



## KEYNOTE HELPS QUALCOMM FIRETHORN MOBILE ENSURE ALL APP USERS HAVE AN EXCELLENT EXPERIENCE

### Impact Highlights:

- Firethorn Mobile, a wholly-owned subsidiary of Qualcomm, wanted a partner to test and monitor performance and availability of its SWAGG™ application from the desktop and on popular smartphones.
- Keynote enabled Firethorn Mobile to monitor all channels via Keynote Mobile Device Perspective™, Mobile Internet Testing Environment (MITE)™, Mobile Web Perspective™, Transaction Perspective™, Application Perspective™, and Keynote Internet Testing Environment (KITE)™.
- Firethorn Mobile and Qualcomm can now proactively track availability and performance from an end-user perspective, plan capacity, perform QA testing, and tune performance.

### Company

Qualcomm is the world leader in next-generation mobile technologies with 17,500 employees in 139 locations worldwide. For 25 years, Qualcomm has driven the evolution of wireless communications, and today, Qualcomm technologies are powering the convergence of mobile communications and consumer electronics, making wireless devices and services more personal, affordable, and accessible to people everywhere. Firethorn Mobile is a wholly-owned subsidiary of Qualcomm, based in Atlanta, Georgia.

### Challenge:

Firethorn Mobile provides a free app called SWAGG that allows consumers to manage their “wallet.” Consumers use the app to purchase gift cards and redeem them online and in stores. If they have a plastic gift or loyalty card,

the consumer can enter the information and SWAGG will track the balance. The app also delivers targeted offers to customers from relevant stores and locations from more than 7,000 merchants across the U.S. The app can be downloaded and installed on Android and iPhone devices or accessed via a Web browser.

To provide end users the most current information, the SWAGG app continually polls the application server for updates, including new account balances, new gift cards, and offers. When the application was initially launched, Firethorn Mobile wanted to understand how the application was performing from an end-user perspective. “We need to know whether and how well the app is working, whether it’s still functioning an hour from now, as well as how well the application runs on a mobile device,” said David Hallum, staff engineer at Firethorn Mobile and lead project manager.



### Why Keynote?

The challenge was to find a vendor of end-user performance testing and monitoring solutions that could support all of SWAGG's delivery channels. Typically, monitoring solutions are segregated; some solutions test Web browser-based applications and others monitor mobile apps. Said Hallum, "We wanted to go to one source and correlate different data points to see a holistic picture. Keynote solutions allow us to test all versions of our application. They provide consistent alarms and ways to update test scripts and allow us to keep all of the data in the same place."

### Solution:

Qualcomm uses a number of Keynote solutions company-wide. To test SWAGG's availability and performance, Firethorn Mobile uses Mobile Device Perspective (MDP), Mobile Internet Testing Environment (MITE), Transaction Perspective, Keynote Internet Testing Environment (KITE), Application Perspective and Mobile Web Perspective.

• **Mobile Device Perspective** — A private MDP agent tests performance of the service on a mobile device. Firethorn Mobile wrote test scripts that capture typical user actions, such as logging in and checking account information. MDP runs this script every 15 minutes to make sure the device can access the most updated information, such as new gift cards and offers. MDP can help the organization determine if there are any device-specific issues.

• **Transaction Perspective and KITE** — Keynote Transaction Perspective tests application performance and availability from areal Web browser. Transaction

Perspective runs scripts (written using KITE) that log on as a user from five locations and perform typical user activities consistently throughout the day. The goal is to make sure customers across the country can retrieve information in the expected time period.

• **Application Perspective** — Qualcomm also performs more frequent system "health checks" using Keynote Application Perspective. For these tests, Qualcomm runs scripts from multiple cities at high frequency that test a single Web page to determine simply whether the servers are available. The responses to these tests are correlated into an aggregate SLA that measures overall uptime and availability. As Hallum explained, "If you hit the servers more frequently, you learn about any failures faster."

• **Mobile Web Perspective** — Most recently, Qualcomm and Firethorn Mobile added Keynote Mobile Web Perspective to its toolkit. Said Hallum, "We recently encountered an incident where we were getting complaints that the application couldn't talk to the backend servers. We found that the problem was a network issue with one of our mobile carriers, and we resolved it. But in the process, we discovered that we didn't understand the availability of our service over various mobile networks. Keynote Mobile Web Perspective allowed us to address this issue."

Qualcomm uses Mobile Web Perspective to run scripts developed using MITE every five minutes from different geographies over multiple mobile network carriers (operators). The company tests the two largest carriers in four cities, plus an additional two carriers from the East and West Coast. These tests allow Qualcomm to see mobile

### About Keynote

Keynote (NASDAQ: KEYN) is the global leader in Internet and mobile cloud monitoring. We provide companies with solutions for continuously improving the online experience.

As an independent and trusted third-party, Keynote provides IT and marketing executives with an unbiased view into their Internet services from around the world. For over a decade, we have been providing measurement data and testing capabilities that allow companies to understand and improve their customer's online and mobile experience.

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network availability as well as latency and performance trends on these mobile networks. Noted Hallum, "With Mobile Web Perspective, we can see how much time it takes for the request to travel over the carrier network to the servers and how much time it takes for a response. We can add that all up to get a detailed view of the environment the applications are operating in."

### Results:

Data from all of these applications can be viewed from a common portal to give Qualcomm and Firethorn Mobile a single, accurate view of availability and performance for the SWAGG application from every user interface and over every delivery channel (e.g., the desktop Internet and smartphones). This is critical because, Hallum explains, "The way the application functions and responds in the users' hands is a direct reflection on us. Our job is to keep customers happy. Our ability to see what the end user is experiencing is a big step in the right direction."

The information provided by Keynote helps Qualcomm take proactive steps to ensure a good experience for all customers. For example, network latency on mobile networks is high. Although Qualcomm cannot control mobile network latency, they can design their system in a manner that mitigates the perceived impact of latency on end users. As Hallum said, "We can think differently about the data we transmit from the client to the server to make the process more efficient. We might bundle requests in batch mode to reduce hits to the server, or instead

place, we might employ a mobile content network to improve response time. Or we could move the content to an application server closer to the end user. It's difficult to determine what's worth spending engineering time on without the Keynote data."

Keynote also provides a number of additional benefits. Qualcomm combines data from all of the Keynote applications with other data, such as mobile subscriber (user) data, to gain a holistic view for capacity planning. Because Keynote data is consistent and highly accurate, it is used to test system upgrades. Engineers look at historical records of, for instance, MDP agent performance and compare these results with those that come back after an application upgrade to determine the upgrade's impact on performance.

Data about performance over time is also used for performance tuning. Said Hallum, "We can report on Keynote performance data over time. For example, in one instance, we saw that response times were escalating over a three week period and subsequently found a performance issue we needed to tune. If we didn't have the trend data, we wouldn't have known about the issue until users started calling with problems."

Overall, said Hallum, "We're always trying to better understand customer behavior and what will keep customers coming back." Keynote helps Qualcomm and Firethorn Mobile ensure that its application reliability and performance are two reasons customers are happy.

## Keynote Understands Your Online Business



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