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Value Tools

Development and operations excellence

System monitoring, usage insight, performance profiling, deployment pipelines & upgrade control

Value Tools

VALUE TOOLS > OVERVIEW

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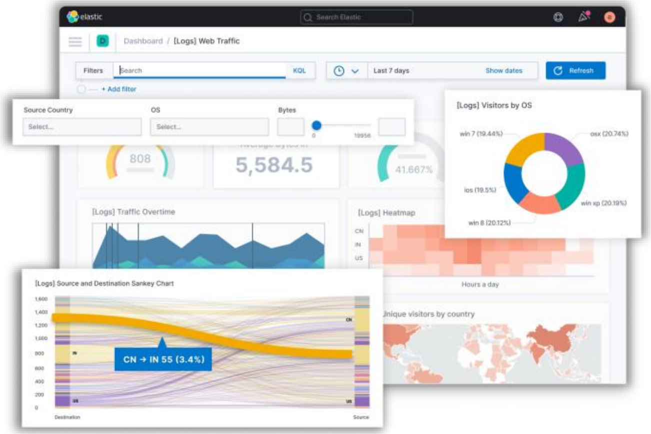
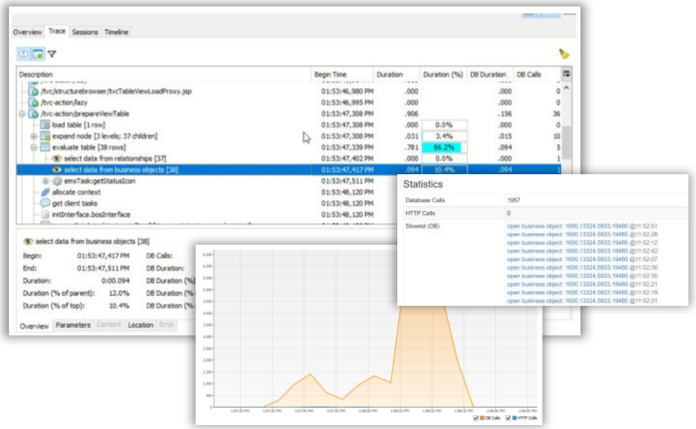


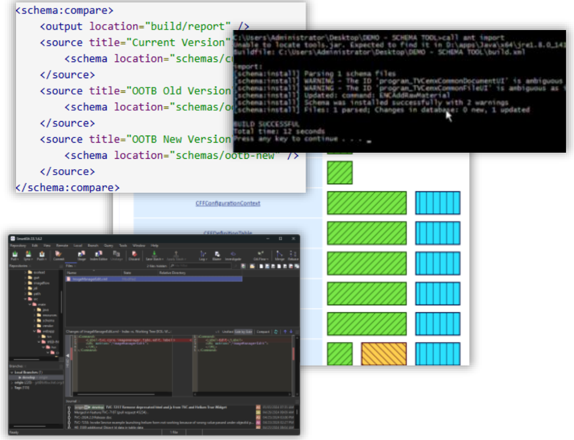


PLATFORM INTELLIGENCE

Proactive operations & analysis. Production system monitoring and understand user behaviour.

PROFILER

Detailed performance analysis. Report slow use cases, understand durations, call count & call stack.



```
<schema:compare>
    <output location="build/report" />
    <source title="Current Version"
        <schema location="schemas/c
    </source>
    <source title="OOTB Old Version
        <schema location="schemas/o
    </source>
    <source title="OOTB New Version
        <schema location="schemas/ootb-new" />
    </source>
</schema:compare>
```

```
C:\Users\Administrator\Desktop\DEMO - SCHEMA TOOL>call ant import
Unable to locate tools.jar. Expected to find it in D:\apps\Java\x64\jre1.8.0_14
Buildfile: C:\Users\Administrator\Desktop\DEMO - SCHEMA TOOL\build.xml

import:
[schema:install] Parsing 1 schema files
[schema:install] WARNING - The ID 'program_TVCenxCommonDocumentUI' is ambiguous
[schema:install] WARNING - The ID 'program_TVCenxCommonFileUI' is ambiguous as
[schema:install] Updated: command: ENCAddRawMaterial
[schema:install] Schema was installed successfully with 2 warnings
[schema:install] Files: 1 parsed; Changes in database: 0 new, 1 updated

BUILD SUCCESSFUL
Total time: 12 seconds
Press any key to continue . . .
```

SCHEMA TOOL

Declarative schema management, concurrent development, failsafe deployment & upgrade analysis.

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Platform intelligence

Proactive platform operations and system analysis

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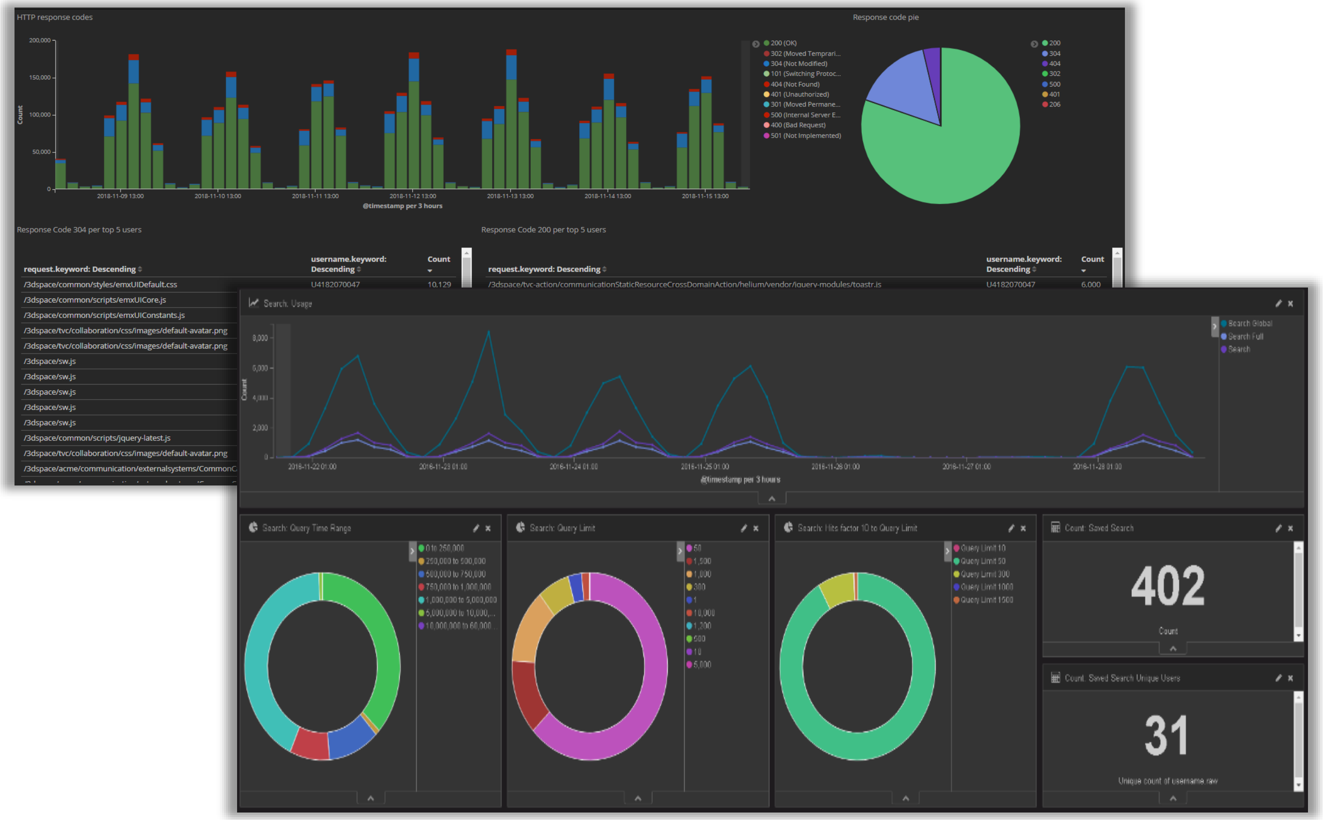
Visualizing combined operations data

- Concurrent analysis of key data
- Helicopter view of system health
- Spot anomalies
- Quality assured facts rather than hearsay
- Drill down into selected data to see details
- Zoom in on specific time intervals
- Real-time analysis
- Compare presence with history
- Predict the future by trend analysis



Response Code 304 per top 5 users

request.keyword: Descending	username.keyword: Descending	Count
/3dspace/common/styles/emxUIDefault.css	U4182070047	10,129
/3dspace/common/scripts/emxUICore.js		
/3dspace/common/scripts/emxUIConstants.js		
/3dspace/tvc/collaboration/css/images/default-avatar.png		
/3dspace/tvc/collaboration/css/images/default-avatar.png		
/3dspace/sw.js		
/3dspace/sw.js		
/3dspace/sw.js		
/3dspace/sw.js		
/3dspace/sw.js		
/3dspace/common/scripts/jquery-latest.js		
/3dspace/tvc/collaboration/css/images/default-avatar.png		
/3dspace/acme/communication/externalsystems/CommonC		

Response Code 200 per top 5 users

request.keyword: Descending	username.keyword: Descending	Count
/3dspace/tvc-action/communicationStaticResourceCrossDomainAction/helium/vendor/jquery-modules/toastr.js	U4182070047	6,000

Value Tools

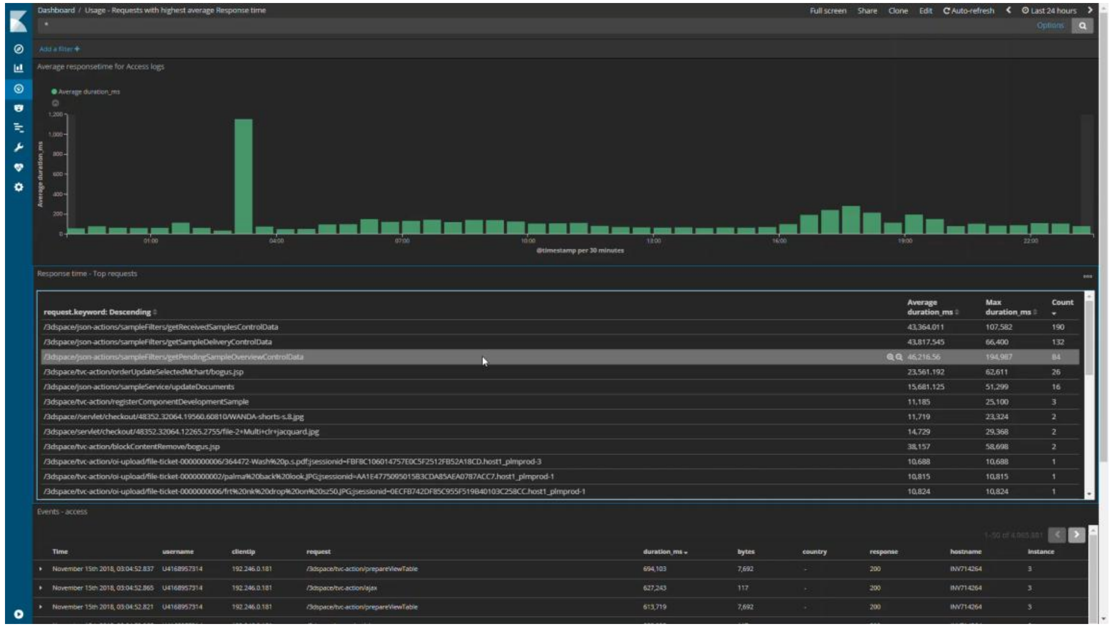
Overview & demo

Features

- Complete 3DEXPERIENCE infrastructure surveillance
- Understand usage patterns, what is used, when, and by whom
- Sampling of ~40 3DEXPERIENCE specific metrics
- Measure Response time, Data Growth, License Consumption
- Trace Long running requests
- Monitor database locks
- Network Information
- OS Level information

Benefits

- Enable proactive actions
- Identify problems areas such as performance bottlenecks
- Ensure system availability
- Understand how the system behaves under usage and over time
- Invest effort where it make sense
- Ease troubleshooting if stability problems
- Identifying areas that might need improvement in terms of performance and stability



Response time - Top requests

request.keyword: Descending	Average duration_ms	Max duration_ms	Count
/3dspace/json-actions/sampleFilters/getReceivedSamplesControlData	43,364.011	107,582	190
/3dspace/json-actions/sampleFilters/getSampleDeliveryControlData	43,817.545	66,400	132
/3dspace/json-actions/sampleFilters/getPendingSampleOverviewControlData	46,216.56	194,987	84
/3dspace/tvc-action/orderUpdateSelectedMchart/bogus.jsp	23,561.192	62,611	26
/3dspace/json-actions/sampleService/updateDocuments	15,681.125	51,299	16
/3dspace/tvc-action/registerComponentDevelopmentSample	11,185	25,100	3
/3dspace//servlet/checkout/48352.32064.19560.60810/WANDA-shorts-s.8.jpg	11,719	23,324	2
/3dspace/servlet/checkout/48352.32064.12265.2755/file-2+Multi+clr+jacquard.jpg	14,729	29,368	2
/3dspace/tvc-action/blockContentRemove/bogus.jsp	38,157	58,698	2
/3dspace/tvc-action/oi-upload/file-ticket-0000000006/364472-Wash%20p.s.pdf;jsessionid=FBF8C106014757E0C5F2512FB52A18CD.host1_plmprod-3	10,688	10,688	1
/3dspace/tvc-action/oi-upload/file-ticket-0000000002/palma%20back%20look.JPG;jsessionid=AA1E4775095015B3CDA85AEA0787ACC7.host1_plmprod-1	10,815	10,815	1
/3dspace/tvc-action/oi-upload/file-ticket-0000000006/frt%20nk%20drop%20on%20sz50.JPG;jsessionid=0ECFB742DF85C955F519B40103C258CC.host1_plmprod-1	10,824	10,824	1

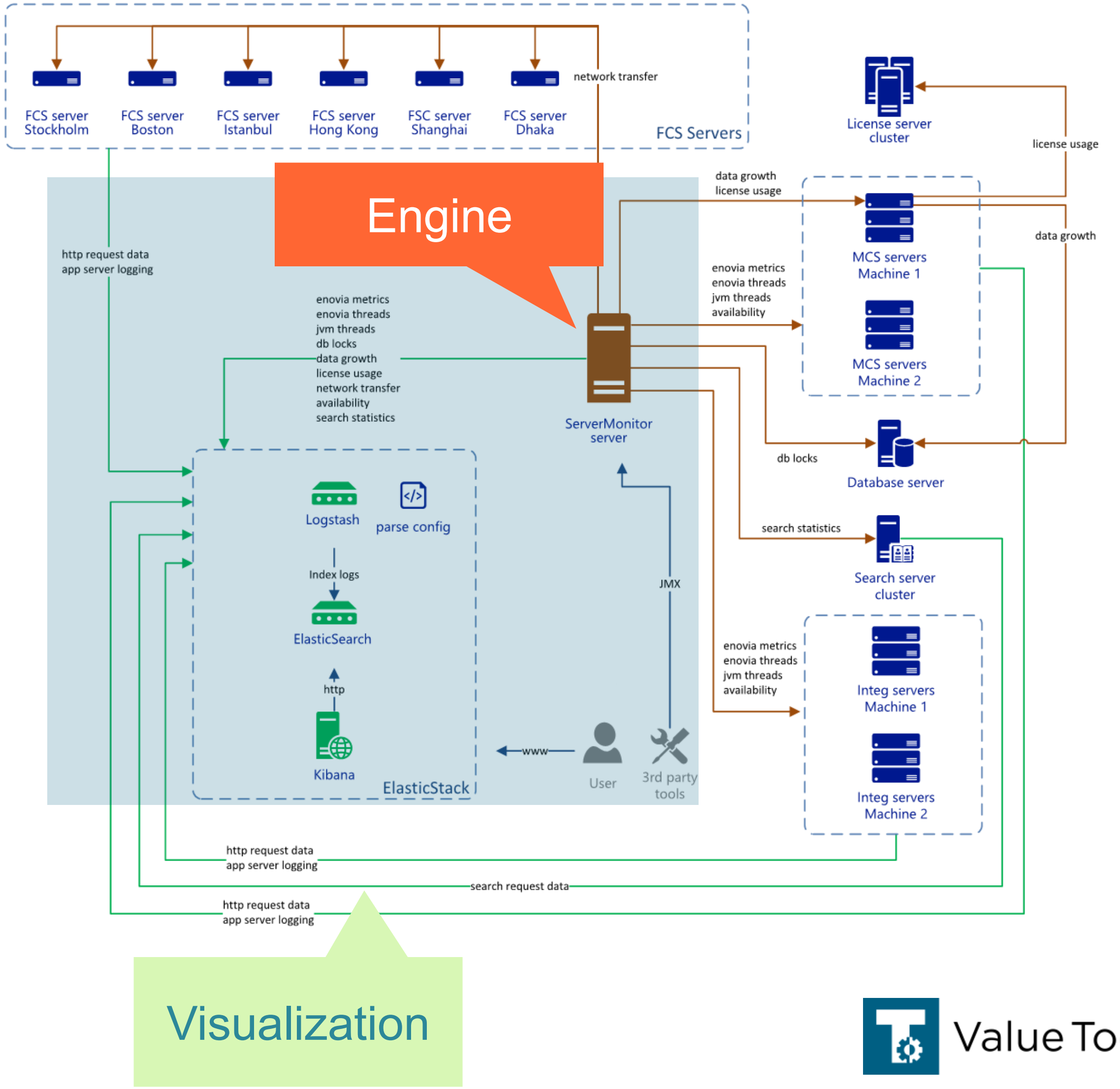
Events - access

Time	username	clientip	request	duration_ms	bytes	country	response	hostname	instance
November 15th 2018, 03:04:52.837	U4168957314	192.246.0.181	/3dspace/tvc-action/prepareViewTable	694,103	7,692	-	200	INV714264	3
November 15th 2018, 03:04:52.865	U4168957314	192.246.0.181	/3dspace/tvc-action/ajax	627,243	117	-	200	INV714264	3
November 15th 2018, 03:04:52.821	U4168957314	192.246.0.181	/3dspace/tvc-action/prepareViewTable	613,719	7,692	-	200	INV714264	3

