

# Diagnostic Tools

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Dynatrace Training Module



## Agenda

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- CPU Profiler & Code Level Analysis
- Memory Dumps
- Process Crash Analysis
- Exception Analysis
- Top Database Statements
- Top Web Requests

# Diagnostic Tools

CPU Profiler & Code Level Analysis

Memory Dumps

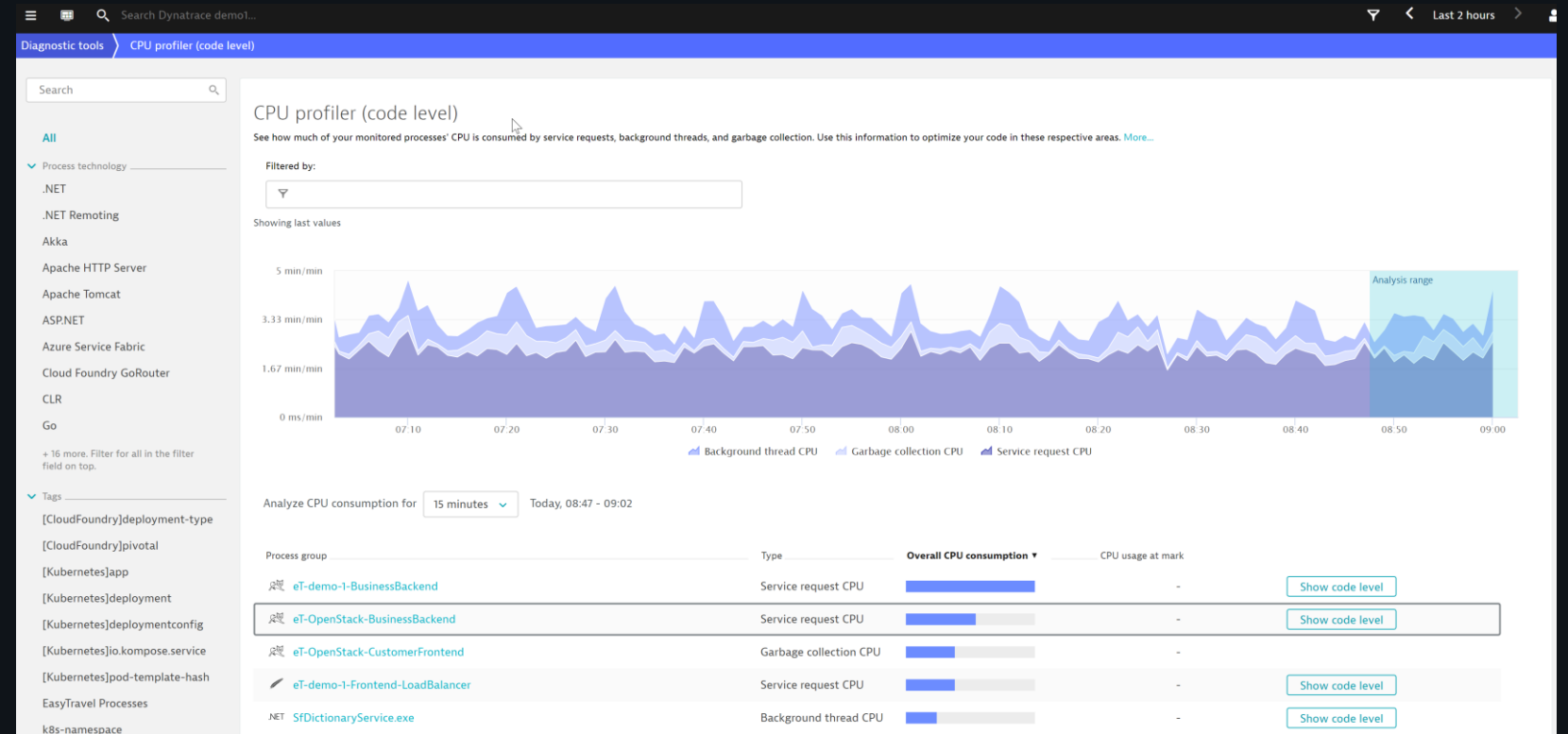
