Data Virtualization and Visualization

SQL access and visualization of mainframe data within IBM technologies

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IBM

Agenda

Virtualizing VSAM, DBMS, IDMS, IMS and other data sources

Accessing virtualized mainframe data via IBM Db2 technologies

SQL Access to Mainframe data

Review Log Analysis and DevOps dashboards

Dashboard Auto generation

Considerations for virtualization

- Why move the data off the mainframe or restructure it?
- What does it cost for MSU? z13 or z14 (Tailored fit pricing)
- Are there security risks? Does the DBA own the security credentials once it’s moved? Who’s ensuring that the data is secure?
- No matter how fast the data is collected and moved, it will never be as fast as real-time, in place virtual access.

SQL Access to Mainframe data using IBM Db2 technologies

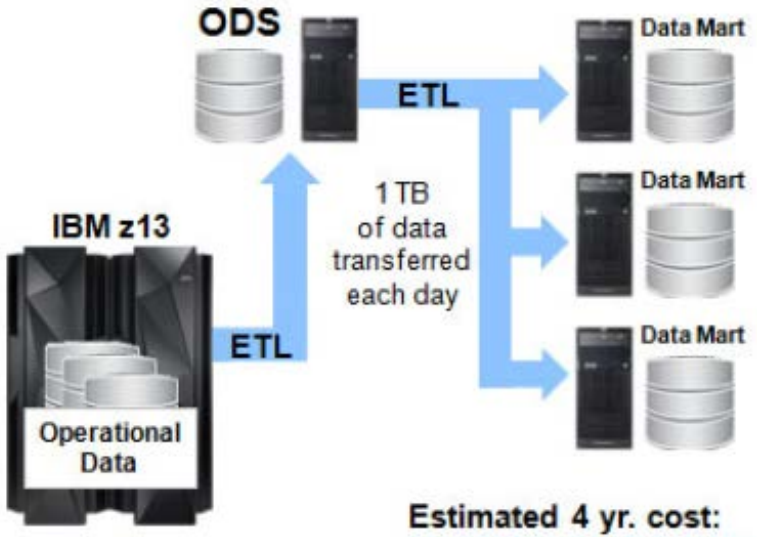
- Mainframe-resident data virtualization happens in real-time and data remains under z/OS control.

- Utilizing server-side processing and z Systems Integrated Information Processors (zIIP up to 99%) making the queries cheaper to run (Minimizing MSU).

- Only one set of credentials required.

- Virtualization of ADABAS, DBMS, IDMS, IMS, MQ, Sequential, VSAM and zFS
  - Only stores the metadata definitions and retrieves the data on demand.
  - On the z System, the data is loaded into memory and then the results are returned to the client.
  - Multiple versions of the same table across different Db2's in parallel.

IBM Study - Four Year Cost Estimate



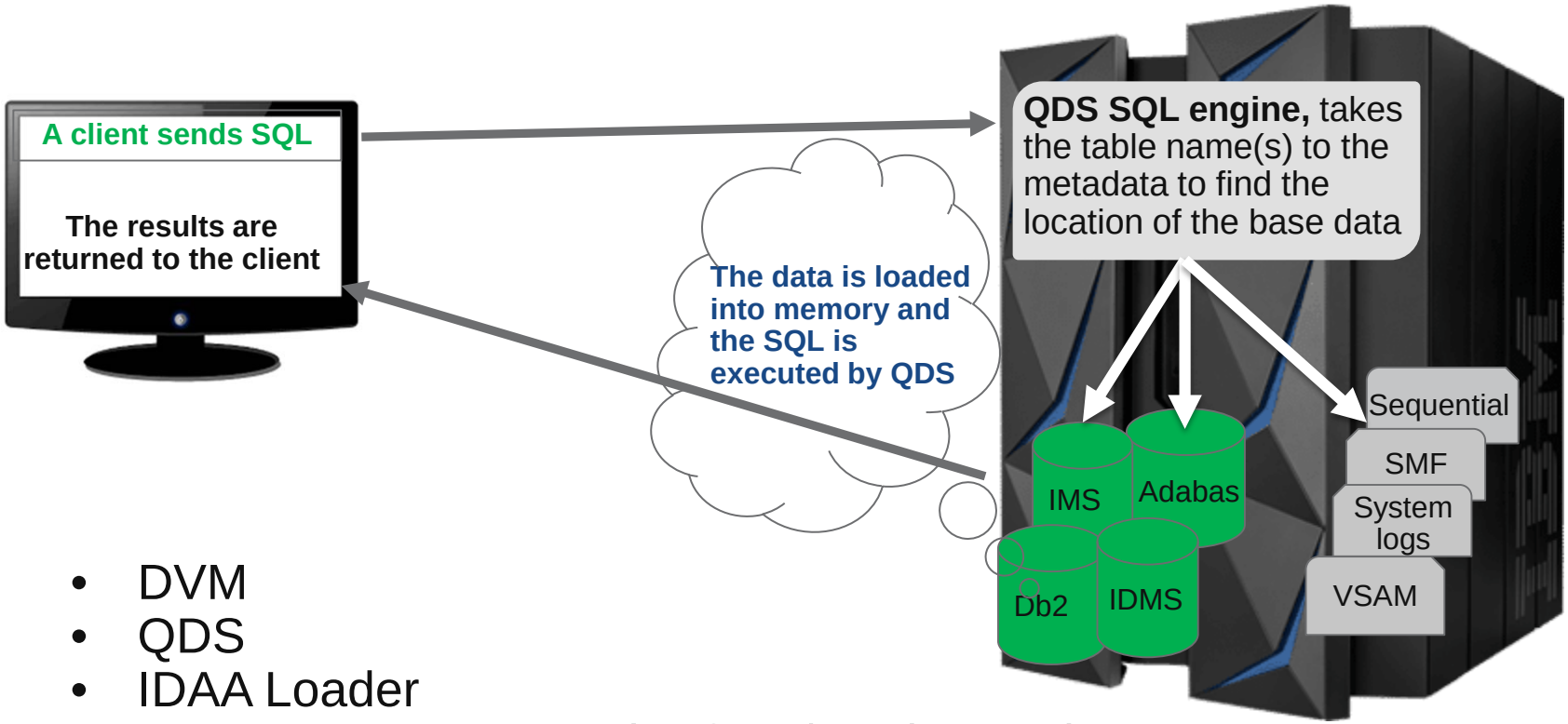
Assuming four cores on z13 running at 85% utilization and 12 cores on x86 servers run at 45% utilization, ETL activity burns **519 MSU** and uses **10 x86 cores** *per day.*

