The importance of measuring application end user experience is significant when it comes to mobile usage. Mobile users are much less tolerant to application errors, slow response times, or poor usability. RUM answers this need by providing performance and availability status and crash reports for your mobile application.

# **Motivation: Monitor What Matters**

# Importance of Network Performance, Availability and Application Crashes

Applications are often required to exchange information with back-end servers. For example, getting the status of a user's bank account, receiving updates from friends, or posting a new picture to a blog. In all cases, the response time of such network communication has a direct effect on the overall user experience and satisfaction with the application. Various parameters can affect these response times, from the network load of the mobile carrier to hardware problems on back-end servers.

Availability is also an important characteristic of a network, since even a 30 minute outage can have a significant impact on revenue and productivity of your business.

Application crashes impact the confidence of users in the application and reduces overall satisfaction from the vendor.

Identifying slow response times and the cause of the lack of availability and application crashes are the first step in improving users' satisfaction and increasing brand loyalty.

# **Measuring on Device**

Measuring a mobile application's latency accurately requires measuring the latency on the device itself in the same way a user experiences it.

Eliminate the blind spots by getting visibility to the performance of third party services such as CDN and ads, which cannot be monitored otherwise as well as to the characteristics of the user device.

In order to determine the exact impact performance and availability problems have on users, RUM collects various user statistics such as device type, operating system, mobile carrier, installed application version, and crash data. See the New "Mobile Health" report section below.



#### Improve user experience for mobile app

One of the most important factors affecting user experience of mobile applications is the responsiveness of back-end servers. The Network for Mobile Apps solution enables you to measure this time from the device, breaking it down to mobile network and server performance components.

#### See how different devices perform

Mobile applications are installed on various devices, each one running on certain operating systems, equipped with different hardware resources, and connected via one of many network carriers. Application performance and availability may vary on each device and RUM can help you identify where performance or availability needs to be improved.

On top of the above, application crashes are captured along with the mobile user statistics allowing a mobile developer the ability to pinpoint problematic code on a specific device, operating system, etc.

# Introduction

## **Simple Instrumentation Process**

RUM Mobile monitors native applications on an end user's device. The application is usually installed from the Apple/Google Stores and comes with embedded RUM Mobile capabilities, being pre-instrumented prior to publishing in the store. For Android applications, we developed a simple utility that embeds instrumentation in the application in a very intuitive way. The main advantage is that no code changes are required and the development process is not affected. With iOS applications, a special library needs to be added to the project, but no code change is required.

## **Native and Hybrid Support**

Mobile applications that are developed using both Native (iOS/Android) and HTML/JavaScript technologies (Hybrid) can also be monitored by RUM. Moreover, the same *instrument-once* process is used for all types of applications and you do not need to perform a different process for Hybrid applications.

## Deployment

Mobile devices running an instrumented application report relevant information to a RUM Client Monitor Probe. This requires a network configuration that enables Mobile users to connect to a predefined RUM Client Monitor Probe URL for data reporting. The RUM Engine also connects to the Client Monitor Probe to pull data; no connections are opened from the Probe to the Engine. You can also locate the Client Monitor Probe outside an organization (for example, on a cloud hosted machine). The following diagram shows both deployment options:





# No Impact on the Application

The instrumentation added by RUM to an application does not change the way the application functions and performs; it only measures the duration of certain operations and HTTP errors and crashes. The data is sent to the RUM Client Monitor Probe in chunks by a background process, so user experience is not affected. Moreover, there are fuses on the amount of memory used by the RUM background process, as well as network usage for the data channel between the mobile device and the Client Monitor Probe. These parameters can be configured during instrumentation.

# Security

Monitoring the user experience from a mobile device requires sending data to the RUM Client Monitor Probe. Only the URLs that the application has accessed are reported, no personal information is collected. The data from the mobile device is sent over an HTTPS (secured) channel. By default, the RUM Engine communicates with the RUM Client Monitor Probe over HTTPS connections with bidirectional authentication using server and client certificates.

## **Mobile Health Report**

The RUM Mobile data is available in all RUM reports in BSM. For a quick and intuitive overview of the status of a mobile app, a new Mobile Health report slices the information by different dimensions: user's location, operating system, application version, device type, mobile network carrier and mobile crashes.

#### Mobile Health Report – Performance

The Mobile Health Performance overview displays locations with the slowest response time.

The geo map provides an indication of the mobile application users along with a volume and status indication.

A red icon indicates users experiencing performance problems.

A tooltip on a selected location shows the overall number of sessions along with the average response time.

The table on the right displays the 10 worst locations according to performance.



The lower pane of the Mobile Health report shows requests, domains and session breakdown.

*The Requests and Domains – HTTP Requests* table lists the 10 slowest requests. This list reveals a specific request that suffers from high response time. You can drill down from here to display the *Action Summary* report.

R	eque	sts and Domain	S   Mumbai			
		HTTP Req	uests	Dom	nains	
F	ITTP Re	quests	<ul> <li>Avg. Respon</li> </ul>	se Time	Total	
	29%	ads.tokens	10.09	sec	96 hits	<b>#</b>
6	82%	getPages	5.91 9	iec .	384 hits	
1	87%	getComments	5.54 9	sec .	576 hits	
6	94%	getUsersBlogs	4.84	sec	192 hits	
5	94%	Home Page	4.88	sec	192 hits	
6	95%	get0ptions	4.88	sec	192 hits	
6	97%	getRecentPosts	4.88	sec	384 hits	
2	97%	getPostFormats	4.85	sec	384 hits	
6	97%	deletePost	4.81 9	sec	192 hits	
2	100%	ads.getads	2.92	sec	96 hits	

The Action Summary report displays the root cause of the long response time.

AUM Action Summary 05/30/2014 02:22:01 AMA05/31/2014 02:22:01 AMA05/													
1 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1													
Highlights Availability and Events Performance													
Action	Tier	Total Action Hits	Performance	Total Time (sec)	Server Time	Server Time to	Network Time	Connect Time	SSL Handshake	Retransmit	Client Time		
			(%)		(sec)	First Buffer (sec)	(sec)	(sec)	Time (sec)	Time (sec)	(sec)		
ads.tokens	Mobile Application	96	28.12	10.16	4.79	4.79	5.37	0.00	0.00	0.00	0.00		
		96	28.12	10.16	4.79	4.79	5.37	0.00	0.00	0.00	0.00		
📕 Critical 📕 OK 📕 Minor 📕 No data 🔲 Downtime 📕 Unknown											**		

#### The action's raw data reveals the slow response time occurrences.

Action Raw Data 05/30/2014 02:25:29 AM-05/	31/2014 02:25:29 AM (GMT-07:00) Mountain Time (US & Ca	nada)										
📲 🐨 🕸 🏹 🕨 Run 🎦 🕈 🔥	· 🕫 🖪											
🖻 💩 🛹 🔞 🔢 🐘												
Action 🛎	Start Time	Application	Server	Running Software	Client	Events	Total Time (sec)	Server Time (sec)	Network Time (sec)	Client Time (sec)	Total Traffic (KB)	Snapshot
ads.tokens	5/30/2014 02:28:10 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.53	-	5.139	2.331	2.808	0.000	1.0	No
ads.toker http://advertisingprovidor.com/active	adds.php?method=ads.Tokens 014 02:38:11 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.50		4.824	1.562	3.262	0.000	0.9	No
ads tokens	svawz014 02:58:11 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.52		6.220	2.841	3.379	0.000	1.2	No
ads.tokens	5/30/2014 03:38:12 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.53		11.138	3.733	7.405	0.000	0.8	No
ads.tokens	5/30/2014 03:48:11 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.53		7.032	4.540	2.492	0.000	0.9	No
ads.tokens	5/30/2014 03:58:08 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.52		12.888	8.521	4.367	0.000	1.4	No
ads.tokens	5/30/2014 03:58:10 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.50		10.551	8.087	2.464	0.000	1.1	No
ads.tokens	5/30/2014 04:08:08 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.50		15.503	8.507	6.996	0.000	1.0	No
ads.tokens	5/30/2014 04:18:08 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.50		4.430	1.251	3.179	0.000	1.9	No
ads.tokens	5/30/2014 04:18:10 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.50		8.789	1.289	7.500	0.000	1.0	No
ads tokens	5/30/2014 04:28:09 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.52		7.854	5.085	2.769	0.000	0.8	No
ads.tokens	5/30/2014 04:38:09 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.52		3.404	0.207	3.197	0.000	1.2	No
ads.tokens	5/30/2014 04:58:09 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.52		9.091	1.636	7.455	0.000	1.3	No
ads.tokens	5/30/2014 04:58:11 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.52		13.235	6.078	7.157	0.000	1.5	No
ads.tokens	5/30/2014 05:08:11 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.53		8.069	1.675	6.394	0.000	1.5	No
ads.tokens	5/30/2014 05:18:12 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.52		5.560	2.934	2.626	0.000	0.9	No
ads.tokens	5/30/2014 05:28:09 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.50		6.611	3.101	3.510	0.000	0.9	No
ads.tokens	5/30/2014 05:38:11 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.50		5.580	2.724	2.856	0.000	1.0	No
ads.tokens	5/30/2014 05:58:09 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.50		13.594	8.159	5.435	0.000	1.8	No
ads.tokens	5/30/2014 06:08:12 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.52	-	15.574	8.209	7.365	0.000	0.9	No
ads.tokens	5/30/2014 06:28:09 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112.79.5.52	-	8.173	1.430	6.743	0.000	1.0	No
ads.tokens	5/30/2014 06:38:09 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (ad	112,79.5.50		10.485	4,714	5.771	0.000	1.8	No

The *Requests and Domains – Domains* table lists the domains used from a specific location. This list can reveal if a third-party component is impacting the overall response time. The table also displays the total number of requests for this specific domain which can provide a hint about the magnitude of the effect of the slow domain.

Requests and Domains I Mumbai										
HTTP Requests		Domains								
Domains	Domains Avg. Response Time									
65% advertisingprovidor.com		192 hits								
92% www.financecenter.org	2496 hits									

The Sessions Breakdown – Carriers graph provides a view of the distribution of all sessions coming from a specific location. This reveals a list of the slowest cellular carriers along with the volume of sessions from each carrier. You can also slice by application versions, operating systems, and devices.



### Sessions Breakdown – App Versions graph



Sessions Breakdown – Operating Systems graph



#### Sessions Breakdown – Devices graph



The *Session Analyzer* report displays a list of sessions from a specific location and a specific carrier. This list reveals all sessions with an indication of the number of total actions and number of slow actions. You can drill down on each of the sessions to view additional details.

