End to End Analysis on System z IBM Transaction Analysis Workbench for z/OS

James Martin

IBM Tools Product SME

August 10, 2015

Please note

IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion.

Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision.

The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code or functionality. Information about potential future products may not be incorporated into any contract. The development, release, and timing of any future features or functionality described for our products remains at our sole discretion.

Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput or performance that any user will experience will vary depending upon many factors, including considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve results similar to those stated here.

Agenda

- Mainframe Transaction Facts
- What is Transaction Analysis Workbench? (TAW)
- The Transaction Index
- Workbench and Big Data
- Workbench for Application Teams
- Summary

Facts about mainframe transactions

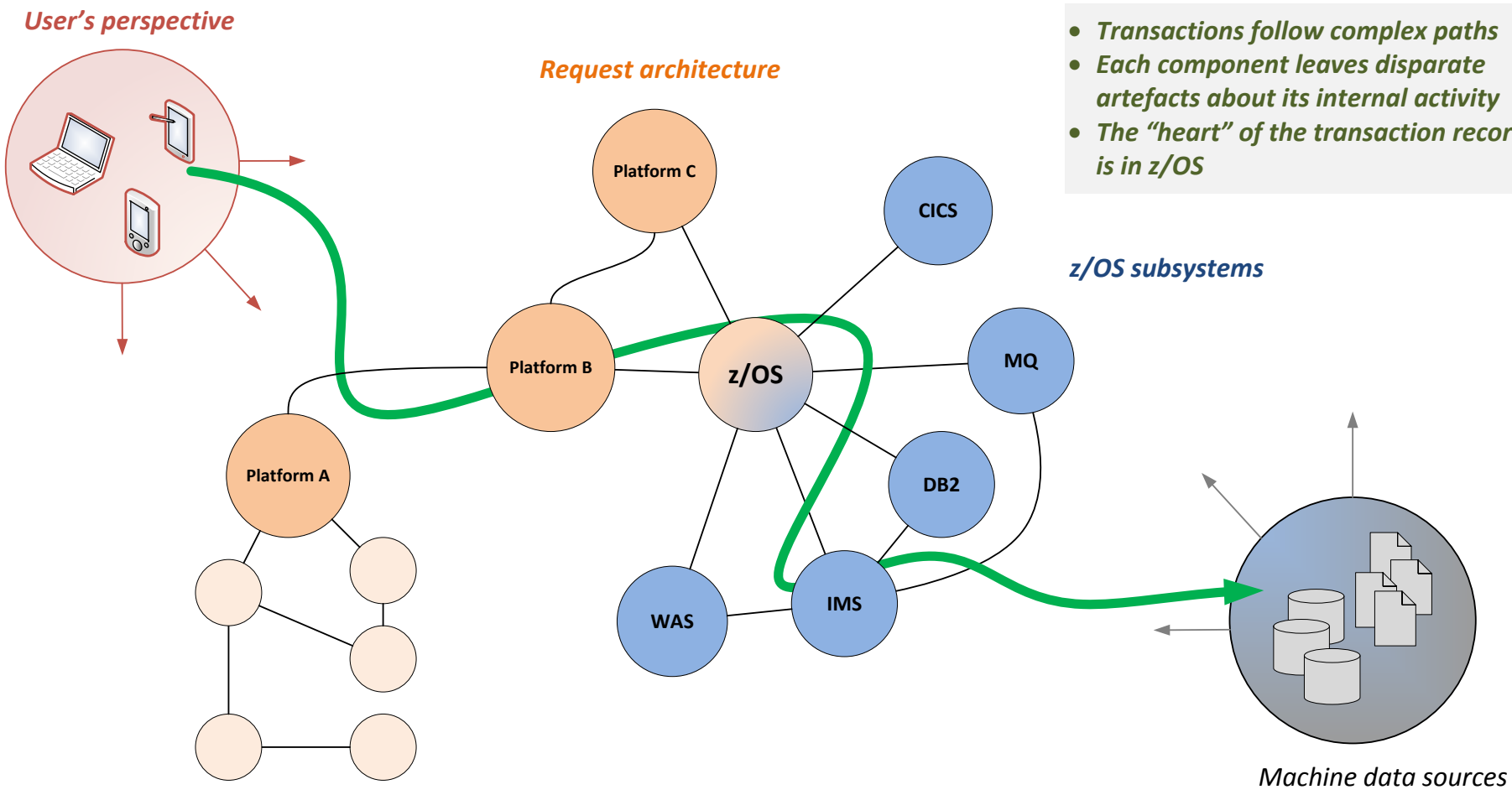
- More than half of enterprise applications call upon the mainframe to complete transactions
  - Workloads are increasing and getting more varied
  - MIPS consumption has increased by over a quarter since interaction with mobile application workloads began
- Complexity is creating new risks in relation to application performance
- High customer expectations are increasing the pressure on the mainframe to perform

Pain points – what CIOs are saying

- Key findings:
  - 74% think that the added complexity of applications is making problem resolution take longer
  - 75% are being pressured to reduce Mean-Time-To-Resolution
  - 79% have no visibility of the actual end-user experience are often unaware of performance problems until calls start coming in to the help desk
  - 79% say there is a ‘war room’ situation in their organisation on a monthly basis

- Compuware published a 350-strong CIO survey
  - http://www.bobsguide.com/guide/news/2013/Dec/5/global-cio-survey-finds-fears-over-negative-impact-of-distributed-apps-on-the-mainframe.html

z/OS: the heart of the transaction record

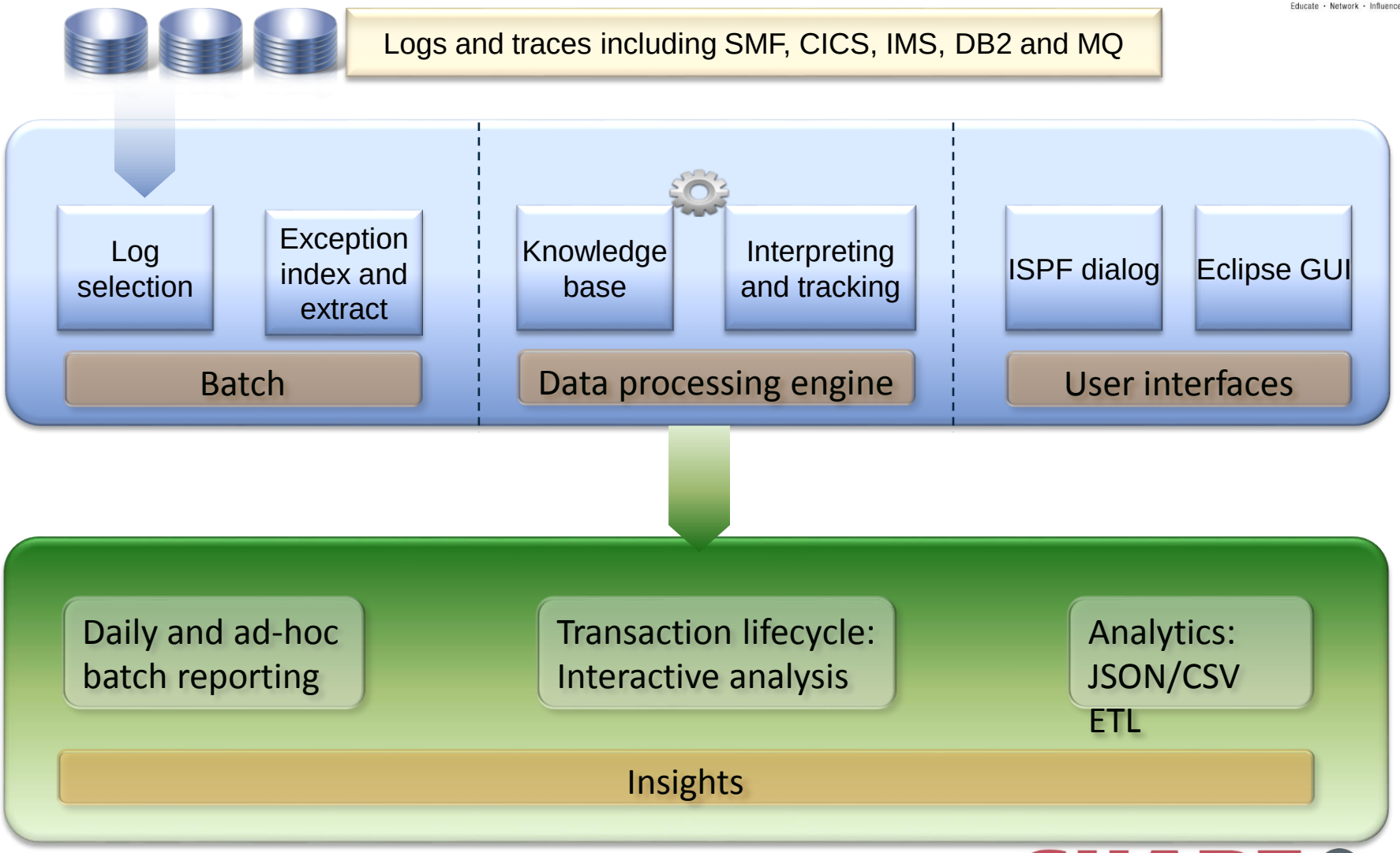


- *Transactions follow complex paths*
- *Each component leaves disparate artefacts about its internal activity*
- *The "heart" of the transaction record is in z/OS*

