

# A better Android tablet experience for your money

&

The dual-core, Intel® Atom™ processor-powered Dell™ Venue™ 7 tablet provided

## A BETTER EXPERIENCE

than the comparably priced, ARM-based Samsung Galaxy® Tab® 3 7.0

## **SMOOTH BROWSING**

comparable to the 50% more expensive, quad-core, ARMbased Google® Nexus™ 7

Smaller tablets provide the comfortable balance between portability and performance that many users look for. But not all tablets are created equal—a powerful processor can make a task such as Web browsing a snap instead of the chore it can be on a sluggish tablet. Luckily, the power to speed through the Web without headaches is available at a reasonable cost. Selecting a tablet that balances power and cost is ideal.

In our labs, we completed hands-on Web browsing tests on three Android tablets to see how they stacked up: the Intel Atom processor-based Dell Venue 7, the ARM processor-based Samsung Galaxy Tab 3 7.0, and the ARM-based Google Nexus 7. We also compared the tablets using industry-standard performance benchmarks.

Of the tablets we tested, we found that the Intel Atom processor-based Dell Venue 7 tablet provided the best combination of Web browsing experience and cost. With the Intel Atom processor-based Dell Venue 7, you can get more for your money than with the other ARM-based Android tablets we tested.

# **GET MORE PERFORMANCE FOR YOUR MONEY**

The processor that powers your tablet determines how it performs. The right processor can help you get to your favorite Web sites quickly, stream videos cleanly, and more. You might assume that the top-performing processor/tablet combination costs the most, but our test results showed that isn't always the case.

We investigated the costs and Web browsing experience of three Android tablets:

- Dual-core Intel Atom processor Z2560-based Dell Venue 7
- Dual-core Qualcomm Snapdragon 400-based Samsung Galaxy Tab 3 7.0
- Quad-core Qualcomm Snapdragon S4 Pro-based Google Nexus 7

To get the best idea of what the real-life Web browsing experience would be like on each tablet, we loaded and browsed 29 popular Web sites on each tablet, side by side. We looked at news, sports, finance, and media sites and compared them in performance, responsiveness, visual quality, and functionality. Then, we ran two industry-standard benchmarks to further validate the results we saw in our hands-on tests. See <u>Appendix A</u> for details on the tablets we tested and <u>Appendix C</u> for the Web sites we visited and our detailed notes on how each tablet performed.

# THE VERDICT

The Intel Atom
processor-based Dell
Venue 7 provided a
better experience than
the Samsung Galaxy Tab
3 7.0, and a comparable
browsing experience at
a lower cost than the
Google Nexus 7.

In terms of Web browsing experience, the Intel Atom processor-based Dell tablet—the least expensive tablet we looked at—dramatically outperformed the ARM-based Samsung Galaxy Tab 3 7.0, which cost \$20 more (see Figure 1 for pricing). On nearly every Web site we visited, the Intel Atom processor-based Dell Venue 7 was quicker at basic tasks such as clicking links, scrolling through long pages of text, and launching videos. Not only did the Samsung Galaxy Tab 3 7.0 provide a much worse Web browsing experience than the Intel Atom processor-based Dell Venue 7 despite its higher price, but it has half the storage capacity. Some of the issues we encountered browsing with the Samsung Galaxy Tab 3.7.0 included:

- nytimes.com loaded slowly, was jerky when browsing articles
- abc.com choppy browsing and scrolling
- cbs.com zooming in caused display issues
- cnn.com video playback hard-locked the device, rendering it unusable for a time
- huffingtonpost.com news ticker scroll was often extremely slow
- nba.com text was blurry until we zoomed in

The Google Nexus 7 provided a Web browsing experience comparable to the Dell Venue 7 and the same amount of storage, but cost \$80 more. This means that out

of the tablets we tested, the Intel Atom Z2560 processor -based (Clover Trail+) Dell Venue 7 offered the best Web browsing performance per dollar.