Process Crash Analysis

Exception Analysis

Top Database Statements


Top Web Requests

## CPU Profiler & Code Level Analysis

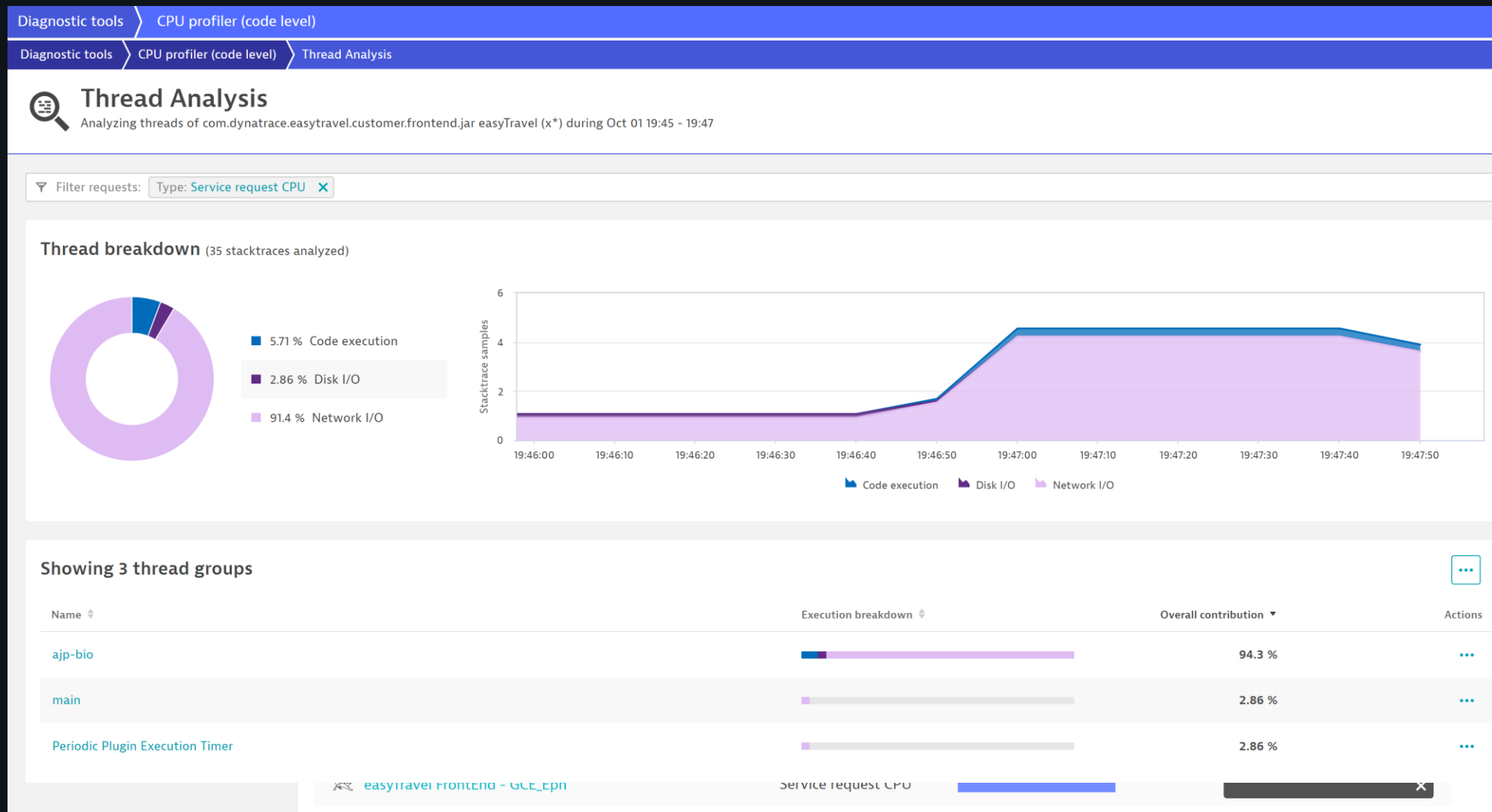


# Continuous Thread Analysis

- Continuous Thread Analysis for Java is now available in Early Adopter mode.
- Enable under the Settings -> Server-side service monitoring -> Deep monitoring -> New OneAgent features