Workbench solution

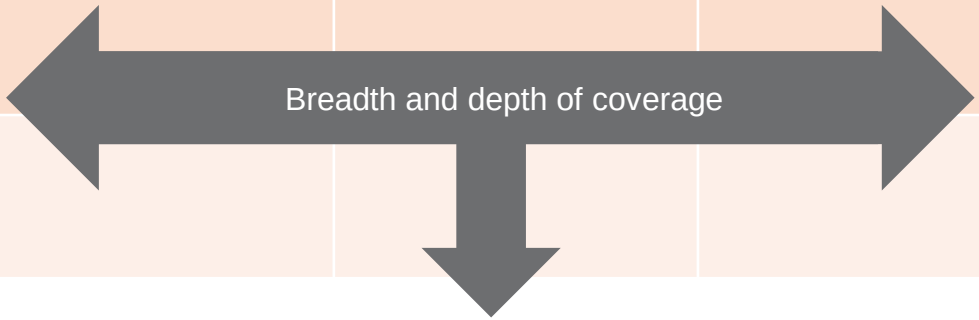
- **A single platform for z/OS transactional problem management**
  - Comprehensive performance analysis with a pedigree in *benchmark* CICS and IMS performance tools adding IBM MQ, z/OS Connect, WAS, and DB2
  - Tracing and profiling of transactions, even across subsystems
- **Minimal overhead**
  - Uses the logs and traces generated by z/OS and the various subsystems during normal transaction processing
- **Simplifies collection and analysis**
  - Automatically selects the required log data from each subsystem
  - Instantly combine and slice information sources in real time
  - Automate problem determination steps and disseminate knowledge through workflows
- **Exposes logs and other z/OS traces to off-host analysis**
  - ETL for Hadoop or using Logstash
  - Input for mobile workload pricing calculation

The Workbench architecture



Extensive and growing coverage

IMS	CICS	DB2	MQ, WAS, and z/OS Connect	z/OS
IMS log and trace	CMF performance class (SMF 110)	DB2 log	MQ log extract	SMF
IMS monitor	CICS trace (Auxiliary or GTF)	DB2 accounting	MQ statistics (SMF 115-1, -2)	OPERLOG
CQS log stream	VSAM Journals	DB2 performance trace (IFCIDs)	MQ accounting (SMF 116)	
IMS Connect event data (collected by IMS Connect Extensions)		Near Term History (collected by OMEGAMON XE for DB2)	WAS request activity performance statistics (SMF 120-9,11)	
OMEGAMON ATF				
IRLM long lock detection (SMF 79-15)				

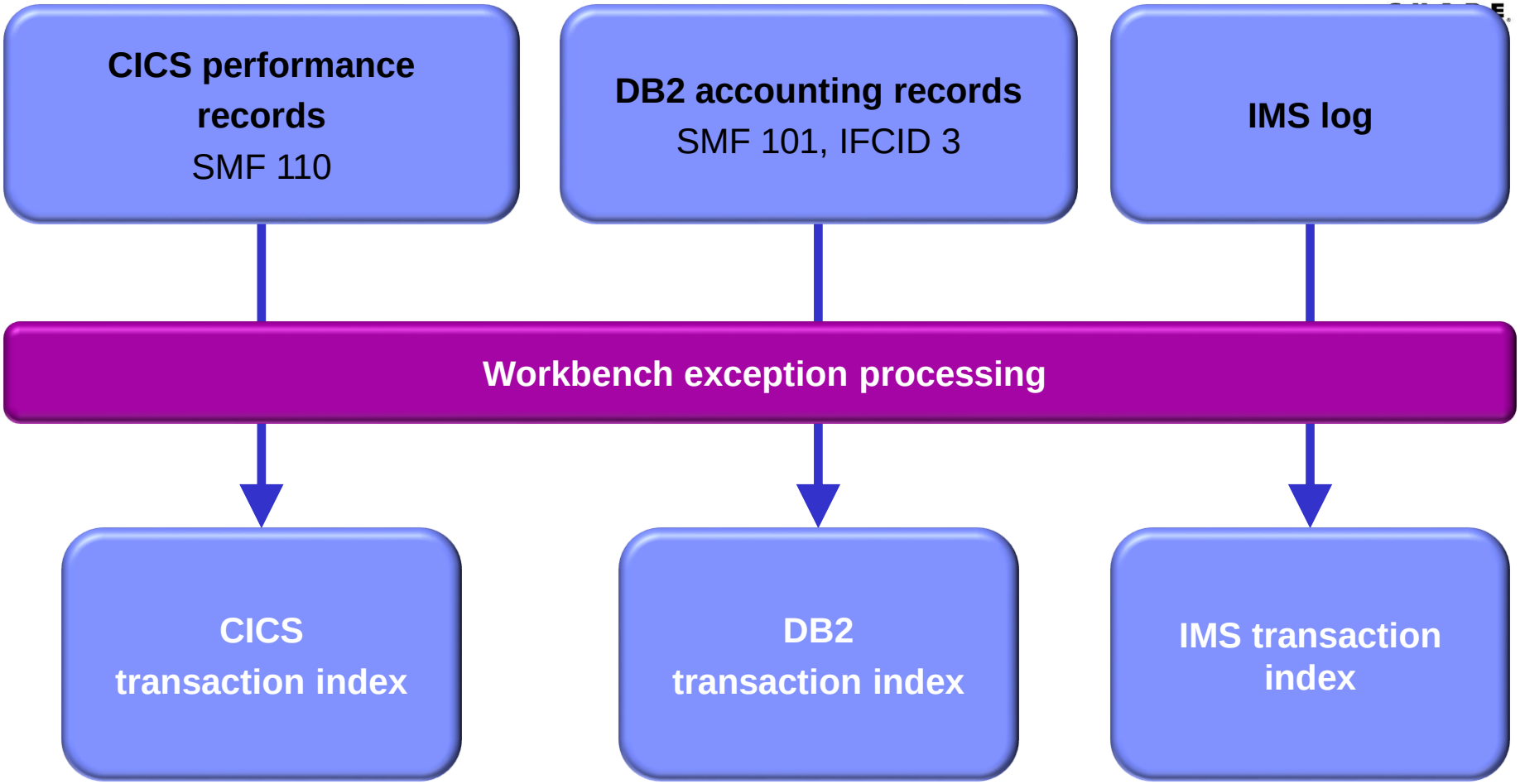


- Formatting
- Interpreting
- Relating
- Selecting
- Reducing
- ETL

The Transaction Index record

- Transaction indexes are a specialized type of extract that contain a single record type, where each record contains information about a single transaction (or thread), sorted in time sequence
  - Each record in a transaction index contains summarized information about the performance of a transaction and the resources that it consumed
  - You can use criteria that refer to field values in transaction index records to quickly identify problem transactions

Exception processing for CICS, DB2, and IMS

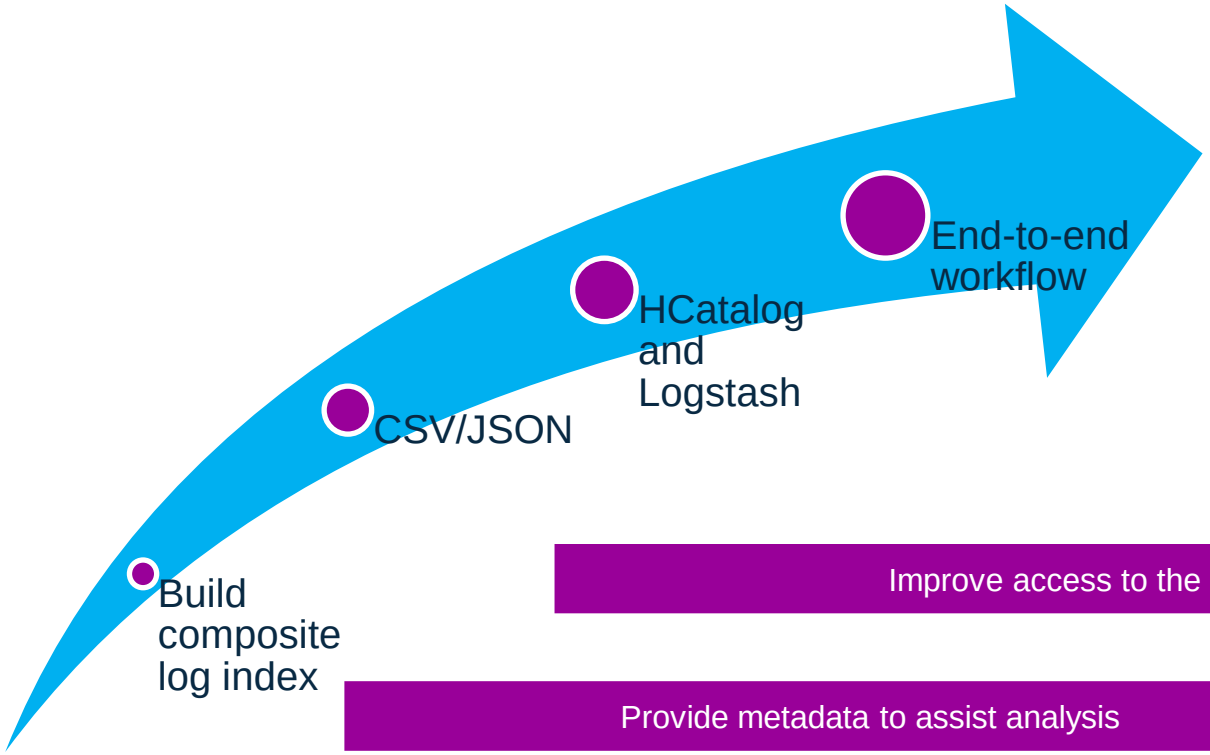


1. Transaction indexes are created by the workbench (a session workflow will create them)
2. They are used to identify all the transaction and UOR workloads in IMS, DB2 and CICS
3. The transaction index is a special extract - one record per transaction in time sequence
4. Contain summarized performance and resource usage information
5. Can be filtered to include exception transactions only
6. Can be used for reporting and to identify problem transactions

Making z/OS performance data available

- Big data tooling provides an opportunity to take analysis to the next level
  - Perform analyses that were previously not feasible
  - Valuable new insights into system performance and security
- Standardized and unified approach to all operational analysis
- Combining z/OS operational data with data from other platforms
- Reduced cost of analysis and storage making long term historical trend analysis cost effective