Tablet	Storage (GB)	Price
Intel Atom processor-based Dell Venue 7	16	\$149.99
ARM-based Samsung Galaxy Tab 3 7.0	8	\$169.99
ARM-based Google Nexus 7	16	\$229.00

Figure 1: Storage and prices for the tablets we tested.<sup>1</sup>

# **Quantifying Web browsing performance**

Because Web browsing experience can be subjective, we turned to two industry-standard benchmarking tools to back up our findings. WebXPRT and Mobile XPRT both use real-world tasks to assess browsing and device performance, respectively (see the What we tested section for details). As Figures 2 and 3 show, the Intel Atom processor-based Dell Venue 7 and the Google Nexus 7 tablet performed comparably, with the Samsung Galaxy Tab 3 7.0 lagging behind—which mirrored the experiences we had when we browsed Web sites on the tablets.

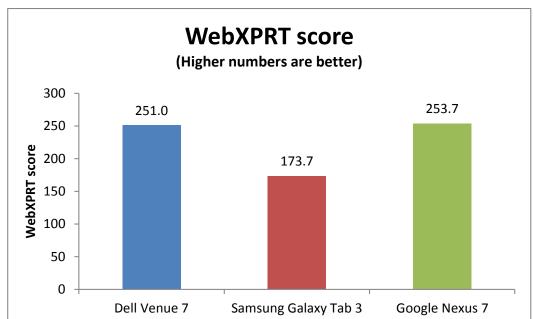


Figure 2: The Intel Atom processor-based Dell Venue 7 and Google Nexus 7 performed comparably on the WebXPRT 2013 benchmark.

<sup>&</sup>lt;sup>1</sup> Prices are from each vendor's respective Web site as of 02/10/14. Prices do not include tax or shipping.

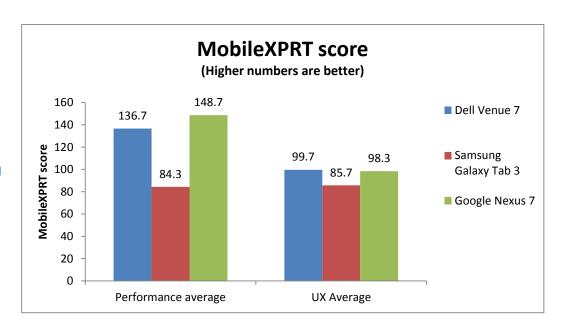


Figure 3: The Intel Atom processor-based Dell Venue 7 and Google Nexus 7 performed similarly on the MobileXPRT 2013 benchmark.

## WHAT WE TESTED

For details on how to run WebXPRT and MobileXPRT, see the step-by-step instructions we followed in Appendix B.

# **About WebXPRT**

WebXPRT 2013 uses scenarios created to mirror the tasks you do every day to compare the performance of almost any Web-enabled device. It contains four HTML5-and JavaScript-based workloads: Photo Effects, Face Detect, Stocks Dashboard, and Offline Notes. To learn more about WebXPRT 2013, visit www.webxprt.com.

### About MobileXPRT

MobileXPRT, the newest member of the XPRT family, evaluates smart phone performance and provides a fair and consistent basis for comparing the growing range of devices on the market. For information about the latest version of MobileXPRT, go to www.mobilexprt.com.

# IN CONCLUSION

No one likes to wait for a sluggish tablet to load a Web site, and no one likes to spend more than necessary. Choosing a tablet that has a powerful processor but remains affordable is a great way to get the most for your money when shopping for a tablet.

In our hands-on tests of three popular Android tablets, we found that the Intel Atom processor-powered Dell Venue 7 provided the best Web browsing experience for the price. It loaded pages quickly, delivered strong performance, and cost less than the other tablets we tested.

The Samsung Galaxy Tab 3 7.0 cost more than the Intel Atom processor-based tablet, had half the storage space, and provided a markedly worse Web browsing experience. And while the Google Nexus 7 provided a similar Web browsing experience and the same amount of storage as the Intel Atom processor-based Dell Venue 7, it cost over 50 percent more.

With the dual-core Intel Atom processor-based Dell Venue 7, you can get a better Web browsing experience for your money than with the other tablets we tested.

# **APPENDIX A – SYSTEM CONFIGURATION INFORMATION**

Figure 4 provides detailed configuration information for the test systems.