Continuous thread analysis	Early adopter	Java	1.175	yes	<input checked="" type="checkbox"/>	⤴
<p>Description: This feature enables the continuous thread analysis on java processes. You can find this feature in the CPU profiler in the diagnostic tools.</p> <p>Release notes: <a href="http://www.dynatrace.com/news/blog/oneagent-activegate-release-notes-version-1-175">http://www.dynatrace.com/news/blog/oneagent-activegate-release-notes-version-1-175</a> </p>						

# Continuous Thread Analysis



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## Memory Dumps

1 memory dump

today, 12:20 - 14:20


Process	Technology	Time ▼
<div><div>dynatrace-dev-CF</div><div>on </div></div>	Apache Tomcat	2017-08-23 14:17


Dump Path

/opt/dynatrace/oneagent/log/memorydump/20170823141735\_26764/dump.hprof

Manually Triggered

true

Download link 1 ( [Download link 1](#))

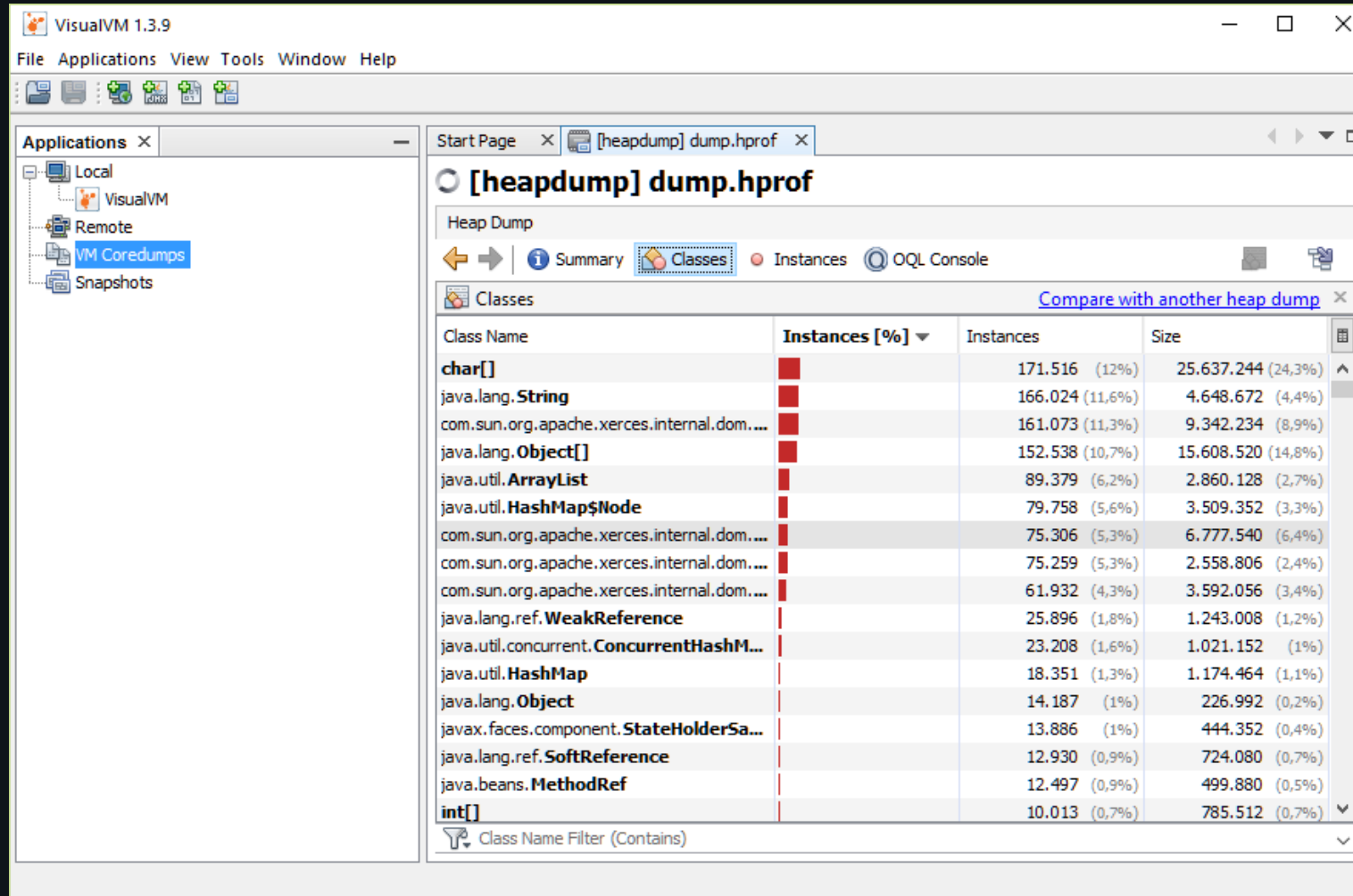
Download link 2 ( [Download link 2](#))