Now Seasion Analyzer													
Start Time 🔻	Tier	End User Subgroup	Client	User Name	Location	Active	Duration (hh:mm:ss)	Latency (ms)	Error Events	Informational Events	Slow Actions	Actions	Has Data for VuGen Scripts
5/31/2014 12:28 AM	Mobile Application	Others [0.0.0.0-255.255	112.79.5.52	robina	Mumbai	No	00:00:09	0	0	0	0	28	No
5/30/2014 8:38 PM	Mobile Application	Others [0.0.0.0-255.255	112.79.5.52	robina	Mumbai	No	00:00:09	0	0	0	1	28	No
5/30/2014 6:38 PM	Mobile Application	Others [0.0.0.0-255.255	112.79.5.53	jojo	Mumbai	No	00:00:06	0	0	0	6	28	No
5/30/2014 3:48 PM	Mobile Application	Others [0.0.0.0-255.255	112.79.5.50	maryh	Mumbai	No	00:00:10	0	0	0	2	28	No
5/30/2014 1:08 PM	Mobile Application	Others [0.0.0.0-255.255	112.79.5.50	dennisc	Mumbai	No	00:00:13	0	0	0	5	28	No
5/30/2014 12:28 PM	Mobile Application	Others [0.0.0.0-255.255	112.79.5.52	jojo	Mumbai	No	00:00:16	0	0	0	3	28	No
5/30/2014 10:18 AM	Mobile Application	Others [0.0.0.0-255.255	112.79.5.50	robina	Mumbai	No	00:00:11	0	0	0	7	28	No
5/30/2014 9:08 AM	Mobile Application	Others [0.0.0.0-255.255	112.79.5.52	randym	Mumbai	No	00:00:08	0	0	0	0	28	No
5/30/2014 8:38 AM	Mobile Application	Others [0.0.0.0-255.255	112.79.5.53	robina	Mumbai	No	00:00:06	0	0	0	2	28	No
5/30/2014 5:58 AM	Mobile Application	Others [0.0.0.0-255.255	112.79.5.50	cassieh	Mumbai	No	00:00:14	0	0	0	1	28	No
						0/10		0	0	0	27	280	

The *Session Details* report displays the user name and all mobile attributes (App version, connection type, device, OS and carrier). The bottom pane displays a list of requests that the device sent to the backend server with an indication of slow requests along with the total time, server time, and network time breakdown.

Session Details 3/30	/2014 10:17 AM-10:19 AM (GN	IT-07:00) Mountain Time (U	IS & Canada)									
⊳ Refresh 🛃 🔻	🔥 🕈 🦻 🚯											
Properties												
Start time:	5/30/2014 10:18 AM											
Application:	Finance Center App	Client host name:	N/A									
Enduser	Others (0.0.0.0-	User name:	robina									
subgroup:	255.255.255.255]	Server IP:	N/A									
Location:	Mumbai	Total action hits:	28									
Total Traffic (KB):	30.7	Application Version:	10.9									
Duration	00-00-11	Connection Type:	Cellular									
(hh:mm:ss):	00.00.11	Devices	LC Navue E060									
Operating	Android	Device.	0.10.									
Later and the she		Mobile Carrier:	CellGo									
Latency (ms):	0.00	OS Version:	Android 3.0									
Client IP:	112.79.5.50											
General Events												
i No data wa	as found.											
Actions												
× * 👸 🕠	i 🖉 💩 👝											
Action				Start Time	Application	Events	Total Time (sec)	Server Time (sec)	Network Time (sec)	Client Time (sec)	Think Time (sec)	Total Traffic (KB)
Action Home Page				Start Time 5/30/2014 10:18:10 AM	Application Finance Center App	Events -	Total Time (sec) 6.137	Server Time (sec)	Network Time (sec) 4.776	Client Time (sec) 0.000	Think Time (sec) 0.000	Total Traffic (KB) 1.8
Action Home Page getUsersBlogs				Start Time 5/30/2014 10:18:10 AM 5/30/2014 10:18:11 AM	Application Finance Center App Finance Center App	Events - -	Total Time (sec) 6.137 6.012	Server Time (sec) 1.361 0.845	Network Time (sec) 4.776 5.167	Client Time (sec) 0.000 0.000	Think Time (sec) 0.000 0.000	Total Traffic (KB) 1.8 0.9
Action Home Page getUsersBlogs getOptions				Start Time 5/30/2014 10:18:10 AM 5/30/2014 10:18:11 AM 5/30/2014 10:18:11 AM	Application Finance Center App Finance Center App Finance Center App	Events - - -	Total Time (sec) 6.137 6.012 5.290	Server Time (sec) 1.361 0.845 0.564	Network Time (sec) 4.776 5.167 4.726	Client Time (sec) 0.000 0.000	Think Time (sec) 0.000 0.000	Total Traffic (KB) 1.8 0.9 0.7
Action Home Page getUsersBlogs getOptions getComments				Start Time 5/30/2014 10:18:10 AM 5/30/2014 10:18:11 AM 5/30/2014 10:18:11 AM 5/30/2014 10:18:11 AM	Application Finance Center App Finance Center App Finance Center App Finance Center App	Events	Total Time (sec) 6.137 6.012 5.290 6.291	Server Time (sec) 1.361 0.845 0.564 1.130	Network Time (sec) 4.776 5.167 4.726 5.161	Client Time (sec) 0.000 0.000 0.000 0.000	Think Time (sec) 0.000 0.000 0.000 0.000	Total Traffic (KB) 1.8 0.9 0.7 1.2
Action Home Page getUsersBlogs getOptions getComments getPostFormats				Start Time           5/30/2014 10:18:10 AM         5/30/2014 10:18:11 AM	Application Finance Center App Finance Center App Finance Center App Finance Center App Finance Center App	Events	Total Time (sec)           6.137           6.012           5.290           6.291           6.017	Server Time (sec) 1.361 0.845 0.564 1.130 0.352	Network Time (sec) 4.776 5.167 4.726 5.161 5.665	Client Time (sec) 0.000 0.000 0.000 0.000 0.000	Think Time (sec) 0.000 0	Total Traffic (KB) 1.8 0.9 0.7 1.2 0.6
Action Home Page getUsersBlogs getOptions getComments getPostFormats getPostFormats				Start Time 5/30/2014 10:18:10 AM 5/30/2014 10:18:11 AM 5/30/2014 10:18:11 AM 5/30/2014 10:18:11 AM 5/30/2014 10:18:11 AM 5/30/2014 10:18:10 AM	Application Finance Center App Finance Center App Finance Center App Finance Center App Finance Center App Finance Center App	Events	Total Time (sec) 6.137 6.012 5.290 6.291 6.017 6.202	Server Time (sec) 1.381 0.584 0.564 1.130 1.130 1.286 1.286 1.286	Network Time (sec) 4.776 5.167 4.726 5.161 5.665 4.906	Client Time (sec) 0.000 0.000 0.000 0.000 0.000 0.000	Think Time (sec) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Total Traffic (KB) 1.8 0.9 0.7 1.2 0.6 1.4 1.4
Action Home Page getUsersElogs getOptions getComments getPostFormats getRecentPosts getReges detailDeat				Start Time           SIG0/2014 10:18:10 AM           SIG0/2014 10:18:11 AM           SIG0/2014 10:18:10 AM           SIG0/2014 10:18:10 AM	Application Entence Center App Finance Center App	Events	Total Time (sec) 6.137 6.012 5.299 6.291 6.017 6.202 6.010	Server Time (sec) 1.381 0.845 0.584 1.130 0.352 1.236 1.071 1.01 1.02 1.021	Hetwork Time (sec) 4.776 5.167 4.726 5.161 5.665 4.906 4.999	Client Time (sec) 0.000	Think Time (sec) 0.000 0	Total Traffic (K8) 1.8 0.9 0.7 1.2 0.6 1.4 1.2
Action Home Page getUsersEtogs getOptions getOptions getPostFormats getRecentPosts getPages deletePost				Start Time 5/30/2014 10:18:10 AM 5/30/2014 10:18:11 AM 5/30/2014 10:18:11 AM 5/30/2014 10:18:11 AM 5/30/2014 10:18:11 AM 5/30/2014 10:18:10 AM 5/30/2014 10:18:10 AM	Application Finance Center App Finance Center App	Events	Total Time (sec) 6.137 5.290 6.291 6.017 7.6.202 6.010 5.997 7.6.597	Server Time (sec) 1.361 0.845 0.564 1.130 0.352 1.295 1.071 1.100	Network Time (sec) 4.776 5.187 4.726 5.181 5.181 5.685 4.906 4.939 4.889 4.839	Client Time (sec) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Think Time (sec)           0.000         0.000           0.000         0.000           0.000         0.000           0.000         0.000           0.000         0.000           0.000         0.000           0.000         0.000           0.000         0.000           0.000         0.000	Total Traffic (KB) 1.8 0.9 0.7 1.2 0.6 1.4 1.4 1.2 1.0 0.6 1.4 1.2 1.0 0.6 1.4 1.4 1.4 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5
Action Home Page getUsersEtogs getOptions getOotFormats getPages deletePost getPages deletePost getComments getComments				Start Time 509/2014 10:18:10 AM 509/2014 10:18:11 AM 509/2014 10:18:11 AM 509/2014 10:18:11 AM 509/2014 10:18:11 AM 509/2014 10:18:10 AM 509/2014 10:18:11 AM 509/2014 10:18:11 AM	Application Finance Center App Finance Center App	Events	Total Time (sec) 6.137 6.012 5.299 6.017 6.017 7.8202 6.010 5.997 6.000 6.997 6.000 6.997 6.000 6.997 6.000 6.997 6.000 6.012 6.012 6.137 6.137 6.012 6.01	Server Time (sec) 1.361 0.845 0.564 1.130 0.352 2.1295 1.071 1.108 1.246 0.991	Network Time (sec) 4.776 5.187 4.726 5.181 5.685 4.906 4.939 4.889 5.250	Client Time (sec) 0.000	Think Time (sec) 0.000 0	Total Traffic (KB) 18 18 19 07 12 06 1.4 1.2 10 06 0.6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Action Home Page getUsersBtogs getOptions getComments getPostFormats getPages deletePost getComments getRecentPosts getRecentPosts				Start Time           Sc0ucch 4 (0:1610 AM           Sc0ucch 4 (0:1611 AM           Sc0uch 4 (0:1611 AM           Sc0ucch 4 (0:1611 AM           Sc0ucch 4 (0:1611 AM           Sc0ucch 4 (0:1611 AM	Application Finisce Center App Finisce Center App	Events	Total Time (sec) 6.137 6.012 5.290 6.291 6.007 6.002 6.010 5.997 6.506 5.997 6.506 5.997 6.506 5.997 6.506 5.997 6.506 5.997 6.506 5.997 6.505 5.990 5.990 5.9000 5.900 5.900 5.900 5.900 5.900 5.9000 5.900 5.900 5.90000 5.90000 5.90000 5.90000 5.90000 5.900000 5.9000000000000000000000000000000000000	Server Time (sec) 1.361 0.845 0.564 1.130 0.352 1.235 1.077 1.1100 1.248 0.891 1.005	Network Time (sec) 4.776 5.187 4.726 5.187 5.685 4.906 4.399 5.258 4.900 5.258 4.900 5.258 4.900	Client Time (sec) 0.000	Think Time (sec) 0.000 0	Total Traffic (KB) 18 09 07 1.2 0.6 1.4 1.4 1.2 10 0.6 0.8 0.8 0.8 0.8 0.8 0.8 0.9 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7
Action Home Page getUsersBlogs getOptions getPostFormats getPostFormats getPages deletePost getOmments getComments getRecentPosts getPostFormats outDance				Start Time           SGB02014 10:16:10 AM           SGB02014 10:16:11 AM           SGB02014 10:16:11 AM           SGB02014 10:16:11 AM           SGB02014 10:16:11 AM           SGB02014 10:16:10 AM           SGB02014 10:16:11 AM	Application Frances Center App Frances Center App	Events	Total Time (sec)           6.137           6.291           6.017           6.291           6.017           6.293           6.017           6.293           6.017           6.294           6.017           6.295           6.010           5.997           6.606           5.791           5.522           6.425	Server Time (sec) 1.381 0.845 0.564 1.130 0.352 1.298 1.107 1.100 1.248 0.691 1.005 1.005 0.05	Retwork Time (sec) 4.776 5.167 4.726 5.161 5.685 4.906 4.839 5.258 4.800 4.517 7.495	Client Time (sec) 0.000	Think Time (sec) 0.000 0	Total Traffic (KB) 18 09 07 12 06 1.4 12 10 06 1.4 12 10 08 11 12 10 10 12 10 10 10
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## Mobile Health Report – Availability

The Mobile Health Availability report overview displays locations with the worst availability.

