

Treppn Plugin for Eclipse Messaging Framework  
August 2013 v4 (Internal and NDA Use Only)

Treppn Plugin for Eclipse Messaging	
<b>Target audience for communications</b>	Primary: Android application developers
<b>Point of View (this should motivate the audience to move forward with this solution with urgency while underscoring Qualcomm's unique position)</b>	<p>Consumers today expect their mobile phones to be instant communicators and always-on portals to the Internet. They care less about how their phones keep them connected and much more about the actual experience of communicating and interacting. Consumers still care a great deal about staying connected, which is why battery life has become so important.</p> <p>As they do more with their mobile devices, consumers expect them to be fast and energy efficient, as losing power in the middle of an application, transaction or conversation is unacceptable. Even worse is losing power in the middle of the day with no way to recharge. Consumers demand always-on connectivity, so being saddled with a dead battery is more than just annoying—it can disrupt personal and business communications. As a result, consumers are quick to uninstall or give a poor rating to applications when they fear the apps are draining their batteries.</p> <p>The challenge is that many of today's most popular applications take advantage of location, social and web services, which seriously impact both power and network resources. As the number of these power-hungry applications continues to grow, developers need to pay more attention to battery life during the app development process. Power really matters, so it can't be an afterthought. As developers focus more on functionality and performance, they can't overlook how those areas impact power consumption.</p> <p>Today, many of the existing tools for optimizing power are difficult to use and require further analysis as the data isn't presented in a way that developers can easily understand or quickly act upon. Also, the information provided typically doesn't offer sufficient insight on how to solve specific power-related problems. Current power tools often require the use of special hardware, which are out of reach to most developers due to their cost. Since most developers prefer to use their own personal devices to develop applications, they must be able to optimize power and test-drive apps easily on their primary phone.</p> <p>Another problem with today's tools is that they display data on the device being tested and developers prefer to consume this information on a development machine with a larger display, keyboard and mouse. System usage metrics often are provided as standalone statistics that don't correlate well with what the application is actually doing, which makes it even more difficult for developers to get enough useful information to improve their applications.</p> <p>Qualcomm is working with developers to solve power consumption problems by leveraging its understanding of all things mobile, proven expertise in power efficiency and commitment to the developer community. This experience played a big role in the development of Treppn Profiler Android app, which was developed for the Snapdragon mobile development platform. Now, Qualcomm is extending that capability with the introduction of the Treppn Plugin for Eclipse and Android Studio, which is a plug-in that helps Android application developers optimize their applications for power efficiency without having to leave their own development environments or use different devices. The tool works seamlessly in the Eclipse and Android Studio integrated development environments (IDE) and presents relevant statistics in charts that can be easily</p>

	<p>understood. This means developers can easily find the information they need to fix power problems and focus on building the most powerful applications that consume the least power.</p> <p>Moreover, when developers use this tool on Snapdragon-powered devices, they gain access to more insight about system and power usage while having the opportunity to take advantage of next-generation features and functionality to create improved mobile experiences.</p>	
<p><b>Trepn Definition</b></p>	<p><b>35-word:</b> The Trepn plug-in for Eclipse and Android Studio lets Android app developers build energy-efficient applications that consume less power. Using this easy to use tool, developers can see how much power an app consumes on their own device, so they can quickly and easily make adjustments.</p> <p><b>50+ words:</b> The Trepn plug-in for Eclipse is a power-profiling tool for Android app developers, enabling them to easily optimize apps for lower power consumption. Unlike traditional tools, which are difficult to use, the Trepn plug-in gathers data from the developer’s device, so issues can be pinpointed and resolved in minutes in order to build powerful, energy-efficient apps.</p>	
<p><b>Key Messages and Proof Points</b></p>	<p><b>Helping developers build better apps</b> The Trepn plug-in for Eclipse is a power-profiling tool that makes it much easier for developers to identify and fix common power consumption problems.</p>	<ul style="list-style-type: none"> <li>• Makes it easy to pinpoint power consumption problems</li> <li>• Improves app performance through faster, easier optimization</li> <li>• Alleviates the need for additional technical resources to address isolated power issues</li> <li>• Can dramatically reduce power consumption</li> </ul>
	<p><b>Giving developers data they can act on</b> The Trepn plug-in for Eclipse gives developers all the information they need, in a way that’s easy to understand, so they can immediately improve an app’s energy efficiency.</p>	<ul style="list-style-type: none"> <li>• Easy to decipher charts depicting high-level details and plots events, state and data over time</li> <li>• Problems can be identified in fewer steps</li> <li>• Easy to correlate power spikes with system events</li> <li>• Common power consumption problems are revealed, such as wakelocks, which show why the system isn’t sleeping, or apps that prevents mobile networks from conserving power</li> </ul>
	<p><b>Seamless workflow with Eclipse integration</b> The Trepn plug-in directly ties into the Eclipse development environment for single-click, streamlined operation</p>	<ul style="list-style-type: none"> <li>• Uninterrupted workflow reduces development costs</li> <li>• Integration with Eclipse IDE enables developers to manipulate data quickly, improving apps in minutes</li> <li>• Easy to start using quickly</li> </ul>