## Memory Analysis

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- Memory dumps are first stored locally on the disk of the monitored application-server machine
- The dump can then be uploaded to a specially configured ActiveGate for storage
  - The provided download links direct you to the Environment ActiveGate that received that memory dump
  - This approach ensures that dumps are only available to users who have access to the network location of your Environment ActiveGate
- This precaution provides an additional security layer that ensures that no sensitive data leaves your data center without you explicitly configuring it that way
- Dump downloaded in hprof format for Java apps (with exception of IBM JVM which is in IBM Portable Heap Dump (PHD) Format)
  - Analyze dump using your preferred tool such as Eclipse Memory analyzer or VisualVM

# Analyzing dump in VisualVM



VisualVM 1.3.9

File Applications View Tools Window Help

Applications ×

- Local
  - VisualVM
- Remote
- VM Coredumps
- Snapshots

Start Page × [heapdump] dump.hprof ×

## [heapdump] dump.hprof

Heap Dump

← → | Summary **Classes** Instances OQL Console

Classes [Compare with another heap dump](#)

Class Name	Instances [%]	Instances	Size
<b>char[]</b>	171.516 (12%)	25.637.244 (24,3%)	
java.lang.String	166.024 (11,6%)	4.648.672 (4,4%)	
com.sun.org.apache.xerces.internal.dom. ...	161.073 (11,3%)	9.342.234 (8,9%)	
java.lang.Object[]	152.538 (10,7%)	15.608.520 (14,8%)	
java.util.ArrayList	89.379 (6,2%)	2.860.128 (2,7%)	
java.util.HashMap\$Node	79.758 (5,6%)	3.509.352 (3,3%)	
com.sun.org.apache.xerces.internal.dom. ...	75.306 (5,3%)	6.777.540 (6,4%)	
com.sun.org.apache.xerces.internal.dom. ...	75.259 (5,3%)	2.558.806 (2,4%)	
com.sun.org.apache.xerces.internal.dom. ...	61.932 (4,3%)	3.592.056 (3,4%)	
java.lang.ref.WeakReference	25.896 (1,8%)	1.243.008 (1,2%)	
java.util.concurrent.ConcurrentHashM...	23.208 (1,6%)	1.021.152 (1%)	
java.util.HashMap	18.351 (1,3%)	1.174.464 (1,1%)	
java.lang.Object	14.187 (1%)	226.992 (0,2%)	
javax.faces.component.StateHolderSa...	13.886 (1%)	444.352 (0,4%)	
java.lang.ref.SoftReference	12.930 (0,9%)	724.080 (0,7%)	
java.beans.MethodRef	12.497 (0,9%)	499.880 (0,5%)	
int[]	10.013 (0,7%)	785.512 (0,7%)	

Class Name Filter (Contains)