The geo map provides an indication of the mobile application users along with a volume and status indication.

A red icon indicates users experiencing availability problems.

A tooltip on a selected location shows the overall number of sessions along with the total availability from the location.

The table on the right displays the 10 worst locations according to availability.



The lower pane of the *Mobile Health* report shows requests, domains and session breakdown. *The Requests and Domains – HTTP Requests* table lists the slowest requests. This list reveals a specific request that suffers from errors.

Requests and Doma	Requests and Domains I Montana, Billings									
HTTP R	equests		Domains							
HTTP Requests	<ul> <li>Pages</li> </ul>	s with errors		Total						
■ 0% ads.tokens		218		218 hits	<b>1</b>					
✓ 97% getComments		17		604 hits						
☑100% getUsersBlogs		0		221 hits						
☑100% getPages		0		442 hits						
☑100% deletePost		0		221 hits						
☑100% getRecentPosts		0		442 hits						
☑100% getPostFormats		0		442 hits						
☑100% getOptions		0		221 hits						
☑100% Home Page		0		221 hits						
✓100% ads.getads		0		218 hits						

 $(i)\,$  The worst results for the sort criteria are displayed (up to 10)

The *RUM Action Summary* displays a request that is not available along with the number of error events. You can drilldown from this report to an action's raw data to view more information.

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Highlights Availability and Events F	Performance											
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on Raw Data 05/30/2014 02:50:20 AM-05/31/2014	02:50:20 AM (GMT-07:00) Mountain Time (US & Ca	anada)										
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eenens	5/30/2014 03.09.17 AM	Finance Center App	advertisingprovidor.com	advertisingprovidor.com (adv	65.100.79.17	Request not found	4.698	1.435	3.263	0.000	0.5	
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Industry Isolans Isolans Isolans Isolans Isolans Isolans Isolans Isolans Isolans Isolans Isolans Isolans	5002014 163004 17 AM 5002024 163947 AM 5002024 163947 AM 5002024 163947 AM 5002024 164051 B AM 5002024 164023 15 AM 5002024 164053 15 AM 5002024 164053 15 AM	Prinance Center App Finance Center App	advertisingprovidor.com advertisingprovidor.com advertisingprovidor.com advertisingprovidor.com advertisingprovidor.com advertisingprovidor.com advertisingprovidor.com advertisingprovidor.com advertisingprovidor.com advertisingprovidor.com advertisingprovidor.com advertisingprovidor.com	advertisingprovider.com (ad- advertisingprovider.com (ad- advertisingprovi	65.100.79.17 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.16 65.100.79.16 65.100.79.16 65.100.79.19 65.100.79.19	Bequest not found     Request not found     Paquest not found     Paquest not found     Request     Request	4.698 4.836 1.982 4.749 5.692 2.672 5.152 4.139 5.015 1.529 2.189 2.486 4.267	1.435 0.337 0.677 1.498 0.504 1.097 1.151 1.012 0.999 0.850 1.841 2.125	3.263 4.499 1.305 3.251 3.703 2.168 4.055 2.988 4.003 0.530 1.339 0.625 2.142	0.000 0	0.5 0.4 1.2 0.4 1.1 1.5 0.9 1.6 1.2 1.3 1.3 1.3 1.5 1.2	
takana takana takana takana takana takana takana takana takana takana takana takana takana takana	5002014 10.00017 AM 5002014 03 04 03 11 AM 5002014 03 04 03 11 AM 5002014 03 04 04 05 11 AM 5002014 04 05 15 AM 5002014 04 02 11 AM 5002014 04 05 11 AM 5002014 04 05 11 AM 5002014 04 55 11 AM	Phance Cetter App Finance Center App	avertaispervider.com alvertaispervider.com advertaispervider.com advertaispervider.com advertaispervider.com advertaispervider.com advertaispervider.com advertaispervider.com advertaispervider.com advertaispervider.com advertaispervider.com advertaispervider.com advertaispervider.com advertaispervider.com advertaispervider.com	advertisingprovider.com (ad- advertisingprovider.com (ad- advertisingprovi	65,100,79,17 65,100,79,18 65,100,79,18 65,100,79,17 65,100,79,18 65,100,79,18 65,100,79,18 65,100,79,16 65,100,79,16 65,100,79,16 65,100,79,19 65,100,79,19	Request not found     Request not found	4 688 4 836 1 982 4 749 5 682 2 672 5 152 4 139 5 015 1 529 2 189 2 466 4 267 3 388	1.435 0.337 0.677 1.498 0.504 1.097 1.151 1.012 0.999 0.850 1.841 2.125 1.566	3.263 4.499 1.305 3.251 3.703 2.168 4.055 2.988 4.003 0.530 1.339 0.625 2.142 1.822	0.000 0	0.5 0.4 1.2 0.4 1.1 1.5 0.9 1.6 1.2 1.3 1.3 1.3 1.3 1.5 1.2 1.5	
Malans Salahas Salahas Kalans Salahas	5002014 163004 17 AM 5002014 16317 18 AM 5002014 16347 18 AM 5002014 16347 18 AM 5002014 16405 18 AM 5002014 16425 18 AM 5002014 16425 18 AM 5002014 16425 18 AM 5002014 16425 18 AM 5002014 16455 18 AM 5002014 1655 18 AM 5002014 1655 18 AM	Prinance Center App Finance Center App	abversingprovider com abversingprovider com	advertisingprovider.com (ad- advertisingprovider.com (ad- advertisingprovi	65.100.79.17 65.107.918 65.100.79.18 65.100.79.17 65.100.79.17 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.16 65.100.79.19 65.100.79.19 65.100.79.15	Paquest not found     Paquest not found	4 688 4 836 1 982 4 749 5 692 2 672 5 152 5 152 5 152 2 189 2 189 2 189 2 189 2 189 2 189 3 388 4 518	1.435 0.337 0.677 1.498 1.989 0.504 1.097 1.151 1.012 0.999 0.850 1.841 2.125 1.566 1.012	3.263 4.499 1.305 3.251 3.703 2.168 4.055 2.988 4.003 0.530 0.530 1.339 0.625 2.142 1.822 3.506	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	0.5 0.4 1.2 0.4 1.1 1.5 0.9 1.6 1.2 1.3 1.3 1.3 1.3 1.5 1.2 1.5 1.2 1.5 1.6	
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Johans Johans Johans Likkens Likkens Johans Johans Johans Johans Johans Johans Johans Johans Johans Johans Johans	5002014 15:00017 AM 5002014 03:0115 AM 5002014 03:0115 AM 5002014 03:0115 AM 5002014 04:05:15 AM 5002014 04:25:15 AM 5002014 04:25:16 AM 5002014 04:25:16 AM 5002014 04:25:16 AM 5002014 04:25:16 AM 5002014 04:25:16 AM 5002014 05:51:15 AM 5002014 05:51:15 AM 5002014 05:51:16 AM 5002014 05:51:16 AM	Prinance Center App Prinance Center App	abversingprovider com abversingprovider com	aðvertisingprovider.com (að aðverstisingprovider.com (að aðverst	65.100.79.17 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.16 65.100.79.19 65.100.79.19 65.100.79.15 65.100.79.15 65.100.79.16	Paquet not found     Paqu	4 698 4 836 1 982 2 672 5 152 4 139 5 015 1 529 2 189 2 2466 4 267 3 388 4 518 3 331 6 366	1.435 0.337 0.677 1.498 0.504 1.989 0.504 1.989 0.504 1.012 0.999 0.850 1.841 2.125 1.566 1.012 0.910 1.918	3.263 4.499 1.305 3.251 3.703 2.168 4.003 0.530 1.339 0.625 2.142 1.622 3.506 2.421 4.448	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	0.5 0.4 1.2 0.4 1.1 1.5 0.9 1.6 1.2 1.3 1.3 1.3 1.5 1.2 1.5 1.2 1.5 1.6 0.7 7 1.2	
bikens bikens	5002014 15.00017 AM 5002014 03.011 AM 5002014 03.011 AM 5002014 03.011 AM 5002014 03.011 AM 5002014 04.051 BAM 5002014 04.251 BAM 5002014 04.551 BAM 5002014 04.551 BAM 5002014 04.51 BAM 5002014 04.51 BAM 5002014 04.51 BAM	Phanec Center App Phanec Center App	abvertränsparväder, com abvertränsparväder, com	advertisingsrevider.com (ad- advertisingsrevider.com) ad- advertisingsrevider.com (ad- advertisingsrevider.com) ad- advertisingsrevider.com) ad- advertisingsrevider.com (ad- advertisingsrevider.com) ad- advertisingsrevider.com) ad-	65.100.79.17 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.19 65.100.79.19 65.100.79.15 65.100.79.15 65.100.79.15 65.100.79.16 65.100.79.15 65.100.79.16 65.100.79.17 65.100.79.16 65	Paquet not found     Paqu	4 4688 4 4386 1 1982 2 4749 5 1692 4 139 5 015 1 1529 2 189 2 486 4 287 3 388 4 518 3 331 6 386 3 3950	1.435 0.337 0.677 1.498 1.989 0.504 1.997 1.151 1.012 0.999 0.850 1.841 2.125 1.566 1.012 0.910 1.918 2.381	3.263 4.499 1.305 3.251 3.703 2.168 4.055 2.988 4.003 0.530 1.339 0.625 2.142 1.822 3.506 2.421 4.448 1.569	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	0.5 0.4 1.2 0.4 1.1 1.5 0.9 1.6 1.2 1.3 1.3 1.3 1.5 1.2 1.5 1.5 1.6 0.7 1.2 1.2 1.5	
b blann	5002014 15:00017 AM 5002024 16:39-17 AM 5002024 16:39-17 AM 5002024 16:39-17 AM 5002024 16:29-15 AM 5002024 16:29-15 AM 5002024 16:29-16 AM 5002024 16:39-16 AM 5002024 16:39-16 AM 5002024 16:39-16 AM 5002024 16:39-16 AM	Hanke Center App Finance Center App	abversingprovider com abversingprovider com	advertisingprovider.com (ad- advertisingprovider.com (ad- advertisingprovi	65.100.79.17 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.19 65.100.79.19 65.100.79.15 65.100.79.15 65.100.79.15 65.100.79.17 65.100.79.17	Paquet not found     Paqu	4 688 4 488 1 982 4 749 5 692 5 152 1 1529 2 189 2 486 4 287 3 388 4 518 3 331 6 365 3 3950	1.435 0.337 0.677 1.498 0.504 1.989 0.504 1.097 1.151 1.012 0.999 0.850 1.841 2.125 1.566 1.012 0.910 1.918 2.381 2.381 2.345	3.263 4.499 1.305 3.251 3.703 2.168 4.055 2.988 4.003 0.530 0.635 2.142 1.822 3.506 2.421 4.448 1.569 3.242	0.000 0.000	0.5 0.4 1.2 0.4 1.1 1.5 0.9 1.6 1.2 1.3 1.3 1.3 1.5 1.2 1.5 1.6 0.7 1.2 1.2 1.2 1.2 1.2 0.9	
bloom	5002014 15.00017 AM 5002014 03.0117 AM 5002014 03.0117 AM 5002014 03.011 AM 5002014 03.011 AM 5002014 04.02115 AM 5002014 04.02116 AM 5002014 04.02116 AM 5002014 04.02116 AM 5002014 04.02116 AM 5002014 04.02116 AM 5002014 04.02116 AM	Handra Center App Finance Center App	abverträngsprunder com abverträngsprunder com	advertisingervöder.com (ad- advertisingervöder.com (ad- ad	65.100.79.17 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.18 65.100.79.16 65.100.79.16 65.100.79.19 65.100.79.19 65.100.79.15 65.100.79.15 65.100.79.15 65.100.79.16 65.100.79.16 65.100.79.17 65.100.79.19	Paquet not found     Paqu	4 688 4 438 1 982 4 749 5 692 2 672 5 152 1 529 2 189 2 466 4 267 3 388 4 518 3 331 6 366 3 950 5 707 5 038	1.435 0.337 0.677 1.4368 0.504 1.097 1.151 1.012 0.999 0.850 1.841 2.125 1.566 0.1012 0.910 1.918 2.381 2.465 1.386	3.263 4.499 1.305 3.251 3.703 2.168 4.055 2.988 4.003 0.530 0.530 0.530 0.625 2.142 1.822 3.506 2.421 4.448 1.569 3.242 3.242 3.242	0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	0.5 0.4 1.2 0.4 1.1 1.5 1.5 1.6 1.2 1.3 1.3 1.3 1.5 1.2 1.5 1.6 0.7 1.2 1.2 1.2 1.2 1.2 1.2 1.2 1.2	