Value Tools

Example setup

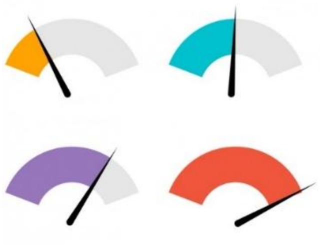
- Complete coverage
- Simple setup
- No impact on system
- Complements existing tools
- Covers the following levels of monitoring
  - Operations & System
  - Application / 3DEXPERIENCE Platform
  - Business Usage (can be fine tuned to your needs)



Engine

Visualization

Gaining intelligence & control



Application load

- Smooth system operations
- Stop ‘reacting’ to emergencies by instead being one step ahead
- A 3DEXPERIENCE system perspective instead of an operation discipline perspective

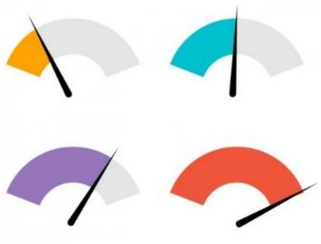
Proactive analysis and troubleshooting

- Identify problems and analyse trends in the fastest way
- Be able to act before the users complain
- Understand what problems affect most users

Usage patterns

- Solving the right problems
- Value based spending
- Identify faulty user behaviours

Answering common questions



Application load

- What does the overall usage of the system look like?
- How is the load distribution per service and per country?
- What do the network characteristics look like?

Proactive analysis and troubleshooting

- What application exceptions are most critical to act on?
- Are users' browser cache utilized correctly with static content?
- What are the most frequent long-running user requests?
- What is taking the most time in the Enovia core and is there any blocking database locks?

Usage patterns

- How is Search used?
- How often is certain functionality used, and how does the data grow?
- How much are certain functionalities used?
- How much are different countries / offices using certain functionality?

Example use cases (views)

Understanding application load

- What do the network characteristics look like?

Proactive analysis and troubleshooting

- Identify TomEE Exceptions to be able to act on most critical
- Are users' browser cache utilized correctly with static content?
- Advanced troubleshooting by combining important logs using the same timeline
- Identify and analyse long-running user requests
- Identify and analyse long-running Enovia threads and database locks

Understanding functionality usage

- How is Search used?
- How often is certain functionality used, and how does the data grow?

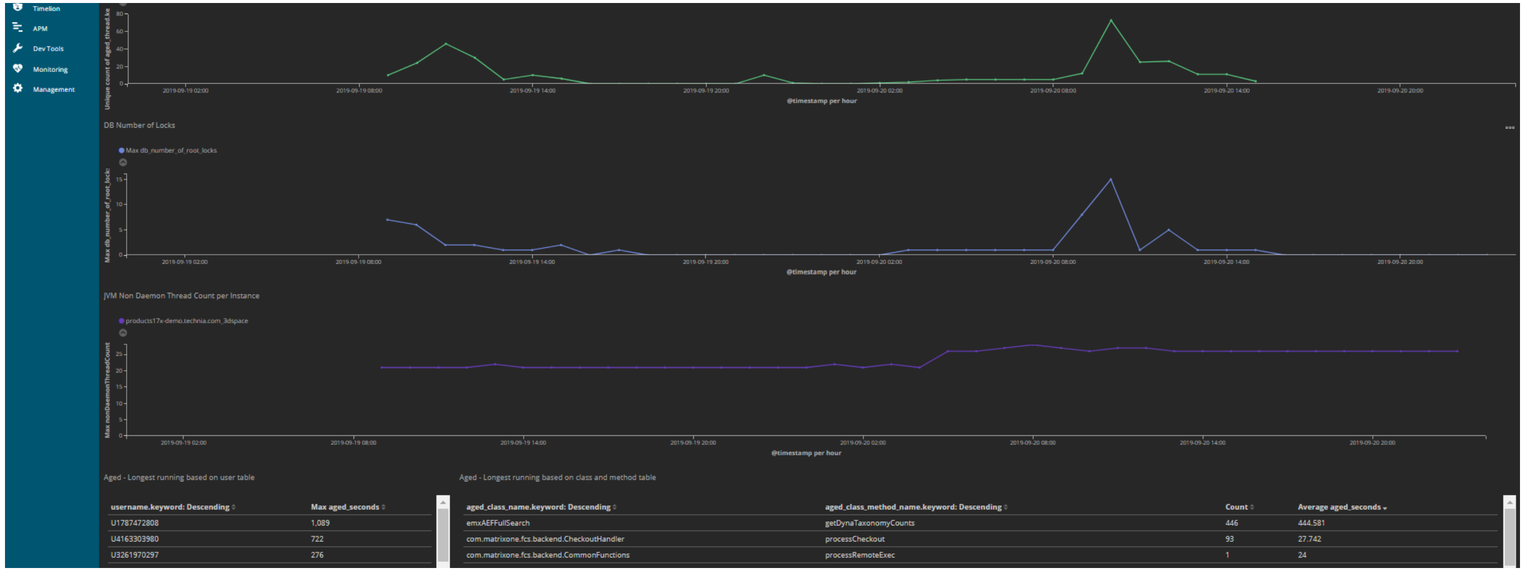
Example: Problem diagnosis

With Platform Intelligence

For the time close to when the problem occurred, get consolidated view of Database behavior, JAVA parameter behavior etc (DB Locks, Long-running threads, JVM Usage), actions performed by what user. These metrics are key to performance monitoring: investigation, prevention. Can eliminate and/or find different problem areas. Can be retrieved and analyzed also for earlier occurrences.

Without (e.g. Manually)

Time consuming parsing through the different source logs, without any previous indication of where the problem might be Data coming from multiple sources (Database, JVM Threads, Processes).



Aged - Longest running based on user table

username.keyword: Descending	Max aged_seconds
U1787472808	1,089
U4163303980	722
U3261970297	276

Aged - Longest running based on class and method table

aged_class_name.keyword: Descending	aged_class_method_name.keyword: Descending	Count	Average aged_seconds
emxAEFFullSearch	getDynaTaxonomyCounts	446	444.581
com.matrixone.fcs.backend.CheckoutHandler	processCheckout	93	27.742
com.matrixone.fcs.backend.CommonFunctions	processRemoteExec	1	24

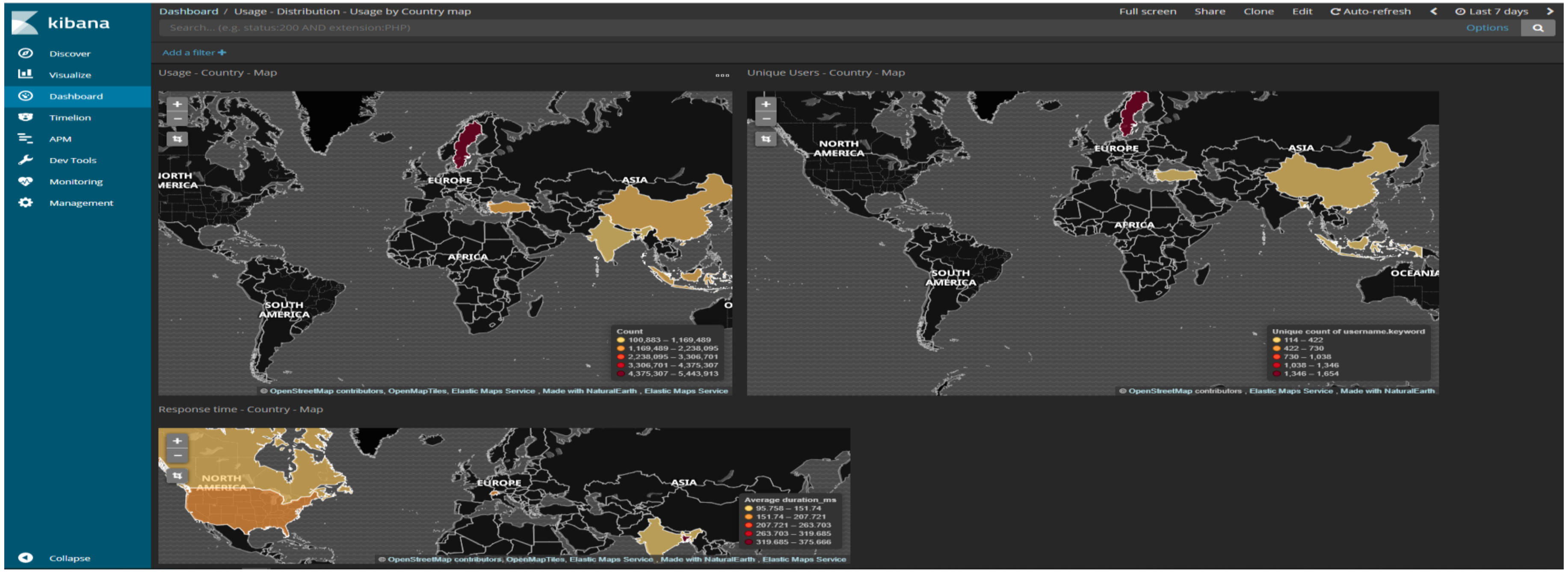
Example: Geo / site

With Platform Intelligence

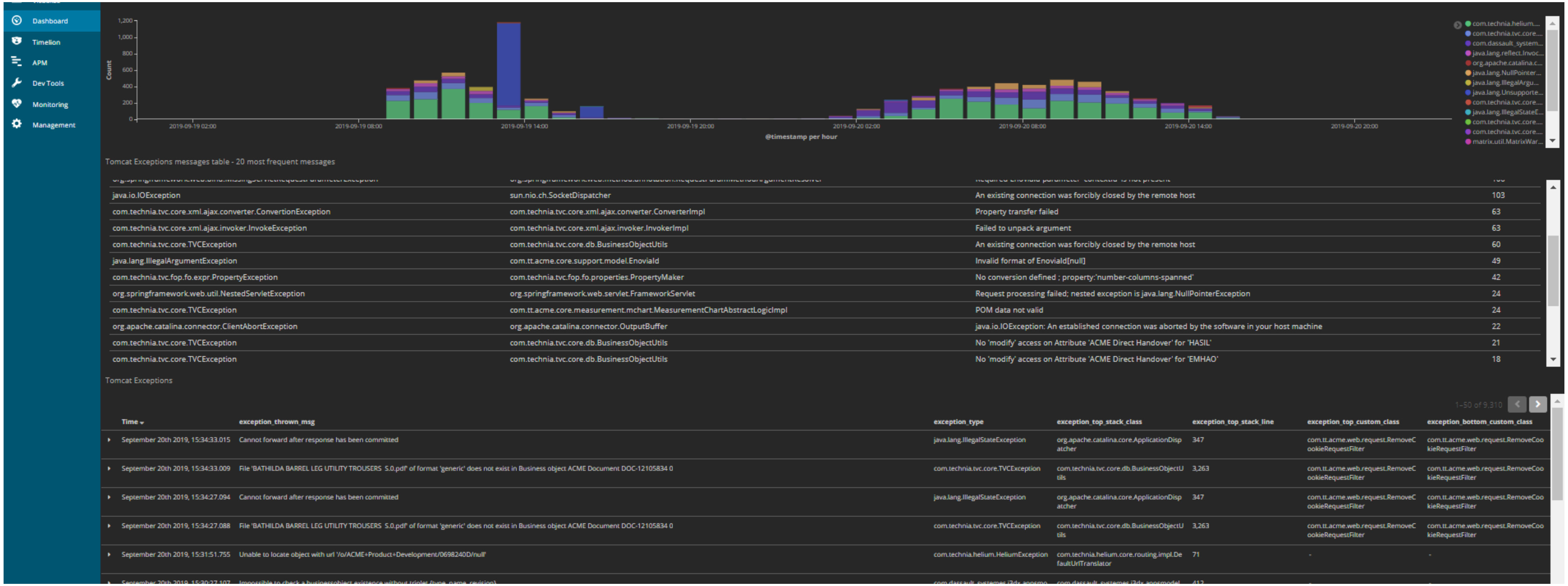
Get overview of your system through the different domains and learn about it. System usage: 3DX Instance Metrics, Network Transfer Times, FCS Usage. Business Usage: integration reports, user distributions by country, events, use cases, etc

Without (e.g. Manually)

Time consuming parsing through the different source logs, without any previous indication of where the problem might be. Data coming from multiple sources.



Example: Response code



Tomcat Exceptions messages table - 20 most frequent messages

org.springframework.web.bind.MissingServletRequestParameterException	org.springframework.web.method.annotation.RequestParamMethodArgumentResolver	Required EnoviaId parameter 'contextId' is not present	106
java.io.IOException	sun.nio.ch.SocketDispatcher	An existing connection was forcibly closed by the remote host	103
com.technia.tvc.core.xml.ajax.converter.ConvertionException	com.technia.tvc.core.xml.ajax.converter.ConverterImpl	Property transfer failed	63
com.technia.tvc.core.xml.ajax.invoker.InvokeException	com.technia.tvc.core.xml.ajax.invoker.InvokerImpl	Failed to unpack argument	63
com.technia.tvc.core.TVCException	com.technia.tvc.core.db.BusinessObjectUtils	An existing connection was forcibly closed by the remote host	60
java.lang.IllegalArgumentException	com.tt.acme.core.support.model.EnoviaId	Invalid format of EnoviaId[null]	49
com.technia.tvc.fop.fo.expr.PropertyException	com.technia.tvc.fop.fo.properties.PropertyMaker	No conversion defined ; property:'number-columns-spanned'	42
org.springframework.web.util.NestedServletException	org.springframework.web.servlet.FrameworkServlet	Request processing failed; nested exception is java.lang.NullPointerException	24
com.technia.tvc.core.TVCException	com.tt.acme.core.measurement.mchart.MeasurementChartAbstractLogicImpl	POM data not valid	24
org.apache.catalina.connector.ClientAbortException	org.apache.catalina.connector.OutputBuffer	java.io.IOException: An established connection was aborted by the software in your host machine	22
com.technia.tvc.core.TVCException	com.technia.tvc.core.db.BusinessObjectUtils	No 'modify' access on Attribute 'ACME Direct Handover' for 'HASIL'	21
com.technia.tvc.core.TVCException	com.technia.tvc.core.db.BusinessObjectUtils	No 'modify' access on Attribute 'ACME Direct Handover' for 'EMHAO'	18

Tomcat Exceptions

1-50 of 9,310

Time	exception_thrown_msg	exception_type	exception_top_stack_class	exception_top_stack_line	exception_top_custom_class	exception_bottom_custom_class
September 20th 2019, 15:34:33.015	Cannot forward after response has been committed	java.lang.IllegalStateException	org.apache.catalina.core.ApplicationDispatcher	347	com.tt.acme.web.request.RemoveCookieRequestFilter	com.tt.acme.web.request.RemoveCookieRequestFilter
September 20th 2019, 15:34:33.009	File 'BATHILDA BARREL LEG UTILITY TROUSERS S.0.pdf' of format 'generic' does not exist in Business object ACME Document DOC-12105834 0	com.technia.tvc.core.TVCException	com.technia.tvc.core.db.BusinessObjectUtils	3,263	com.tt.acme.web.request.RemoveCookieRequestFilter	com.tt.acme.web.request.RemoveCookieRequestFilter
September 20th 2019, 15:34:27.094	Cannot forward after response has been committed	java.lang.IllegalStateException	org.apache.catalina.core.ApplicationDispatcher	347	com.tt.acme.web.request.RemoveCookieRequestFilter	com.tt.acme.web.request.RemoveCookieRequestFilter
September 20th 2019, 15:34:27.088	File 'BATHILDA BARREL LEG UTILITY TROUSERS S.0.pdf' of format 'generic' does not exist in Business object ACME Document DOC-12105834 0	com.technia.tvc.core.TVCException	com.technia.tvc.core.db.BusinessObjectUtils	3,263	com.tt.acme.web.request.RemoveCookieRequestFilter	com.tt.acme.web.request.RemoveCookieRequestFilter
September 20th 2019, 15:31:51.755	Unable to locate object with url '/o/ACME+Product+Development/0698240D/null'	com.technia.helium.HeliumException	com.technia.helium.core.routing.impl.DefaultUrlTranslator	71	-	-
September 20th 2019, 15:30:27.107	Impossible to check a businessobject existence without triplet (type, name, revision)	com.dassault_systemes.i3dx.appsmo	com.dassault_systemes.i3dx.appsmodel	412	-	-

