The Power of the Crowd

SUMMARY

With the shift to Software-as-a-Service and Cloud nearly complete, organizations can optimize their end-user experience and network operations with the power of crowd-sourcing. For decades, Internet-based sharing and cooperation have improved the lives of billions of people in helpful ways. Now, companies can take advantage of crowd-sourcing when it comes to optimizing the thing that connects us all, **the Internet!**

Crowd-sourced network and application insights provide a remarkable way to understand how IT assets and SaaS services are performing in real time. This white paper explains how Internet insights, crowd-powered monitoring, application benchmarks, and network visibility can benefit any organization.

KEY INSIGHTS

→ The Internet can power unique benchmarking capabilities

→ Crowd-sourced monitoring of common SaaS services reduces MTTR

→ Reveal operational excellence across applications, networking and infrastructure

→ Big data analytics enables global Internet performance insight

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CROWD-SOURCED NETWORK ANALYTICS THAT SPEED TIME TO RESOLUTION

The Internet enables aggregation of efforts from many people worldwide, resulting in the whole *truly* being more than the sum of its parts. Whether it is called crowd-sourcing, mob programming, or simply online community efforts, it has led to a plethora of open-source software, new software development and testing methodologies, and social and technology activism.

In short, the Internet provides ways of gathering people together for a common cause. In most cases, those causes are worthwhile and provide information and geographical reach that wouldn't be available to individuals.

These and other innovations show the power of the crowd online. And they all have something in common – we're all in this together! So why not take advantage of using common, shared, multi-tenant infrastructures for Internet-scale and Internet-powered insights.
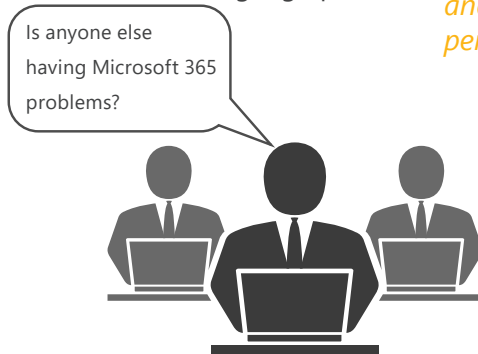
Take advantage of the crowd to improve real-time diagnostics, benchmark your SaaS application and network performance.

Is anyone else having Microsoft 365 problems?

THE NEW ONLINE SAAS CROWD

Millions of organizations have adopted Software-as-a-Service (SaaS) applications like Office 365 and cloud-based infrastructures like Amazon Web Services (AWS) or Microsoft Azure. The common usage of shared, multi-tenant resources make it possible for organizations to benefit from crowd-sourced monitoring and network intelligence. In particular, it's possible to use the Internet crowd's everyday actions to improve and optimize network performance and access for your SaaS and cloud users.

Using Digital Experience Monitoring (DEM) solutions like Exoprise enables enterprises to measure the performance and health of their SaaS applications, gateways, ISPs, Internet routing and DNS response time from any location. And at the same time, the
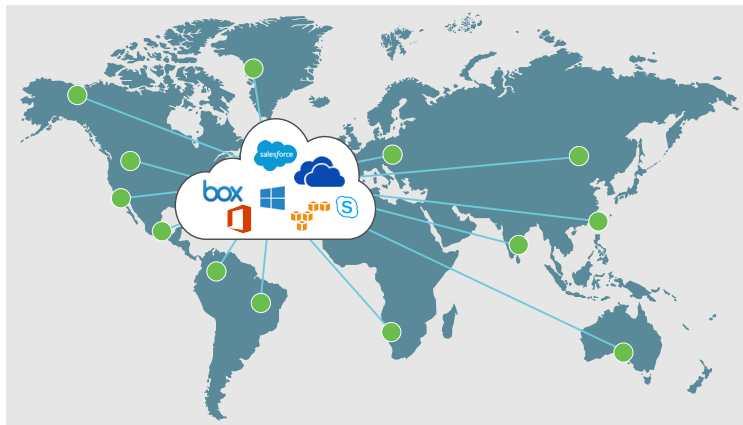
data is accumulated, aggregated **and anonymously leveraged** to provide the ultimate real-time benchmark for how the Internet and shared cloud services, such as Microsoft 365, are operating. Everyone wins and we call it crowd-powered intelligence!

CROWD-POWERED NETWORK INTELLIGENCE

Some Application Performance Management (APM) tools have attempted to measure user satisfaction with an Application Performance Index, or Apdex (https://en.wikipedia.org/wiki/Apdex), which offers a measure based on user surveys. Other vendors interpret their data to try and superimpose it onto an Apdex. User surveys or waiting for complaints is one way to measure satisfaction, but regular monitoring and testing provide you with actual values to back up those more subjective impressions.

