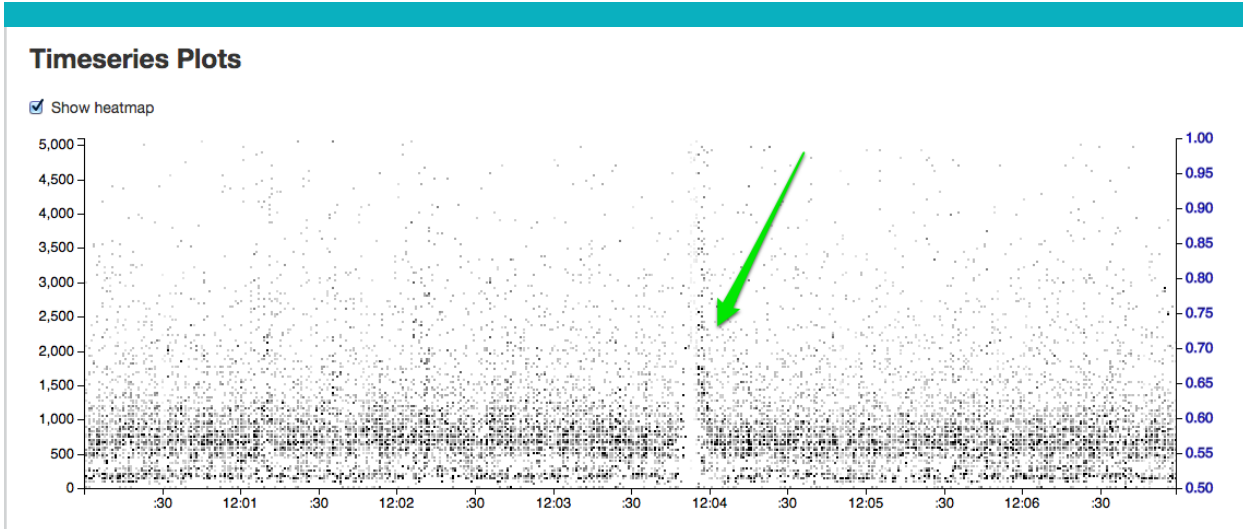
Now, let's plot the mean as an overlay and you can see three spikes instead of just one at 12:04. Each one of these would have been an alert—two of them being false—skewed by outliers.
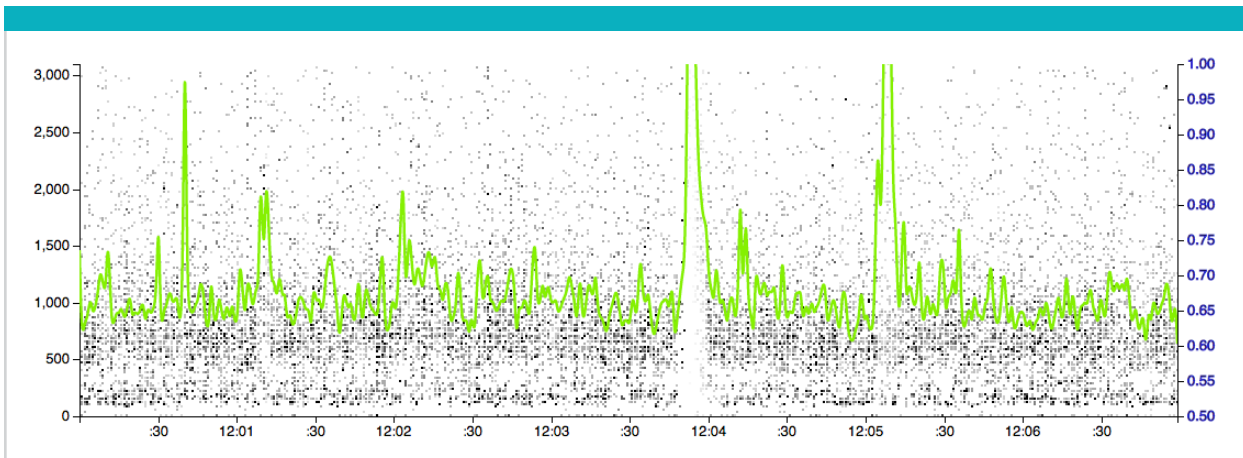
The Apdex score, on the other hand, is unaffected by the outliers. The following is a plot of the score with the T value set at the 85th percentile (1700ms). It shows one major "valley" indicating an event of significant performance degradation and nothing else.
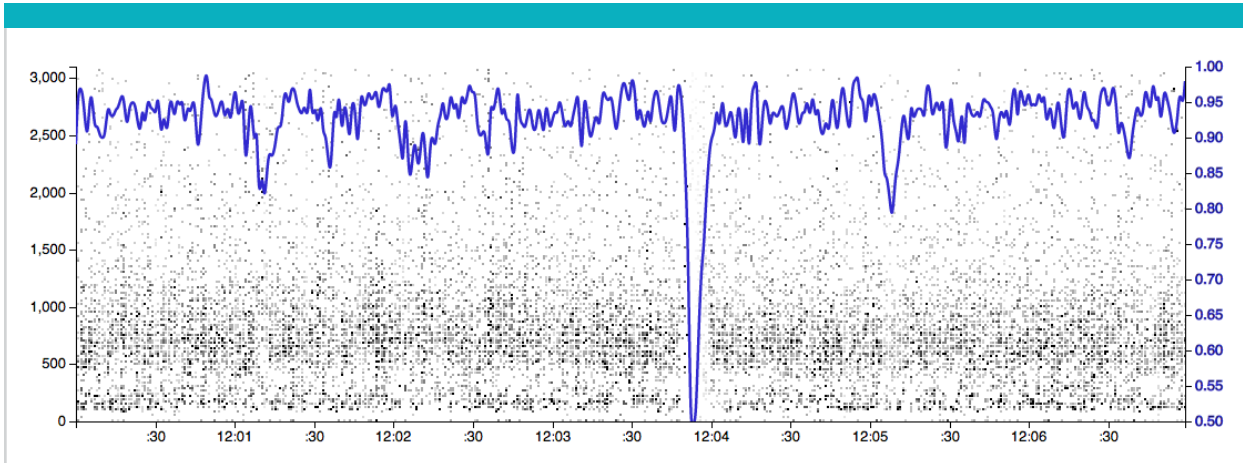