Open and scalable performance analysis

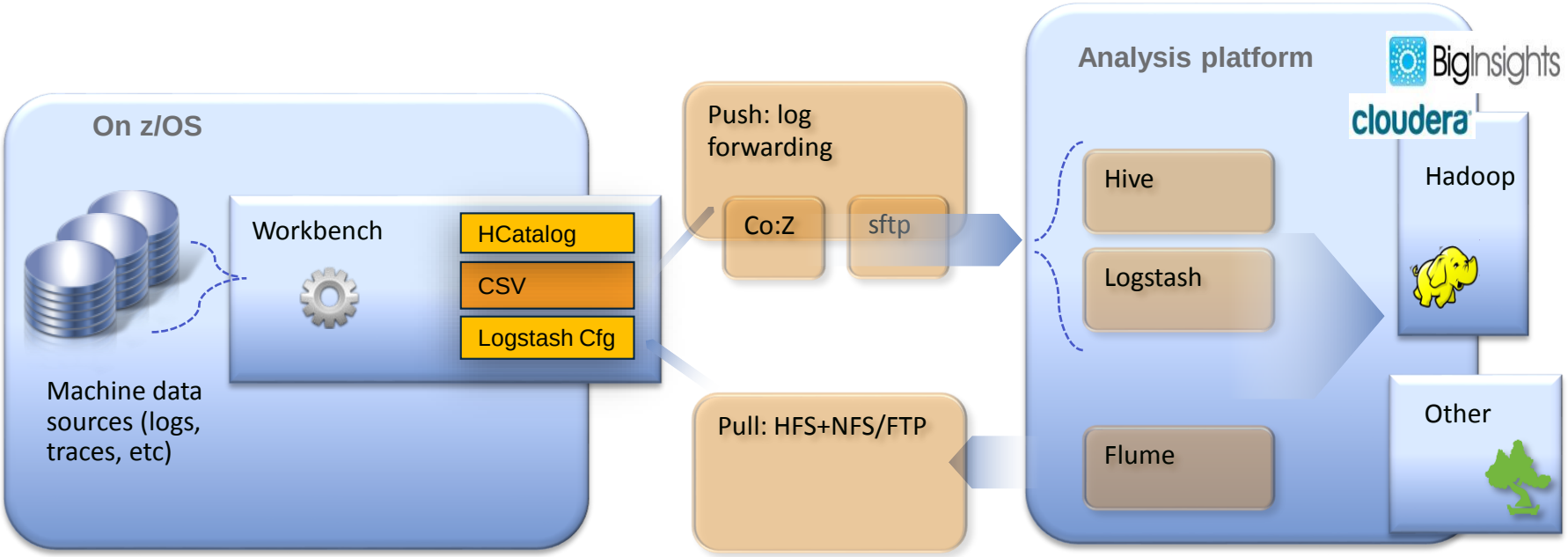


Improve access to the data

Provide metadata to assist analysis

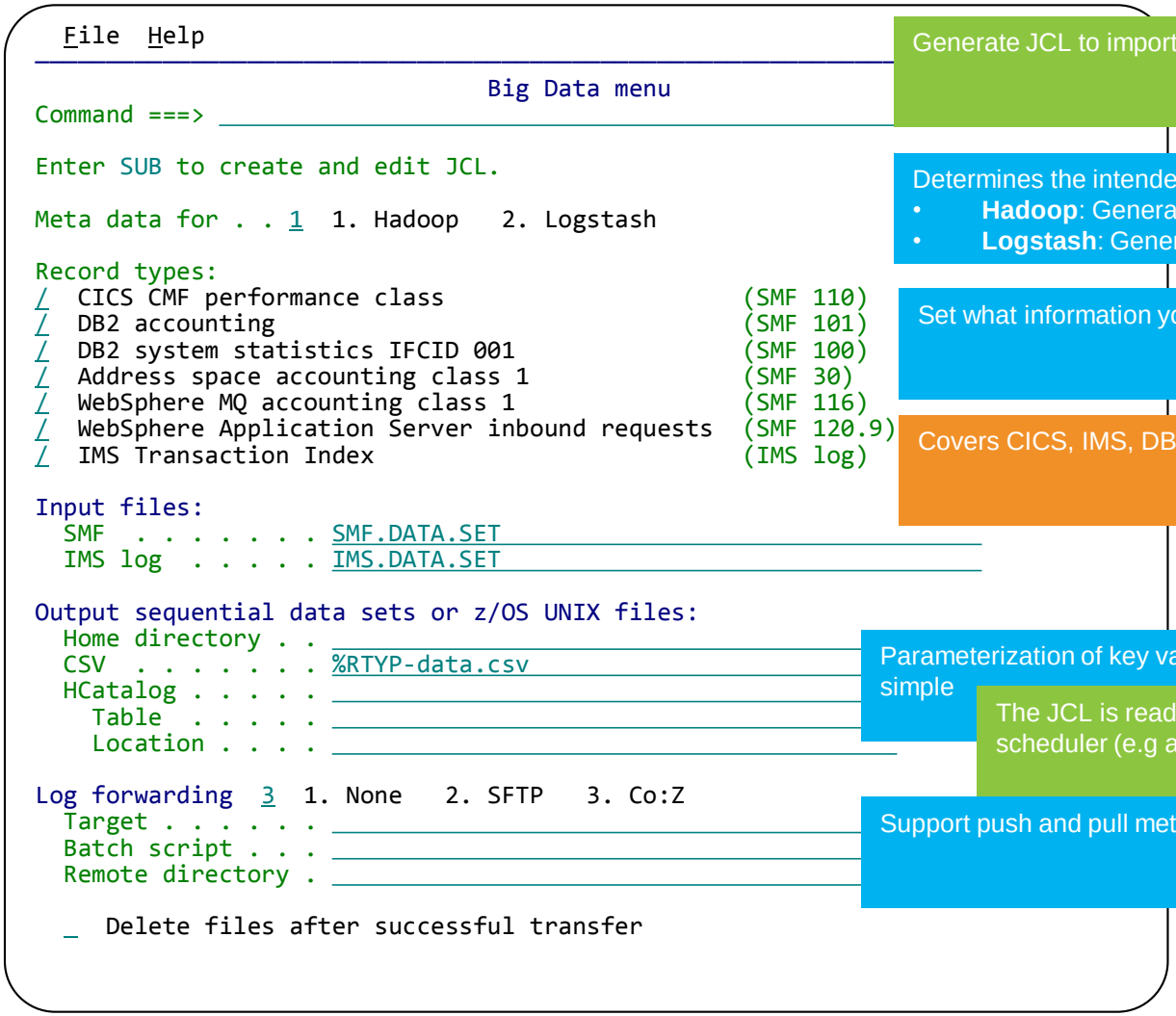
Capture and synthesize detailed transaction indices

Workbench enables z/OS performance data Analytics



- Flexible
- Integrated
- Quick setup

Workbench Big Data Panel



Generate JCL to import log data to analysis platform

Determines the intended target:
- **Hadoop**: Generates HCatalog
- **Logstash**: Generates logstash config

Help interpret the data: timestamps, float, string, etc

Set what information you can export

Identify relevant fields in the data

Covers CICS, IMS, DB2, MQ, WAS

These are just the most common.
Use any supported data source/field

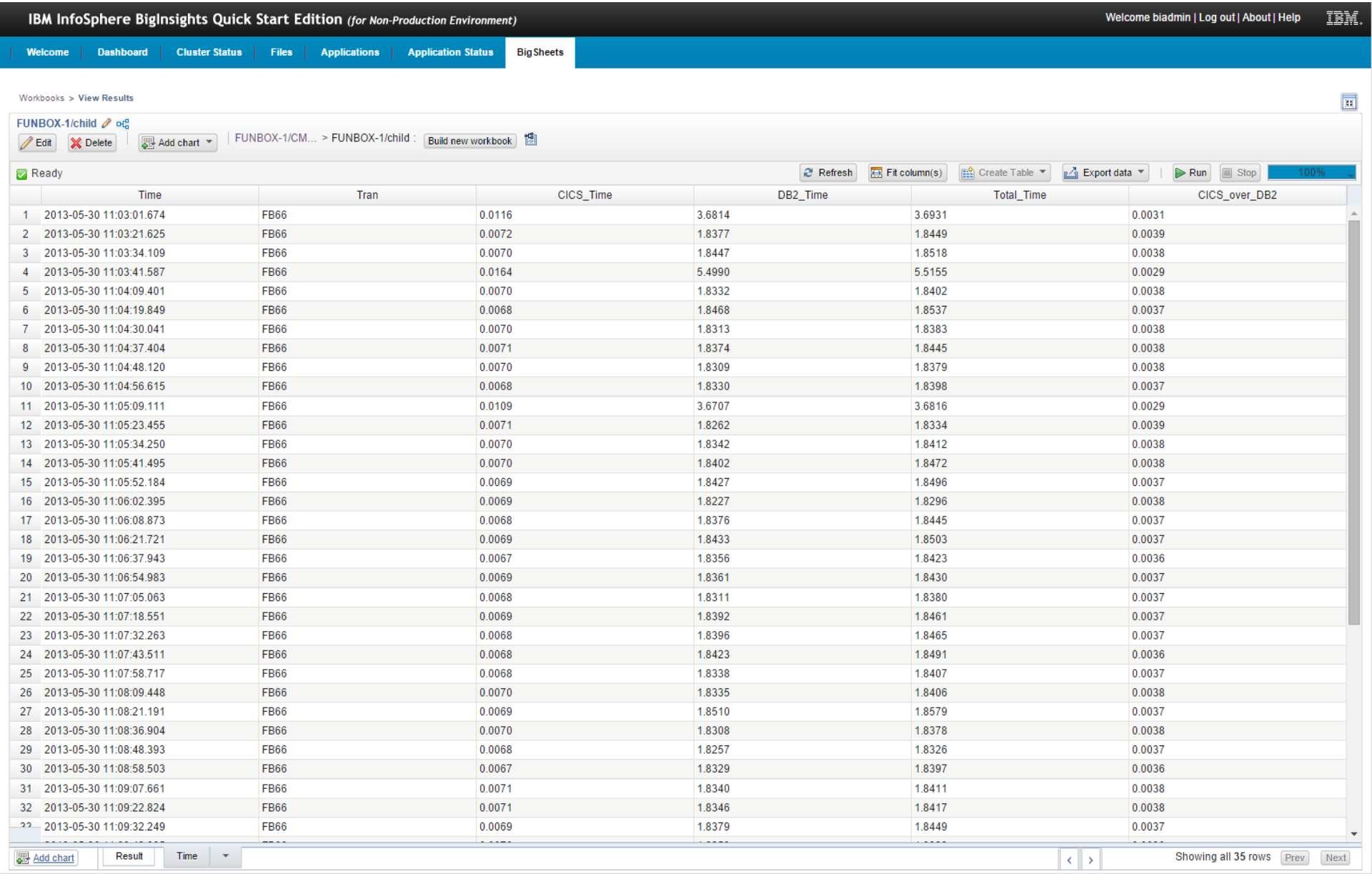
Parameterization of key variables makes reuse simple