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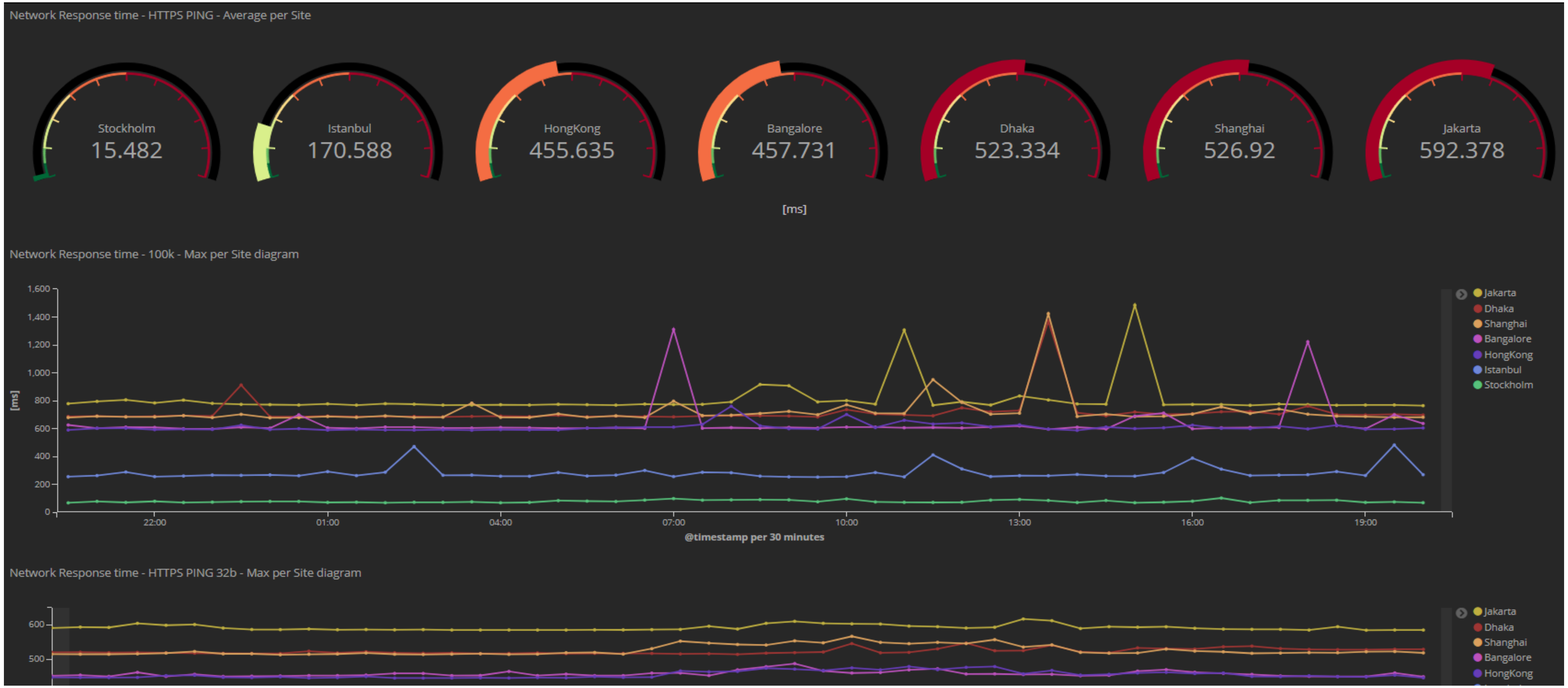
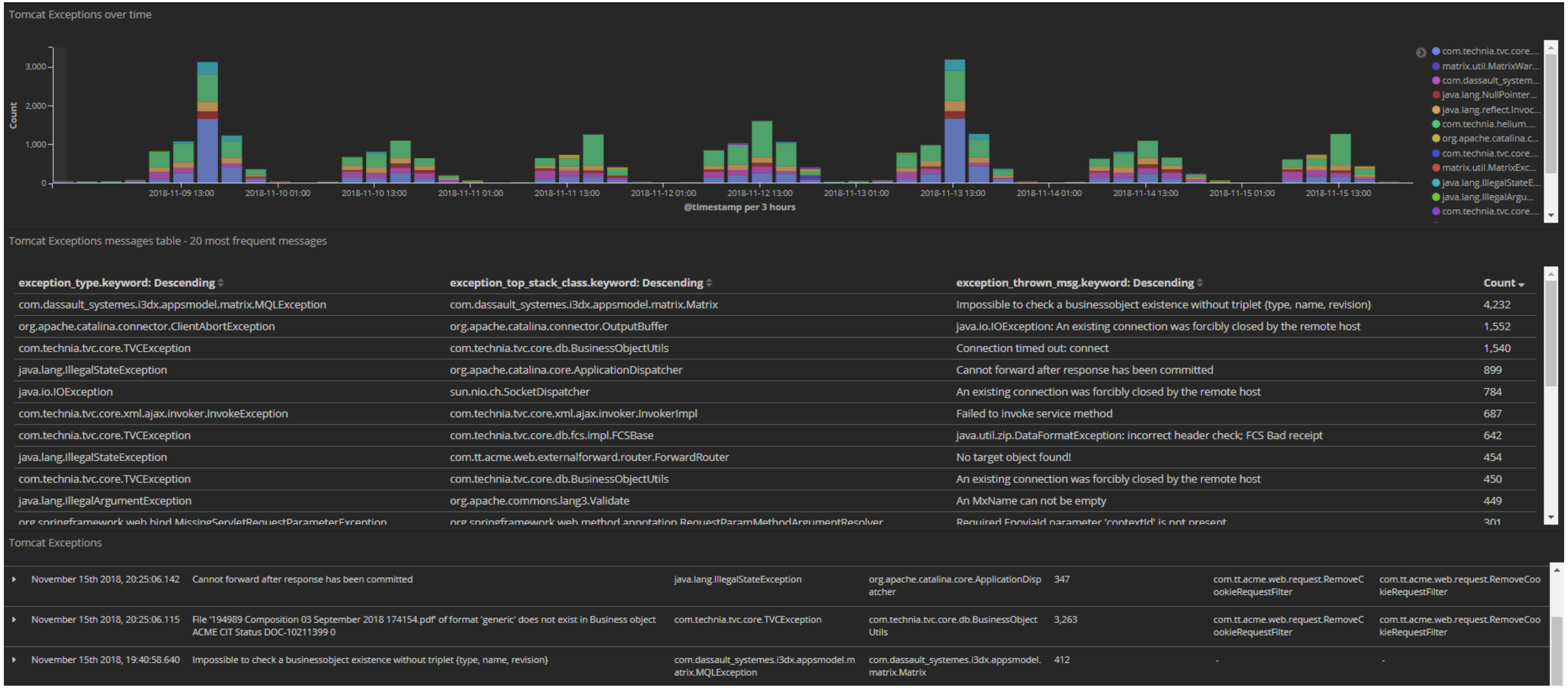
Example: Network



Value Tools

Example: Exceptions



Tomcat Exceptions over time

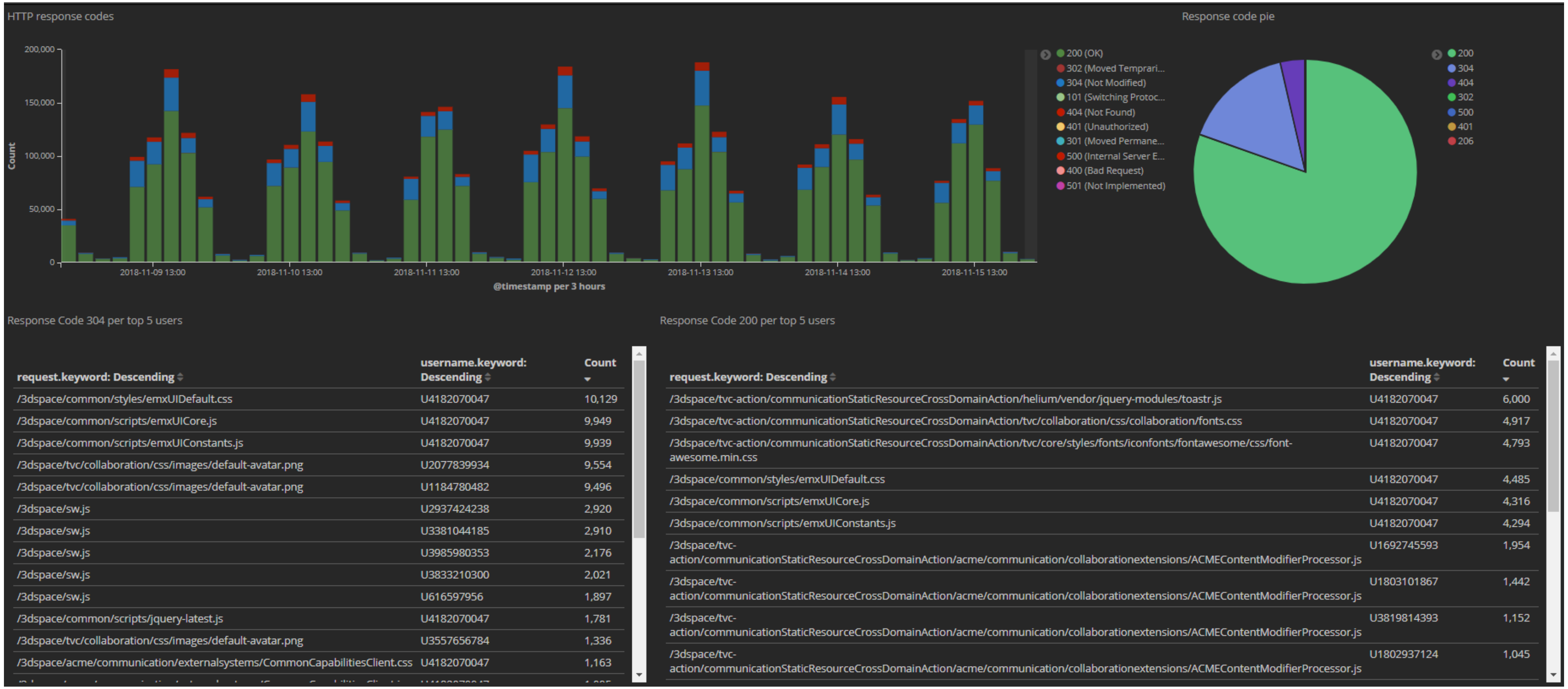
Tomcat Exceptions messages table - 20 most frequent messages

exception_type.keyword: Descending ⇕	exception_top_stack_class.keyword: Descending ⇕	exception_thrown_msg.keyword: Descending ⇕	Count ▾
com.dassault_systemes.i3dx.appsmodel.matrix.MQLException	com.dassault_systemes.i3dx.appsmodel.matrix.Matrix	Impossible to check a businessobject existence without triplet {type, name, revision}	4,232
org.apache.catalina.connector.ClientAbortException	org.apache.catalina.connector.OutputBuffer	java.io.IOException: An existing connection was forcibly closed by the remote host	1,552
com.technia.tvc.core.TVCException	com.technia.tvc.core.db.BusinessObjectUtils	Connection timed out: connect	1,540
java.lang.IllegalStateException	org.apache.catalina.core.ApplicationDispatcher	Cannot forward after response has been committed	899
java.io.IOException	sun.nio.ch.SocketDispatcher	An existing connection was forcibly closed by the remote host	784
com.technia.tvc.core.xml.ajax.invoker.InvokeException	com.technia.tvc.core.xml.ajax.invoker.InvokerImpl	Failed to invoke service method	687
com.technia.tvc.core.TVCException	com.technia.tvc.core.db.fcs.impl.FCSBase	java.util.zip.DataFormatException: incorrect header check; FCS Bad receipt	642
java.lang.IllegalStateException	com.tt.acme.web.externalforward.router.ForwardRouter	No target object found!	454
com.technia.tvc.core.TVCException	com.technia.tvc.core.db.BusinessObjectUtils	An existing connection was forcibly closed by the remote host	450
java.lang.IllegalArgumentException	org.apache.commons.lang3.Validate	An MxName can not be empty	449
org.springframework.web.bind.MissingServletRequestParameterException	org.springframework.web.method.annotation.RequestParamMethodArgumentResolver	Required EnoviaId parameter 'contextId' is not present	301

Tomcat Exceptions

▸	November 15th 2018, 20:25:06.142	Cannot forward after response has been committed	java.lang.IllegalStateException	org.apache.catalina.core.ApplicationDispatcher	347	com.tt.acme.web.request.RemoveCookieRequestFilter	com.tt.acme.web.request.RemoveCookieRequestFilter
▸	November 15th 2018, 20:25:06.115	File '194989 Composition 03 September 2018 174154.pdf' of format 'generic' does not exist in Business object ACME CIT Status DOC-10211399 0	com.technia.tvc.core.TVCException	com.technia.tvc.core.db.BusinessObjectUtils	3,263	com.tt.acme.web.request.RemoveCookieRequestFilter	com.tt.acme.web.request.RemoveCookieRequestFilter
▸	November 15th 2018, 19:40:58.640	Impossible to check a businessobject existence without triplet {type, name, revision}	com.dassault_systemes.i3dx.appsmodel.matrix.MQLException	com.dassault_systemes.i3dx.appsmodel.matrix.Matrix	412	-	-

Example: Cache



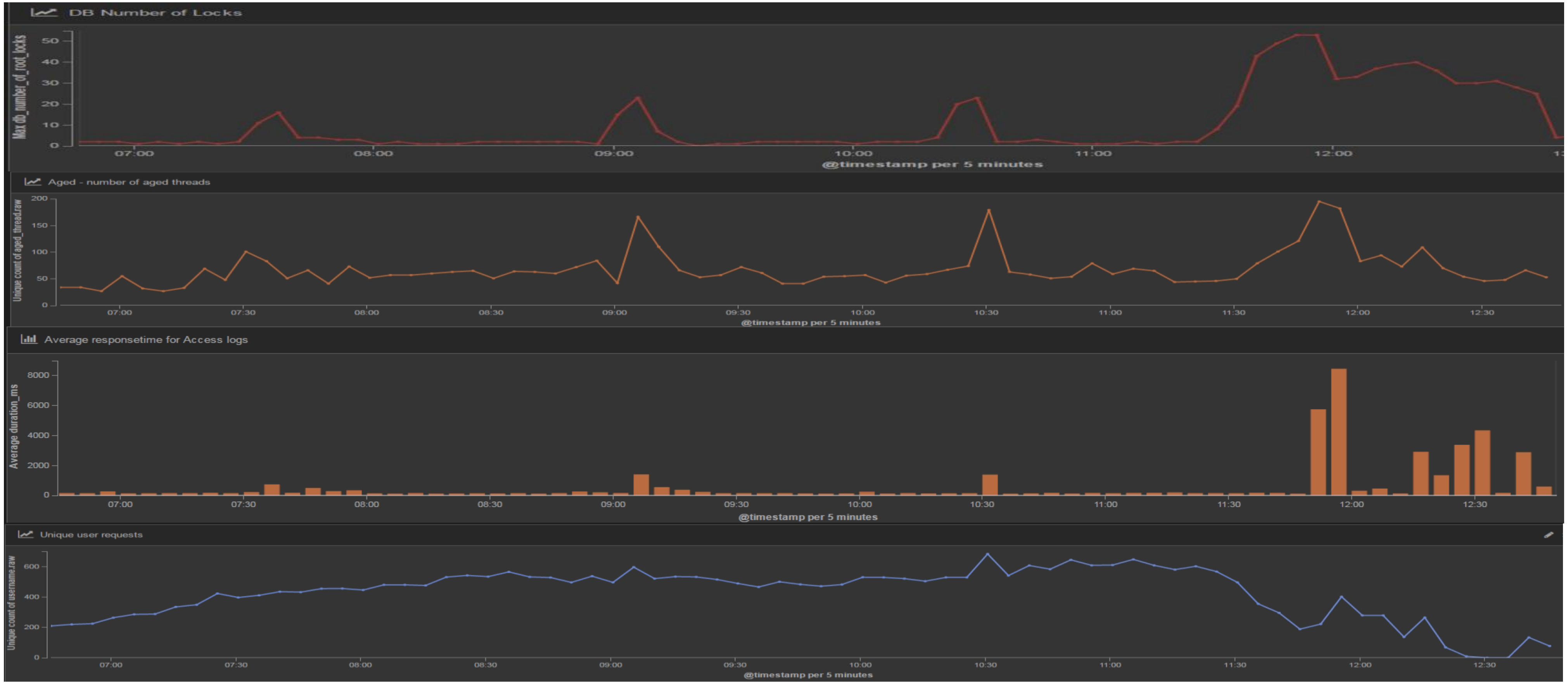
Response Code 304 per top 5 users

request.keyword: Descending	username.keyword: Descending	Count
/3dspace/common/styles/emxUIDefault.css	U4182070047	10,129
/3dspace/common/scripts/emxUICore.js	U4182070047	9,949
/3dspace/common/scripts/emxUIConstants.js	U4182070047	9,939
/3dspace/tvc/collaboration/css/images/default-avatar.png	U2077839934	9,554
/3dspace/tvc/collaboration/css/images/default-avatar.png	U1184780482	9,496
/3dspace/sw.js	U2937424238	2,920
/3dspace/sw.js	U3381044185	2,910
/3dspace/sw.js	U3985980353	2,176
/3dspace/sw.js	U3833210300	2,021
/3dspace/sw.js	U616597956	1,897
/3dspace/common/scripts/jquery-latest.js	U4182070047	1,781
/3dspace/tvc/collaboration/css/images/default-avatar.png	U3557656784	1,336
/3dspace/acme/communication/externalsystems/CommonCapabilitiesClient.css	U4182070047	1,163