And how does IT achieve this goal? Crowd-powered network intelligence offers a measure that is both easier to collect and more accurate than an Apdex. In this case, the crowd is everyone else using that application being monitored by Exoprise. That crowd data is the same as you are measuring, and is plotted on the same graphs as your data, but represent the anonymized aggregate of everyone using Exoprise, often for the same shared multi-tenant application like Microsoft 365, Salesforce, or Google Workspace. And since the tests being executed are essentially the same as everyone else, you can instantly benchmark your results to the rest of the crowd.

Try Exoprise for instant network and SaaS application benchmarks. You get 3 sensors from 3 different locations for free.

HOW DOES THAT HELP

On a single graph, you can observe both your end-user perspective of performance and the crowd comparison, over multiple sensor readings, to know whether your organization's performance is better or worse than the crowd-sourced benchmark. Further, you get to see the real-time effects of an Internet or service provider slowdown, outage or network change. Real-time telemetry helps to **reduce Mean Time To Resolution** (MTTR) and long-term trending helps to detect capacity issues and network infrastructure changes. That's the power of the crowd.

In Figure 1, we compare our page time performance from a SharePoint Online sensor with Time to First Byte (TTFB) data aggregated across the entire range of Exoprise CloudReady synthetic SharePoint sensors. Time to first byte is an excellent metric used to measure server response from the client or end-user perspective.

In the graph, the dark blue line represents the time to first byte of and individual sensor running in a location, while the light blue line represents the aggregate of the crowd.

The graph shows, that for about an hour, the server was overloaded, responding slowly, and even causing HTTP 503 return codes. Whereas the crowd data was showing no such elevation in TTFB measurements. This clearly indicates that the customer's
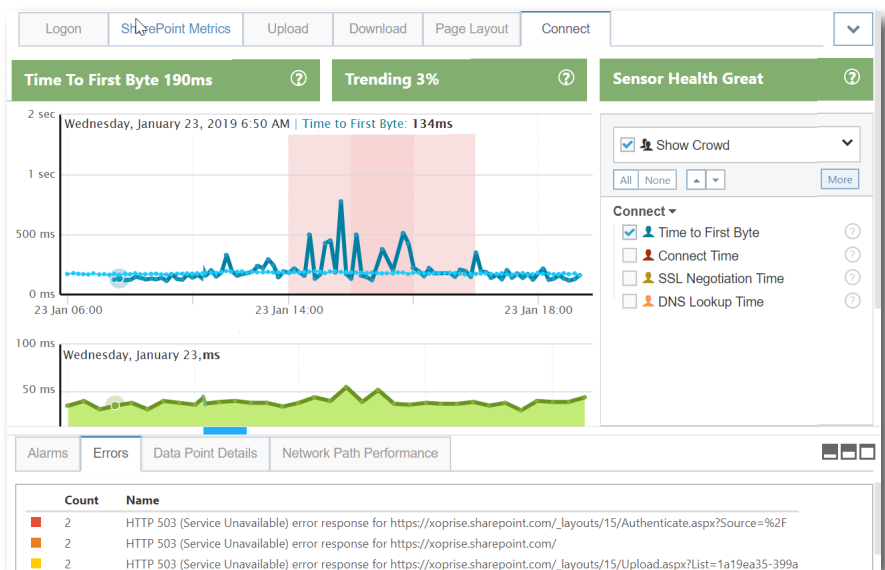

Figure 1. Site page times versus crowd averages in SharePoint

SharePoint infrastructure was performing poorly. In addition, we can quickly look at other measures, such as Network Path Performance (hop-by-hop latency) or TCP/IP connect times and SSL negotiation timings for other determinations and root cause analysis.

Why is this so powerful? The crowd enables immediate answers to high-level questions like "Is it hanging for you? Is SharePoint slow for everyone?" And with low-level metrics, you can quickly decipher where the problem lies. The power of the crowd makes sure to leave no one in the dark.

HIGH-LEVEL ACTIONS, LOW-LEVEL METRICS

Exoprise captures and synthesizes **thousands of data points for each sensor run or test**. From high-level actions such as logon times and mail flow queueing to low-level TCP/IP stats such as connect timings, SSL negotiate and packet-loss. Start with high-level crowd comparisons to ensure your end-user experience is up to par. Then, drill further to diagnose network conditions and problems. Here's a sample of some metrics across SharePoint, Exchange, and Microsoft Teams that help you decipher it all and what the crowd tells you.

MORE METRIC EXAMPLES

→ **Logon Time:** Overall logon time is captured from the start of page navigation through to when the initial site page is visible. This is an excellent place to start when analyzing the overall health of SharePoint.

Crowd: When the logon time is above the crowd, you should filter the crowd metrics to determine if its a regional issue or investigate further to determine the root cause.