Custom	Intel Atom processor-	ARM-based	ARM-based
System	based Dell Venue 7	Samsung Galaxy Tab 3 7.0	Google Nexus 7
General			
Number of processor packages	1	1	1
Number of cores per			
processor	2	2	4
Number of hardware	2	1	1
threads per core	2	-	1
Total number of threads	4	2	4
System dimensions (length x width x height)	7.60" x 4.65" x 0.38"	7.4" x 4.37" x 0.39"	7.87" x 4.49" x 0.34"
System weight (pounds)	0.69	0.67	0.64
CPU		·	
Vendor	Intel	Qualcomm	Qualcomm
Model number	Atom Z2560	Snapdragon™ 400	Snapdragon S4 Pro
Core frequency (GHz)	1.6	1.2	1.5
lal.	32KB Instruction + 24KB	16KB Instruction + 16KB	16KB Instruction + 16KB
L1 cache	Data (per core)	Data (per core)	Data (per core)
L2 cache	1 MB (512 KB per core)	1 MB (per core)	2 MB (per core)
Memory			
Amount of RAM (GB)	2	1.5	2
Туре	DDR2	DDR2	DDR3L
Storage			
Vendor and model number	eMMC SSD flash storage	Integrated flash storage	Integrated flash storage
Size (GB)	16	8	16
Operating system			
Name	Android 4.2.2	Android 4.1.2	Android 4.4.2
Graphics			
Vendor and model number	Intel HD Graphics	Adreno 305	Adreno 320
Resolution	1,280 x 800	1,024 x 600	1,920 x 1,200
Wireless			
Vendor and model number	802.11a/b/g/n	802.11a/b/g/n	802.11a/b/g/n
Ports			
USB type	1 x USB 2.0	1 x USB 2.0	1 x USB 2.0
Other	Headphone jack, MicroSD slot	Headphone jack, MicroSD slot	Headphone jack
Display	•	·	·
	IPS capacitive multi-touch	TFT capacitive multi-touch	HD IPS capacitive multi-
Туре	screen	screen	touch screen
Screen size	7.0"	7.0"	7.02"

System	stem Intel Atom processor- based Dell Venue 7		ARM-based Google Nexus 7					
Battery								
Type	Built-in	Built-in	Built-in					
Rated capacity	4,100 mAh	4,000 mAh	3,950 mAh					

Figure 4: Configuration information for the tablets we tested.

## **APPENDIX B – HOW WE TESTED**

# Measuring Web browsing performance with WebXPRT 2013

## **Running the test**

- 1. Open the default Web browser, and go to <a href="http://www.principledtechnologies.com/benchmarkxprt/webxprt/">http://www.principledtechnologies.com/benchmarkxprt/webxprt/</a>.
- 2. Click Run WebXPRT 2013.
- 3. At the Ready to test your browser screen, click Continue.
- 4. Click Start.
- 5. When the test completes, record the results.
- 6. Repeat steps 1 through 5 two more times, and report the average of the three runs.

# Measuring Web browsing performance with MobileXPRT 2013

#### Setting up the test

- 1. Install MobileXPRT 2013.
  - a) Under Security Settings, configure the test device to allow installation of apps from local storage (unknown sources).
  - b) Copy the MobileXPRT2013CP.apk to /phone or /sdcard on the Android device.
  - c) Double-click the APK. Note: If the test device does not have a default file explorer, you may need to install a file explorer application. You can also use Android Debug Bridge (ADB) to copy and install MobileXPRT by connecting the test device to a PC.
  - d) Click Install to begin the installation.
  - e) After the installation is complete, click Open.
  - f) MobileXPRT will then prompt to install the UX Tests component. Click Install.
- 2. After installation of the UX Tests is complete, click Done. MobileXPRT will then copy the workload data files to required folders.
- 3. Once the workload data files are copied, setup is complete.

## **Running the test**

- 1. Launch MobileXPRT 2013 by pressing the MobileXPRT icon.
- 2. Press All Tests.
- 3. When the test completes, record the results.
- 4. Repeat steps 1 through 3 two more times.
- 5. Report the average of three runs.