The JCL is ready for use and can be easily adapted into scheduler (e.g as part of archiving job)

Support push and pull methods; direct offload

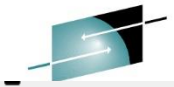
IBM InfoSphere BigInsights: BigSheets

- CICS-DB2 transactions with performance metrics from both subsystems



	Time	Tran	CICS_Time	DB2_Time	Total_Time	CICS_over_DB2
1	2013-05-30 11:03:01.674	FB66	0.0116	3.6814	3.6931	0.0031
2	2013-05-30 11:03:21.625	FB66	0.0072	1.8377	1.8449	0.0039
3	2013-05-30 11:03:34.109	FB66	0.0070	1.8447	1.8518	0.0038
4	2013-05-30 11:03:41.587	FB66	0.0164	5.4990	5.5155	0.0029
5	2013-05-30 11:04:09.401	FB66	0.0070	1.8332	1.8402	0.0038
6	2013-05-30 11:04:19.849	FB66	0.0068	1.8468	1.8537	0.0037
7	2013-05-30 11:04:30.041	FB66	0.0070	1.8313	1.8383	0.0038
8	2013-05-30 11:04:37.404	FB66	0.0071	1.8374	1.8445	0.0038
9	2013-05-30 11:04:48.120	FB66	0.0070	1.8309	1.8379	0.0038
10	2013-05-30 11:04:56.615	FB66	0.0068	1.8330	1.8398	0.0037
11	2013-05-30 11:05:09.111	FB66	0.0109	3.6707	3.6816	0.0029
12	2013-05-30 11:05:23.455	FB66	0.0071	1.8262	1.8334	0.0039
13	2013-05-30 11:05:34.250	FB66	0.0070	1.8342	1.8412	0.0038
14	2013-05-30 11:05:41.495	FB66	0.0070	1.8402	1.8472	0.0038
15	2013-05-30 11:05:52.184	FB66	0.0069	1.8427	1.8496	0.0037
16	2013-05-30 11:06:02.395	FB66	0.0069	1.8227	1.8296	0.0038
17	2013-05-30 11:06:08.873	FB66	0.0068	1.8376	1.8445	0.0037
18	2013-05-30 11:06:21.721	FB66	0.0069	1.8433	1.8503	0.0037
19	2013-05-30 11:06:37.943	FB66	0.0067	1.8356	1.8423	0.0036
20	2013-05-30 11:06:54.983	FB66	0.0069	1.8361	1.8430	0.0037
21	2013-05-30 11:07:05.063	FB66	0.0068	1.8311	1.8380	0.0037
22	2013-05-30 11:07:18.551	FB66	0.0069	1.8392	1.8461	0.0037
23	2013-05-30 11:07:32.263	FB66	0.0068	1.8396	1.8465	0.0037
24	2013-05-30 11:07:43.511	FB66	0.0068	1.8423	1.8491	0.0036
25	2013-05-30 11:07:58.717	FB66	0.0068	1.8338	1.8407	0.0037
26	2013-05-30 11:08:09.448	FB66	0.0070	1.8335	1.8406	0.0038
27	2013-05-30 11:08:21.191	FB66	0.0069	1.8510	1.8579	0.0037
28	2013-05-30 11:08:36.904	FB66	0.0070	1.8308	1.8378	0.0038
29	2013-05-30 11:08:48.393	FB66	0.0068	1.8257	1.8326	0.0037
30	2013-05-30 11:08:58.503	FB66	0.0067	1.8329	1.8397	0.0036
31	2013-05-30 11:09:07.661	FB66	0.0071	1.8340	1.8411	0.0038
32	2013-05-30 11:09:22.824	FB66	0.0071	1.8346	1.8417	0.0038
33	2013-05-30 11:09:32.249	FB66	0.0069	1.8379	1.8449	0.0037

Kibana (ELK)



kibana | Discover | Visualize | Dashboard | Settings | Last 90 days

Search...

logstash-*

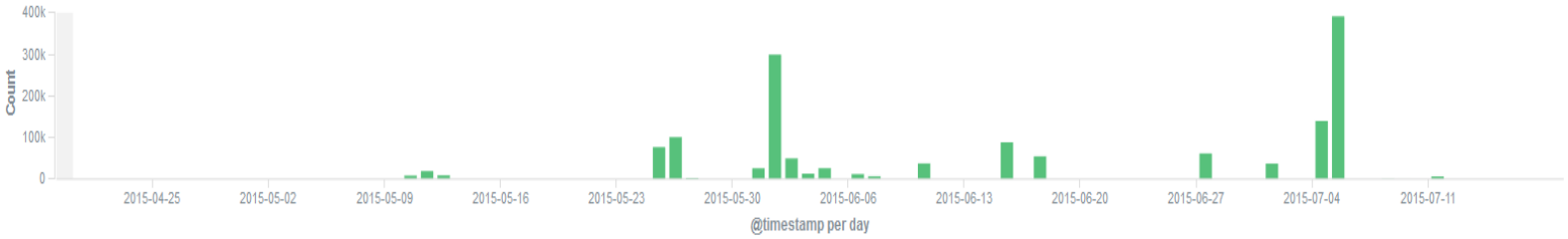
Selected Fields
- # CPU
- # DB2calls
- # Response
- # Suspend
- t Tran

Fields

Popular fields
- t _source
- t _type
- @timestamp
- t @version
- t APPLID
- # DB2elapsed
- # Dispatch
- # FCTotal
- # L8CPU
- t LPAR
- t Program
- # QRCPU
- # RMIelapsed
- # RMIsuspend
- t TIME
- # Task
- t Userid
- t _id
- t _index
- t host

1,469,050 hits

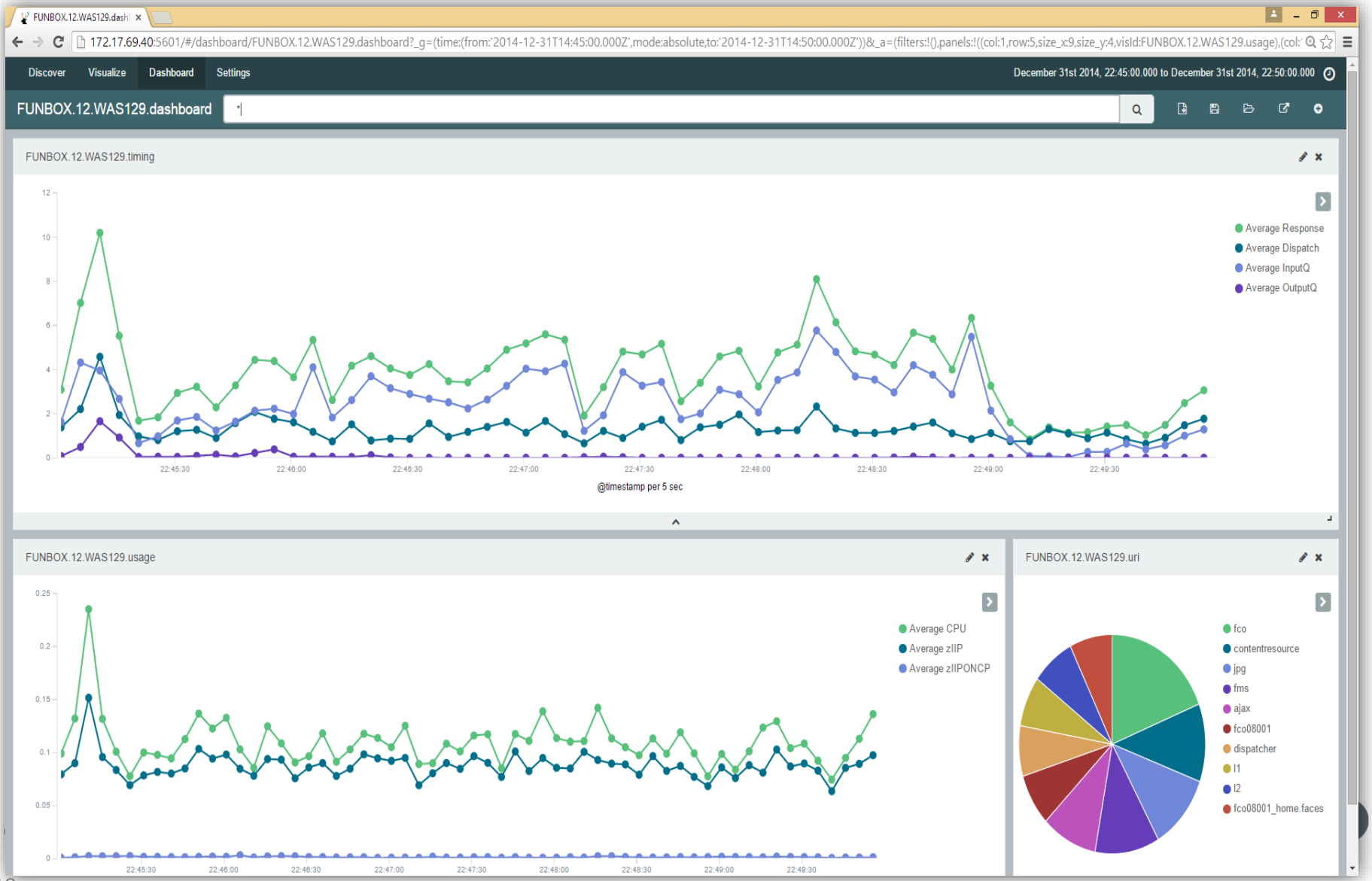
April 20th 2015, 23:50:57.353 - July 19th 2015, 23:50:57.353