# Analyzing Node.js dumps

- Node.js memory dumps are also supported
- These can be opened in Google Chrome's integrated memory heap snapshot analysis tool

Summary				
Constructor	Distance	Objects Count	Shallow Size	Retained Size
▶ (compiled code)	3	16 497 8 %	4 877 520 18 %	15 326 464 57 %
▼ (array)	-	41 977 21 %	7 121 312 26 %	8 929 640 33 %
▶ (object properties)[] @126801	9		196 664 1 %	259 376 1 %
▶ (object properties)[] @61635	7		24 632 0 %	149 560 1 %
▶ (object properties)[] @152939	10		98 360 0 %	98 424 0 %
▶ (object properties)[] @152943	10		98 360 0 %	98 392 0 %
▶ (object properties)[] @152891	10		98 360 0 %	98 360 0 %
▶ (object properties)[] @154517	10		98 360 0 %	98 360 0 %
▶ [] @311599	3		65 576 0 %	69 952 0 %
▶ [] @40187	5		12 752 0 %	59 112 0 %
▶ (script line ends)[] @40183	5		57 320 0 %	57 320 0 %
▶ (object properties)[] @156317	9		49 208 0 %	49 208 0 %
▶ (object properties)[] @93197	12		24 632 0 %	31 352 0 %
▶ (map descriptors)[] @322557	11		1 592 0 %	29 248 0 %
▶ (object properties)[] @59725	7		24 632 0 %	25 400 0 %
▶ (code deopt data)[] @334591	12		6 864 0 %	24 976 0 %
▶ (code deopt data)[] @334553	13		24 672 0 %	24 672 0 %
▶ (object properties)[] @94097	13		24 632 0 %	24 632 0 %
▶ (code deopt data)[] @370929	11		5 264 0 %	20 024 0 %
▶ (object properties)[] @58835	6		12 344 0 %	19 848 0 %
▶ [] @359275	13		17 976 0 %	17 976 0 %
▶ [] @210431	12		5 648 0 %	17 696 0 %
Retainers				
Object	Distance	Shallow Size	Retained Size	

## Limitations

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- Currently supports only Java, .NET, and Node.js
- Memory dumps are not yet available for PaaS integrations
- Your application server must have adequate space available to store the heap dump

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## Process Crash Analysis

Hosts

lr-ub-l04v

Processes

dynatrace-dev-CF

Crashes

3 crashes

Nov 02 2016, 17:51 - today 17:51

Start typing to filter table

Crashes	Time	Details
<div>Aborted</div> <div>/home/labuser/easytravel-2.0.0</div> <div><div>Executable Path</div><div>java</div></div> <div><div>Fault Module Path</div><div>/home/labuser/easytravel-</div></div> <div><div>Fault Module Version</div><div>GNU Build-Id: 16524e367b8b2891c1a9c6a1c876a1ca7cf19066</div></div> <div><div>Fault Location</div><div>V [libjvm.so+0x5bcb02] instanceKlass::oop_follow_contents(oopDesc*)+0x382</div></div> <div><div>Signal</div><div>Aborted</div></div> <div><div>Fault Thread</div><div>00007fbc4812f800 VMThread [stack: 0x00007fbc3c018000,0x00007fbc3c119000] [id=30959]</div></div> <div><div>crash_20161108091557_30904.zip</div><div>Download</div></div>	2016 Nov 8 09:16:00.421	
<div>Aborted</div> <div>/opt/dynatrace/oneagent/agent/lib64/liboneagentcore.so at liboneagentcore.so!&lt;imagebase&gt;+0xa69559</div>	2016 Nov 8 06:02:00.264	
<div>Aborted</div> <div>/home/labuser/easytravel-2.0.0-x64/jre/lib/amd64/server/libjvm.so at libjvm.so!os::abort(bool)+0x35</div>	2016 Nov 5 19:32:00.376	

## Sensitive User Data

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- Crash reports may contain sensitive personal information that should not be viewed by all users
- For this reason, your Dynatrace administrator must enable the 'View logs' account-security option in your user profile before you can view sensitive data