# APPENDIX C – WEB EXPERIENCE TESTING RESULTS

The following pages contain the details of our Web browser experience testing, which was based on business and informational sites we gathered from the Alexa Top Sites list (<a href="www.alexa.com/topsites">www.alexa.com/topsites</a>) for users in the United States.

Once the list was created, we conducted our experience tests from January 21 to February 6, 2014. For each site we visited, the table presents the relative performance observed between the tablets during side-by-side testing. The side-by-side testing consisted of browsing both sites simultaneously, observing response to taps and drag-to-scroll gestures, and opening image and video media files. We noted any issues or differences in end-user experience during the testing.

Many Web sites detect if a device is a tablet, phone, or desktop/notebook computer and either redirect a mobile device to the mobile site or load the full version, sometimes referred to as the desktop version of the site. In the following table, we refer to the mobile site when redirection occurs, and full site when redirection does not occur and the page that loads is formatted for a computer display.

Use case	Site and URL	User task	Intel Atom-based Dell Venue 7 Android 4.2.2	ARM-based Samsung Galaxy Tab 3 7.0 Android 4.1.2	ARM-based Google Nexus 7 Android 4.4.2	Notes
Browser capa	bilities					
	www.whatismybrowser.com	Identification	Chrome 32 on	Chrome 32 on	Chrome 32 on	
	www.wnatismybrowser.com	identification	Android (v4.2)	Android (v4.1)	Nexus 7	
		Javascript	Yes	Yes	Yes	
		Cookies	Yes	Yes	Yes	
		Flash	No	No	No	
		Java	No	No	No	
		Reported resolution	601 x 914 32-bit	600x1,024 32-bit	600 x 912 32-bit	
		Version	32.0.1700.99	32.0.1700.99	32.0.1700.99	
		OS	4.2.2	4.1.2	4.4.2	
		Webkit	537.36	637.36	537.36	
		System Build	JDQ39	JZO54K	КОТ49Н	
		Language	English	English	English	
		Agent	Mozilla/5.0 (Linux; Android 4.2.2; Venue 7 3730 Build/JDG39) AppleWebKit/537.36 (KHTML, like Gecko) Chrome /32.0.1700.99 Safari/537.36	Mozilla/5.0 (Linux; Android 4.1.2; SM- T210R Build/JZO54K) AppleWebKit/537.36 (KHTML, like Gecko) Chrome /32.0.1700.99 Safari/537.36	Mozilla/5.0 (Linux; Android 4.4.2; Nexus 7 Build/KOT49H) AppleWebKit/537.3 6 (KHTML, like Gecko) Chrome/32.0.1700. 99 Safari 537.36	
News portals						
	NYT www.nytimes.com	Browsing news articles	Initial page load is in the full version, opening an article jumps to mobile site. Some articles open in full style, others in mobile.  Topic pages rendered in full.  Loads quickly and browses smoothly.	Initial page load is in full version, opening an article jumps to mobile site.  Some articles open in full style, others in mobile.  Topic pages rendered in full.  Loads a bit slowly, browsing articles is jerky.	Initial page load and subsequent articles rendered in mobile view. Article pages consistently rendered in mobile view. Topic pages rendered in full. Loads quickly and browses smoothly.	Vs. Galaxy: Venue loaded front page much faster and subsequent page loads somewhat faster. Venue scrolling of text was smoother. Vs. Nexus 7: Comparable performance.