Customer Benefits	Developers	OEMs	Consumers
	<ul style="list-style-type: none"> <li>• Trepn plug-in for Eclipse makes it much easier for developers to build powerful, energy-efficient apps.</li> <li>• Developers simply download the Trepn plug-in and immediately begin improving their apps.</li> <li>• With the Trepn plug-in, developers no longer have to worry about the best way to optimize power because the most important profiling data is integrated right into their development environment.</li> <li>• The Trepn plug-in for Eclipse reduces the time and effort of identifying and alleviating power-consumption problems.</li> <li>• Trepn makes it easier for developers to think about power when developing apps</li> <li>• Early adopters of Trepn report reducing power in half in standby</li> <li>• Qualcomm Developer Network provides tools, like Trepn Plug-in for Eclipse, as well as resources to help them deliver experiences that will define the next generation of mobile communications.</li> </ul>	<ul style="list-style-type: none"> <li>• OEMs can differentiate their devices with enhanced capabilities to improve mobile experiences without worrying about battery life</li> <li>• OEMs can unleash a new set of user experiences by using the tool to optimize their own applications without worrying about functionality, performance and power trade-offs.</li> <li>• Qualcomm has many partnerships with developers and mobile operators across the entire ecosystem, which opens access to a wealth of resources and streamlines go-to-market strategies.</li> </ul>	<ul style="list-style-type: none"> <li>• I can talk longer on my mobile device</li> <li>• My battery lasts longer on my mobile device</li> <li>• More confidence the apps I download will be power efficient</li> </ul>
<b>Business Highlights</b>	<ul style="list-style-type: none"> <li>• Trepn helps app developers create apps which are as energy efficient as possible.</li> <li>• Trepn removes barriers that have made it difficult for developers to address power-consumption issues.</li> </ul>		
<b>Technical Highlights &amp; Benefits</b>	<ul style="list-style-type: none"> <li>• Install Trepn Plugin for Eclipse via Eclipse's simple software installation process.</li> <li>• System usage data is automatically transferred to Eclipse and plotted for fast analysis of the following:</li> <li>• Power at battery: Battery usage over time, correlates spikes with other events, shows relative power drain of system components.</li> </ul>		

	<ul style="list-style-type: none"> <li>• CPU: Displays CPU cores and frequency as well as wakelock state and details, which is beneficial for understanding when a CPU core goes up or down and what is preventing the CPU from sleeping.</li> <li>• Network: 3G/4G and Wi-Fi network states are presented, along with Wi-Fi lock state and details, and network usage per app/interface. This data is meaningful in extracting information on the networks effect on power consumption, when the network is established and by which app, as well as which apps are using the network and waking up the system. Details on which Wi-Fi lock is preventing sleep also is provided.</li> <li>• Display and GPU: Data on how the GPU and display impact power includes information on display state and brightness, including when the display turns on/off or dims while GPU data shows when GPU/frequency increases/decreases.</li> <li>• GPS state and Bluetooth state: Shows when GPS is turned on/off, when Bluetooth is turned on/off and how GPS and Bluetooth affect power.</li> <li>• Code correlation: Includes logcat correlation and custom events from logcat, which reveal what happens in logcat when system events change and when the cursor between logcat and plots are synched. Code correlation also makes it much easier to add app events to plots for increased correlation.</li> </ul>
<b>Headlines / Taglines</b>	<ul style="list-style-type: none"> <li>- Build the most powerful apps with the least power</li> <li>- Take the pain out of power drain</li> <li>- Optimize your applications, build your business</li> </ul>
<b>Key Words / Phrases</b>	Easy, seamless, power-optimized, code correlation, existing workflow, simple, actionable, no distractions, meaningful data
<b>Use Cases</b>	<ul style="list-style-type: none"> <li>• Any application can benefit from power optimization, especially those requiring back-end processing, including: <ul style="list-style-type: none"> <li>• GPS</li> <li>• Web services</li> <li>• Weather updates</li> <li>• Social networking</li> </ul> </li> <li>• Facebook use case: A developer discovers that an app is draining battery power when it's in standby mode. Using Trepn, the developer easily discovers an unexpected, extra 3G network connection that occurs two minutes after the app synchs. Armed with this knowledge, the developer understands the impact new 3G connections have on power and learns to group data activity temporally to close all connections cleanly. The developer then iterates and re-measures the app quickly and easily with new code.</li> <li>• Game use case: A developer discovers that a game drains battery even when powered off. Using Trepn, the developer sees the CPU never sleeps after the game is installed because the app doesn't release sensor events when the application stops. Once the problem is pinpointed, the developer can iterate and re-measure the application with new code to alleviate the power consumption issue.</li> </ul>
<b>Snapdragon Tie-in Messaging</b>	<ul style="list-style-type: none"> <li>• Apps run better and consume less power on Snapdragon-powered devices.</li> <li>• Trepn is fully optimized to work with select Snapdragon-powered MDP devices, which means those apps are more energy efficient.</li> </ul>
<b>Competitive commentary</b>	<ul style="list-style-type: none"> <li>- There are existing tools on the market, including Qualcomm's legacy Trepn Profiler app, but they have all been designed without taking the developer's workflow into consideration, which is a big barrier to adoption.</li> </ul>

NOTE: Competitive statements are not to be quoted, and require substantiation and prepared documentation for any use

Additionally, most existing tools simply present system usage statistics without providing enough data or correlating it in such a way that a developer knows what to do to fix a problem and improve the app.

- Qualcomm's legacy Trepn app has useful information but some features only run on Snapdragon MDP hardware, which is somewhat costly (\$799-\$1,099)..
- Intel Power Monitor presents log system resources in a non-graphical format that isn't intuitive; system usage metrics are exported via a file, which developers then must parse through to decipher and pinpoint problems.
- Android provides data on power usage per components/apps, which comes standard on all Android devices. The on-device graph shows key states and presents high-level info targeted at users.
- Power Tutor provides useful component estimates per app, but all the data is on the device; the model is only accurate on select devices.
- AT&T Application Resource Optimization (ARO): A very powerful profiling tool, but very difficult to use.