Time	Tran	DB2calls	Response	Suspend	CPU
July 12th 2015, 04:03:54.298	CESD	0	0.036	0	0
July 12th 2015, 04:03:52.201	CESD	0	0.001	0	0
July 12th 2015, 04:03:50.104	CESD	0	0.001	0	0
July 12th 2015, 04:03:48.010	CESD	0	0.001	0	0
July 12th 2015, 04:03:47.136	CISD	0	0.829	0.623	0
July 12th 2015, 04:03:45.910	CESD	0	0.001	0	0
July 12th 2015, 04:03:45.718	CISD	0	0.959	0.882	0
July 12th 2015, 04:03:45.695	CESD	0	2.271	2.199	0.001
July 12th 2015, 04:03:44.191	CESD	0	2.409	2.275	0.001
July 12th 2015, 04:03:43.812	CESD	0	0.001	0	0
July 12th 2015, 04:03:41.715	CESD	0	0.001	0	0
July 12th 2015, 04:03:39.618	CESD	0	0.001	0	0
July 12th 2015, 04:03:38.338	CISD	0	0.02	0.018	0
July 12th 2015, 04:03:38.249	CESD	0	0.106	0.104	0.001
July 12th 2015, 04:03:38.145	CISD	0	0	0	0
July 12th 2015, 04:03:38.059	CESD	0	0.085	0.084	0.001

Kibana (ELK)

- Here we use Logstash to feed data into Elasticsearch and view in Kibana (all open source)
- Kibana offers interactive charts and helps build and identify useful JSON queries



Advantages of the solution

- **Minimal barrier to entry** for proof-of-concept implementations. All that is needed:
  - Existing logging on z/OS (no agents to configure)
  - A Hadoop implementation on the network

  Or:
  - Supported Logstash output (e.g. Elasticsearch/Kibana)
  - Dialog-configured JCL accelerates implementation
- **Comprehensive**: covers most transactional information sources
- **Flexible**: Direct offload with Co:Z or sftp or any preferred file transfer mechanism
- **Scalable**: rely on the inherent capabilities of big data platforms to grow your historical database and identify trends and exceptions

Workbench for Application Development teams

Do your Application Teams measure performance?

- Usually run ‘production like’ tests using some form of automation such as workload simulator
  - Tables and/or databases may not be production size
  - Transaction rates may not reach production levels
- How do you evaluate the results of the run?
  - How many transaction abends did you have?
  - How much CPU did the transactions use?
  - How many transactions exceeded the expected response time?

The typical Application Development process

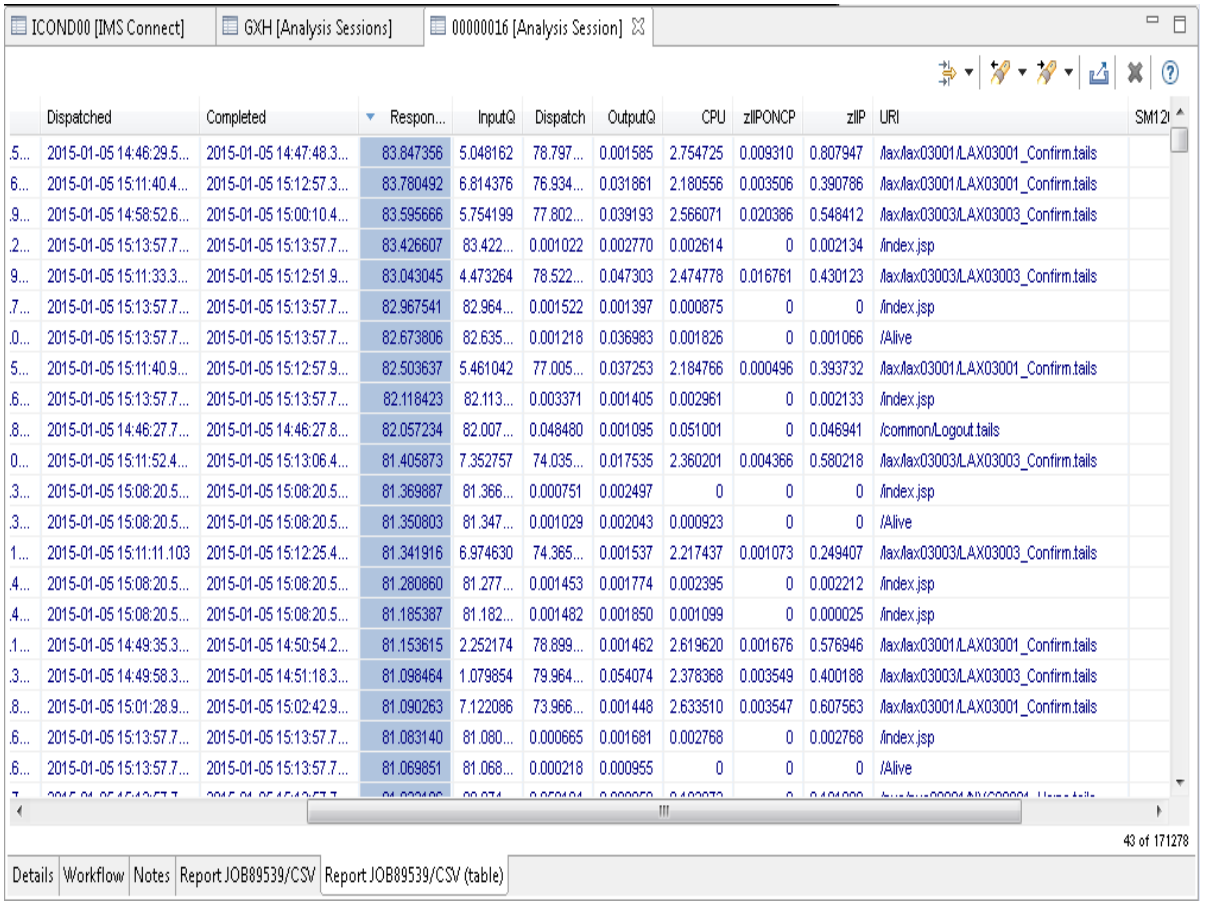
- Focus is on function not performance
  - But may incorporate known performance orientated practices
- Tools used enable function and often include:
  - Setting of breakpoints
  - Instruction tracing
  - Storage modification
  - File management
- Data sizes
  - Databases and tables sizes may be a small subset of production
    - Minor programming mistake may go unnoticed
    - Full table and/or database scan due to incorrect call

Instrumentation data limitations for developers

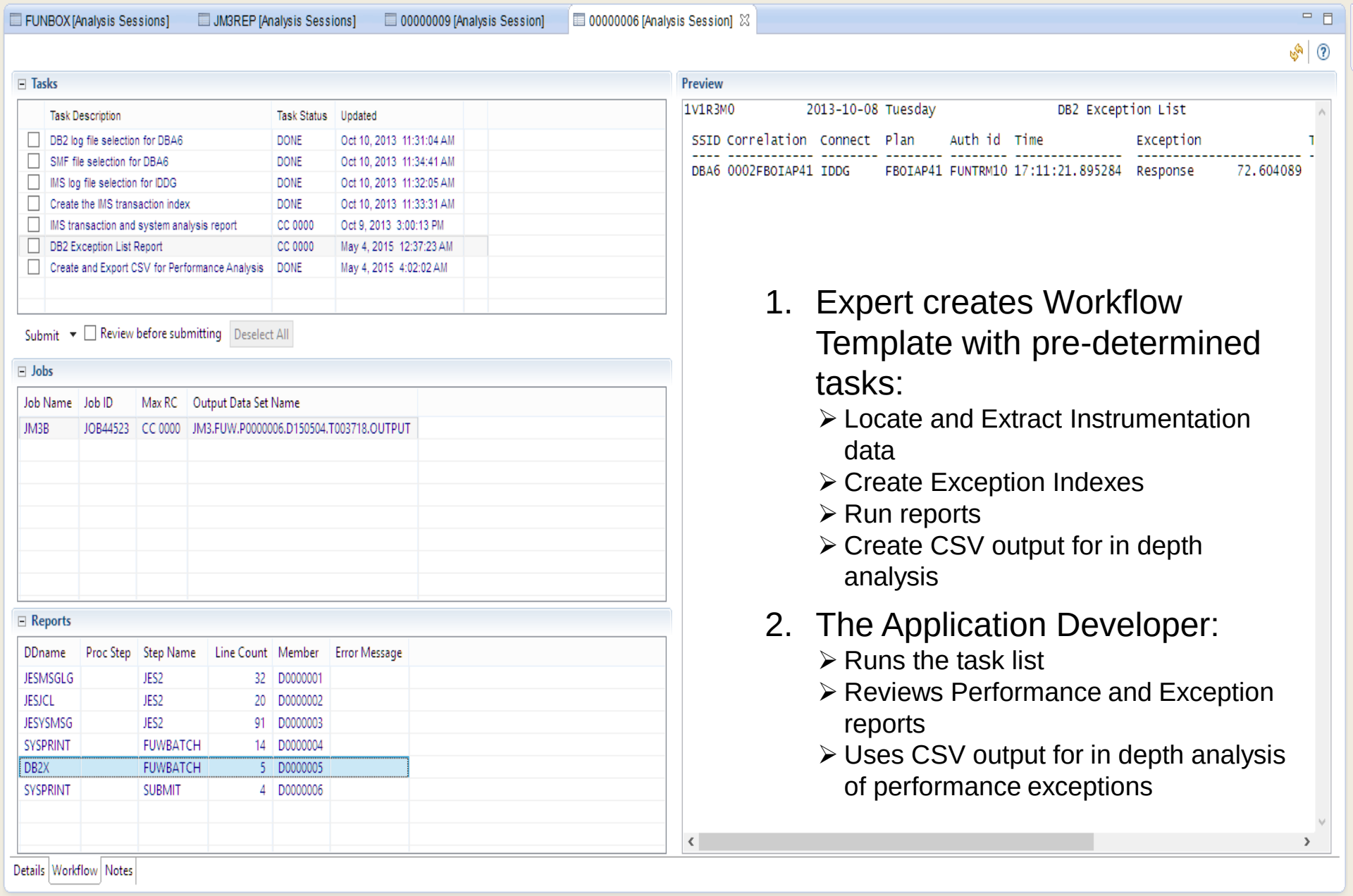
- Do not know about it or how it can provide benefit
- May not be granted physical access
- Do not understand how to obtain the various instrumentation data
- Do not understand how to use the information
- Do not know that instrumentation data can extend your unit testing
- Data security issues – sensitive data
- Production test generates thousands if not millions of transactions. Where and how do I start?
- Do not understand the various traces and/or how to relate them to a transaction
- Do not know how to relate all the instrumentation into a single lifecycle view