Use case	Site and URL	User task	Intel Atom-based Dell Venue 7 Android 4.2.2	ARM-based Samsung Galaxy Tab 3 7.0 Android 4.1.2	ARM-based Google Nexus 7 Android 4.4.2	Notes
	ABC www.abcnews.go.com	Browsing news articles	Pages load quickly and browse smoothly. Error attempting to full-screen some videos: "Sorry this video cannot be played."	Pages load acceptably fast. Browsing/scrolling is choppy. Error attempting to full-screen some videos: "Sorry this video cannot be played."	Pages load quickly and browse smoothly. Video plays correctly.	Vs. Galaxy: Venue loaded front page much faster and subsequent page loads somewhat faster. Venue scrolling of text was smoother. Vs. Nexus 7: Comparable performance. Dell Venue encountered an error attempting to play full-screen video.
	CBS www.cbsnews.com	Browsing news articles	Site loads the mobile version. No option to full-screen the video. Turning on closed captions does not always work Lacks impression of full desktop site. However, the tablet-optimized site is better for readability, with the caveat of bad video handling.	Site loads full version. No option to full-screen the video. Zooming in on the news page causes display issues (overlays from the left column flood the article column). Lower performance than the mobile site.	Initial page load is in the full version. No option to fullscreen video. Turning on closed captions does not always work Gives the full desktop experience. However, video playback is badly handled.	Vs. Galaxy: Venue loaded front page much faster and subsequent page loads somewhat faster. Venue scrolling of text was smoother. Vs. Nexus 7: Comparable performance.
	NBC www.nbcnews.com	Browsing news articles	Loads full site. Articles load in mobile view. Video plays well.	Loads full site. Articles load in mobile view. Video plays well.	Loads full site. Articles load in mobile view. Video plays well.	Vs. Galaxy: Venue loaded front page much faster and subsequent page loads somewhat faster. Venue scrolling of text was smoother. Vs. Nexus 7: Comparable performance

Use case	Site and URL	User task	Intel Atom-based Dell Venue 7 Android 4.2.2	ARM-based Samsung Galaxy Tab 3 7.0 Android 4.1.2	ARM-based Google Nexus 7 Android 4.4.2	Notes
	CNN www.cnn.com	Browsing news articles	Loads full site. Video ad before content video does not autoplay; required tapping the Play arrow again.	Loads full site. Browsing performance acceptable, but jerky. When we attempted to play a video on cnn.com, the tablet locked and became unresponsive. The only way to return it to a fully functioning device was to hard power cycle. This happened with every video we tried to play	Loads full site. Video ad before content video does not autoplay; required tapping the Play arrow again.	Vs. Galaxy: Galaxy hard-locked while playing video content. Vs. Nexus 7: Comparable performance
	Huffington Post www.huffingtonpost.com	Browsing news articles	Loads full site.	Loads full site News ticker scroll is extremely slow at times.	Loads full site.	Vs. Galaxy: Venue loaded the site faster. Vs. Nexus 7: Comparable performance.
	Fox News www.foxnews.com	Browsing news articles	Loads mobile site. Every time an ad appeared, it prevented the video from continuing to play from that point on.	Loads full site. Every time an ad appeared, it prevented the content from continuing to play from that point on.	Loads full site. Video will not go fullscreen.	Vs. Galaxy: Performance on the mobile site on the Venue is much faster than the desktop experience, although lacking the layout of desktop.  Vs. Nexus 7: Comparable performance.
	MSNBC www.msnbc.com	Browsing news articles	Loads narrow site layout of full site. Not all videos play. (Says Your video is loading, then plays audio with no video.) Full screen does not work correctly on videos.	Loads narrow site layout of full site. Not all videos play. (Says Your video is loading, then plays audio with no video.) Full screen does not work correctly on videos.	Loads narrow site layout of full site. Video does not play. (Says Your video is loading, then plays audio with no video.) Poll formatting button broken ("Cast your vot <li>linebreak&gt;e")</li>	Vs. Galaxy: Venue loaded front page much faster and subsequent page loads somewhat faster. Venue scrolling of text was smoother. Vs. Nexus 7: Comparable performance.