→ **DNS Lookup:** DNS performance is critical for all your applications and captured across every sensor run for continuous error detection and troubleshooting.

Crowd: You should investigate improving the LAN-based DNS server caching when the DNS lookup time is worse than the crowd. Cloud-based services such as SharePoint Online bring together content from many servers and names requiring fast DNS performance and large caches.

→ **SharePoint Health Scores:** SharePoint sensors record the SharePoint health scores populated by the service. The number ranges from 0 to 10 where 0 indicates the server is idle and 10 indicates the server is busy.

Crowd: When the SharePoint health score is consistently higher than the crowd you know you have an overloaded server and you should contact your Microsoft representatives.

→ **TCP/IP Connect:** Connect times are captured for every connection during a sensor run and reflects network latency.

Crowd: If your latency is consistently above the crowd for the same region then you should contemplate adding additional network capacity.

→ **Time-to-first-byte (TTFB):** This metric is a good indicator of server response time and should be close to TCP/IP connect time. When the value is high, its an indicator of an overloaded server or poor end-to-end network performance.

Crowd: When TTFB is above the crowd, its showing that the server is responding more slowly. If TTFB is higher but, for something like a SharePoint server, health score is lower or not elevated then there is a network issue at the provider or somewhere along the network path.

CROWD-POWERED ROUTING METRICS

Minimizing end-to-end latency and packet loss along the network paths to cloud services like Single Sign-On, Salesforce, or Microsoft 365 is vital to delivering healthy end-user experiences. Organizations should ensure that for branch and satellite locations, when there is a choice between backhauling traffic or going direct to the Internet, that Organizations must test, emulate and measure the employee experience.

Emulating user experience, establishing baselines, and synthetically testing cloud and web services are the only way to ensure sufficient capacity and that the network workloads can be handled sufficiently.

Net Segment	Time Spent In	Trend	Crowd
Local	0 ms	0% ▬	-7%
ISP	12 ms	7% ▬	-3%
Backbone	64 ms	43% ▲	+12%
Provider	44 ms	-20% ▼	-26

Figure 2: Network path breakdown compared to crowd

Exoprise continuously analyzes network paths for each sensor from where they are deployed. Network administrators can quickly determine the network path, the routes and a breakdown of how the path performance compares to the crowd. The following high-level network segments are computed:

→ **Local** — local segments are private IP-addresses that exist behind the gateway. Depending on the network topology, VPNs and use of MPLS this network segment can represent larger portions of latency in the path to the cloud.

→ **ISP** — Exoprise automatically detects the first network segment beyond the gateways. We refer to this as the ISP and it is the network provider for an Organizations egress to the cloud.

→ **Backbone** — This segment is also automatically calculated based on the routes and hops that the packets traverse up to final destination provider's network.

→ **Provider** — Finally, the last segment is the providers. Depending on the cloud solution you can see varying levels of detail behind the clouds ingress points.

Armed with this breakdown of network segment performance from all of your locations to all of your service providers, you can quickly diagnose the source of slowdowns.

END-TO-END VISIBILITY FOR ANY APP, ANY LOCATION

Exoprise CloudReady provides synthetic sensors for any web application, Microsoft 365, SharePoint, Microsoft Teams, Exchange, and various other SaaS services. These services don't necessarily have to be in the cloud; in many cases, they can be hosted locally or in a private data center. Whether served from the cloud or a private data center, they provide essential information on the performance of mission-critical enterprise applications.

Further, **Exoprise takes only minutes to deploy**, and can provide SaaS application performance data from behind the firewall and in the cloud. Using multiple sensors, you can measure enterprise application performance at different points on your network. Not only that, but you can also compare the performance with other user groups, and for many of your mission-critical enterprise applications. And the crowd still provides you with a basis for benchmarking your results.

NETWORK VISIBILITY IS MORE IMPORTANT THAN EVER

Cloud-based SaaS applications and services will continue to transform enterprise IT. For most enterprises, SaaS and IaaS free IT departments from the never-ending and seemingly impossible task of building and maintaining the infrastructure required to run their business applications, supporting the ever-increasing business demands for mobility, device support, disaster recovery, security and reliability. The cloud service provider deals with all of that complexity. They generally do it better and at a lower cost than any individual or IT team can with their scale and sophistication.

But IT still has an important role to play. You still own availability and performance for enterprise applications in the cloud and you still need to manage service levels and remote worker experience. Service level dashboards are a piece of the puzzle, but short of the level of visibility and proactive notification that enterprises need to make the cloud everything it can be. You need a combination of the real-time performance data, its comparison to the crowd, and alarms to understand the behavior of your SaaS applications in production. **You get all three in Exoprise**.