Eclipse GUI

- Run reports and follow workflows
- Tabulate list reports and search for outliers
- Export result sets to CSV
- Suitable as a quick “turn-key” implementation for off-z/OS analysis
- For more advanced use cases use the big data offerring…

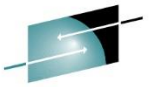


Eclipse interface for Application Developers



1. Expert creates Workflow Template with pre-determined tasks:
   - Locate and Extract Instrumentation data
   - Create Exception Indexes
   - Run reports
   - Create CSV output for in depth analysis
2. The Application Developer:
   - Runs the task list
   - Reviews Performance and Exception reports
   - Uses CSV output for in depth analysis of performance exceptions

Application Developers – IMS Analysis



Transaction Analysis Workbench - 00000006 [Analysis Session] @ JM3FB1 [Analysis Sessions] @ JM3_TAW1 [Common Services Library Server] (fts1:39905) - IBM Explorer for z...

File Edit Navigate Search Project Run Window Help

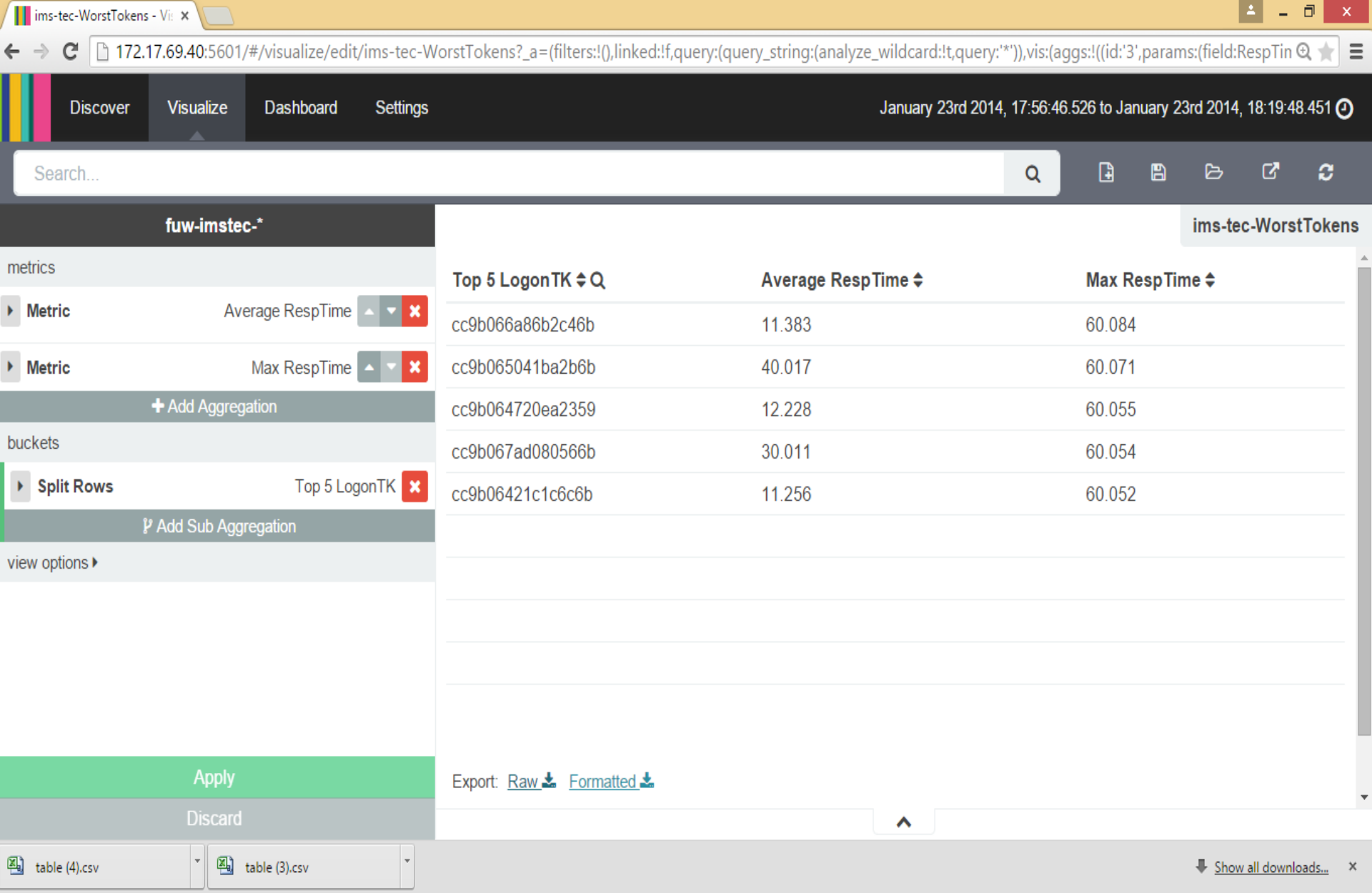
Quick Access | z/OS | Transaction Analysis Workbench | IMS Configuration Manager | IMS Connect Extensions | Resour

JM3FB1 [Analysis Sessions] | 00000006 [Analysis Session]

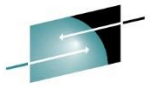
TIME	Type	TranCode	Userid	InputQ	Process	TotalTm	RespIMS	CPUtime	StartIMS	FFCalls	TPESAF	ESAFName	DBName	CompCode	RecCount	title
2013-10-08 17:10:09.284086	CA	FBOIAT41	FUNTRM10	0.000309	72.612278	72.612943	72.612943	45.699549	2013-10-09 01:10:09.284078	0	5	DBA6		00000000	1	
2013-10-08 17:15:12.276476	CA	FBOIAT41	FUNTRM10	0.000361	0.007591	0.008006	0.008006	0.004247	2013-10-09 01:15:12.276470	0	0					
2013-10-08 17:15:19.060184	CA	FBOIAT41	FUNTRM10	0.000354	18.105197	18.105590	18.105590	11.512388	2013-10-09 01:15:19.060177	0	5	DBA6		00000000	1	
2013-10-08 17:15:45.907320	CA	FBOIAT41	FUNTRM10	0.000358	23.369672	23.370071	23.370071	11.582053	2013-10-09 01:15:45.907312	0	5	DBA6		00000000	1	
2013-10-08 17:16:20.310289	CA	FBOIAT41	FUNTRM10	0.000332	26.572429	26.572801	26.572801	11.670139	2013-10-09 01:16:20.310281	0	5	DBA6		00000000	1	
2013-10-08 17:18:10.042966	CA	FBOIAT41	FUNTRM10	0.000343	28.236657	28.237084	28.237084	11.574547	2013-10-09 01:18:10.042958	0	5	DBA6		00000000	1	
2013-10-08 17:18:43.971741	CA	FBOIAT41	FUNTRM10	0.000392	23.546690	23.547100	23.547100	11.475108	2013-10-09 01:18:43.971732	0	5	DBA6		00000000	1	
2013-10-08 17:22:09.647762	CA	FBOIAT41	FUNTRM10	0.000309	13.350696	13.351052	13.351052	11.150293	2013-10-09 01:22:09.647753	0	5	DBA6		00000000	1	
2013-10-08 17:22:28.096635	CA	FBOIAT41	FUNTRM10	0.000323	13.475249	13.479100	13.479100	11.155138	2013-10-09 01:22:28.096627	0	5	DBA6		00000000	1	
2013-10-08 17:22:46.401615	CA	FBOIAT41	FUNTRM10	0.000388	13.362887	13.363308	13.363308	11.148490	2013-10-09 01:22:46.401607	0	5	DBA6		00000000	1	
2013-10-08 17:23:05.471218	CA	FBOIAT41	FUNTRM10	0.000322	13.238923	13.241740	13.241740	11.102978	2013-10-09 01:23:05.471211	0	5	DBA6		00000000	1	
2013-10-08 17:23:24.833163	CA	FBOIAT41	FUNTRM10	0.000348	13.518582	13.520729	13.520729	11.128644	2013-10-09 01:23:24.833155	0	5	DBA6		00000000	1	
2013-10-08 17:23:42.895357	CA	FBOIAT41	FUNTRM10	0.000301	13.218620	13.219072	13.219072	11.127269	2013-10-09 01:23:42.895349	0	5	DBA6		00000000	1	
2013-10-08 17:24:01.688097	CA	FBOIAT41	FUNTRM10	0.000341	13.232239	13.234805	13.234805	11.127513	2013-10-09 01:24:01.688089	0	5	DBA6		00000000	1	
2013-10-08 17:24:20.544430	CA	FBOIAT41	FUNTRM10	0.000317	13.085581	13.085941	13.085941	11.049074	2013-10-09 01:24:20.544421	0	5	DBA6		00000000	1	
2013-10-08 17:24:37.826763	CA	FBOIAT41	FUNTRM10	0.000319	12.494472	12.494827	12.494827	11.068077	2013-10-09 01:24:37.826755	0	5	DBA6		00000000	1	
2013-10-08 17:24:54.676014	CA	FBOIAT41	FUNTRM10	0.000295	13.784744	13.785077	13.785077	11.087253	2013-10-09 01:24:54.676006	0	5	DBA6		00000000	1	

1 of 17

Details | Workflow | Notes | Report JOB85501/CSV | Report JOB85501/CSV (table)



Application Developers – CICS Analysis



Transaction Analysis Workbench - 00000002 [Analysis Session] @ JM3FB1 [Analysis Sessions] @ JM3_TAW1 [Common Services Library Server] (fts1:39905) - IBM Explorer for z...