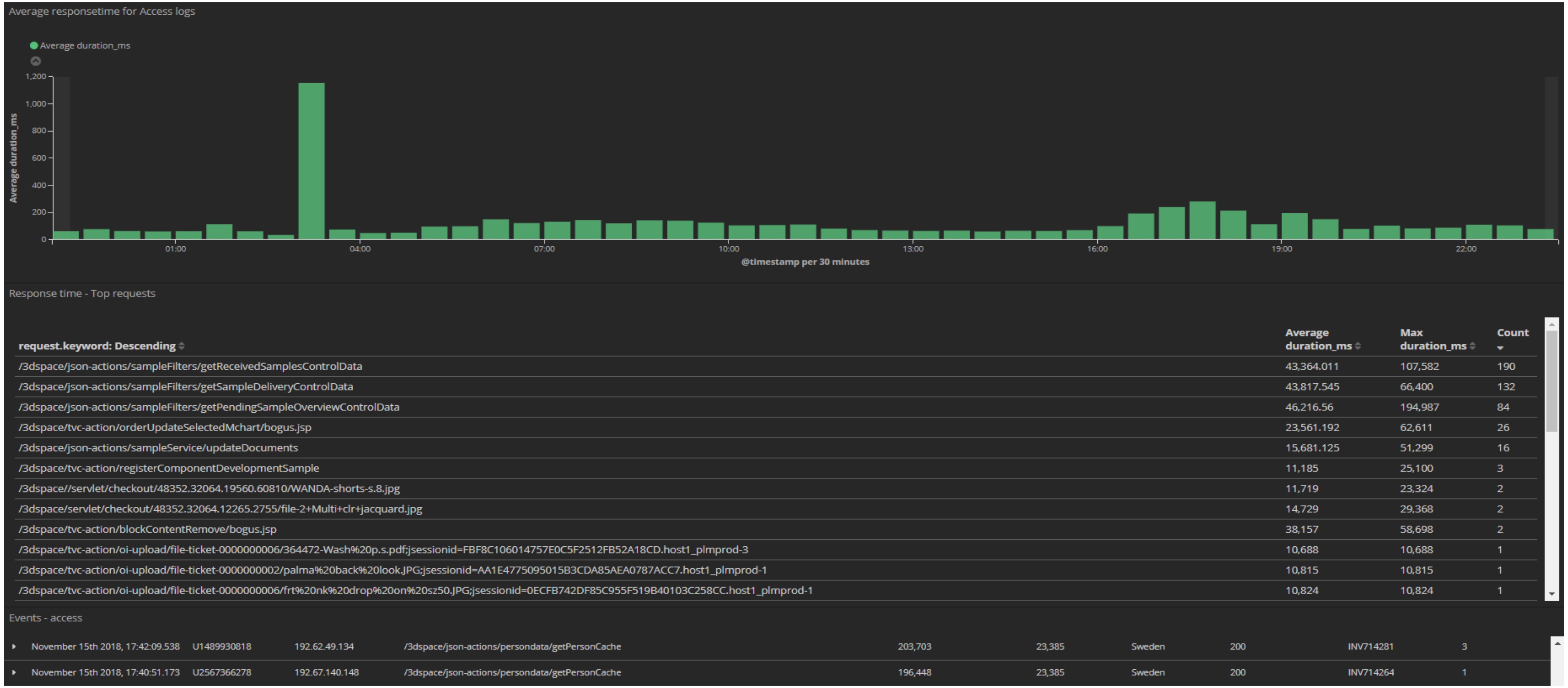
Response Code 200 per top 5 users

request.keyword: Descending	username.keyword: Descending	Count
/3dspace/tvc-action/communicationStaticResourceCrossDomainAction/helium/vendor/jquery-modules/toastr.js	U4182070047	6,000
/3dspace/tvc-action/communicationStaticResourceCrossDomainAction/tvc/collaboration/css/collaboration/fonts.css	U4182070047	4,917
/3dspace/tvc-action/communicationStaticResourceCrossDomainAction/tvc/core/styles/fonts/iconfonts/fontawesome/css/font-awesome.min.css	U4182070047	4,793
/3dspace/common/styles/emxUIDefault.css	U4182070047	4,485
/3dspace/common/scripts/emxUICore.js	U4182070047	4,316
/3dspace/common/scripts/emxUIConstants.js	U4182070047	4,294
/3dspace/tvc-action/communicationStaticResourceCrossDomainAction/acme/communication/collaborationextensions/ACMEContentModifierProcessor.js	U1692745593	1,954
/3dspace/tvc-action/communicationStaticResourceCrossDomainAction/acme/communication/collaborationextensions/ACMEContentModifierProcessor.js	U1803101867	1,442
/3dspace/tvc-action/communicationStaticResourceCrossDomainAction/acme/communication/collaborationextensions/ACMEContentModifierProcessor.js	U3819814393	1,152
/3dspace/tvc-action/communicationStaticResourceCrossDomainAction/acme/communication/collaborationextensions/ACMEContentModifierProcessor.js	U1802937124	1,045

Example: Combine in one timeline



Example: Long running requests



Response time - Top requests

request.keyword: Descending	Average duration_ms	Max duration_ms	Count
/3dspace/json-actions/sampleFilters/getReceivedSamplesControlData	43,364.011	107,582	190
/3dspace/json-actions/sampleFilters/getSampleDeliveryControlData	43,817.545	66,400	132
/3dspace/json-actions/sampleFilters/getPendingSampleOverviewControlData	46,216.56	194,987	84
/3dspace/tvc-action/orderUpdateSelectedMchart/bogus.jsp	23,561.192	62,611	26
/3dspace/json-actions/sampleService/updateDocuments	15,681.125	51,299	16
/3dspace/tvc-action/registerComponentDevelopmentSample	11,185	25,100	3
/3dspace//servlet/checkout/48352.32064.19560.60810/WANDA-shorts-s.8.jpg	11,719	23,324	2
/3dspace/servlet/checkout/48352.32064.12265.2755/file-2+Multi+clr+jacquard.jpg	14,729	29,368	2
/3dspace/tvc-action/blockContentRemove/bogus.jsp	38,157	58,698	2
/3dspace/tvc-action/oi-upload/file-ticket-0000000006/364472-Wash%20p.s.pdf;jsessionid=FBF8C106014757E0C5F2512FB52A18CD.host1_plmprod-3	10,688	10,688	1
/3dspace/tvc-action/oi-upload/file-ticket-0000000002/palma%20back%20look.JPG;jsessionid=AA1E4775095015B3CDA85AEA0787ACC7.host1_plmprod-1	10,815	10,815	1
/3dspace/tvc-action/oi-upload/file-ticket-0000000006/frt%20nk%20drop%20on%20sz50.JPG;jsessionid=0ECFB742DF85C955F519B40103C258CC.host1_plmprod-1	10,824	10,824	1

Events - access

November 15th 2018, 17:42:09.538	U1489930818	192.62.49.134	/3dspace/json-actions/persondata/getPersonCache	203,703	23,385	Sweden	200	INV714281	3
November 15th 2018, 17:40:51.173	U2567366278	192.67.140.148	/3dspace/json-actions/persondata/getPersonCache	196,448	23,385	Sweden	200	INV714264	1

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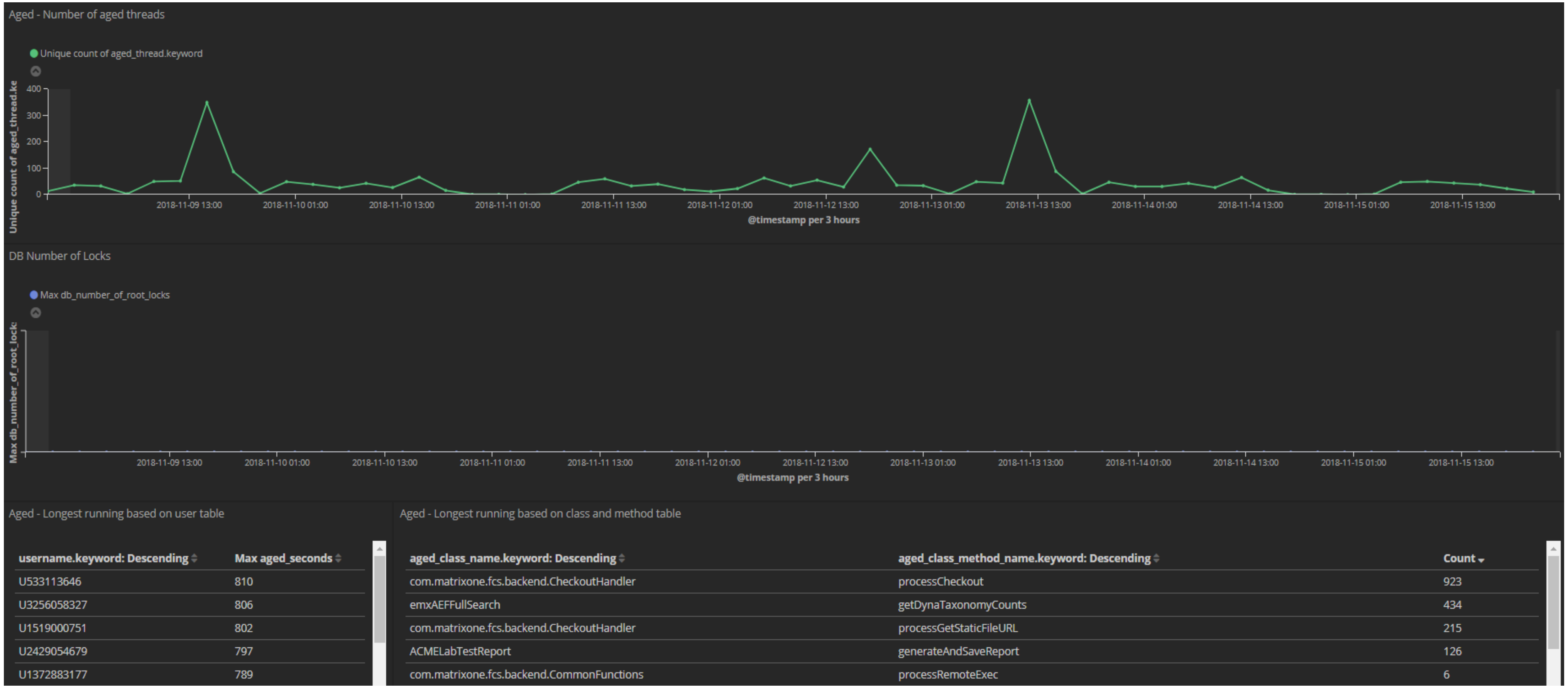
PART OF ADDNODE GROUP

Example: Long running threads & DB locks



Aged - Longest running based on user table

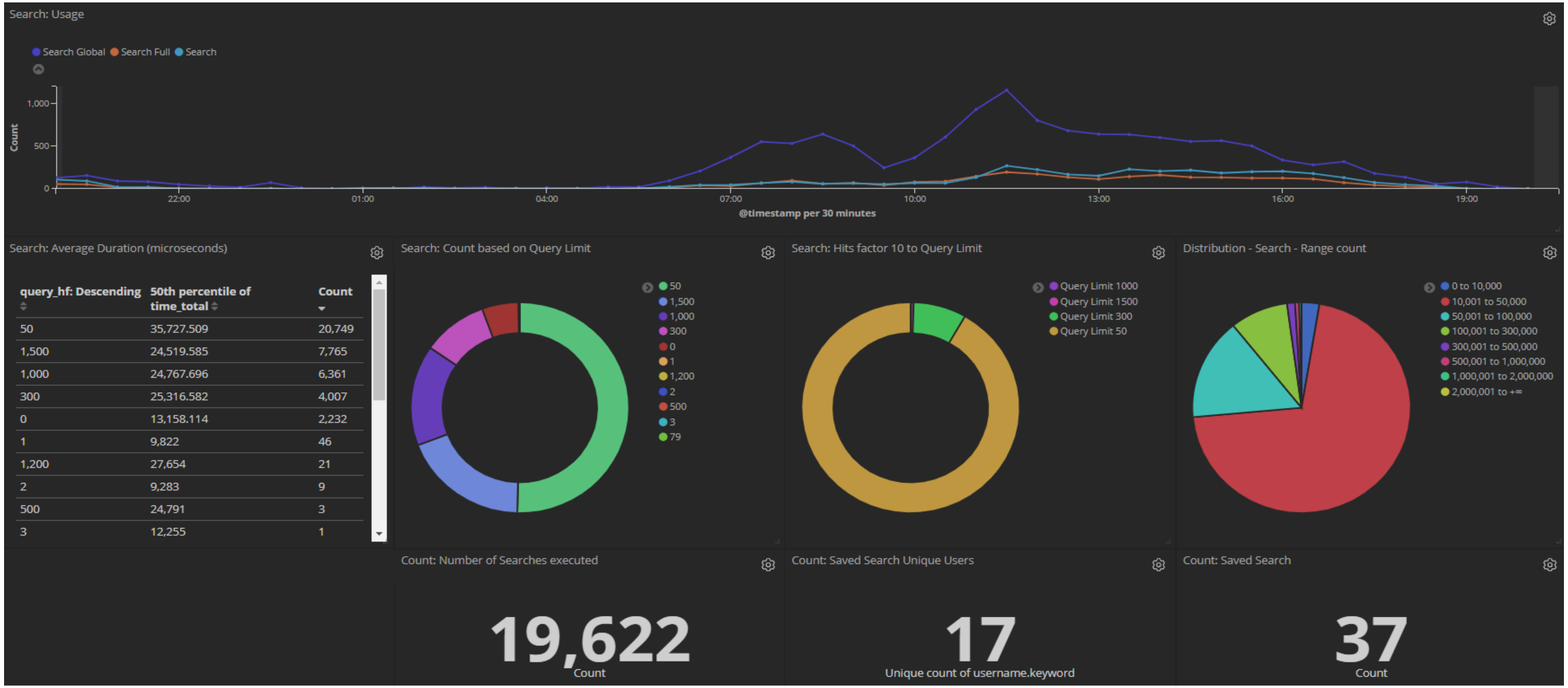
username.keyword: Descending	Max aged_seconds
U533113646	810
U3256058327	806
U1519000751	802
U2429054679	797
U1372883177	789

Aged - Longest running based on class and method table

aged_class_name.keyword: Descending	aged_class_method_name.keyword: Descending	Count
com.matrixone.fcs.backend.CheckoutHandler	processCheckout	923
emxAEFFullSearch	getDynaTaxonomyCounts	434
com.matrixone.fcs.backend.CheckoutHandler	processGetStaticFileURL	215
ACMELabTestReport	generateAndSaveReport	126
com.matrixone.fcs.backend.CommonFunctions	processRemoteExec	6

Value Tools

Example: Usage insight / Search



Search: Usage

● Search Global ● Search Full ● Search
Count
1,000
500
0
22:00
01:00
04:00
07:00
10:00
13:00
16:00
19:00
@timestamp per 30 minutes

Search: Average Duration (microseconds)

query_hf: Descending	50th percentile of time_total	Count
50	35,727.509	20,749
1,500	24,519.585	7,765
1,000	24,767.696	6,361
300	25,316.582	4,007
0	13,158.114	2,232
1	9,822	46
1,200	27,654	21
2	9,283	9
500	24,791	3
3	12,255	1