Use case	Site and URL	User task	Intel Atom-based Dell Venue 7 Android 4.2.2	ARM-based Samsung Galaxy Tab 3 7.0 Android 4.1.2	ARM-based Google Nexus 7 Android 4.4.2	Notes
	Google www.news.google.com	Browsing news articles	Loads mobile layout.	Loads tablet-friendly layout.	Loads tablet-specific layout.	Vs. Galaxy: Venue's mobile layout performed far better than the tablet layout presented to the Galaxy Tab 3. Vs. Nexus 7: Comparable performance, with the caveat that the layouts are different.
	Yahoo! www.news.yahoo.com	Browsing news articles	Loads mobile layout.	Loads tablet-friendly layout.	Loads mobile layout.	Vs. Galaxy: Venue's mobile layout performed far better than the tablet layout presented to the Galaxy Tab 3. Vs. Nexus 7: Nexus performance slightly better.
	Washington Post www.washingtonpost.com	Browsing news articles	Loads full layout. PostTV videos do not play.	Loads full layout. PostTV videos do not play.	Loads full layout. Poor performance for loading and user interaction. PostTV videos do not play.	Vs. Galaxy: Venue loaded front page much faster and subsequent page loads somewhat faster. Venue scrolling of text was smoother.  Vs. Nexus 7: Site loading and touch response equally slow on both tablets.
	USA Today www.usatoday.com	Browsing news articles	Loads tablet layout. Throws an error while trying to play video fullscreen. "Sorry, this video cannot be played."	Loads tablet layout. Video played with no issues.	Loads tablet layout. Video played with no issues.	Vs. Galaxy: Venue performed better, but had an error attempting to play video full screen. Vs. Nexus 7: Venue performed comparably, but had an error attempting to play video full screen.
Business			I			
	WSJ www.online.wsj.com	Browsing news articles	Loads full layout.	Loads full layout.	Loads full layout.	Vs. Galaxy: Venue loaded front page much faster and subsequent page loads somewhat faster. Venue scrolling of text was smoother. Vs. Nexus 7: Comparable performance.

Use case	Site and URL	User task	Intel Atom-based Dell Venue 7	ARM-based Samsung Galaxy Tab 3 7.0	ARM-based Google Nexus 7	Notes
			Android 4.2.2	Android 4.1.2	Android 4.4.2	
	Forbes www.forbes.com	Browsing news articles	Loads full layout with no issues.	Loads full layout with no issues.	Loads full layout. "Also on Forbes" links in the bottom- right pop-up do not load.	Vs. Galaxy: Venue loaded front page much faster and subsequent page loads somewhat faster. Venue scrolling of text was smoother. Vs. Nexus 7: Comparable performance, though links in the bottom right did not pop up on the Nexus 7.
Finance						
	Google Finance www.google.com/finance	Browse stock news and charts	Loads full layout. Individual stock tracker pages are non-interactive, due to the lack of Flash. Stock screener sliders are difficult to use.	Loads full layout. Individual stock tracker pages are non-interactive, due to the lack of Flash. Stock screener sliders are difficult to use.	Loads full layout. Individual stock tracker pages are non-interactive, due to the lack of Flash. Stock screener sliders are difficult to use.	Vs. Galaxy: Loading performance Comparable. Venue scrolling of text was much smoother. Vs. Nexus 7: Comparable performance.
	Yahoo! Finance www.finance.yahoo.com	Browse stock news and charts	Loads mobile layout.	Loads tablet layout.	Loads full layout.	Vs. Galaxy: Venue layout performed much better. Vs. Nexus 7: Performance noticeably better on the Venue due to much simpler Web layout.
Sports			ı	ı	I	
	MLB www.mlb.com	Browse articles and scores	Loads mobile site. Player statistic horizontal scrolling is smooth.	Loads mobile site. Player statistic horizontal scrolling is smooth.	Loads mobile site. Player statistic horizontal scrolling is a bit slow, framerate-wise.	Vs. Galaxy: Venue loaded front page much faster and subsequent page loads somewhat faster. Venue scrolling of text was much smoother.  Vs. Nexus 7: Performance slightly better on Venue.