File Edit Navigate Search Project Run Window Help

Quick Access | z/OS | Transaction Analysis Workbench | IMS Configuration Manager | IMS Connect Extensions | Reso

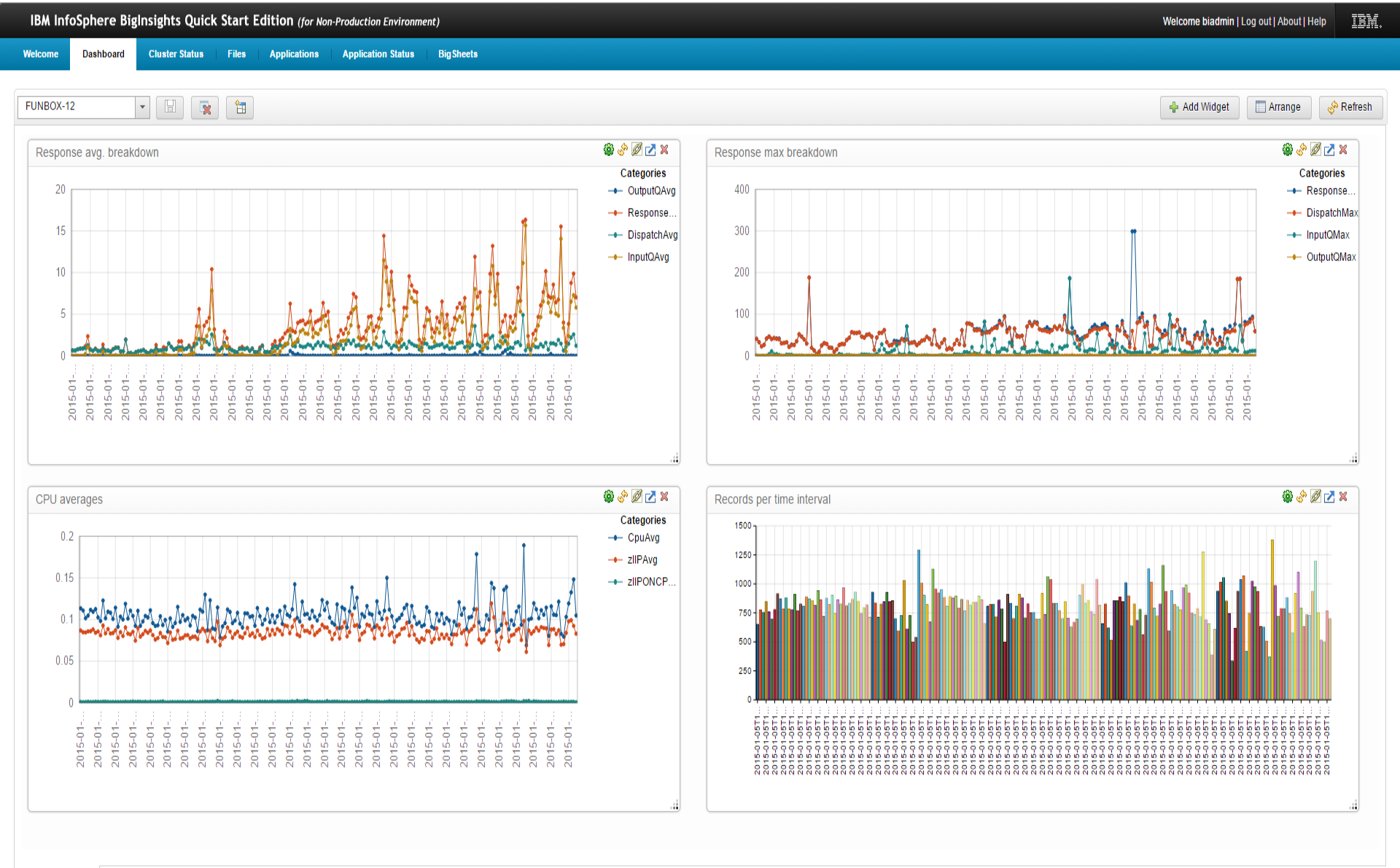
JM3FB1 [Analysis Sessions] | 00000002 [Analysis Session]

TIME	SMFRTY	SMFMNSPN	SMFMNJBN	SMFMNRSD	SMFMNRST	SMFMNUIF	Tran	Dispatch	UserCPU	Suspend	TaskNo	CICSWait	JVMelap	JVMSusp	QRDisp	QRCPU	MSDisp
2013-10-08 15:23:33.278075	6E	FUWTCIC	FUWTCIC	113280	0043052C		FB66	0.002272	0.001785	0.000063	238	0	0	0	0.002272	0.001785	0
2013-10-08 15:23:40.382468	6E	FUWTCIC	FUWTCIC	113280	0043052C		FB66	1.683515	0.006504	0.000403	239	0	0	0	0.005767	0.004158	0
2013-10-08 15:23:46.381856	6E	FUWTCIC	FUWTCIC	113280	0043052C		FB66	0.002712	0.002087	0.000064	240	0	0	0	0.002712	0.002087	0
2013-10-08 15:23:47.232287	6E	FUWTCIC	FUWTCIC	113280	0043052C		FBOX	0.001936	0.001297	0.000056	241	0	0	0	0.001936	0.001297	0
2013-10-08 15:23:49.389808	6E	FUWTCIC	FUWTCIC	113280	0043052C		FBOX	0.001884	0.001452	0.000067	242	0	0	0	0.001884	0.001452	0
2013-10-08 15:23:52.509963	6E	FUWTCIC	FUWTCIC	113280	0043052C		FBOX	1.054879	0.007421	5.184994	243	0	0	0	0.007273	0.005079	0
2013-10-08 15:24:14.558025	6E	FUWTCIC	FUWTCIC	113280	0043052C		FB66	0.002256	0.001740	0.000059	244	0	0	0	0.002256	0.001740	0
2013-10-08 15:24:18.717807	6E	FUWTCIC	FUWTCIC	113280	0043052C		FB66	1.128904	0.006453	0.000559	245	0	0	0	0.005731	0.004132	0
2013-10-08 14:56:25.116977	6E	FUWTCIC	FUWTCIC	113280	0043052C		CSOL	0.000153	0.000127	1887.436826	3	0	0	0	0.000031	0.000031	0.000121
2013-10-08 15:27:54.365616	6E	FUWTCIC	FUWTCIC	113280	0043052C		FB66	0.002825	0.002116	0.000114	246	0	0	0	0.002825	0.002116	0
2013-10-08 15:27:55.005570	6E	FUWTCIC	FUWTCIC	113280	0043052C		FBOX	0.001699	0.001307	0.000055	247	0	0	0	0.001699	0.001307	0
2013-10-08 15:27:59.166081	6E	FUWTCIC	FUWTCIC	113280	0043052C		FBOX	0.002563	0.001467	0.000063	248	0	0	0	0.002563	0.001467	0
2013-10-08 15:28:01.407051	6E	FUWTCIC	FUWTCIC	113280	0043052C		FBOX	1.614352	0.007469	5.071690	249	0	0	0	0.007692	0.005066	0
2013-10-08 15:28:11.926167	6E	FUWTCIC	FUWTCIC	113280	0043052C		FB66	0.003037	0.001861	0.000067	250	0	0	0	0.003037	0.001861	0
2013-10-08 15:28:17.693992	6E	FUWTCIC	FUWTCIC	113280	0043052C		FB66	1.515844	0.006805	0.000514	251	0	0	0	0.006774	0.004351	0
2013-10-08 15:28:22.637323	6E	FUWTCIC	FUWTCIC	113280	0043052C		FB66	0.002332	0.001779	0.000063	252	0	0	0	0.002332	0.001779	0
2013-10-08 15:28:26.395768	6E	FUWTCIC	FUWTCIC	113280	0043052C		FB66	1.167777	0.006750	0.000936	253	0	0	0	0.008784	0.004319	0
2013-10-08 15:28:30.667183	6E	FUWTCIC	FUWTCIC	113280	0043052C		FB66	0.002418	0.001815	0.000068	254	0	0	0	0.002418	0.001815	0
2013-10-08 15:28:34.383952	6E	FUWTCIC	FUWTCIC	113280	0043052C		FB66	1.590379	0.006645	0.000415	255	0	0	0	0.006474	0.004251	0
2013-10-08 15:29:14.555379	6E	FUWTCIC	FUWTCIC	113280	0043052C		FB66	0.002781	0.001833	0.000067	256	0	0	0	0.002781	0.001833	0
2013-10-08 15:29:18.102709	6E	FUWTCIC	FUWTCIC	113280	0043052C		FB66	1.721050	0.017456	43.015981	257	0	0	0	0.017290	0.012514	0
2013-10-08 15:30:06.811392	6E	FUWTCIC	FUWTCIC	113280	0043052C		FB66	0.002381	0.001786	0.000060	259	0	0	0	0.002381	0.001786	0
2013-10-08 15:30:11.820429	6E	FUWTCIC	FUWTCIC	113280	0043052C		FB66	1.625380	0.006708	0.000916	260	0	0	0	0.005847	0.004285	0
2013-10-08 15:30:14.715450	6E	FUWTCIC	FUWTCIC	113280	0043052C		FB66	0.002489	0.001842	0.000064	261	0	0	0	0.002489	0.001842	0
2013-10-08 15:30:15.931298	6E	FUWTCIC	FUWTCIC	113280	0043052C		FB66	0.002704	0.002089	0.000064	262	0	0	0	0.002704	0.002089	0
2013-10-08 15:30:16.827526	6E	FUWTCIC	FUWTCIC	113280	0043052C		FBOX	0.001944	0.001493	0.000086	263	0	0	0	0.001944	0.001493	0
2013-10-08 15:07:17.160312	6E	FUWTCIC	FUWTCIC	113280	0043052C		CEMT	0.006749	0.005626	1398.445801	228	0	0	0	0.006749	0.005626	0