The *Requests and Domains – Domains* table lists the domains used from a specific location. This list can reveal if a third- party component is impacting the overall availability.

The table also displays the total number of requests for this specific domain which can provide a hint about the magnitude of the effect of the overall availability from this location.

Requests and Domains I Mont										
HTTP Requests		Domains								
Domains	Pages with errors		Total							
■ 50% advertisingprovidor.com	218		436 hits							
♥ 99% www.financecenter.int 17										

The Sessions Breakdown graph shows only sessions with availability problems.

A tooltip reveals the number of sessions with errors compared to the overall number of sessions with a specific application version.



The *Session Analyzer* displays a list of sessions from a specific location and a specific carrier. This list reveals all sessions with an indication of the number of total actions and number of slow actions.

<b>T</b> 1												
The												
Her	End User Subgroup	Client	User Name	Location	Active	Duration (hh:mm:ss)	Latency (ms)	Error Events	Informational Events	Slow Actions	Actions	Has Data for VuGen Scripts
Mobile Application	Others [0.0.0.0-255.255	65.100.79.19	cassieh	Billings	No	00:00:03	0	2	0	0	17	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.18	dennisc	Billings	No	00:00:01	0	1	0	0	15	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.17	randym	Billings	No	00:00:02	0	2	0	0	17	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.17	dennisc	Billings	No	00:00:05	0	1	0	0	15	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.19	dennisc	Billings	No	00:00:03	0	1	0	0	14	No
Mobile Application	Others [0.0.0.0-255.255.	65.100.79.20	robina	Billings	No	00:00:05	0	2	0	0	16	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.15	cassieh	Billings	No	00:00:03	0	1	0	0	15	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.17	randym	Billings	No	00:00:04	0	1	0	0	15	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.17	cassieh	Billings	No	00:00:04	0	1	0	0	15	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.17	cassieh	Billings	No	00:00:04	0	2	0	0	15	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.18	cassieh	Billings	No	00:00:01	0	1	0	0	15	No
Mobile Application	Others [0 0 0 0.255 255	65 100 79 20	maryh	Billings	No	00:00:06	n	2	0	0	17	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.19	cassieh	Billings	No	00:00:03	0	1	0	0	14	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.15	cassieh	Billings	No	00:00:03	0	1	0	0	15	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.17	randym	Billings	No	00:00:05	0	1	0	0	14	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.17	dennisc	Billings	No	00:00:02	0	2	0	0	16	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.15	cassieh	Billings	No	00:00:02	0	2	0	0	15	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.15	maryh	Billings	No	00:00:02	0	1	0	0	15	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.16	dennisc	Billings	No	00:00:03	0	1	0	0	14	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.15	randym	Billings	No	00:00:02	0	1	0	0	15	No
Mobile Application	Others [0.0.0.0-255.255.	65.100.79.17	randym	Billings	No	00:00:04	0	1	0	0	15	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.20	randym	Billings	No	00:00:04	0	2	0	0	17	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.16	cassieh	Billings	No	00:00:05	0	2	0	0	17	No
Mobile Application	Others [0.0.0.0-255.255.	65.100.79.18	jojo	Billings	No	00:00:03	0	1	0	0	15	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.19	jojo	Billings	No	00:00:01	0	1	0	0	14	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.19	robina	Billings	No	00:00:03	0	1	0	0	15	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.15	randym	Billings	No	00:00:02	0	1	0	0	15	No
Mobile Application	Others [0.0.0.0-255.255	65.100.79.15	maryh	Billings	No	00:00:06	0	1	0	0	15	No
	Tier           Mobile Application           Mobile Application	Ter         End User Subgroup           Moble Application         Others (0, 0, 0, 0, 255, 255           Moble Application         Others (0, 0, 0, 0, 255, 255           Moble Application         Others (0, 0, 0, 0, 255, 255           Moble Application         Others (0, 0, 0, 0, 255, 255           Moble Application         Others (0, 0, 0, 0, 255, 255           Moble Application         Others (0, 0, 0, 0, 255, 255           Moble Application         Others (0, 0, 0, 0, 255, 255           Moble Application         Others (0, 0, 0, 0, 255, 255           Moble Application         Others (0, 0, 0, 0, 255, 255           Moble Application         Others (0, 0, 0, 0, 255, 255           Moble Application         Others (0, 0, 0, 0, 255, 255           Moble Application         Others (0, 0, 0, 255, 255 </td <td>Ter         End User Subgroup         Clent           Mobile Application         Others (0.0.0.2552.25)         65:00.79.10           Mobile Application         Others (0.0.0.2552.25)         65:10.07.910           Mobile Application         Others (0.0.0.2552.25)         65:10.07.911           Mobile Application         Others (0.0.0.2552</td> <td>Ter         End User Subgroup         Client         User Name           Mobile Application         Others (0.0.0.2552.25)         65:100.79.10         cassieh           Mobile Application         Others (0.0.0.2552.25)         65:100.79.10         dennisc           Mobile Application         Others (0.0.0.2552.25)         65:100.79.10         cassieh           Mobile Application         Others (0.0.0.2552.25)         65:100.79.10         cassieh           Mobile Application         Others (0.0.0.2552.25)         65:100.79.11         cassieh           Mobile Application         Others (0.0.0.2552.25)         65:100.79.11</td> <td>Ter         End User Subgroup         Cleant         User Name         Location           Mobile Application         Others 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0.0         0.0</td><td>Ter         End bark Subjective         Clearn Manuel         Ucation         Active         Duration (minimum)         Error Events         Information           Mobile Application         Others (0 0.0-2522 St 50 100.73 10         casain         Baings         No         0.00001         0         1         0         0           Mobile Application         Others (0 0.0-2522 St 50 100.73 10         enemics         Blings         No         0.00001         0         1         0         0           Mobile Application         Others (0 0.0-2522 St 50 100.73 10         enemics         Blings         No         0.00003         0         1         0         0           Mobile Application         Others (0 0.0-2522 St 50 100.73 10         enemics         Blings         No         0.00003         0         1         0         <td< td=""><td>Image: Brief User Subgroup         Cleant         User State         Duration (Internation)         Error Events         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Mobile Application         Others (0.0.0.25525)         55:007.917         casainh         Billings         No         0.000005</td></td<></td></td<></td>	Ter         End User Subgroup         Clent           Mobile Application         Others (0.0.0.2552.25)         65:00.79.10           Mobile Application         Others (0.0.0.2552.25)         65:10.07.910           Mobile Application         Others (0.0.0.2552.25)         65:10.07.911           Mobile Application         Others (0.0.0.2552	Ter         End User Subgroup         Client         User Name           Mobile Application         Others (0.0.0.2552.25)         65:100.79.10         cassieh           Mobile Application         Others (0.0.0.2552.25)         65:100.79.10         dennisc           Mobile Application         Others (0.0.0.2552.25)         65:100.79.10         cassieh           Mobile Application         Others (0.0.0.2552.25)         65:100.79.10         cassieh           Mobile Application         Others 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10.0.0.255255         65 100 7.17         casaleh         Blings         No         0.000.000           Mobile Application         Others 10.0.0.252525         65 100 7.17         casaleh         Blings         No         0.000.000           Mobile Application         Others 10.0.0.252525 <td< td=""><td>Ter         End User Subgroup         Client         User Name         Latency (ms)         Duration (Minimized)         Latency (ms)           Mobile Application         Others (0.0.0.25225)         55.100.79.10         casish         Bilings         No         0.000.01</td><td>Terd         End last's Sugroup         Clein         User Name         Location         Active         Duration (htmm)         Lastency (ms)         Enror Events           Mobile Application         Othens (0.0.0-2522.55)         65 100.79.11         cassieh         Bilings         No         000001         0         2           Mobile Application         Othens (0.0.0-252.25)         65 100.79.11         randym         Bilings         No         000001         0         2           Mobile Application         Othens (0.0.0-252.25)         65 100.79.17         randym         Bilings         No         0000005         0         1           Mobile Application         Othens (0.0.0-252.55)         65 100.79.17         dennice         Bilings         No         0000005         0         2           Mobile Application         Othens (0.0.0-252.55)         65 100.79.17         cassieh         Bilings         No         0000005         0         2         2           Mobile Application         Othens (0.0.0-252.55)         65 100.79.17         cassieh         Bilings         No         00000.01         0         0         1         1           Mobile Application         Othens (0.0.0-252.55)         65 100.79.17         cassieh         Bilings</td><td>Tref         End User Subjroup         Client         User Nume         Coattion         Active         Duration (Mamma, partial)         End rec Yeans         End rec Yeans           Mobile Application         Others (0.0.0.25525)         55:007.913         cassien         Billings         No         000001         0         1         0           Mobile Application         Others (0.0.0.25525)         55:007.917         randym         Billings         No         0.00002         0         2.2         0           Mobile Application         Others (0.0.0.25525)         55:007.917         randym         Billings         No         0.00005         0         0.2         2         0.0           Mobile Application         Others (0.0.0.25525)         55:007.917         cassien         Billings         No         0.00005         0         0.2         2         0.0           Mobile Application         Others (0.0.0.25525)         55:007.917         cassien         Billings         No         0.00004         0         1         0.0         0.0         0.0         1         0.0         0.0         1         0.0         0.0         0.0         1         0.0         0.0         1         0.0         0.0         0.0         0.0</td><td>Ter         End bark Subjective         Clearn Manuel         Ucation         Active         Duration (minimum)         Error Events         Information           Mobile Application         Others (0 0.0-2522 St 50 100.73 10         casain         Baings         No         0.00001         0         1         0         0           Mobile Application         Others (0 0.0-2522 St 50 100.73 10         enemics         Blings         No         0.00001         0         1         0         0           Mobile Application         Others (0 0.0-2522 St 50 100.73 10         enemics         Blings         No         0.00003         0         1         0         0           Mobile Application         Others (0 0.0-2522 St 50 100.73 10         enemics         Blings         No         0.00003         0         1         0         <td< td=""><td>Image: Brief User Subgroup         Cleant         User State         Duration (Internation)         Error Events         Information         Siow Actions         Actions           Mobile Application         Others (0.0.0.25525)         55:007.913         casain         Billings         No         000001         0         1         0         0         177           Mobile Application         Others (0.0.0.25525)         55:007.917         randym         Billings         No         0.00002         0         1         0         0         117           Mobile Application         Others (0.0.0.25525)         55:007.917         randym         Billings         No         0.00005         0         1         0         0         161           Mobile Application         Others (0.0.0.25525)         55:007.917         casainh         Billings         No         0.00005         0         1         0         0         151           Mobile Application         Others (0.0.0.25525)         55:007.917         casainh         Billings         No         0.00005         0         1         0         0         151           Mobile Application         Others (0.0.0.25525)         55:007.917         casainh         Billings         No         0.000005</td></td<></td></td<>	Ter         End User Subgroup         Client         User Name         Latency (ms)         Duration (Minimized)         Latency (ms)           Mobile Application         Others (0.0.0.25225)         55.100.79.10         casish         Bilings         No         0.000.01	Terd         End last's Sugroup         Clein         User Name         Location         Active         Duration (htmm)         Lastency (ms)         Enror Events           Mobile Application         Othens (0.0.0-2522.55)         65 100.79.11         cassieh         Bilings         No         000001         0         2           Mobile Application         Othens (0.0.0-252.25)         65 100.79.11         randym         Bilings         No         000001         0         2           Mobile Application         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cassien         Billings         No         000001         0         1         0           Mobile Application         Others (0.0.0.25525)         55:007.917         randym         Billings         No         0.00002         0         2.2         0           Mobile Application         Others (0.0.0.25525)         55:007.917         randym         Billings         No         0.00005         0         0.2         2         0.0           Mobile Application         Others (0.0.0.25525)         55:007.917         cassien         Billings         No         0.00005         0         0.2         2         0.0           Mobile Application         Others (0.0.0.25525)         55:007.917         cassien         Billings         No         0.00004         0         1         0.0         0.0         0.0         1         0.0         0.0         1         0.0         0.0         0.0         1         0.0         0.0         1         0.0         0.0         0.0         0.0	Ter         End bark 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55:007.917         casainh         Billings         No         0.000005</td></td<>	Image: Brief User Subgroup         Cleant         User State         Duration (Internation)         Error Events         Information         Siow Actions         Actions           Mobile Application         Others (0.0.0.25525)         55:007.913         casain         Billings         No         000001         0         1         0         0         177           Mobile Application         Others (0.0.0.25525)         55:007.917         randym         Billings         No         0.00002         0         1         0         0         117           Mobile Application         Others (0.0.0.25525)         55:007.917         randym         Billings         No         0.00005         0         1         0         0         161           Mobile Application         Others (0.0.0.25525)         55:007.917         casainh         Billings         No         0.00005         0         1         0         0         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The Session Details report displays the user name and all mobile attributes (App version, connection type, device, OS and carrier). The bottom pane displays a list of requests that the device sent to the backend server with an indication of the requests with *Request not found* availability problem.