Accurate performance representations

Unlike other alerting approaches that are based on averages, New Relic's use of Apdex doesn't mask performance degradation, offering a more accurate representation of what your users are experiencing. The graph below is a plot of response times for a web app. You can see two bands—a dark, dense band at 200ms and a lighter, gray band between 2000ms and 2500ms. The second band represent the Safari users who are experiencing a significant performance degradation.
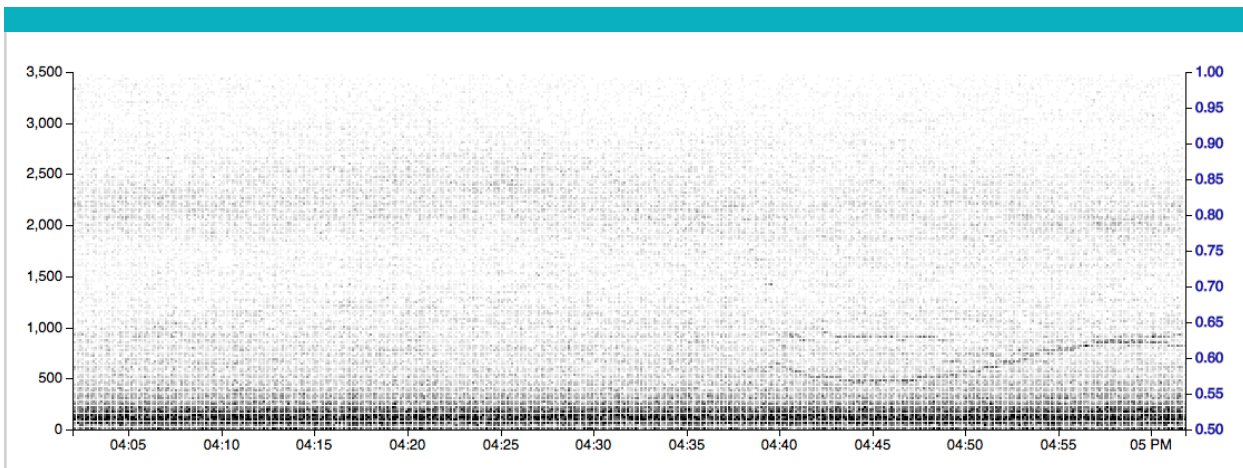
In the histogram below you can clearly see the poor Safari users, but the green line shows the mean deviated from 1000ms to 1050ms. This deviation is not enough to fire an alert in the APM world based on averages. Since the dynamic baseline is based on mean, performance degradation goes unnoticed.