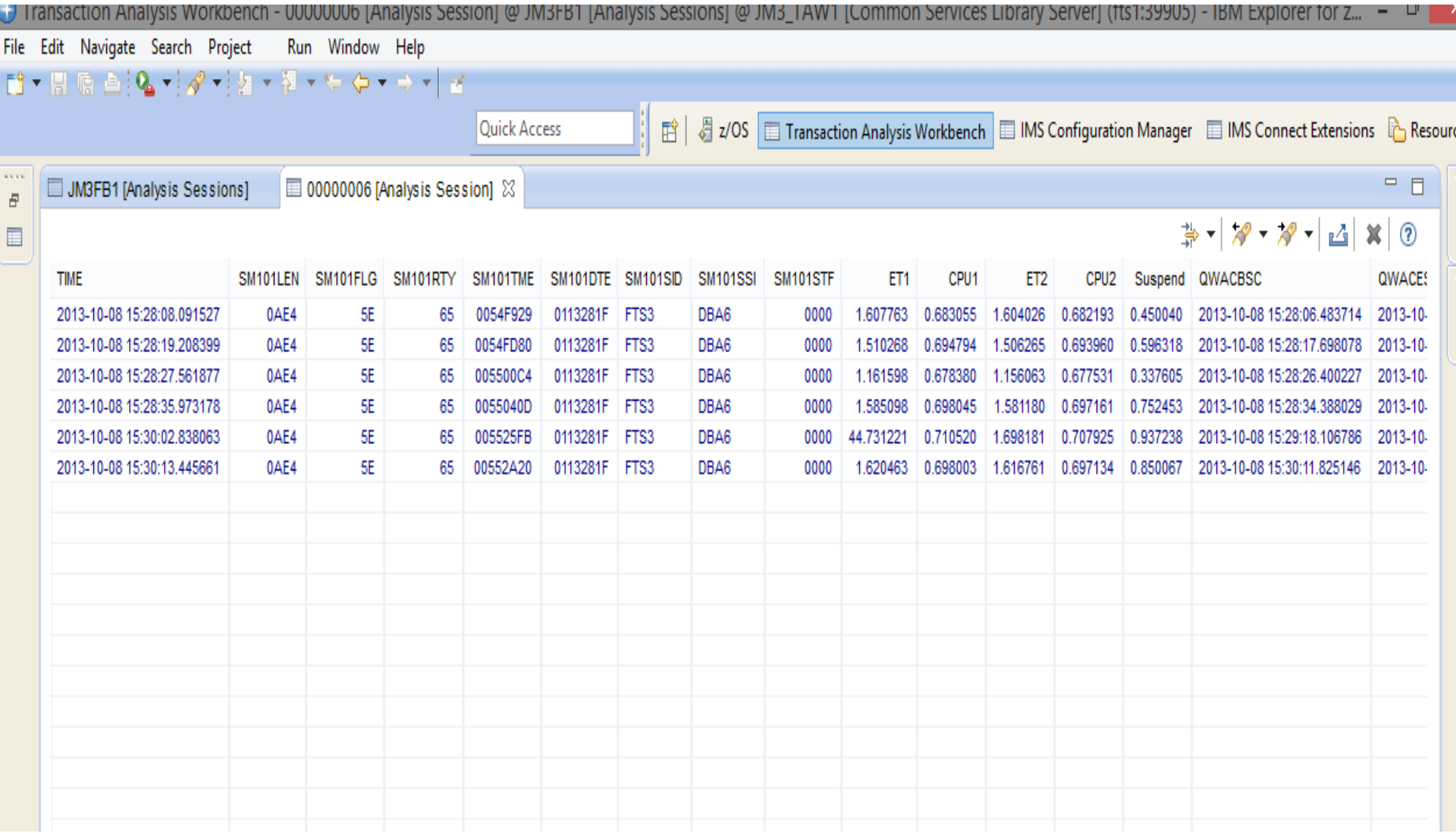
1 of 27

Details | Workflow | Notes | Report JOB16951/CSV | Report JOB16951/CSV (table)

Example: IBM BigInsights - Dashboard



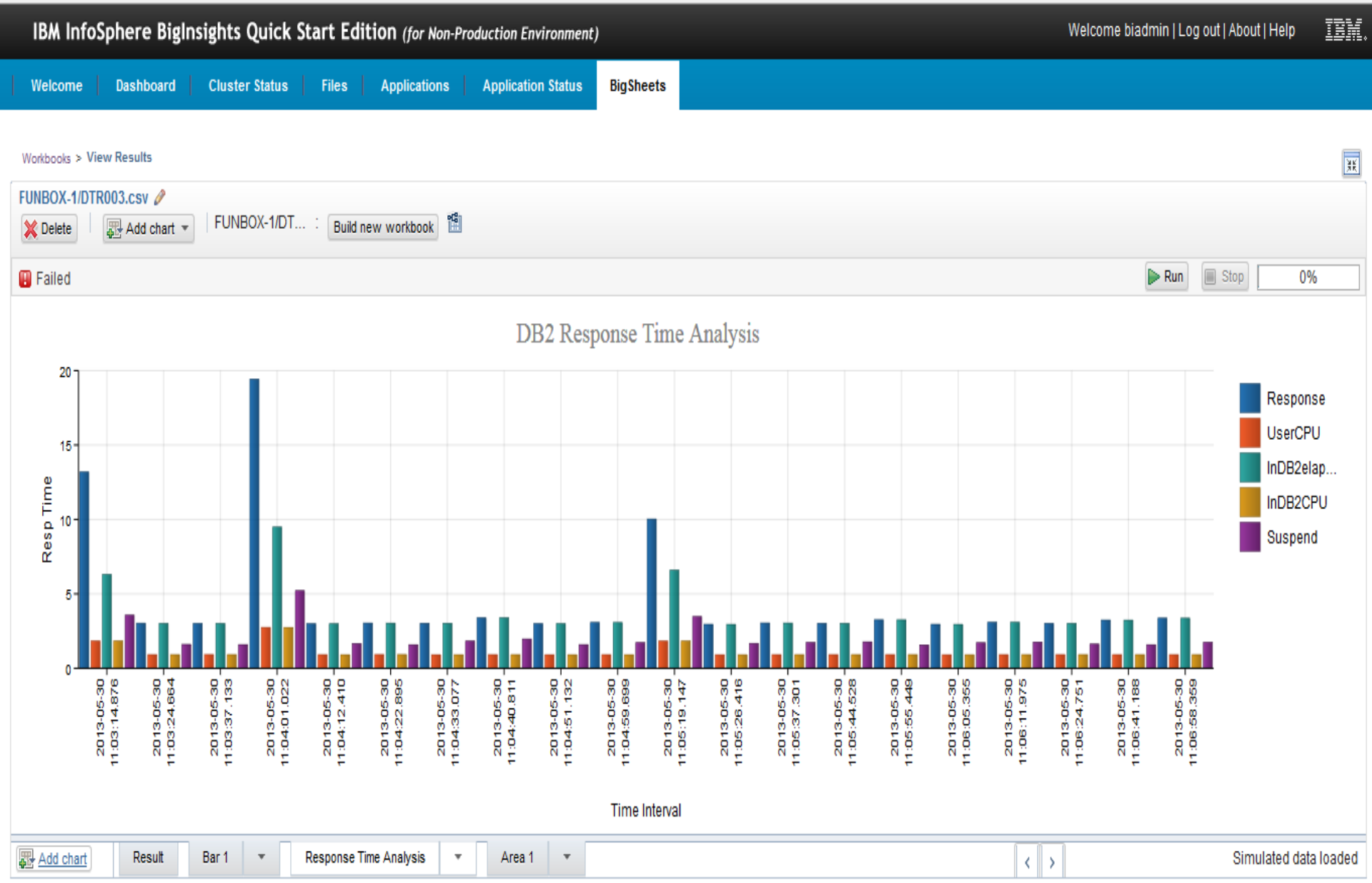
Application Developers – DB2 Analysis



TIME	SM101LEN	SM101FLG	SM101RTY	SM101TME	SM101DTE	SM101SID	SM101SSI	SM101STF	ET1	CPU1	ET2	CPU2	Suspend	QWACBSC	QWACES
2013-10-08 15:28:08.091527	0AE4	5E	65	0054F929	0113281F	FTS3	DBA6	0000	1.607763	0.683055	1.604026	0.682193	0.450040	2013-10-08 15:28:06.483714	2013-10-
2013-10-08 15:28:19.208399	0AE4	5E	65	0054FD80	0113281F	FTS3	DBA6	0000	1.510268	0.694794	1.506265	0.693960	0.596318	2013-10-08 15:28:17.698078	2013-10-
2013-10-08 15:28:27.561877	0AE4	5E	65	005500C4	0113281F	FTS3	DBA6	0000	1.161598	0.678380	1.156063	0.677531	0.337605	2013-10-08 15:28:26.400227	2013-10-
2013-10-08 15:28:35.973178	0AE4	5E	65	0055040D	0113281F	FTS3	DBA6	0000	1.585098	0.698045	1.581180	0.697161	0.752453	2013-10-08 15:28:34.388029	2013-10-
2013-10-08 15:30:02.838063	0AE4	5E	65	005525FB	0113281F	FTS3	DBA6	0000	44.731221	0.710520	1.698181	0.707925	0.937238	2013-10-08 15:29:18.106786	2013-10-
2013-10-08 15:30:13.445661	0AE4	5E	65	00552A20	0113281F	FTS3	DBA6	0000	1.620463	0.698003	1.616761	0.697134	0.850067	2013-10-08 15:30:11.825146	2013-10-

BigData Tooling example: in-depth Analysis

- Application teams can then use a variety of available BigData Tooling for in-depth




Questions?

More information

- IBM DB2 and IMS Tools website:
  www.ibm.com/software/data/db2imstools/
- IBM Transaction Analysis Workbench for z/OS:
  www.ibm.com/software/data/db2imstools/imstools/trans-analysis/
- Jim Martin, US Representative, Fundi Software:
  jim_martin@fundi.com.au
- James Martin, US Representative, Fundi Software:
  james_martin@fundi.com.au
- Martin Hubel, DB2 Consultant, Fundi Software:
  martin_hubel@fundi.com.au