Session Details 5/	31/2014 1:56 AM-1:58 AM (GMT-	07:00) Mountain Time (U	S & Canada)									
⊳ Refresh 🛅 🖲	· 🗛 🔹 🕼 🔣											
Properties												
Start time:	5/31/2014 1:57 AM											
Application:	Finance Center Ann	Client heat name:	NZA									
Enduser	Othere	chent nost name.	N/A									
subgroup:	[0.0.0.0-255.255.255.255]	User name:	cassien									
Location:	Billings	Server IP:	N/A									
Total Traffic	40.7	Total action hits:	17									
(KB):	10.7	Application Version:	2.0									
Duration	00:00:03	Connection Type:	Cellular									
(nn:mm:ss):		Device:	Samsung GT-I9152									
Operating system:	Android	Mobile Carrier:	Al Tel									
Latency (ms):	0.00	OS Version:	Android 2.2.3									
Client IP:	65.100.79.19											
Conoral Evonto												
Contrar Events												
No data	was found.											
Actions												
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Action				Start Time	Application	Events	Total Time (sec)	Server Time (sec)	Network Time (sec)	Client Time (sec)	Think Time (sec)	Total Traffic (KB)
Home Page				5/31/2014 01:57:17 AM	Finance Center App		4.005	0.82	3.178	0.000	0.000	0.7
getUsersBlogs				5/31/2014 01:57:16 AM	Finance Center App		3.994	1.03	2.957	0.000	0.000	1.0
getOptions				5/31/2014 01:57:16 AM	Finance Center App		4.527	1.28	3.234	0.000	0.000	0.9
getConments				5/51/2014 01:57.16 AM	Finance Center App		0.009	1.9%	3.000	0.000	0.000	1.4
getPostPormats				5/51/2014 01:57:17 AM	Finance Center App		3.390	0.31	3.004	0.000	0.000	1.0
getRecentPosts				5/31/2014 01:57:16 AM	Finance Center App		4.002	1.240	3.330	0.000	0.000	1.0
deleteRost				5/01/2014 01:57:17 AM	Finance Center App		3.040	0.53	2.5/1	0.000	0.000	0.7
deleterost delCommente				5/01/2014 01:57:16 AM	Finance Center App	-	4 754	0.55	2.724	0.000	0.000	0.7
getRecentPosts				5/31/2014 01:57:16 AM	Finance Center App		5310	0.913	4 398	0.000	0.000	0.9
getPostFormate				5/31/2014 01:57:16 AM	Finance Center Ann		4 417	1.049	3 368	0.000	0.000	14
getPages				5/31/2014 01:57:17 AM	Finance Center App		4.365	0.58	3 780	0.000	0.000	11
getComments				5/31/2014 01:57:17 AM	Einance Center App		4.317	0.718	3 599	0.000	0.000	0.5
ads.getads				5/31/2014 01:57:17 AM	Finance Center App		2 738	1.956	0.000	0.000	0.000	0.5
adstokens				5/31/2014 01:57:16 AM	Finance Center App	Request not found	3.321	2.426	0.895	0.000	0.000	0.8
ads.getads				5/31/2014 01:57:16 AM	Finance Center App		5.506	2.053	3.453	0.000	0.000	1.3
					Contract of the							

The *Session Summary* report gives you the ability to slice and dice your sessions according to different attributes (Carrier, connection type, Application version, device, operating system, and user name)

RUM Session Summary 06/08/2014	19 50 35 AM-06/09/201	4 09:50:35 AM (GMT-07:00) Mountain Tir	ne (US & Canada)								
Session Groups	and the second										
Usemame	1 cont on	1									
Group session by: Device	2= U	]									
Application	Version	Number of Sessions	Number of Subaroups *	Error Events	Info Events	Performance Eve	nts Total	Actions Unav	vailable Actions	Latency (ms)	Total Traffic (KB)
Mobile Carr	ier									contrast front	
Android 4.4.2	14	"	28	53	0		40	1,029	53	0.00	67,605.6
Android 4.3		14	8	1	0		18	171	1	0.00	18,337.7
Android 4.2.2		16	8	2	0		5	194	2	0.00	21,727.7
Android 4.1.2		7	4	8	0		21	494	0	0.00	15,162.3
Android 4.0.3		1	1	U	0		0	20	0	0.00	0.7
Android 4.4.3		3		1	0		0	60	1	0.00	0,022.4
Android 2.3.3		1	1	0	0		2		0	0.00	1.4
Android 4.1.1		4		0	0		1	12	0	0.00	30.1
Android 4.4		1	1	1	0		2	22	1	0.00	31.6
Android 4.3.1				0	0		0	3	0	0.00	1.5
Android 4.0.4		1	1	0	0		0	3	0	0.00	1.5
		129		58	0		89	2,012	58	0.00	129,730.4
Detailed Subgroups											
Group session by: Device	V 1 9= 170	1									
		3									^
Value		Number of Sessions	Error Events 🐨	Info Events	Performance	Events	Total Actions	Unavailable Act	tions	Latency (ms)	Total Traffic (KB)
HTC One		9		17	0	2		113	17	0.00	3,874
Samsung SCH-1545		7		9	0	2		90	9	0.00	6,951
Samsung SAMSUNG-SGH-I337		8		5	0	7		137	5	0.00	8,934
Samsung SGH-M919		1		4	0	0		19	4	0.00	106
LGE Nexus 5		6		3	0	3		55	3	0.00	3,192
Samsung GT-19500		5		3	0	0		54	3	0.00	4,175
Motorola XT1032		1		3	0	0		28	3	0.00	1,943
Samsung SM-N900W8		3		2	0	0		30	2	0.00	3,555
HTC6500LVW		1		1	0	0		5	1	0.00	1
Motorola XT1060		3		1	0	0		28	1	0.00	3,514
Samsung SM-G900W8		1		1	0	0		20	1	0.00	4,157
Samsung SM-P600		2		1	0	0		91	1	0.00	4,566
HTC One_M8		3		1	0	0		14	1	0.00	213
Asus Nexus 7		1		1	0	0		10	1	0.00	2,581
Samsung SM-T520		2		1	0	0		60	1	0.00	4,739
Motorola XT1055		2		0	0	2		23	0	0.00	489
HTCONE		1		0	0	3		27	0	0.00	832
Samsung SPH-L720		2		0	0	0		11	0	0.00	18
Motorola XT907		1		0	0	10		29	0	0.00	201
Motorola DROID RAZR HD		2		0	0	0		14	0	0.00	1,381
Samsung SAMSUNG-SM-N900A		1		0	0	0		3	0	0.00	1
Samsung SM-G900T		4		0	0	2		26	0	0.00	467
Samsung SGH-I337M		5		0	0	4		74	0	0.00	3,773
LGE Nexus 4		1		0	0	0		11	0	0.00	2,296
HTC6525LVW		2		0	0	2		30	0	0.00	1,665
Samsung GT-19505G		1		0	0	2		10	0	0.00	402
Samsung SM-G900V		1		0	0	0		9	0	0.00	1,412
Samsung GT-19505		1		0	0	1		8	0	0.00	2,154
		27		53	0	40	17	20	53	0.00	67 605