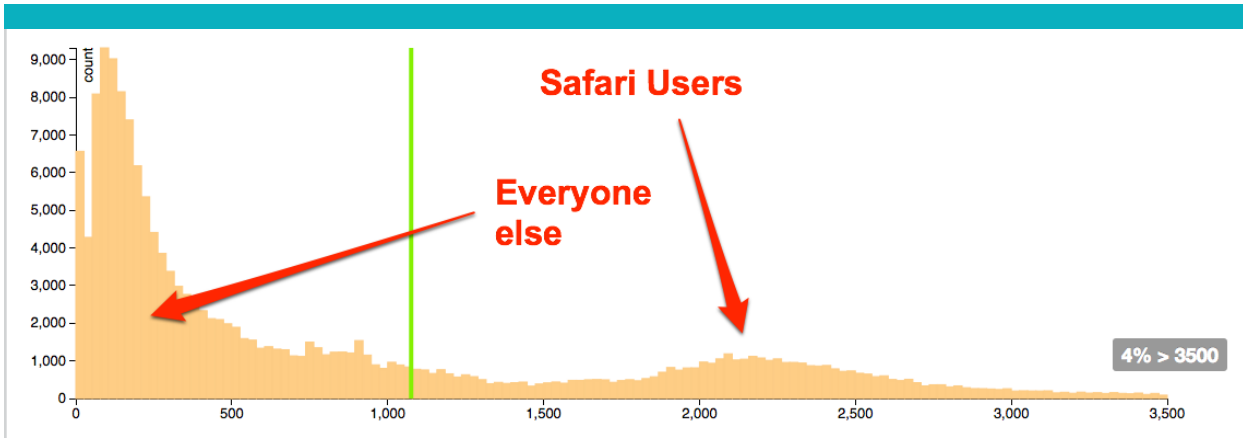
Now, let's contrast that with the Apdex view of the performance degradation. By setting an acceptable (satisfied) response time threshold of 400ms (85th percentile of histogram), you can see the business impact of Safari users' negative experience. As shown in the previous example, a baseline would hide this behind the illusion of a consistent 1050ms response time.
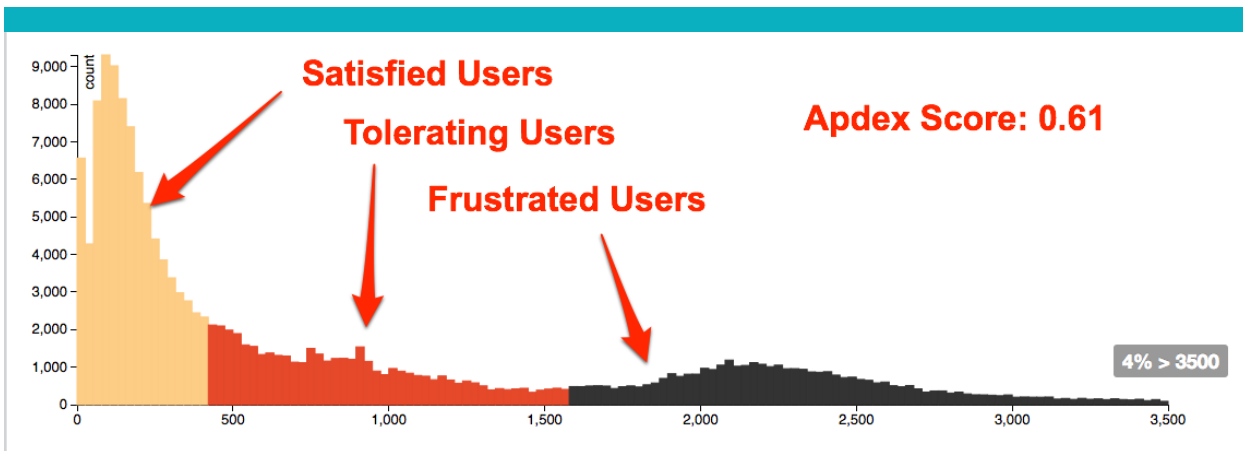
Apdex is the way to go

There's a reason why millions of applications rely on New Relic's Apdex-driven alerting. It's simple, it's accurate, and it's based on a trusted industry standard. Improve user satisfaction by seeing what Apdex and New Relic alerting can do for your software.

Request a demo or contact your sales rep to get started.

New Relic.