## Cleanup

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- The log and support alert directories are cleaned up automatically.
  - For support alerts, we process the core dump, then zip it and keep it in order to be sent to cluster
  - For crashes (non-instrumented processes or instrumented ones where we decide Dynatrace is not at fault), we process and then delete the copy of the core dump

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Memory Dumps

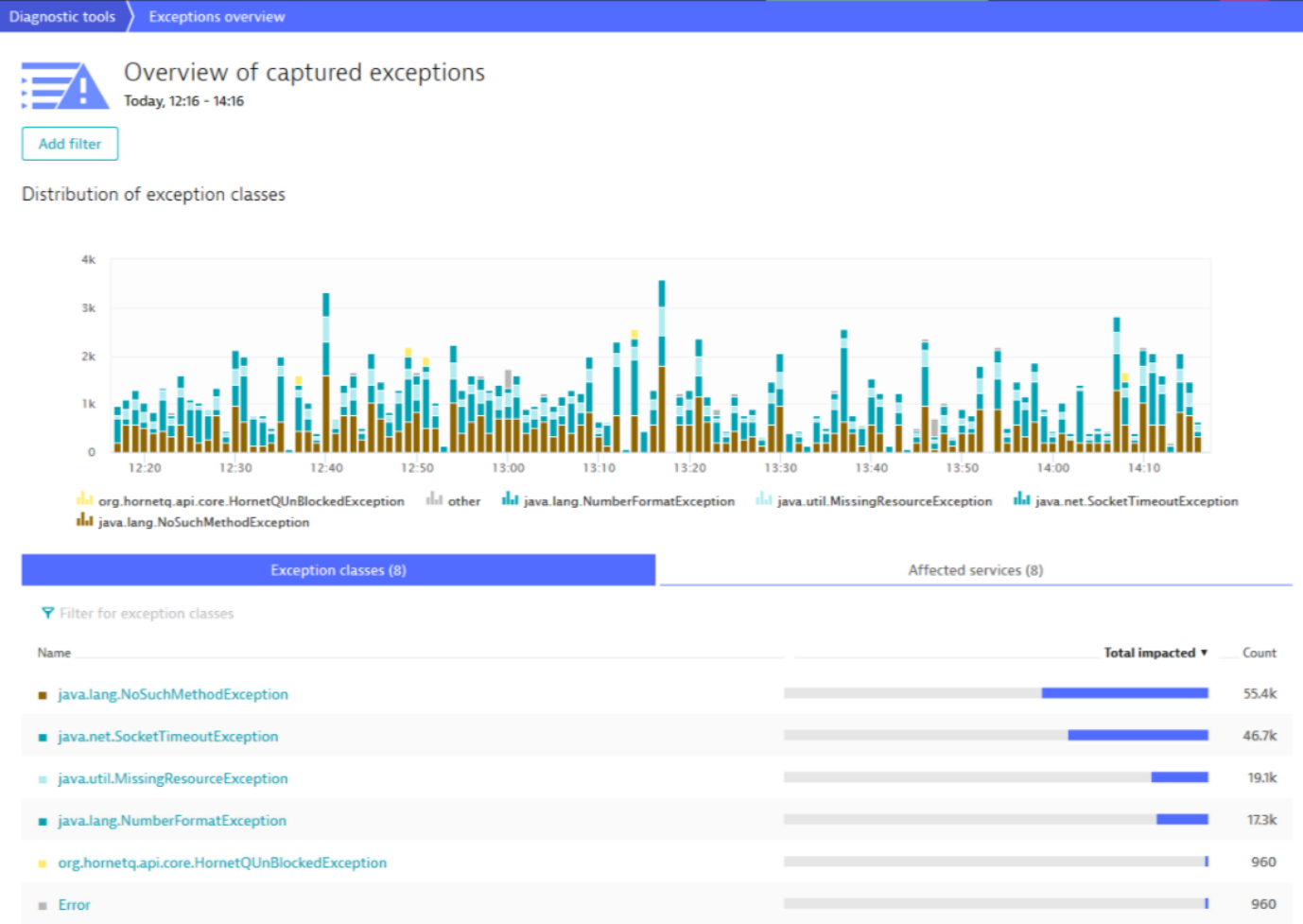
Process Crash Analysis

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# Exception Analysis



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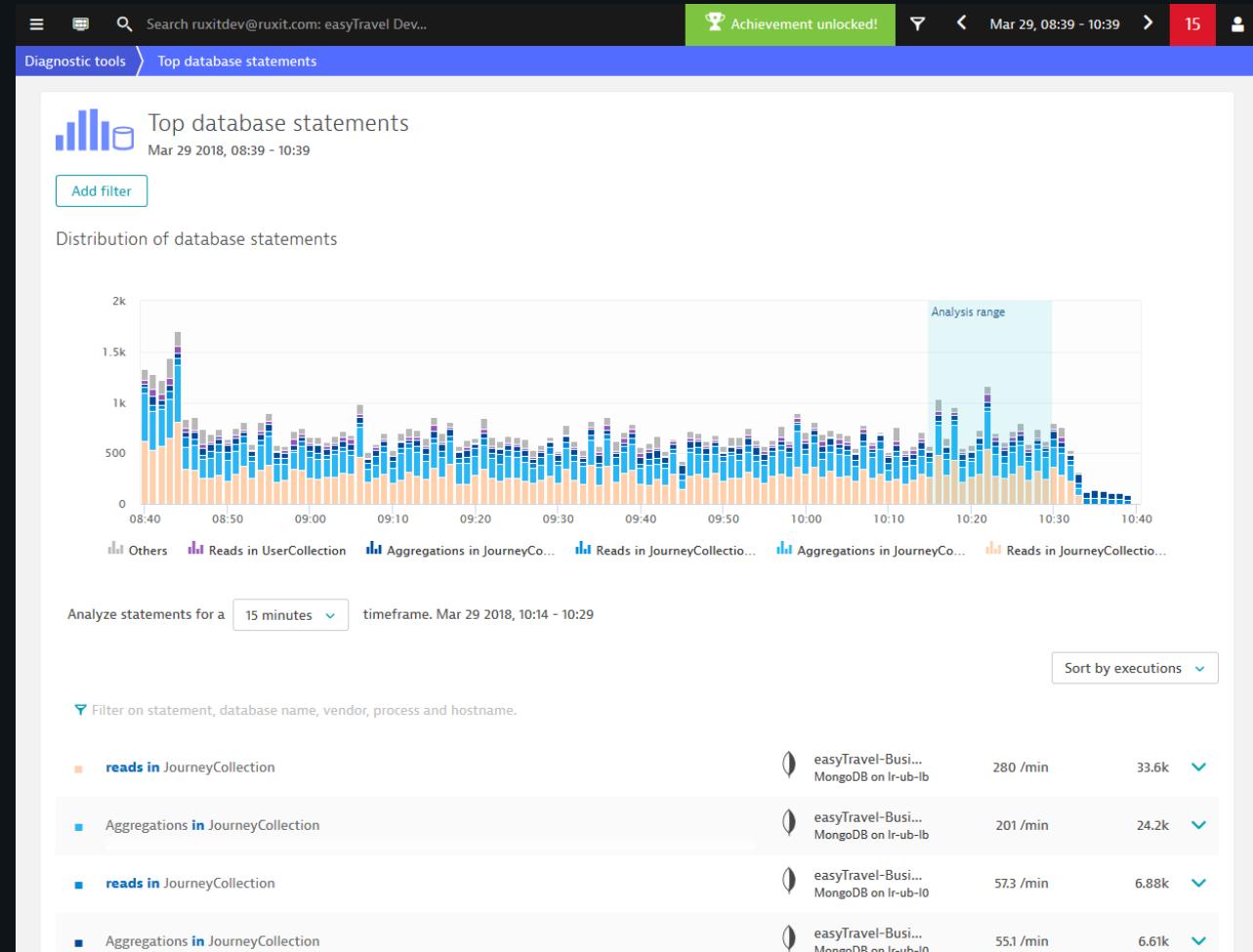
Process Crash Analysis