## Mobile Health Report – Application Crashes

Finance Center App | User Sessions: 5449 | Crashes: 104 Past day 5/30/14-5/31/14 Performance 99% Availability 98% Worst Locations Response Time (pages) Number of Sessions 82% Kansas, Wichita 5.45 sec 135 × 83% Morocco 5.26 sec 94 🔀 83% Tegucigalpa 5.54 sec 83 🔀 83% Mumbai 5.27 sec 98 3.80 sec 117 96% Galmaarden 🗹 100% Erding 3.26 sec 53 (i) The 10 worst locations are displayed Less than 1% of total sessions more than 5% of total sessions 1% to 5% of total sessions

In the Mobile Health report, you can see the number of crashes that occurred during a defined time frame.

In the *Event Log*, you can view a list of mobile crashes in a defined time frame. For each crash the exception name, message, and the beginning of the stack trace including the line number in the code is displayed. From each line you can drill to *Session Details* report

Time 🛋	Event Name	Tier	Server	End User Group	Event Details
5/30/2014 2:03 AM	Application Crash	Mobile Application	Finance Center App_Crashes	Others	jana lang NaliPanterException: "divide by zero" at onospps crashme si activities LoginActivity onCreate(LoginActivity jana 81) at android app Netwity performCareatin(Activity jana 814) at android app Netministion calActivity (procested) nature
5/30/2014 2:03 AM	Application Grash	Mobile Application	Finance Center App_Crashes	Others	jara Jang JuMPariter Erceptor: "Ario Nages crashme ui achilles LoginActivity onCreater[LoginActivity jara 81] at android app Achily performCreate(Achily jara 5104) at android app brentmilican adAchily for Centelinstrum
5/30/2014 2:33 AM	Application Crash	Mobile Application	Finance Center App_Crashes	Others	jara Jang JuliPrinterEcceptor: "Virke by zero" at orangene scrashme ui achiteles LoginActivity onCreate(LoginActivity java.81) at andreid app Activity performCreate(Activity java.5104) at andreid app historeation calActivity for CelesteInstrum
5/30/2014 2:33 AM	Application Grash	Mobile Application	Finance Center App_Crashes	Others	jara Jang JuliPrinterEcceptor: "virkive by zero" at oranges crashme ui activites LoginActivity onCreate(LoginActivity java 81) at android app Activity performCreate(Activity java 5104) at android app historeation: adActivity for activities LoginActivity onCreate(LoginActivity java 81)
5/30/2014 3:03 AM	Application Grash	Mobile Application	Finance Center App_Crashes	Others	jara Jang JuliPainterEuception: "Invince by zero" at at antionid graphics. NinePatch genWMMth/linePatch jara 130) at android graphics draw able NinePatch/Draw able computeBimapSice(NinePatchDraw able jara.196) at android graphics draw able NinePatchDraw able jara.1960
5/30/2014 3:03 AM	Application Crash	Mobile Application	Finance Center App_Crashes	Others	jara Jang Juli Parinet Exception: "Avine by zero" at orangene su activities LoginActivity onCreate(LoginActivity java 81) at android app Activity performCreate(Activity java 5104) at android app brentmition calActivity for Create(Instrum
5/30/2014 3:03 AM	Application Crash	Mobile Application	Finance Center App_Crashes	Others	jara Jang JuliPointerCooption: "Ordo by zero" at concepts crashme ui activites LoginActivity onCreate(LoginActivity java.81) at android ap Activity performCreate(Activity java.5104) at android ap britementation callet-(vity Create(Instrum
5/30/2014 3:33 AM	Application Grash	Mobile Application	Finance Center App_Crashes	Others	juro king Mulhreineficiospilon: "vicini by zero" at oxoappe ranshme ui activilies Login/solve) enCreate(Login/solve) juro 3(1) at android app Activity performCreate(Activity juro 314) at android app historeation calActivity for Celete(Instrum
5/30/2014 3:33 AM	Application Grash	Mobile Application	Finance Center App_Crashes	Others	jara lang JuliPainterEuception: "Work by zero" at orangene si activities LoginActivity onCreate(LoginActivity java 81) at android app Activity performCreate(Activity java 5104) at android app Istermation: adActivity for Contextingtion
5/30/2014 3:33 AM	Application Grash	Mobile Application	Finance Center App_Crashes	Others	jara Aang MuRPAnterEcceptorn: "diriche by zero" at nonapps crashme ui activities LoginActivity onCreate(LoginActivity java.81) at android ap breitwity performCreate(Activity java.5104) at android app intermation callActivity (Create(Instrum
5/30/2014 4:03 AM	Application Crash	Mobile Application	Finance Center App_Crashes	Others	jara Jang Juli Printer Ecceptora: "Avide by zero" at orangene sa cashine ui achites LoginActivity conCreater(LoginActivity java.81) at android app Activity performCreate(Activity java.5104) at android app brenetistica adActivity for Seteletistrum
5/30/2014 4:33 AM	Application Crash	Mobile Application	Finance Center App_Crashes	Others	jara lang "Anfinnek Ecception" tivide by zero" at come sample crashme MahAchthy crasteArthmateEcception(MahAchthy java 100) at come sample crashme MahAchthy onArthmateCrash(MahAchthy java 55) 
5/30/2014 5:03 AM	Application Grash	Mobile Application	Finance Center App_Crashes	Others	jara Jang JuliPointerSception: "divide by zoro" at la tandroid graphics. NinePatch.getVidMp(NenPatch java: 138) at android graphics draw able NinePatchDraw able computeBitmapSce(NinePatchDraw able java: 196) at android graphics draw able NinePatchDraw
5/30/2014 5:33 AM	Application Crash	Mobile Application	Finance Center App_Crashes	Others	jara kang MuRhamberGoogdona: "Worke by zero" at la android graphica. NewPatch gerWMMth(BinePatch jara 133) at android graphics.draw able NewPatchToraw able goroupdeBimapSice(NinePatchToraw able jara 196) at android graphics.draw able NewPatchToraw able jara 1960
5/30/2014 5:33 AM	Application Crash	Mobile Application	Finance Center Ann. Crashes	Others	java Jang NalPahrierEiception: "divide by zero" at at android graphics NanePatch getVidM(NanePatch java V35) In director another Kinewa bie NanePatch Tanza Wate consultation Nane Nane Nane Nane Nane Nane Nane Nan

In the *Session Details* report, you can view a user session that experienced a crash. This report includes the user name and all mobile attributes (application version, connection type, device, operating system, and carrier).

Below this information, you can see the crash details including the exception name, message, and the beginning of the stack trace including the line of the code where the exception was thrown.

This information is followed by a list of requests that the device sent to the backend server before the crash occurred.