Search: Count based on Query Limit

Search: Hits factor 10 to Query Limit

Distribution - Search - Range count

Count: Number of Searches executed

19,622
Count

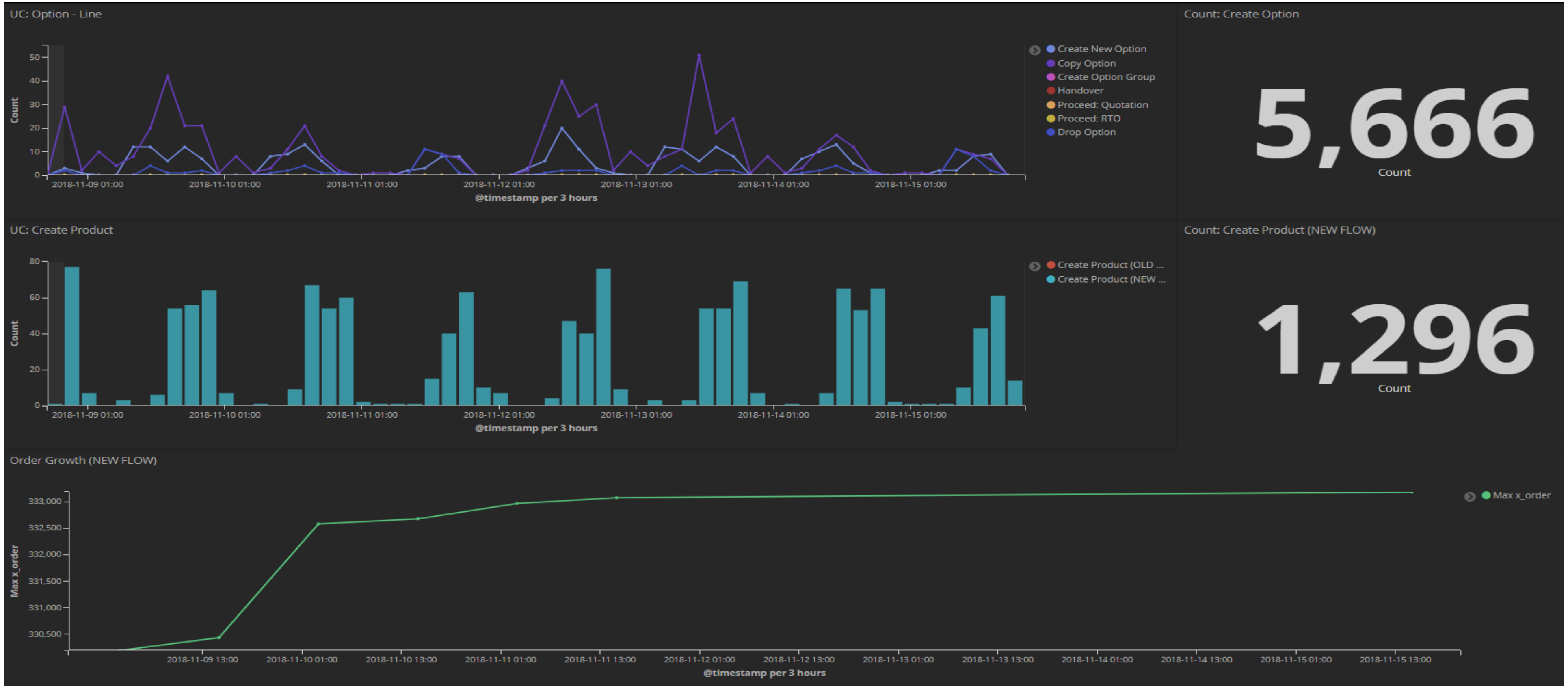
Count: Saved Search Unique Users

17
Unique count of username.keyword

Count: Saved Search

37
Count

Example: Functional use & data growth



Value Tools

TECHNIA
PART OF ADDNODE GROUP

Profiler

Quick and accurate performance analysis

Value Tools

Capture processing details

Usage

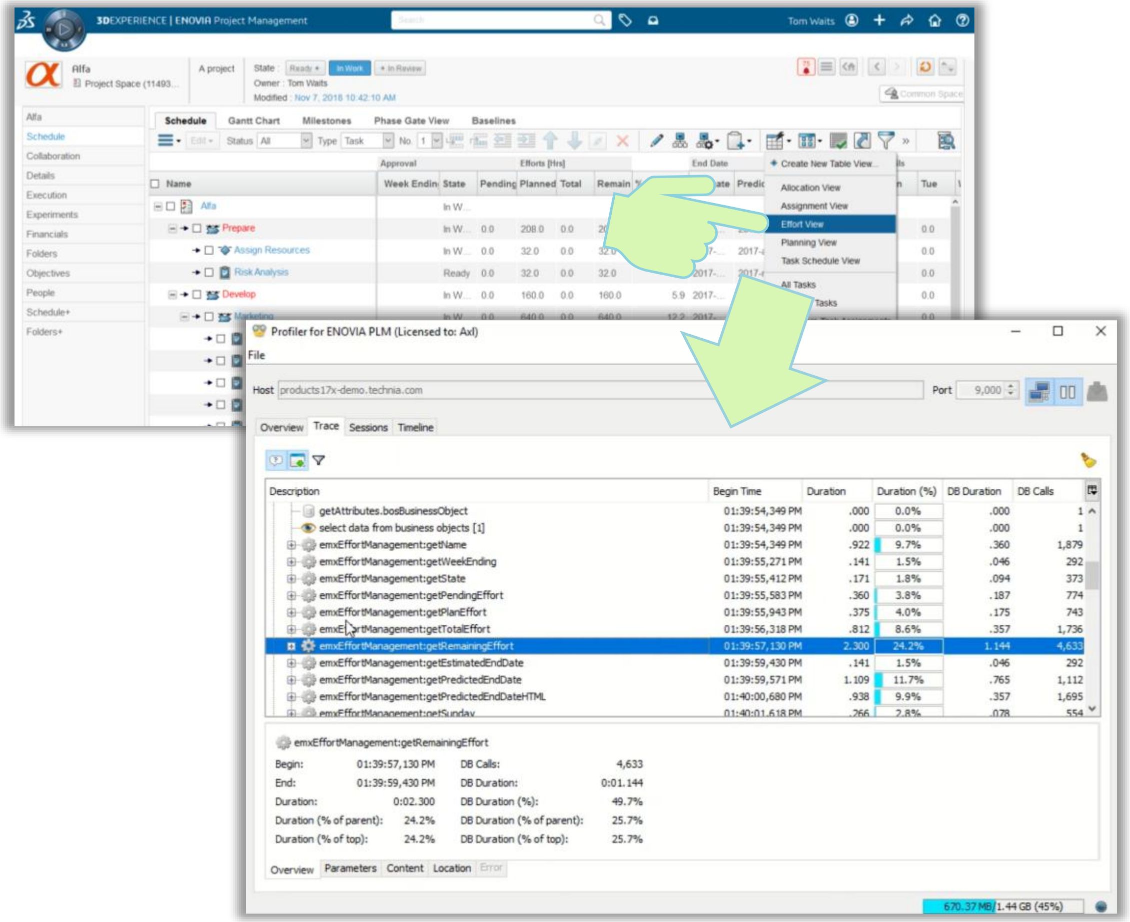
- Performance analysis & trouble shooting
- Code review

Features

- Duration
- Call count
- Filter
- Expand
- Parameters
- Call stack
- Report
- Memory usage

Technology

- Java agent (Aspects, AOP, AspectJ)
  - Monitoring ENOVIA kernel calls
- Client / server

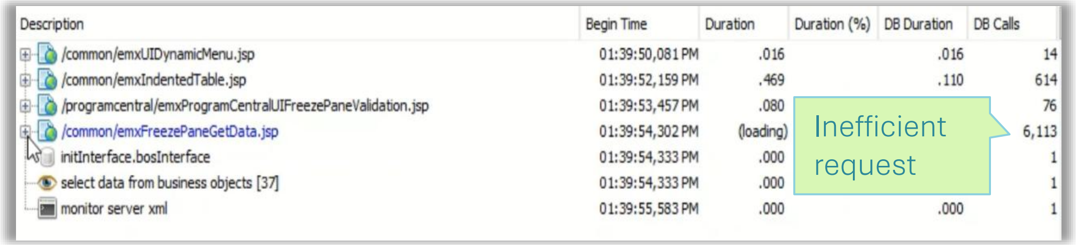


Description	Begin Time	Duration	Duration (%)	DB Duration	DB Calls
getAttributes.bosBusinessObject	01:39:54,349 PM	.000	0.0%	.000	1
select data from business objects [1]	01:39:54,349 PM	.000	0.0%	.000	1
emxEffortManagement:getName	01:39:54,349 PM	.922	9.7%	.360	1,879
emxEffortManagement:getWeekEnding	01:39:55,271 PM	.141	1.5%	.046	292
emxEffortManagement:getState	01:39:55,412 PM	.171	1.8%	.094	373
emxEffortManagement:getPendingEffort	01:39:55,583 PM	.360	3.8%	.187	774
emxEffortManagement:getPlanEffort	01:39:55,943 PM	.375	4.0%	.175	743
emxE rtManagement:getTotalEffort	01:39:56,318 PM	.812	8.6%	.357	1,736
emxEffortManagement:getRemainingEffort	01:39:57,130 PM	2.300	24.2%	1.144	4,633
emxEffortManagement:getEstimatedEndDate	01:39:59,430 PM	.141	1.5%	.046	292
emxEffortManagement:getPredictedEndDate	01:39:59,571 PM	1.109	11.7%	.765	1,112
emxEffortManagement:getPredictedEndDateHTML	01:40:00,680 PM	.938	9.9%	.357	1,695
emxEffortManagement:getSunday	01:40:01,618 PM	.266	2.8%	.078	554

emxEffortManagement:getRemainingEffort

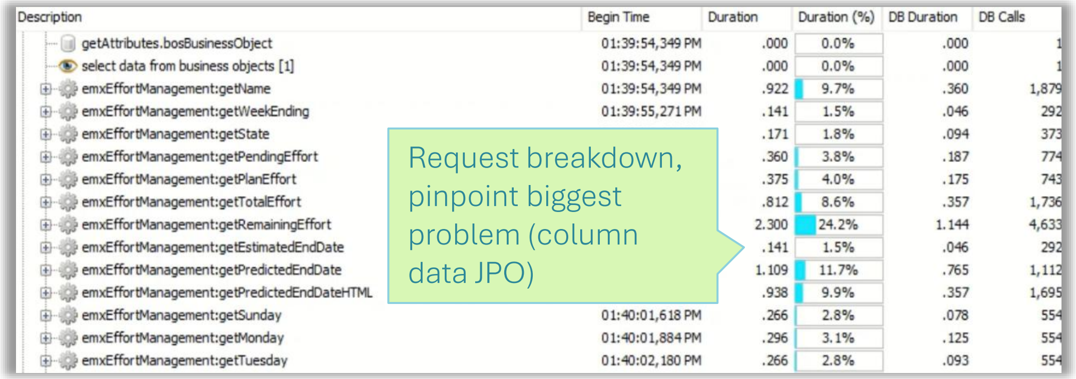
Begin:	01:39:57,130 PM	DB Calls:	4,633
End:	01:39:59,430 PM	DB Duration:	0:01.144
Duration:	0:02.300	DB Duration (%):	49.7%
Duration (% of parent):	24.2%	DB Duration (% of parent):	25.7%
Duration (% of top):	24.2%	DB Duration (% of top):	25.7%

Example: Troubleshooting a slow table view



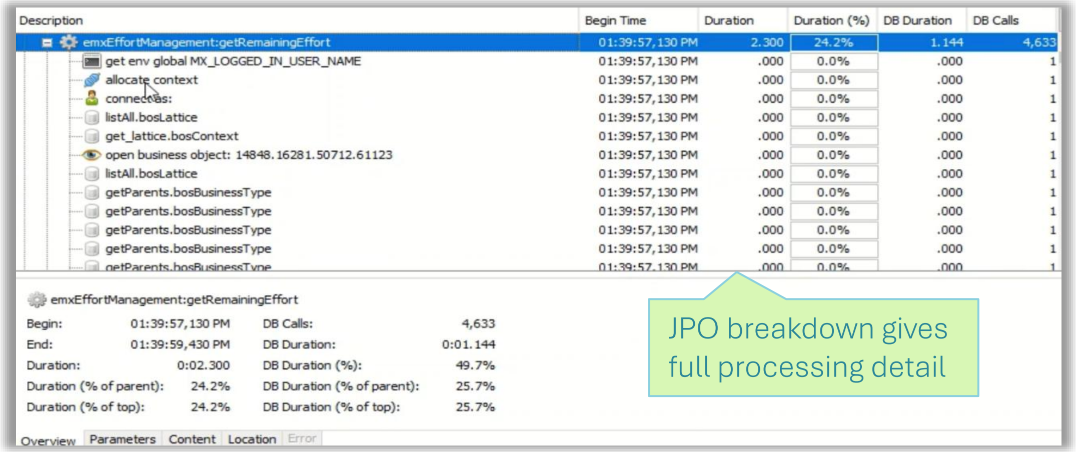
Description	Begin Time	Duration	Duration (%)	DB Duration	DB Calls
/common/emxUIDynamicMenu.jsp	01:39:50,081 PM	.016		.016	14
/common/emxIndentedTable.jsp	01:39:52,159 PM	.469		.110	614
/programcentral/emxProgramCentralUIFreezePaneValidation.jsp	01:39:53,457 PM	.080			76
/common/emxFreezePaneGetData.jsp	01:39:54,302 PM	(loading)			6,113
initInterface.bosInterface	01:39:54,333 PM	.000			1
select data from business objects [37]	01:39:54,333 PM	.000			1
monitor server xml	01:39:55,583 PM	.000		.000	1

Inefficient request



Description	Begin Time	Duration	Duration (%)	DB Duration	DB Calls
getAttributes.bosBusinessObject	01:39:54,349 PM	.000	0.0%	.000	1
select data from business objects [1]	01:39:54,349 PM	.000	0.0%	.000	1
emxEffortManagement:getName	01:39:54,349 PM	.922	9.7%	.360	1,879
emxEffortManagement:getWeekEnding	01:39:55,271 PM	.141	1.5%	.046	292
emxEffortManagement:getState		.171	1.8%	.094	373
emxEffortManagement:getPendingEffort		.360	3.8%	.187	774
emxEffortManagement:getPlanEffort		.375	4.0%	.175	743
emxEffortManagement:getTotalEffort		.812	8.6%	.357	1,736
emxEffortManagement:getRemainingEffort		2.300	24.2%	1.144	4,633
emxEffortManagement:getEstimatedEndDate		.141	1.5%	.046	292
emxEffortManagement:getPredictedEndDate		1.109	11.7%	.765	1,112
emxEffortManagement:getPredictedEndDateHTML		.938	9.9%	.357	1,695
emxEffortManagement:getSunday	01:40:01,618 PM	.266	2.8%	.078	554
emxEffortManagement:getMonday	01:40:01,884 PM	.296	3.1%	.125	554
emxEffortManagement:getTuesday	01:40:02,180 PM	.266	2.8%	.093	554

Request breakdown, pinpoint biggest problem (column data JPO)

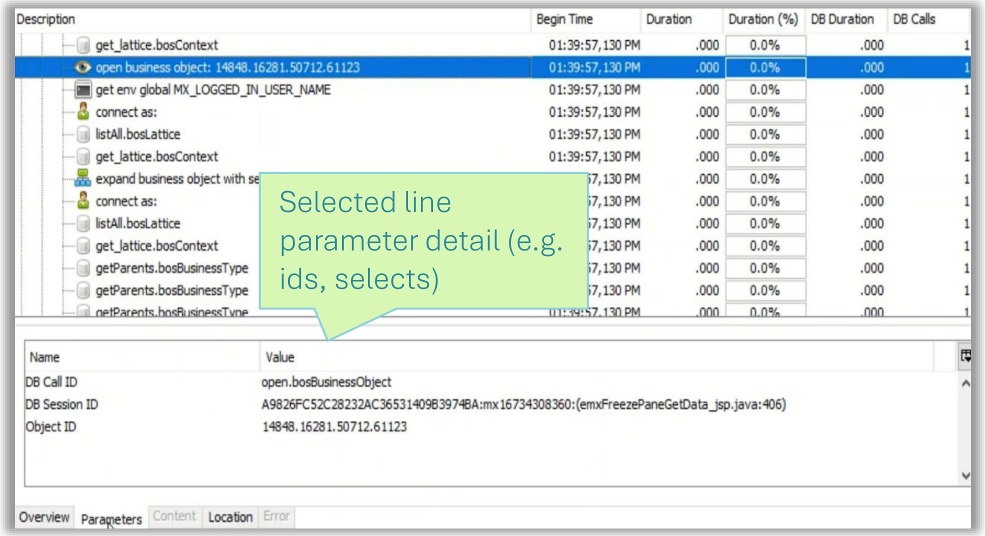


Description	Begin Time	Duration	Duration (%)	DB Duration	DB Calls
emxEffortManagement:getRemainingEffort	01:39:57,130 PM	2.300	24.2%	1.144	4,633
get env global MX_LOGGED_IN_USER_NAME	01:39:57,130 PM	.000	0.0%	.000	1
allocate context	01:39:57,130 PM	.000	0.0%	.000	1
connect as:	01:39:57,130 PM	.000	0.0%	.000	1
listAll.bosLattice	01:39:57,130 PM	.000	0.0%	.000	1
get_lattice.bosContext	01:39:57,130 PM	.000	0.0%	.000	1
open business object: 14848.16281.50712.61123	01:39:57,130 PM	.000	0.0%	.000	1
listAll.bosLattice	01:39:57,130 PM	.000	0.0%	.000	1
getParents.bosBusinessType	01:39:57,130 PM	.000	0.0%	.000	1
getParents.bosBusinessType	01:39:57,130 PM	.000	0.0%	.000	1
getParents.bosBusinessType	01:39:57,130 PM	.000	0.0%	.000	1
getParents.bosBusinessType	01:39:57,130 PM	.000	0.0%	.000	1
getParents.bosBusinessType	01:39:57,130 PM	.000	0.0%	.000	1

emxEffortManagement:getRemainingEffort

Begin:	01:39:57,130 PM	DB Calls:	4,633
End:	01:39:59,430 PM	DB Duration:	0:01.144
Duration:	0:02.300	DB Duration (%):	49.7%
Duration (% of parent):	24.2%	DB Duration (% of parent):	25.7%
Duration (% of top):	24.2%	DB Duration (% of top):	25.7%