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## Top Database Statements



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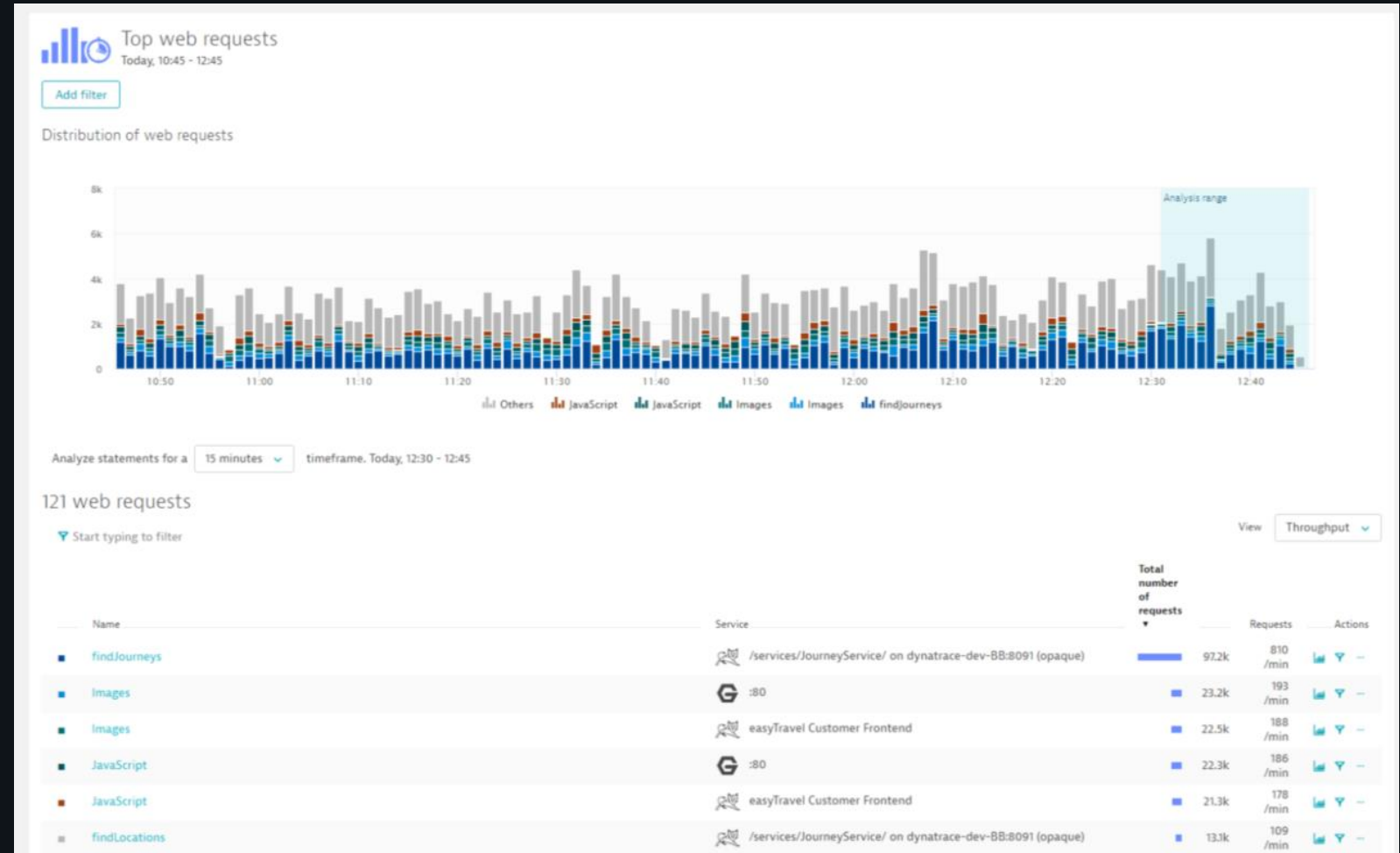
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## Top Web Requests





# Questions?

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Simply smarter clouds