Use case	Site and URL	User task	Intel Atom-based Dell Venue 7 Android 4.2.2	ARM-based Samsung Galaxy Tab 3 7.0 Android 4.1.2	ARM-based Google Nexus 7 Android 4.4.2	Notes
	NBA www.nba.com	Browse articles and scores	Loads full site. Initial page loads take a while to display all graphics. Performance once page is loaded is slow, but usable. Video functions well.	Loads full site Initial page loads take a long time to display all graphics Performance once page is loaded is poor. Text is blurred until zoomed in. Video functions well.	Loads full site. Initial page loads take a while to display all graphics. Performance once page is loaded is acceptable. No video functionality.	Vs. Galaxy: Venue loaded front page much faster and subsequent page loads somewhat faster. Venue scrolling of text was smoother. Vs. Nexus 7: Comparable browsing performance, but Nexus 7 had no video functionality.
	NFL www.nfl.com	Browse articles and scores	Loads full site. Video is restricted to a Verizon app. Performance reduced by constant attempts to load video and other content.	Loads full site. Video is restricted to a Verizon app. Performance reduced by constant attempts to load video and other content.	Loads full site. Video is restricted to a Verizon app. Performance reduced by constant attempts to load video and other content.	Vs. Galaxy: Venue loaded front page much faster and subsequent page loads somewhat faster. Venue scrolling of text was much smoother.  Vs. Nexus 7: Comparable performance.
	NHL www.nhl.com	Browse articles and scores	Loads mobile site.	Loads mobile site.	Loads mobile site.	Vs. Galaxy: Venue loaded front page much faster and subsequent page loads somewhat faster. Venue scrolling of text was much smoother.  Vs. Nexus 7: Comparable performance
	ESPN www.espn.go.com	Browse articles and scores	Loads tablet site.	Loads tablet site.	Loads mobile site.	Vs. Galaxy: Galaxy loads front page somewhat faster and more reliably (after initially loading an HTML 1.0-style document) Venue subsequent page loads somewhat faster. Venue scrolling of text much smoother. Vs. Nexus 7: Comparable performance

			Intel Atom-based	ARM-based Samsung	ARM-based Google	
Use case	Site and URL	User task	Dell Venue 7	Galaxy Tab 3 7.0	Nexus 7	Notes
osc case	Site and Site	OSC: task	Android 4.2.2	Android 4.1.2	Android 4.4.2	110103
Special intere	oct		Alluloiu 4.2.2	Alluloid 4.1.2	Android 4.4.2	
·	Boston.com-The Big Picture	Browse	Loads full site, scales	Loads full site, scales	Loads full site, scales correctly for	Vs. Galaxy: Venue loaded front page much faster and subsequent page loads somewhat faster. Venue scrolling of text was much
	www.boston.com/bigpicture	photo essays	correctly for mobile.	correctly for mobile.	mobile.	smoother.  Vs. Nexus 7: Nexus was slightly smoother, but only by directly comparing side by side.
	NPR www.npr.org	Browse news and articles	Loads mobile site.	Loads mobile site.	Loads mobile site.	Vs. Galaxy: Initial load time about equal. Venue subsequent page loads are somewhat faster. Venue scrolling of text much smoother. Vs. Nexus 7: Comparable performance.
Aggregators						
	Reddit www.reddit.com	Browse news listings	Loads full site with option for mobile.	Loads full site with option for mobile.	Loads full site with option for mobile.	Vs. Galaxy: Venue loads front page much faster. Venue scrolling of text much smoother. Vs. Nexus 7: Comparable performance.
Tech						
	Cnet www.cnet.com	Browse articles and reviews	Loads tablet site.	Loads tablet site.	Loads tablet site.	Vs. Galaxy: Venue loads front page and subsequent pages somewhat faster. Venue scrolling of text much smoother. Vs. Nexus 7: Comparable performance.