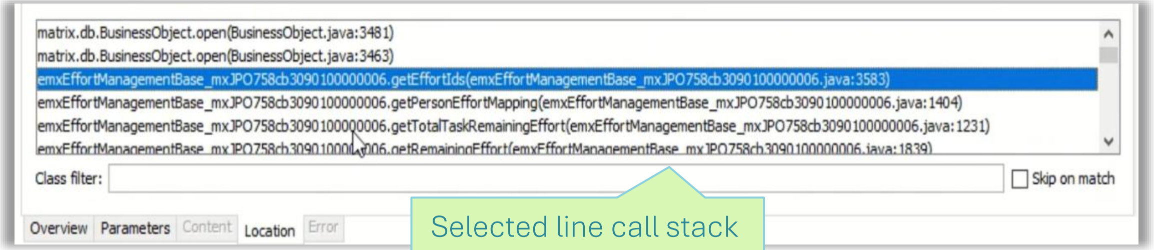
JPO breakdown gives full processing detail



Description	Begin Time	Duration	Duration (%)	DB Duration	DB Calls
get_lattice.bosContext	01:39:57,130 PM	.000	0.0%	.000	1
open business object: 14848.16281.50712.61123	01:39:57,130 PM	.000	0.0%	.000	1
get env global MX_LOGGED_IN_USER_NAME	01:39:57,130 PM	.000	0.0%	.000	1
connect as:	01:39:57,130 PM	.000	0.0%	.000	1
listAll.bosLattice	01:39:57,130 PM	.000	0.0%	.000	1
get_lattice.bosContext	01:39:57,130 PM	.000	0.0%	.000	1
expand business object with se	7,130 PM	.000	0.0%	.000	1
connect as:	7,130 PM	.000	0.0%	.000	1
listAll.bosLattice	7,130 PM	.000	0.0%	.000	1
get_lattice.bosContext	7,130 PM	.000	0.0%	.000	1
getParents.bosBusinessType	7,130 PM	.000	0.0%	.000	1
getParents.bosBusinessType	7,130 PM	.000	0.0%	.000	1
getParents.bosBusinessType	01:39:57,130 PM	.000	0.0%	.000	1

Name	Value
DB Call ID	open.bosBusinessObject
DB Session ID	A9826FC52C28232AC36531409B3974BA:mx16734308360:(emxFreezePaneGetData_jsp.java:406)
Object ID	14848.16281.50712.61123

Selected line parameter detail (e.g. ids, selects)



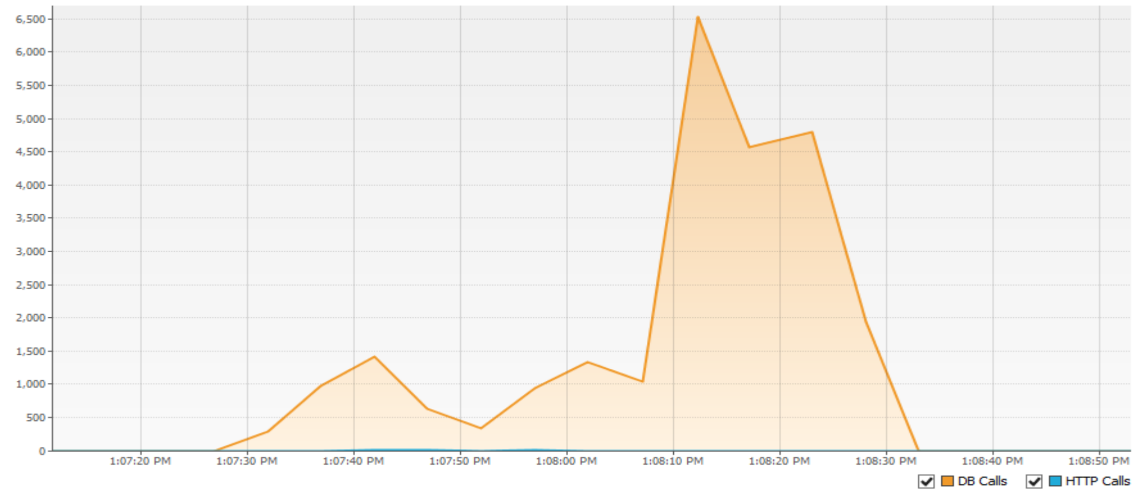
```
matrix.db.BusinessObject.open(BusinessObject.java:3481)
matrix.db.BusinessObject.open(BusinessObject.java:3463)
emxEffortManagementBase_mxJPO758cb3090100000006.getEffortIds(emxEffortManagementBase_mxJPO758cb3090100000006.java:3583)
emxEffortManagementBase_mxJPO758cb3090100000006.getPersonEffortMapping(emxEffortManagementBase_mxJPO758cb3090100000006.java:1404)
emxEffortManagementBase_mxJPO758cb3090100000006.getTotalTaskRemainingEffort(emxEffortManagementBase_mxJPO758cb3090100000006.java:1231)
emxEffortManagementBase_mxJPO758cb3090100000006.getRemainingEffort(emxEffortManagementBase_mxJPO758cb3090100000006.java:1839)
```

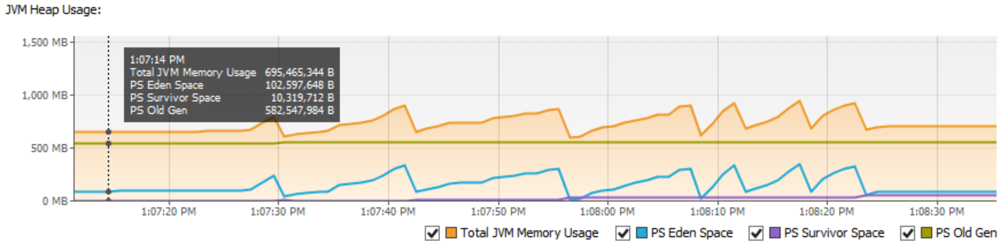
Class filter: □ Skip on match

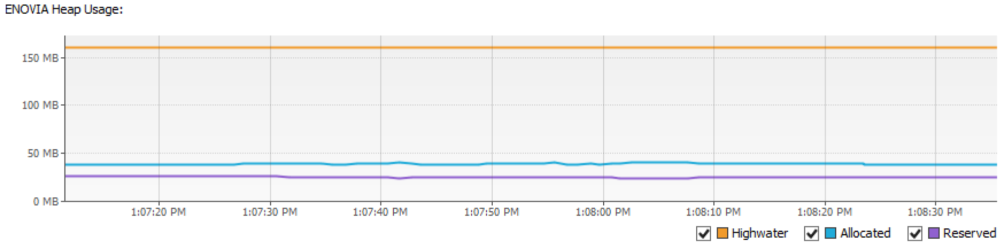
Selected line call stack gives you the line of code to fix

Value Tools

Example: Troubleshooting a slow table view

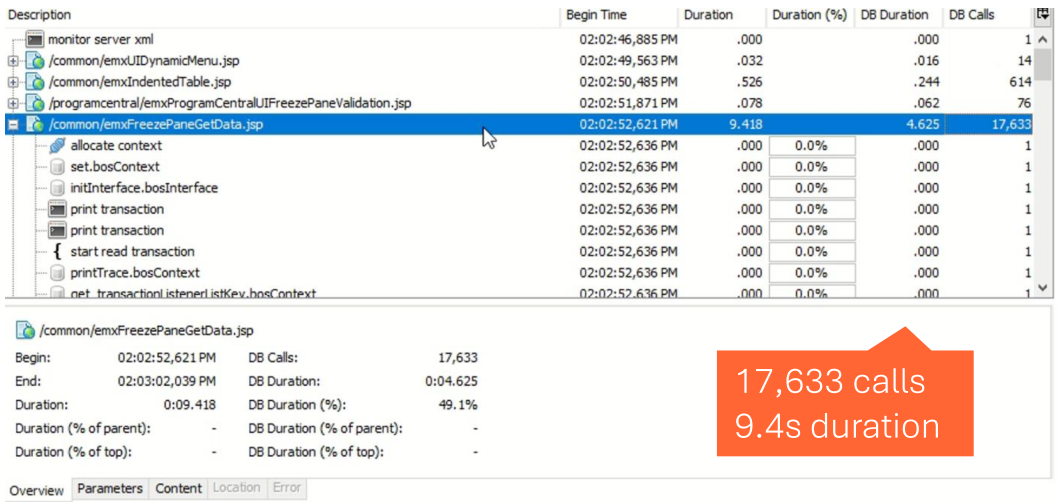






Example: Troubleshooting a slow table view

Poor coding example



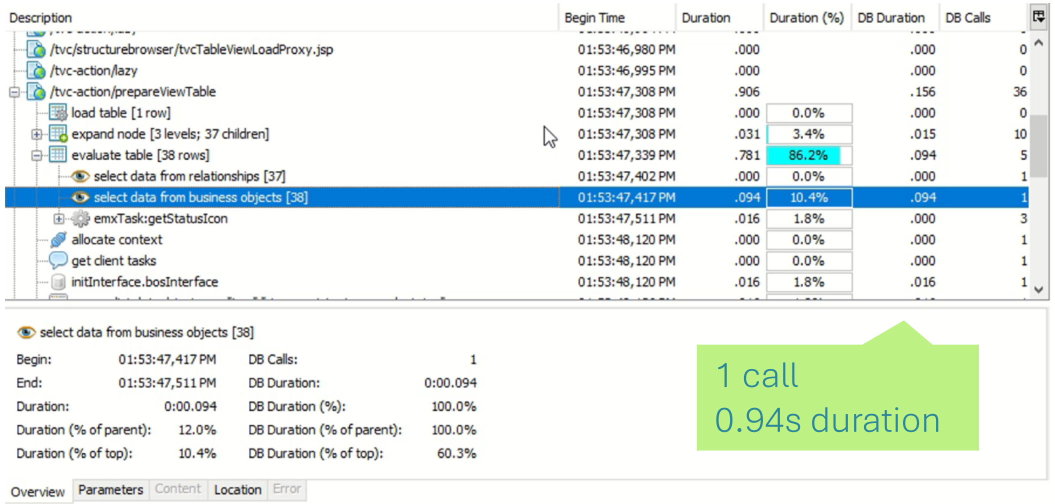
Description	Begin Time	Duration	Duration (%)	DB Duration	DB Calls
monitor server xml	02:02:46,885 PM	.000		.000	1
/common/emxUIDynamicMenu.jsp	02:02:49,563 PM	.032		.016	14
/common/emxIndentedTable.jsp	02:02:50,485 PM	.526		.244	614
/programcentral/emxProgramCentralUIFreezePaneValidation.jsp	02:02:51,871 PM	.078		.062	76
/common/emxFreezePaneGetData.jsp	02:02:52,621 PM	9.418		4.625	17,633
allocate context	02:02:52,636 PM	.000	0.0%	.000	1
set.bosContext	02:02:52,636 PM	.000	0.0%	.000	1
initInterface.bosInterface	02:02:52,636 PM	.000	0.0%	.000	1
print transaction	02:02:52,636 PM	.000	0.0%	.000	1
print transaction	02:02:52,636 PM	.000	0.0%	.000	1
start read transaction	02:02:52,636 PM	.000	0.0%	.000	1
printTrace.bosContext	02:02:52,636 PM	.000	0.0%	.000	1
get_transactionListenerListKey.bosContext	02:02:52,636 PM	.000	0.0%	.000	1

/common/emxFreezePaneGetData.jsp

Begin:	02:02:52,621 PM	DB Calls:	17,633
End:	02:03:02,039 PM	DB Duration:	0:04.625
Duration:	0:09.418	DB Duration (%):	49.1%
Duration (% of parent):	-	DB Duration (% of parent):	-
Duration (% of top):	-	DB Duration (% of top):	-

17,633 calls
9.4s duration

Good coding example



Description	Begin Time	Duration	Duration (%)	DB Duration	DB Calls
/tvc/structurebrowser/tvcTableViewLoadProxy.jsp	01:53:46,980 PM	.000		.000	0
/tvc-action/lazy	01:53:46,995 PM	.000		.000	0
/tvc-action/prepareViewTable	01:53:47,308 PM	.906		.156	36
load table [1 row]	01:53:47,308 PM	.000	0.0%	.000	0
expand node [3 levels; 37 children]	01:53:47,308 PM	.031	3.4%	.015	10
evaluate table [38 rows]	01:53:47,339 PM	.781	86.2%	.094	5
select data from relationships [37]	01:53:47,402 PM	.000	0.0%	.000	1
select data from business objects [38]	01:53:47,417 PM	.094	10.4%	.094	1
emxTask:getStatusIcon	01:53:47,511 PM	.016	1.8%	.000	3
allocate context	01:53:48,120 PM	.000	0.0%	.000	1
get client tasks	01:53:48,120 PM	.000	0.0%	.000	1
initInterface.bosInterface	01:53:48,120 PM	.016	1.8%	.016	1

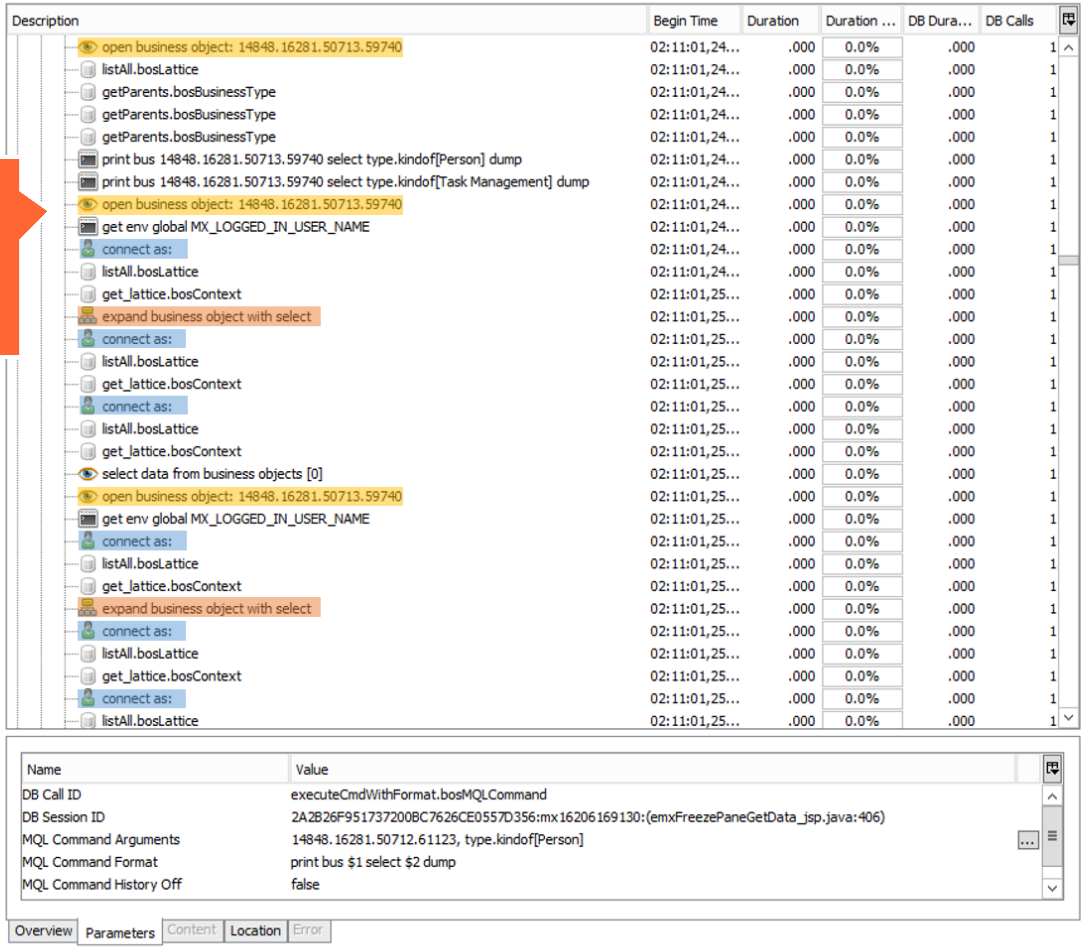
select data from business objects [38]