Properties												
Start time:	time: 5/0/2014-4.33 AM											
Application:	on: Finance Center App Client host nam		NA									
End user	Others [0.0.0.0-	User name:	dennisc									
subgroup:	255.255.255.255]	Server IP:	N/A									
Location:	UNKNOWN	Total action hits:	13									
Total Traffic (KB):	Total Traffic (KB): 12.6		2.5.1									
Duration	Duration 00:00:05		Cellular									
(001000088):		Device:	100000-0000									
system:	Android	Mobile Carrier:										
Latency (ms):	0.00	OS Version:	Android 3.2									
Client IP:	1.9.255.11											
Our set E set to												
General Events												
8= 🗰												
						Description						
Event Nan	ne 🛎					Description						
Event Nan	ne	ang ArithmeticException: "divide n.example.crashme.MainActivity more ang ArithmeticExcepti	by zero" at contexample .onArithmaticCrash(Main	e.crashme.MainActivity.createArit 1Activity.java:55)	hmaticException(MainActivity.java:10	)						
Event Nan	ne ▲ java.lar at com 14 n java.lar	ing ArithmeticException: "divide in example.crashme.MainActivity more ang ArithmeticExcepti	by zero" at com.example .onArithmaticCrash(Main	e.crashme.MainActivity.createArit iActivity.java:55)	hmaticException(MainActivity java:10	)						
Event Nan Application Crash Actions × × Ø [1]	ne ▲ java.lar at.com 14 n java.lar	ung ArithmeticException: "divide n.example.crashme.MainActivity mgravithmeticExcepti	by zero" at com.example .onArithmaticCrash(Main	e.crashme.MainActivity.createArit Activity.java:55)	hmaticException(MainActivity java:10)	i)						
Event Nan Application Crash Actions × × ØI III	ne ▲ java.la at.com …14 n java.la	ang ArithmeticException: "divide n example crashme. MainActivity more ang ArithmeticExcepti	by zero" at com.example .onArithmaticCrash(Main	e.crashme.MainActivity.createArit Activity.java:55) Start Time	hmaticException(MainActivity java:10)	) Events	Total Time (sec)	Server Time (sec)	Network Time (sec)	Client Time (sec)	Think Time (sec)	Total Traffic (KB)
Event Nan Application Crash Actions Cation Bone Page	ne 🔺 java.lar at com 14 n java.lar	ang ArithmeticException: "divide n example.crashme.MainActivity more ang ArithmeticExcepti	by zero" at com.example .onArithmaticCrash(Main	e crashme MainActivity createArit Activity java.55) Start Time 500/2014 04:33:24 AM	hmaticException(MainActivity java:10) Application Finance Center App	) Events	Total Time (sec) 4.092	Server Time (sec) 1.450	Network Time (sec) 2.542	Client Time (sec)	Think Time (sec)	Total Traffic (KB)
Event Nam Application Crash Actions × * ©1 [[1] Home Page getUsersBlogs articleting	ne ▲ javalar n … 14 n javalar	ng ArithmeticException. "divide a example, crashme MainActivity nore ng ArithmeticExcepti	by zero" at com example on Anthmatic Crash (Main	e crashme MainActivity.createArit Activity java:55) Start Time 5/30/2014 04:33:24 AM 5/30/2014 04:33:25 AM	hmaticException(MainActivity java 10) Application Finance Center App Finance Center App	) Events	Total Time (sec) 4.092 3.593	Server Time (sec) 1.450 0.978	Network Time (sec) 2.642 2.615	Client Time (sec) 0.000 0.000	Think Time (sec) 0.000 0.000	Total Traffic (KB) 0.9 0.4
Event Nan Application Crash Actions × * ØT III Home Page getUsersBlogs getUsersBlogs getUsersete	ne ▲ java.la aicon 14 n java.la ĵava.la	ang ArithmeticException: "divide n example.crashme.MainAclivity nore ng ArithmeticExcepti	by zero" at com example on Anthmatic Crash (Main	e crashme. MainActivity, createAnt Activity java:55) Start Time 5/30/2014 04:33:24 AM 5/30/2014 04:33:25 AM 5/30/2014 04:33:25 AM	Amatic Exception (MainActivity Java 10) Application Finance Center App Finance Center App Finance Center App Finance Center App	Events - -	Total Time (sec)           4.092           3.593           4.654           6.64	Server Time (sec) 1.450 0.976 1.025	Network Time (sec) 2.642 2.615 3.639 3.423	Client Time (sec) 0.000 0.000 0.000	Think Time (sec) 0.000 0.000 0.000	Total Traffic (KB) 0.9 0.4 1.2 1.9
Event Nan Actions × A @ Impleation Crash Actions × A @ Impleation Home Page getUsersBlogs getOptions getOptions getOptions	ne ▲ jovala at com …14 n javala	ng ArthmeticException: "divide ne cample, crashme MainActivity more Ing ArthmeticExcepti	by zero" at com sxample on Arithmatic Crash (Main	e crashme MainActivity createAnt Activity java:55) Start Time 5/30/2014 04:33:24 AM 5/30/2014 04:33:25 AM 5/30/2014 04:33:24 AM 5/30/2014 04:33:25 AM	Application Application Finance Center App Finance Center App Finance Center App Finance Center App Finance Center App	) Events	Total Time (sec) 4.032 3.533 4.664 4.565 4.564 4.564	Server Time (sec) 1.450 0.978 1.025 1.103 1.333	Network Time (sec) 2.642 2.615 3.639 3.442 3.118	Client Time (sec) 0.000 0.000 0.000 0.000 0.000	Think Time (sec) 0.000 0.000 0.000 0.000	Total Traffic (KB) 0.9 0.4 1.2 1.3 1.2 1.3
Event Nam	ne ▲ java la java la 	ing Arithmetic Exception "divide ne caraptic crashme ManActivity more ing Arithmetic Excepti	by zero" at com example onArithmaticCrash(Main	e crashme ManActivity createAnt Activity java.35) Start Time 55002014 04:33.24 AM 55002014 04:33.24 AM 55002014 04:33.25 AM 55002014 04:33.25 AM 55002014 04:33.25 AM	InnaticException(MainActivity Java: 10 Application Enance Center App Finance Center App Finance Center App Finance Center App Finance Center App Finance Center App	) Cents	Total Time (sec) 4.092 3.593 4.564 4.565 4.565 4.565 4.565 4.515 4.565	Server Time (sec) 1.450 0.976 1.025 1.103 1.303 1.301	Network Time (sec) 2.642 2.615 3.639 3.442 3.118 2.257	Client Time (sec) 0.000 0.000 0.000 0.000 0.000 0.000	Think Time (sec) 0.000 0.000 0.000 0.000 0.000 0.000	Total Traffic (KB) 0.9 0.4 1.2 1.3 1.2 0.7
Event Nam	ne 🔺 java laa nijva laa in	ng Anthreet: Exception "devide ne campic crashme ManActivity mroe ang Anthreet: Excepti	by zero" al com example onAnthmaticCrash(Main	e crashme Mank-Citvity createArt Acchirty java 35) Start Time 5502014 04 33 24 AM 5502014 04 33 24 AM	Institution (Main-Activity java 10 Application Pronoce Certer App Pronoce Certer App Pronoce Certer App Pronoce Certer App Pronoce Certer App Pronoce Certer App Pronoce Certer App	) Cescription	Total Time (sec)           4.092           3.893           4.684           4.545           4.511           3.811	Server Time (sec) 1.450 0.976 1.025 1.100 1.383 1.081 0.406	Hetwork Time (sec) 2.642 2.615 3.539 3.442 3.118 3.257 3.205	Client Time (sec) 0.000 0.000 0.000 0.000 0.000 0.000	Think Time (sec) 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Total Traffic (KB) 0.9 0.4 1.2 1.3 1.2 0.7 1.0
Event Nam Application Crash Actions x x (3) [1] Action Home Page getUsersBlogs getOptionsts getPostFormts getPostFormts getPostFormts	ne 🔺 iyra lai n di acono 147 jiyra lai P (k) Al	ing ArithmeticException "divide nexample crashme ManActivity more ng ArithmeticExcepti	by Zero <sup>m</sup> al com example .onArthmatic Crash (Main	e crashme ManActivity createAnt Activity java 35) Start Time 500/2014 04 33 24 AM 500/2014 04 33 25 AM 500/2014 04 33 25 AM 500/2014 04 33 24 AM 500/2014 04 33 24 AM 500/2014 04 33 24 AM	Application Prance Creter App Finance Creter App	)  Frents  Frents	Total Time (sec) 4 002 3 593 4 654 4 551 4 511 4 338 3 611 4 328 4 575	Server Time (sec) 1450 0978 1.025 1.103 1.383 1.081 0.465 1.450	Network Time (sec) 2.642 2.615 3.639 3.442 3.118 3.257 3.205 3.205	Client Time (sec) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Think Time (sec) 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Total Traffic (KB) 04 12 13 12 07 10 13
Event Nam	ne ▲ yra is a a tom i ara i ara	ng Anthreetic Exception. "divide ne cample crashine MeinActivity nore ng Anthreetic Excepti	by zero" al com example on Arithmatic Crash (Main	Crashme ManActivity createArt Activity java S5) Start Time 5502014 04 33 24 AM 5502014 04 33 25 AM	Application Encoded and a second	) Feents  Feents Feent	Total Time (sec)           4.092         2.693           4.694         4.694           4.694         4.545           4.513         3.611           4.625         4.338	Server Time (sec) 1.450 0.976 1.033 1.033 1.033 1.0465 1.463 0.665 0.886	Network Time (sec) 2.842 2.845 3.853 3.442 3.118 3.205 3.205 3.225 3.840	Client Time (sec) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Think Time (sec) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Total Traffic (KB) 08 04 12 13 12 12 10 10 13 12 12
Event Nam Application Crash Actions x = 0 Control Action Home Page getUsersBigs getOptions getCommerts getPogts deltePost getPogts getPogt getPo	ne ▲ yva la ai vya la i 4a i 4a i yva la i 4a	nng Anthrente Discoption "divide ne sample cashma Naka-Chrifty nng Anthrende Discopti	by zero <sup>®</sup> al com example onArithmaticCrash(Main	сизание МалАсониј сизака/ Исониј јича 55) Start Time 550/2014 (44 33 24 АМ 550/2014 (44 33 24 АМ	Application Application Application Finance Cetter App Finance Cetter	) Foents Foents 	Total Time (sec) 4 402 3 4584 4 4584 4 4581 4 4581 4 4575 4 4575 4 4575 4 4575 5 200	Server Time (sec) 1 450 0 97 1 025 1 103 1 383 1 081 0 466 1 420 0 888 1 1055	Network Time (sec) 2.842 2.845 3.839 3.442 3.118 3.267 3.275 3.265 3.225 3.840 4.153	Client Time (sec) 0 000 0 000 0 000 0 000 0 000 0 000 0 000 0 000 0 000	Think: Time (sec) 0 000 0 000 0 000 0 000 0 000 0 000 0 000 0 000 0 000 0 000	Total Traffic (KB) 09 04 12 13 12 07 12 07 12 12 07 13 13 13 12 11
Event Nam Application Creative Actions (a) (1) (1) Action Action Action Action Actions (1) (1) Actions (2) (2) (1) Actions (2) (2) (1) (2)	ne ▲ yralsa a atom 14n jyralsa C <sup>2</sup> @ Aa	mg Anthrenic Deoption "divide coampe cashimo Main-Chify ng Anthrenic Coast	by zero" al com example on Arithmatic Crash (Main	Crashme ManActivity createArt Activity java 35) Start Time 5002014 04 33 24 AM 5002014 04 33 24 AM	Application Pronoc Cetter App Pronoc Cetter App	)	Total Time (sec) 4 002 3 059 4 056 4 056 4 056 4 057 4 057 5 04 05 4 057 5 04 05 8 05 0 05 0 05 0 05 0 05 0 05 0 05 0	Server Time (sec) 1 450 0 575 1 105 1 383 1 085 1 450 0 685 1 055 1 057	Network Time (sec) 2 642 2 645 3 643 3 442 3 118 3 442 3 316 3 442 3 345 3 442 3 345 3 442 3 355 3 225 3 640 4 415 3 640 2 833 2 833	Client Time (sec) 0 000 0 000	Think Time (sec)           0.000         0.000         0.000           0.000	Total Traffic (H0) 09 04 12 13 12 12 12 12 10 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 12 13 13 12 13 13 13 13 13 13 13 13 13 13 13 13 13
Event Nam Application Crash Actions V a (3) [1] Action Hone Page getOgenes getOgenes getOgenes getOgenes getOgenes getPage getPage getPage getPage getPage getPage getPage getPage	ne ▲ yora la a dom 14 yora la graduat	ng Anthenet Despition "divide in same in same ing Anthenet Despition Ing Anthenet Despit	by zero" al com example on Arthnutic Crash (Man	Crashme ManActivity createArt Activity jure 35) Stert Time 5002014 04 33 24 AM 5002014 04 33 24 AM	Application Application Protoco Cetter App Protoco Cetter App	) Events 	Total Time (sec)           3.999           4.664           4.654           4.633           3.811           4.675           3.393           3.393           3.393           3.393           3.393           4.707	Server Time (sec) 1,450 0,070 1,050 1,383 1,085 1,450 0,055 1,655 1,055 1,055 1,15	Hetwork Time (sec) 2.642 2.645 5.659 3.444 3.454 3.275 3.225 3.255 3.5555 3.555 3.555 3.555 3.555 3.5555 3.5555 3.5555 3.5555 3.5555 3.5555 3.55555 3.55555 3.55555 3.555555 3.55555 3.55555555	Client Time (sec) 0 000 0 000	Think Time (sec) 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000 0.000	Total Traffic (Hil) 03 04 13 13 13 14 13 13 12 12 12 12 12 12 12 12 12 12 12 12 12
Event Kan Application Crash Actions S & (2) [1]; Action Home Page getCornerts getPostFormats getPostFormats getPostFormats getPostFormats getPostFormats	ne 쇼 / yva la al com / 11 - 11 jva la 다 / 12 · 14 jva la · 14 jva la · 14 jva la · · · · · · · · · · · · · · · · · ·	mg Anthenic Deception: "divide costing is cashine MainAchiny ng Anthenik Costing ng Anthenik Costing	by zero" al com example on Arithmatic Crash (Main	силание МалАсонту сизавани (Acohing Java 35) Start Time 5/00/2014 04:33 24 АМ 5/00/2014 04:33 24 АМ 5/00/2014 04:33 25 АМ	Application Prince Screen App Prince Center App	)  Frents  Frents Frents  Frents  Frents  Frents  Frents  Frents  Frents  Frents  Frents  Frents  Frents  Frents  Frents  Frents  Frents  Frents  Frents  Frents  Fren	Total Time (sec) 4 992 3 693 4 695 4 695 6	Server Time (sec) 1 450 0.978 1.025 1.103 1.037 1.0466 1.656 1.057 1.165 1.175	Network Time (sec) 2 442 2 615 3 639 3 442 3 161 3 265 3 442 3 164 4 153 2 653 3 640 4 153 3 642 3 1642 3 643 3 642 3 642 3 642 3 642 3 644 3 645 3 645 645 645 645 645 645 645 645 645 645	Ctient Time (sec) 0 000 0 000 000000	Think Time (sec)           0.000         0.000         0.000           0.000         0.000         0.000         0.000           0.000         0.000         0.000         0.000           0.000         0.000         0.000         0.000           0.000         0.000         0.000         0.000           0.000         0.000         0.000         0.000         0.000	Total Traffic (HD) 09 04 12 13 13 12 13 13 12 13 13 12 13 13 12 13 14 10 4 10 04 10 05