Use case	Site and URL	User task	Intel Atom-based Dell Venue 7 Android 4.2.2	ARM-based Samsung Galaxy Tab 3 7.0 Android 4.1.2	ARM-based Google Nexus 7 Android 4.4.2	Notes
	Engadget www.engadget.com	Browse news	Loads tablet site.	Loads tablet site.	Loads tablet site.	Vs. Galaxy: Venue loads front page and subsequent pages much faster. Venue scrolling of text much smoother. Vs. Nexus 7: Comparable performance.
Video stream	ing					
	Netflix www.movies.netflix.com (URL is necessary outside of the app to manage movie queue and for account management.)	Browse, organize queue	Loads full site. Tapping on most links, buttons, or text boxes has a significant delay.	Loads full site. Tapping on most links, buttons, or text boxes has a significant delay.	Loads full site. Tapping on most links, buttons, or text boxes has a significant delay.	Vs. Galaxy: Venue loads queue much faster. Venue scrolling of text much smoother. Venue reorganized queue somewhat faster. Vs. Nexus 7: Comparable performance.
	Hulu www.hulu.com (URL is necessary outside of the app to manage queue and for account management.)	Browse and play clips	Loads mobile site. Clips play correctly.	Loads mobile site. Clips play correctly.	Loads mobile site. Clips play correctly.	Vs. Galaxy: Venue loads queue much faster. Venue scrolling of videos much smoother. Venue video playback noticeably smoother. Vs. Nexus 7: Comparable performance.
Reference			I	ı		
	Wikipedia www.wikipedia.org	Browse English featured article and sub-articles	Opens in mobile view.	Opens in mobile view.	Opens in mobile view.	Vs. Galaxy: Venue opens pages slightly faster and scrolls much smother. On-page actions Comparable.  Vs. Nexus 7: Comparable performance.

# ABOUT PRINCIPLED TECHNOLOGIES



Principled Technologies, Inc. 1007 Slater Road, Suite 300 Durham, NC, 27703 www.principledtechnologies.com We provide industry-leading technology assessment and fact-based marketing services. We bring to every assignment extensive experience with and expertise in all aspects of technology testing and analysis, from researching new technologies, to developing new methodologies, to testing with existing and new tools.

When the assessment is complete, we know how to present the results to a broad range of target audiences. We provide our clients with the materials they need, from market-focused data to use in their own collateral to custom sales aids, such as test reports, performance assessments, and white papers. Every document reflects the results of our trusted independent analysis.

We provide customized services that focus on our clients' individual requirements. Whether the technology involves hardware, software, Web sites, or services, we offer the experience, expertise, and tools to help our clients assess how it will fare against its competition, its performance, its market readiness, and its quality and reliability.

Our founders, Mark L. Van Name and Bill Catchings, have worked together in technology assessment for over 20 years. As journalists, they published over a thousand articles on a wide array of technology subjects. They created and led the Ziff-Davis Benchmark Operation, which developed such industry-standard benchmarks as Ziff Davis Media's Winstone and WebBench. They founded and led eTesting Labs, and after the acquisition of that company by Lionbridge Technologies were the head and CTO of VeriTest.

Principled Technologies is a registered trademark of Principled Technologies, Inc. All other product names are the trademarks of their respective owners.

Disclaimer of Warranties; Limitation of Liability:

PRINCIPLED TECHNOLOGIES, INC. HAS MADE REASONABLE EFFORTS TO ENSURE THE ACCURACY AND VALIDITY OF ITS TESTING, HOWEVER, PRINCIPLED TECHNOLOGIES, INC. SPECIFICALLY DISCLAIMS ANY WARRANTY, EXPRESSED OR IMPLIED, RELATING TO THE TEST RESULTS AND ANALYSIS, THEIR ACCURACY, COMPLETENESS OR QUALITY, INCLUDING ANY IMPLIED WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE. ALL PERSONS OR ENTITIES RELYING ON THE RESULTS OF ANY TESTING DO SO AT THEIR OWN RISK, AND AGREE THAT PRINCIPLED TECHNOLOGIES, INC., ITS EMPLOYEES AND ITS SUBCONTRACTORS SHALL HAVE NO LIABILITY WHATSOEVER FROM ANY CLAIM OF LOSS OR DAMAGE ON ACCOUNT OF ANY ALLEGED ERROR OR DEFECT IN ANY TESTING PROCEDURE OR RESULT.

IN NO EVENT SHALL PRINCIPLED TECHNOLOGIES, INC. BE LIABLE FOR INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH ITS TESTING, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL PRINCIPLED TECHNOLOGIES, INC.'S LIABILITY, INCLUDING FOR DIRECT DAMAGES, EXCEED THE AMOUNTS PAID IN CONNECTION WITH PRINCIPLED TECHNOLOGIES, INC.'S TESTING, CUSTOMER'S SOLE AND EXCLUSIVE REMEDIES ARE AS SET FORTH HEREIN.