Begin:	01:53:47,417 PM	DB Calls:	1
End:	01:53:47,511 PM	DB Duration:	0:00.094
Duration:	0:00.094	DB Duration (%):	100.0%
Duration (% of parent):	12.0%	DB Duration (% of parent):	100.0%
Duration (% of top):	10.4%	DB Duration (% of top):	60.3%

1 call
0.94s duration

Example: Troubleshooting a slow table view

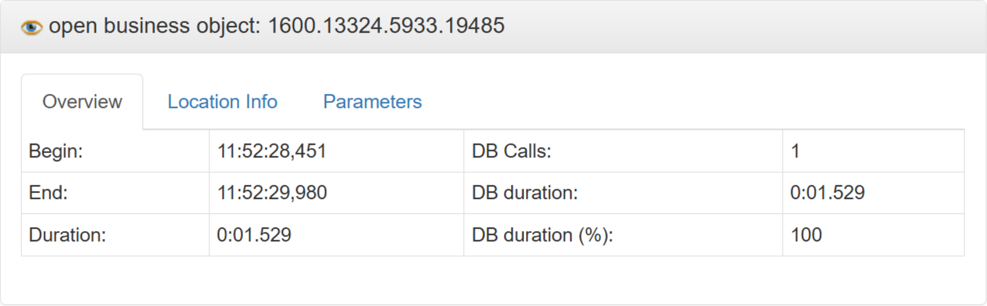
PROBLEM
Iterative data retrieval, sometimes from same ID



Description	Begin Time	Duration	Duration ...	DB Dura...	DB Calls
open business object: 14848.16281.50713.59740	02:11:01,24...	.000	0.0%	.000	1
listAll.bosLattice	02:11:01,24...	.000	0.0%	.000	1
getParents.bosBusinessType	02:11:01,24...	.000	0.0%	.000	1
getParents.bosBusinessType	02:11:01,24...	.000	0.0%	.000	1
getParents.bosBusinessType	02:11:01,24...	.000	0.0%	.000	1
print bus 14848.16281.50713.59740 select type.kindof[Person] dump	02:11:01,24...	.000	0.0%	.000	1
print bus 14848.16281.50713.59740 select type.kindof[Task Management] dump	02:11:01,24...	.000	0.0%	.000	1
open business object: 14848.16281.50713.59740	02:11:01,24...	.000	0.0%	.000	1
get env global MX_LOGGED_IN_USER_NAME	02:11:01,24...	.000	0.0%	.000	1
connect as:	02:11:01,24...	.000	0.0%	.000	1
listAll.bosLattice	02:11:01,24...	.000	0.0%	.000	1
get_lattice.bosContext	02:11:01,25...	.000	0.0%	.000	1
expand business object with select	02:11:01,25...	.000	0.0%	.000	1
connect as:	02:11:01,25...	.000	0.0%	.000	1
listAll.bosLattice	02:11:01,25...	.000	0.0%	.000	1
get_lattice.bosContext	02:11:01,25...	.000	0.0%	.000	1
connect as:	02:11:01,25...	.000	0.0%	.000	1
listAll.bosLattice	02:11:01,25...	.000	0.0%	.000	1
get_lattice.bosContext	02:11:01,25...	.000	0.0%	.000	1
select data from business objects [0]	02:11:01,25...	.000	0.0%	.000	1
open business object: 14848.16281.50713.59740	02:11:01,25...	.000	0.0%	.000	1
get env global MX_LOGGED_IN_USER_NAME	02:11:01,25...	.000	0.0%	.000	1
connect as:	02:11:01,25...	.000	0.0%	.000	1
listAll.bosLattice	02:11:01,25...	.000	0.0%	.000	1
get_lattice.bosContext	02:11:01,25...	.000	0.0%	.000	1
expand business object with select	02:11:01,25...	.000	0.0%	.000	1
connect as:	02:11:01,25...	.000	0.0%	.000	1
listAll.bosLattice	02:11:01,25...	.000	0.0%	.000	1
get_lattice.bosContext	02:11:01,25...	.000	0.0%	.000	1
connect as:	02:11:01,25...	.000	0.0%	.000	1
listAll.bosLattice	02:11:01,25...	.000	0.0%	.000	1

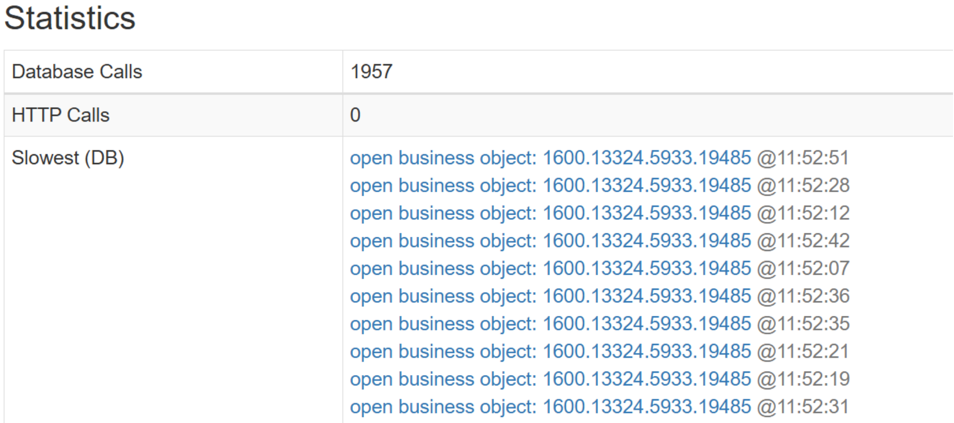
Name	Value
DB Call ID	executeCmdWithFormat.bosMQLCommand
DB Session ID	2A2B26F951737200BC7626CE0557D356:mx16206169130:(emxFreezePaneGetData_jsp.java:406)
MQL Command Arguments	14848.16281.50712.61123, type.kindof[Person]
MQL Command Format	print bus $1 select $2 dump
MQL Command History Off	false

Example: Report (export & share)



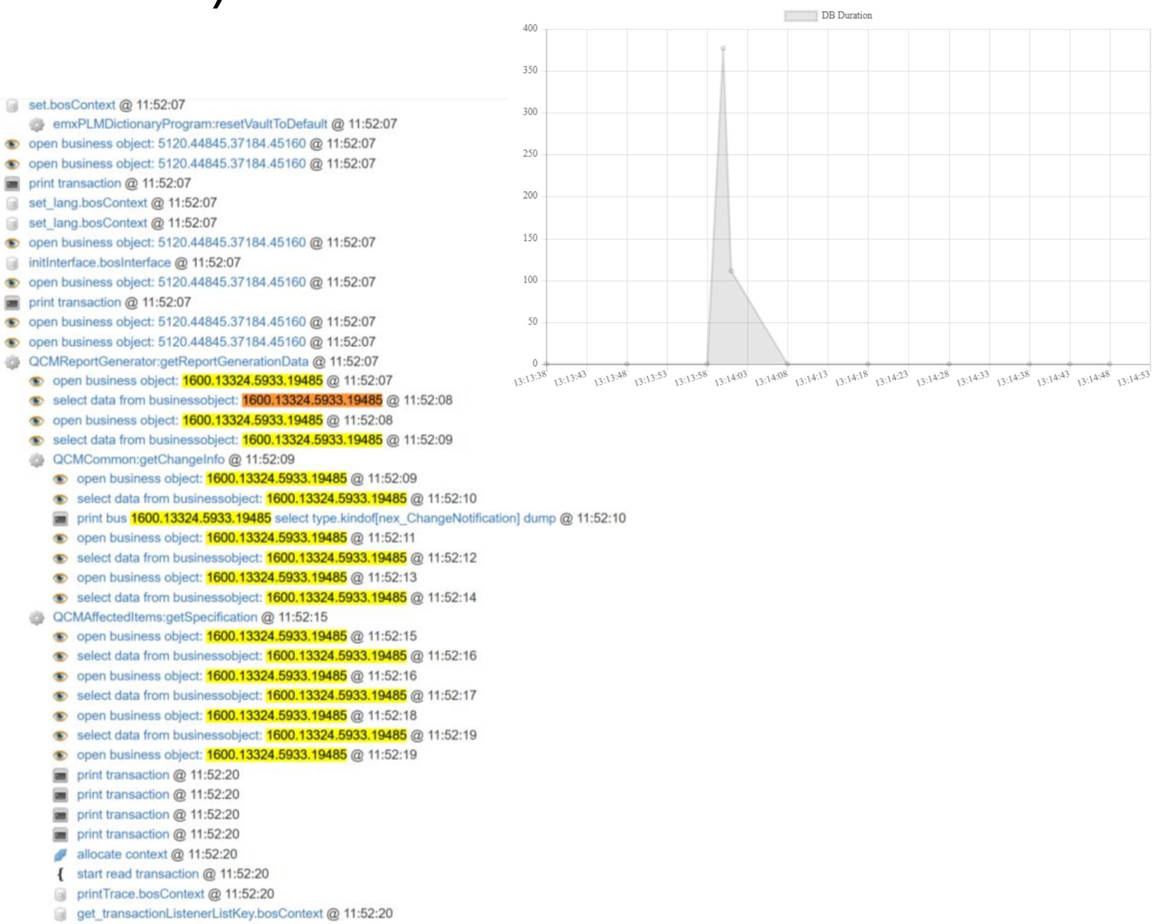
open business object: 1600.13324.5933.19485

Begin:	11:52:28,451	DB Calls:	1
End:	11:52:29,980	DB duration:	0:01.529
Duration:	0:01.529	DB duration (%):	100



Statistics

Database Calls	1957
HTTP Calls	0
Slowest (DB)	open business object: 1600.13324.5933.19485 @11:52:51 open business object: 1600.13324.5933.19485 @11:52:28 open business object: 1600.13324.5933.19485 @11:52:12 open business object: 1600.13324.5933.19485 @11:52:42 open business object: 1600.13324.5933.19485 @11:52:07 open business object: 1600.13324.5933.19485 @11:52:36 open business object: 1600.13324.5933.19485 @11:52:35 open business object: 1600.13324.5933.19485 @11:52:21 open business object: 1600.13324.5933.19485 @11:52:19 open business object: 1600.13324.5933.19485 @11:52:31



```
set.bosContext @ 11:52:07
  emxPLMDictionaryProgram:resetVaultToDefault @ 11:52:07
open business object: 5120.44845.37184.45160 @ 11:52:07
open business object: 5120.44845.37184.45160 @ 11:52:07
print transaction @ 11:52:07
set_lang.bosContext @ 11:52:07
set_lang.bosContext @ 11:52:07
open business object: 5120.44845.37184.45160 @ 11:52:07
initInterface.bosInterface @ 11:52:07
open business object: 5120.44845.37184.45160 @ 11:52:07
print transaction @ 11:52:07
open business object: 5120.44845.37184.45160 @ 11:52:07
open business object: 5120.44845.37184.45160 @ 11:52:07
QCMReportGenerator:getReportGenerationData @ 11:52:07
  open business object: 1600.13324.5933.19485 @ 11:52:07
  select data from businessobject: 1600.13324.5933.19485 @ 11:52:08
  open business object: 1600.13324.5933.19485 @ 11:52:08
  select data from businessobject: 1600.13324.5933.19485 @ 11:52:09
  QCMCommon:getChangeInfo @ 11:52:09
    open business object: 1600.13324.5933.19485 @ 11:52:09
    select data from businessobject: 1600.13324.5933.19485 @ 11:52:10
    print bus 1600.13324.5933.19485 select type.kindof[nex_ChangeNotification] dump @ 11:52:10
    open business object: 1600.13324.5933.19485 @ 11:52:11
    select data from businessobject: 1600.13324.5933.19485 @ 11:52:12
    open business object: 1600.13324.5933.19485 @ 11:52:13
    select data from businessobject: 1600.13324.5933.19485 @ 11:52:14
  QCMAffectedItems:getSpecification @ 11:52:15
    open business object: 1600.13324.5933.19485 @ 11:52:15
    select data from businessobject: 1600.13324.5933.19485 @ 11:52:16
    open business object: 1600.13324.5933.19485 @ 11:52:16
    select data from businessobject: 1600.13324.5933.19485 @ 11:52:17
    open business object: 1600.13324.5933.19485 @ 11:52:18
    select data from businessobject: 1600.13324.5933.19485 @ 11:52:19
    open business object: 1600.13324.5933.19485 @ 11:52:19
    print transaction @ 11:52:20
    print transaction @ 11:52:20
    print transaction @ 11:52:20
    print transaction @ 11:52:20
    allocate context @ 11:52:20
  { start read transaction @ 11:52:20
    printTrace.bosContext @ 11:52:20
    get_transactionListenerListKey.bosContext @ 11:52:20
```

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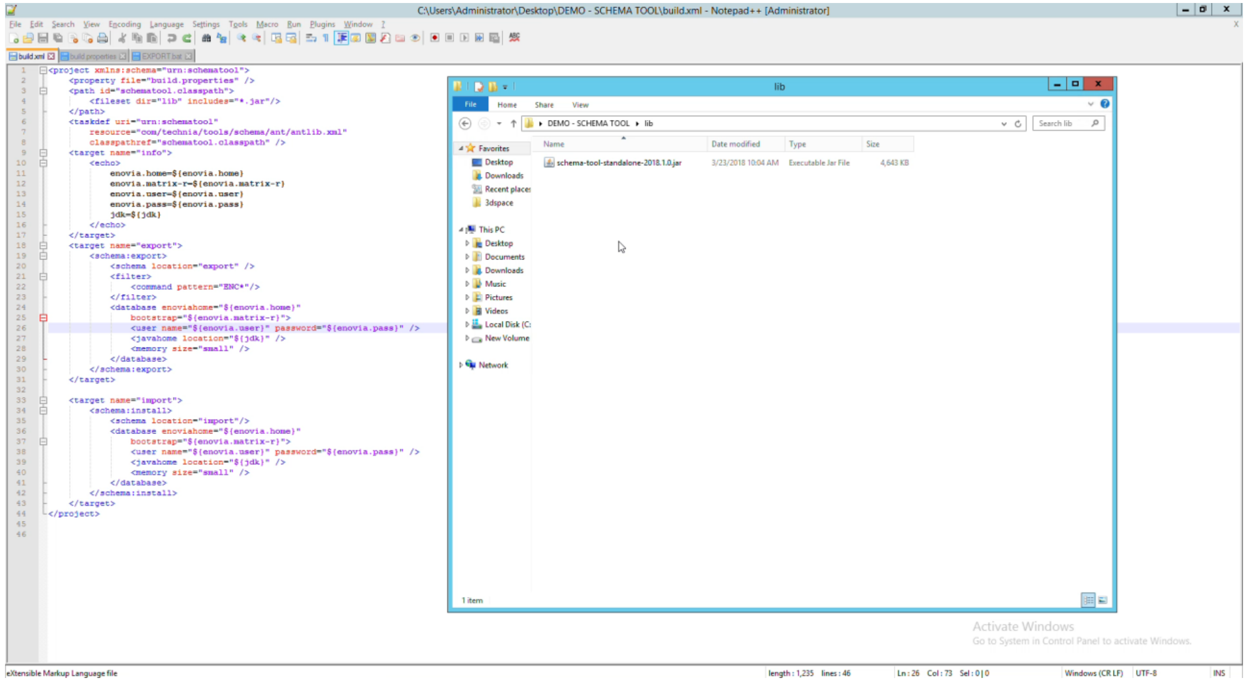
Schema tool

Declarative schema management, concurrent development, failsafe deployment, and upgrade analysis.