# How to Configure RUM Monitoring for Your Mobile App

## Install

Install BSM, RUM Engine, or RUM Client Monitor Probe. We recommend you allocate different hardware for each probe and a separate hardware for the RUM Engine. Refer to the *Deployment* paragraph above when choosing the location for the Client Monitor Probe. Consider both "In house" and "Cloud" options.

**Note:** Do not install both the Client Monitor Probe and the Sniffer Probe on the same server. You can install one of the probe types on the same server as the RUM Engine if limited capacity is required (for POC purposes, for example). However, you should expect lower capacity on all modules that are installed on the same server. If you do encounter capacity issues, do not install the probes on the same server as the RUM Engine.

## **Create Applications in BSM**

Create a new RUM application in BSM End User Management (EUM) Administration, using the new "Mobile Application" template. As part of an application creation, a unique *Application Key* is generated, which is used when instrumenting the mobile applications. Do not forget to assign a RUM Engine and RUM Client Monitor Probe for the new application in the BSM EUM Administration.

## **Instrument Mobile Applications - Android**

In order to instrument Android applications, open the *Mobile Application Instrumentation* tool, from the *Tools* menu in the RUM Engine web console. Provide the APK (compiled Android application) you want to instrument.

Mobile Application Instrumentation for Android											
Use	this tool to instrument Android app	lications.									
For IOS instrumentation instructions refer to the Real User Monitor Installation and Upgrade Guide.											
* AP	* APK file: Browse										
	Instrument for Droduction /use this ontion to enable you to unload the instrumented application to the Diay Store)										
	* Application:										
	RUM Client Monitor Probe										
	URL.	(Example: https://Host:8080/hpmobilemon/data)									
	Application Signing (leave blank if you want to sign the application later)										
	Keystore file:			Browse							
	Keystore password:										
	Key alias:										
	Key password:										
				are stated							
	Add "Access Network State"	permission to the application (required for ROM to determine the	e user connection type: v	VIFI OF MODILE)							
	Enable content extraction from mobile application (configured in BSM Admin as extracted parameters, username detection or allowed POST parameters)										
0	Instrument for Testing (use this option to test monitoring functionality without uploading the application to the Play Store)										
	* Application:		$\checkmark$								
	RUM Client Monitor Probe URL:										
		(Example: https://Host:8080/hpmobilemon/data)									
0	Instrument for Offline Testing	and Data Collection (In this mode the instrumented application w	will not report data to the	RUM Client Monitor probe)							
	Store monitored data locally	Monitored data will be saved to a local file in the application fol includes POST content of requests, which can assist you in de	older on the mobile device efining Extracted Paramet	. This data ters in BSM.							

The URL you specify in the "RUM Client Monitor Probe URL" field is the URL that will be accessed by the users' mobile devices. It may be different from the internal host name/URL that is used for communication with the RUM Engine. It is recommended to use the "https://" connection scheme.

Select the application that you previously defined in BSM. The *Application Key* is fetched automatically and embedded in the instrumented application.

If you select *Instrument for Testing*, the instrumented application is signed with a temporary certificate that can be used for testing purposes.

Note: RUM Mobile uses a third-party tool called ACRA for Crash Reports for Android. This third-party tool is embedded as part of the

instrumentation process. However, if the application already uses a crash reporting module that uses ACRA, a warning message will appear during instrumentation and crash reporting for android will be disabled.

## Instrument Mobile Applications – iOS

For iOS application instrumentation, you need to add the RUM Monitoring library to your project, along with couple of dependency frameworks. You also need to add a PLIST file to your project, which will configure the URL of the Probe, Application Key, and other optional parameters. Refer to the *RUM Installation and Upgrade* guide for complete information.

## Test

As with any change to your application, it is recommended that you verify the user experience of the application after the instrumentation process. You can see how the data is reflected in BSM reports and enhance the configuration if needed.

## **Extract Additional Content**

By default, RUM will only report the URLs of HTTP requests made by the application. In some cases you may want to extract additional information from the HTTP headers or POST content in order to identify the requests and understand the user flow in the application. You can define content extraction in the *Extracted Parameters* section, and add rules to extract the *Username*.

The configuration is dynamically pushed to all monitored devices, so you can continue making changes to the configuration of the extracted parameters after shipping the application to the Play/App Store. For security and privacy considerations, while instrumenting the app, you can instruct the application to ignore such dynamic configuration.

In order to define the Extracted Parameters, you should be familiar with the internal format of the POST content that your application sends to the server, as well as with special HTTP headers. In order to get this information, you can use the special instrumentation mode, which stores content of all requests in a local file instead of sending data to the Client Monitor Probe. For Android, you select "Instrument for Offline Testing" mode and check "Store monitored data locally". For iOS you add a special flag to the PLIST file in your project. You install the instrumented application on a testing device, perform the usual business process within the application, and collect the resulting textual file (Android\data\<app package name>\files\hp-app-network-data.txt) for content analysis. Note that in this mode whole content is saved, including sensitive data if such was sent by the application to the server. Do not distribute the application instrumented in this mode to your users.

## Distribute

The last step is uploading the instrumented version of the application to the Store. For Android, you use the "Instrument for Production" mode, providing the certificate to sign the APK file (alternatively, you can sign it later). With iOS applications, you need to build the project in production configuration.

# **Mobile Resources Utilization**

As mentioned above, RUM monitored data is collected and reported by a background process, without affecting the user experience. There are a number of types of mobile device resources used by the RUM data collection of which you should be aware.

**Network bandwidth**. The volume of the network used by RUM to transfer the collected data to the Client Monitor Probe depends on the type of monitored application. For a typical mobile application, RUM monitoring adds up to 7% overhead to the total network usage. For applications that make a relatively low number of network requests, the overhead is up to 15KB for a 10-minute session. You can configure the maximal network bandwidth that RUM is allowed to consume during the instrumentation process.

**Battery**. The main parameter that affects battery usage by RUM monitoring is the frequency of HTTP communication to the RUM Client Monitor Probe. When the application is not generating any network activity, RUM has no data to report to the Client Monitor Probe. In order to reduce the number of HTTP requests made by RUM monitoring, we delay the information on the device, and send it to the Client Monitor Probe in larger chunks. By default, the maximal delay is 2 minutes. In case a large amount of data is accumulated, it is delivered earlier, but the minimal interval between two subsequent reports is 30 seconds. Both minimal and maximal time intervals can be changed during the instrumentation.

**Performance.** There is no visible performance degradation in an instrumented application (or in an application with RUM embedded) relative to the original application.

Memory. Memory usage is less than 100k.

# **End-to-End Monitoring**

Monitoring the application on device is important for validating end user experience and isolation problems. In order to gain visibility to the health of the backend of the application, we recommend combining mobile client monitoring with monitoring application backend components.

## **Application Tiers**

Combined with the RUM Network/Sniffer functionality, you can define Web and Backend tiers for your mobile application, as you do for any application monitored by RUM. Additional application tiers can be configured in the *Application Tiers* tab of the application in End User Management Administration.

With Web Tiers, you can follow the same HTTP request through multiple components:

Action	Tier 🛋	Total Action Hits	Availability (%)	Total Time (sec)	Server Time (sec)	Requests per Action Hit
Confirm Payment	1-RUM Browser	3,166	100.00	4.62	0.09	22.00
Confirm Payment	2-Reverse Proxy	3,154	100.00	4.83	3.66	34.99
Confirm Payment	3-Load Balancer	3,520	100.00	4.69	4.59	1.00
Confirm Payment	4-Ajax Application Servers	1,740	100.00	8.56	8.15	1.00
		11,580	100.00	5.29	3.64	16.00

Backend Tiers can provide visibility to additional application components:

Running Softwares									
🗧 🛪 👸 📭 🖻 🖓 🖓 🛔 💇 Group by: Running Software   🗸									
Name	Host	IP Address	Availability (%)	Response Time	Total Actions Hits				
				(sec)					
Ajax Application Server (mydvm0639)	mydvm0639	16.59.56.85	100.00	0.09	7,668				
Ajax Application Server (vmamrnd35)	vmamrnd35	16.55.244.192	99.83	0.32	77,093				
mysql_database (vmamrnd38.devlab.ad)	vmamrnd38.devlab.ad	16.59.63.17	100.00	0.03	2,810,671				
Web Server (labm3rum05.devlab.ad)	labm3rum05.devlab.ad	16.59.57.43	99.93	0.23	153,892				
B Web Server (LABM3RUM06.devlab.ad)	LABM3RUM06.devlab.ad	16.59.56.209	99.92	0.42	153,783				

## **Integration with HP Diagnostics**

To enable quick isolation and pinpointing of the cause of a performance problem, you can drill down from a request monitored by RUM into Diagnostics to understand the application server behavior at the time, or view a full call profile to identify a problematic method.

# **Privacy and Security**

The information collected on the mobile device is transferred to the RUM Client Monitor Probe over a secure HTTPS channel.

By default, RUM only collects URLs of HTTP requests and general device information, such as the OS version, device model, and mobile carrier.

The *Extracted Parameters* that are manually configured for the application may potentially include a user's sensitive information, so be extra careful when defining these parameters. In BSM, only a Secure User has permissions to modify sensitive configurations including

Extracted Parameters and Username extraction. In addition, as part of the instrumentation process, you can instruct the application to ignore any extracted parameters that are defined in BSM, and not to do any POST content extraction.

The location of the users is determined by the Client Monitor Probe based on the visible IP address of the reporting device. GPS or other location services available on a device are not used by RUM.