Value Tools

Overview

- Export
- Import
- Filter (include / exclude)
- Delta
- Declarative
- Extend
- Modules
- Generate script / mql
- All admin types
- Admin objects



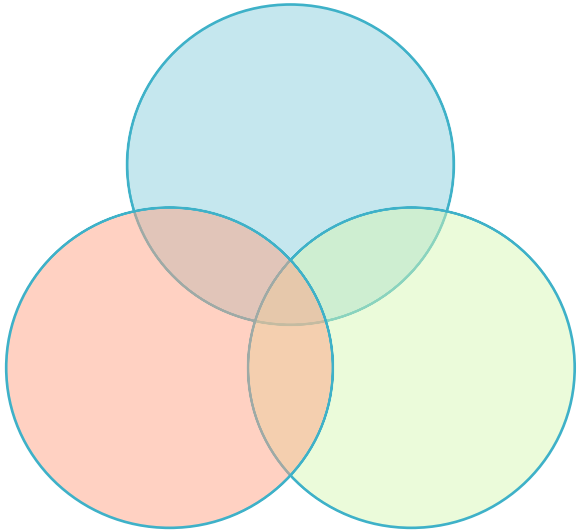
C:\Users\Administrator\Desktop\DEMO - SCHEMA TOOL\build.xml - Notepad++ [Administrator]
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
build.xml
build.properties
EXPORT.bat
lib
File Home Share View
DEMO - SCHEMA TOOL ▸ lib
Search lib
Favorites
Desktop
Downloads
Recent places
3dspace
This PC
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:
New Volume
Network
1 item
Activate Windows
Go to System in Control Panel to activate Windows.
eXtensible Markup Language file
length : 1,235 lines : 46
Ln : 26 Col : 73 Sel : 0 | 0
Windows (CR LF) UTF-8 INS

```xml
<project xmlns:schema="urn:schematool">
    <property file="build.properties" />
    <path id="schematool.classpath">
        <fileset dir="lib" includes="*.jar"/>
    </path>
    <taskdef uri="urn:schematool"
        resource="com/technia/tools/schema/ant/antlib.xml"
        classpathref="schematool.classpath" />
    <target name="info">
        <echo>
            enovia.home=${enovia.home}
            enovia.matrix-r=${enovia.matrix-r}
            enovia.user=${enovia.user}
            enovia.pass=${enovia.pass}
            jdk=${jdk}
        </echo>
    </target>
    <target name="export">
        <schema:export>
            <schema location="export" />
            <filter>
                <command pattern="ENC*"/>
            </filter>
            <database enoviahome="${enovia.home}"
                bootstrap="${enovia.matrix-r}">
                <user name="${enovia.user}" password="${enovia.pass}" />
                <javahome location="${jdk}" />
                <memory size="small" />
            </database>
        </schema:export>
    </target>

    <target name="import">
        <schema:install>
            <schema location="import"/>
            <database enoviahome="${enovia.home}"
                bootstrap="${enovia.matrix-r}">
                <user name="${enovia.user}" password="${enovia.pass}" />
                <javahome location="${jdk}" />
                <memory size="small" />
            </database>
        </schema:install>
    </target>
</project>
```

Name	Date modified	Type	Size
schema-tool-standalone-2018.1.0.jar	3/23/2018 10:04 AM	Executable Jar File	4,643 KB

Upgrades analysis and execution



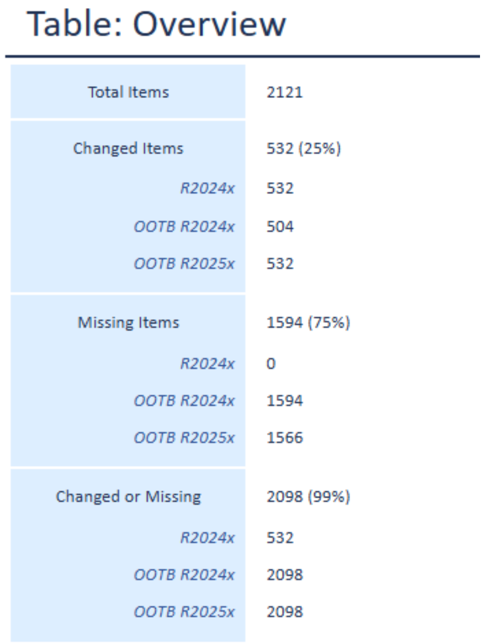
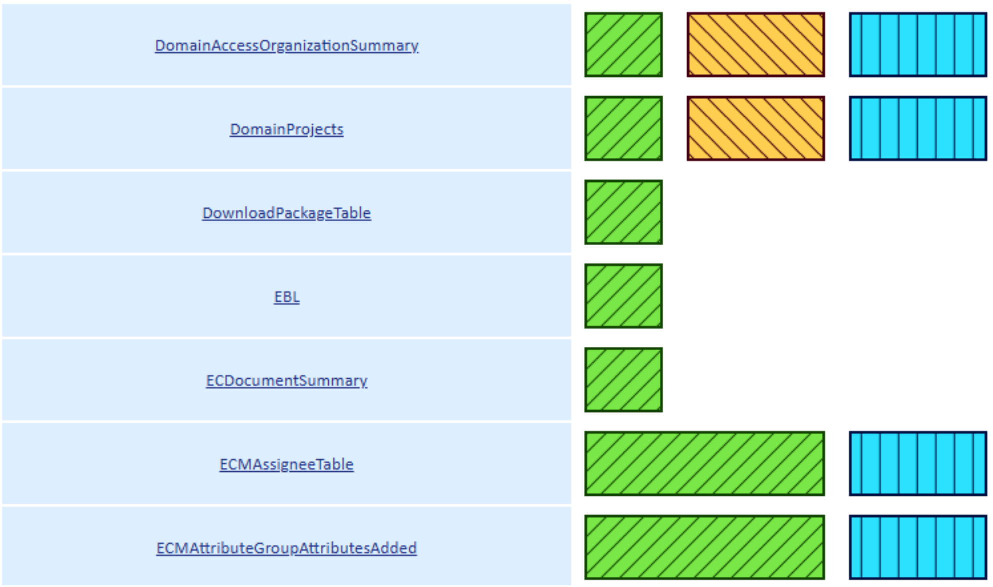


Table: Overview

Total Items	2121
Changed Items	532 (25%)
R2024x	532
OOTB R2024x	504
OOTB R2025x	532
Missing Items	1594 (75%)
R2024x	0
OOTB R2024x	1594
OOTB R2025x	1566
Changed or Missing	2098 (99%)
R2024x	532
OOTB R2024x	2098
OOTB R2025x	2098



DomainAccessOrganizationSummary	🟩	🟧	🟦
DomainProjects	🟩	🟧	🟦
DownloadPackageTable	🟩		
EBL	🟩		
ECDocumentSummary	🟩		
ECMAssigneeTable	🟩		🟦
ECMAttributeGroupAttributesAdded	🟩		🟦

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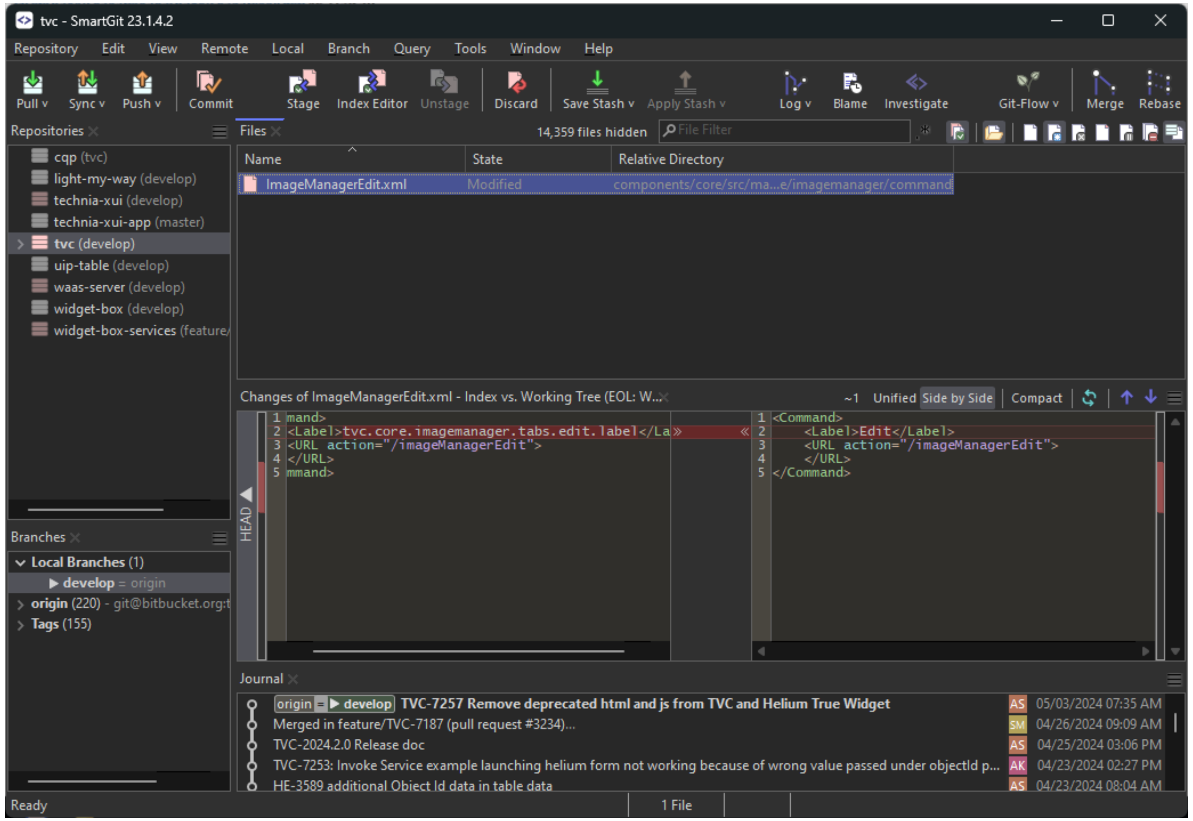
Concurrent development

- XML
- Development friendly format
- SCM merge
- Compare
- Discrete files
- Version independent



Name	State	Relative Directory
ImageManagerEdit.xml	Modified	components/core/src/ma...e/imagemanager/command

Changes of ImageManagerEdit.xml - Index vs. Working Tree (EOL: W...

```
mand>
<Label>tvc.core.imagemanager.tabs.edit.label</La
<URL action="/imageManagerEdit">
</URL>
mmand>
```

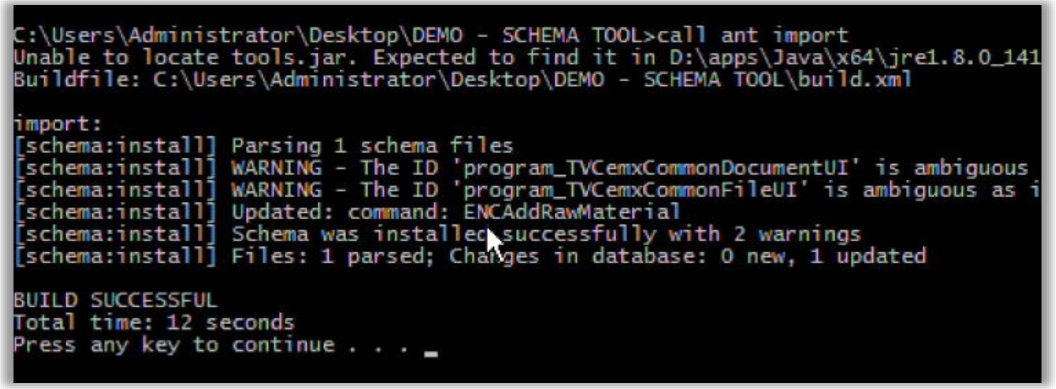
```
<Command>
    <Label>Edit</Label>
    <URL action="/imageManagerEdit">
    </URL>
</Command>
```

```
origin = ▶ develop TVC-7257 Remove deprecated html and js from TVC and Helium True Widget   AS 05/03/2024 07:35 AM
Merged in feature/TVC-7187 (pull request #3234)...                                            SM 04/26/2024 09:09 AM
TVC-2024.2.0 Release doc                                                                      AS 04/25/2024 03:06 PM
TVC-7253: Invoke Service example launching helium form not working because of wrong value passed under objectId p...   AK 04/23/2024 02:27 PM
HE-3589 additional Object Id data in table data                                               AS 04/23/2024 08:04 AM
```

Value Tools

Failsafe deployment & dev-ops pipelines

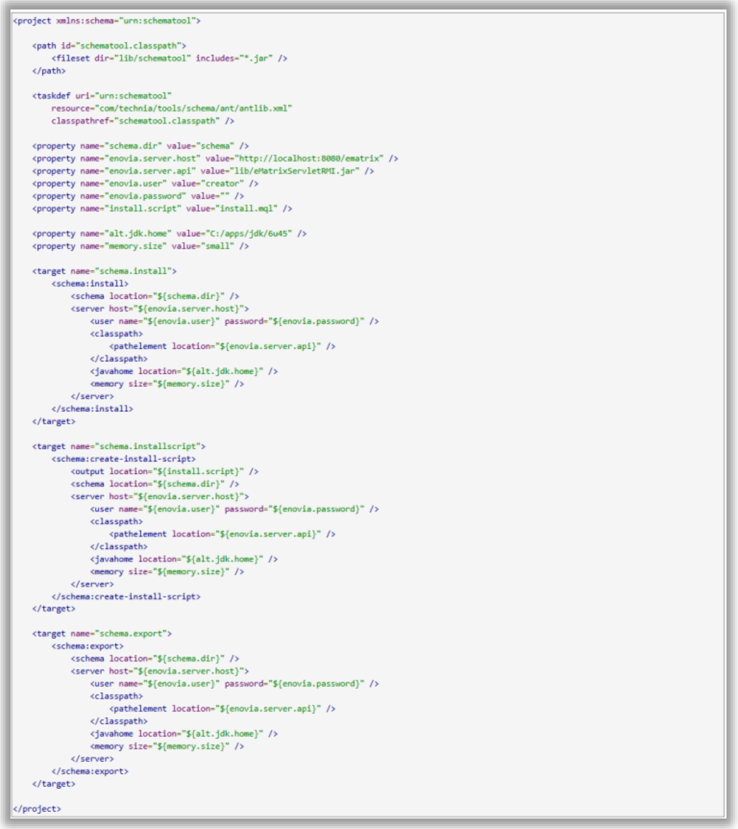
- Ant
  - Command line
  - Jenkins
- Delta
- Extend



```
C:\Users\Administrator\Desktop\DEMO - SCHEMA TOOL>call ant import
Unable to locate tools.jar. Expected to find it in D:\apps\Java\x64\jre1.8.0_141
Buildfile: C:\Users\Administrator\Desktop\DEMO - SCHEMA TOOL\build.xml

import:
[schema:install] Parsing 1 schema files
[schema:install] WARNING - The ID 'program_TVCemxCommonDocumentUI' is ambiguous
[schema:install] WARNING - The ID 'program_TVCemxCommonFileUI' is ambiguous as i
[schema:install] Updated: command: ENCAddRawMaterial
[schema:install] Schema was installed successfully with 2 warnings
[schema:install] Files: 1 parsed; Changes in database: 0 new, 1 updated

BUILD SUCCESSFUL
Total time: 12 seconds
Press any key to continue . . . _
```



```xml
<project xmlns:schema="urn:schematool">

    <path id="schematool.classpath">
        <fileset dir="lib/schematool" includes="*.jar" />
    </path>

    <taskdef uri="urn:schematool"
        resource="com/technia/tools/schema/ant/antlib.xml"
        classpathref="schematool.classpath" />

    <property name="schema.dir" value="schema" />
    <property name="enovia.server.host" value="http://localhost:8080/ematrix" />
    <property name="enovia.server.api" value="lib/eMatrixServletRMI.jar" />
    <property name="enovia.user" value="creator" />
    <property name="enovia.password" value="" />
    <property name="install.script" value="install.mql" />

    <property name="alt.jdk.home" value="C:/apps/jdk/6u45" />
    <property name="memory.size" value="small" />

    <target name="schema.install">
        <schema:install>
            <schema location="${schema.dir}" />
            <server host="${enovia.server.host}">
                <user name="${enovia.user}" password="${enovia.password}" />
                <classpath>
                    <pathelement location="${enovia.server.api}" />
                </classpath>
                <javahome location="${alt.jdk.home}" />
                <memory size="${memory.size}" />
            </server>
        </schema:install>
    </target>

    <target name="schema.installscript">
        <schema:create-install-script>
            <output location="${install.script}" />
            <schema location="${schema.dir}" />
            <server host="${enovia.server.host}">
                <user name="${enovia.user}" password="${enovia.password}" />
                <classpath>
                    <pathelement location="${enovia.server.api}" />
                </classpath>
                <javahome location="${alt.jdk.home}" />
                <memory size="${memory.size}" />
            </server>
        </schema:create-install-script>
    </target>

    <target name="schema.export">
        <schema:export>
            <schema location="${schema.dir}" />
            <server host="${enovia.server.host}">
                <user name="${enovia.user}" password="${enovia.password}" />
                <classpath>
                    <pathelement location="${enovia.server.api}" />
                </classpath>
                <javahome location="${alt.jdk.home}" />
                <memory size="${memory.size}" />
            </server>
        </schema:export>
    </target>

</project>
```

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About TECHNIA

Few things are more complex, costly, or time-consuming than bringing new products to market.

In fiercely competitive industries, increased efficiency and transparency are more in demand than ever. That's why we help clients deploy unique solutions that simplify processes, drive product innovation, and shorten time to market.

We're not saying it will always be straightforward. But with the right mix of technology, people, and dedication, we reduce complexity so companies can accelerate and excel.

We're forward-thinking problem solvers, and we love working with ambitious clients. For us, it's about making sure companies overcome barriers on their way to breakthroughs.

It's about bringing smarter products to market faster.