Estimated 4 yr. cost:

System costs = $9,864,412
Labor costs = $393,927
Total costs = $10,258,339

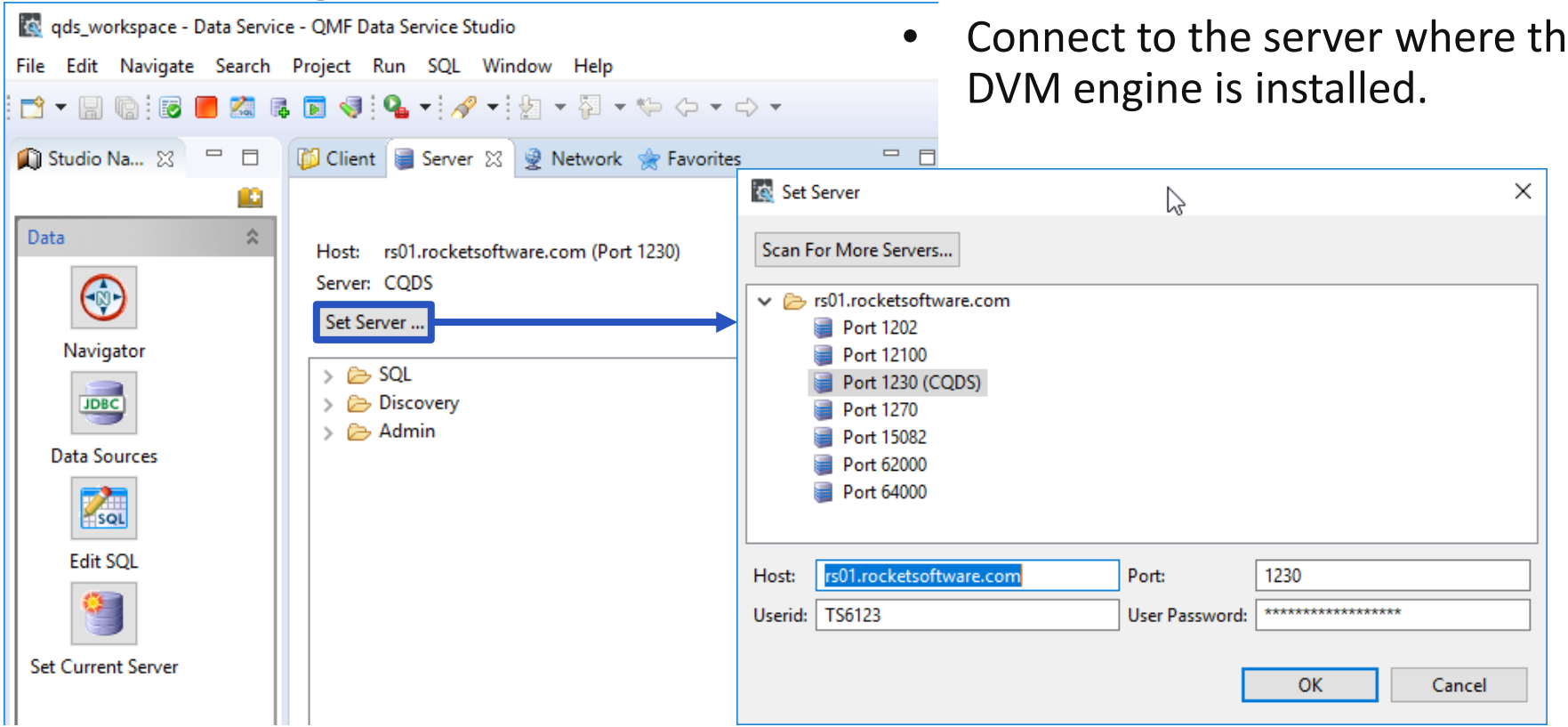
- Estimate is for moving data – What about transforming and analyzing it?
- Run analytic workloads as close to the data as possible.
- Estimate is not utilizing zIIP, data virtualization, parallel processing or IDAA.

Simplified Workflow



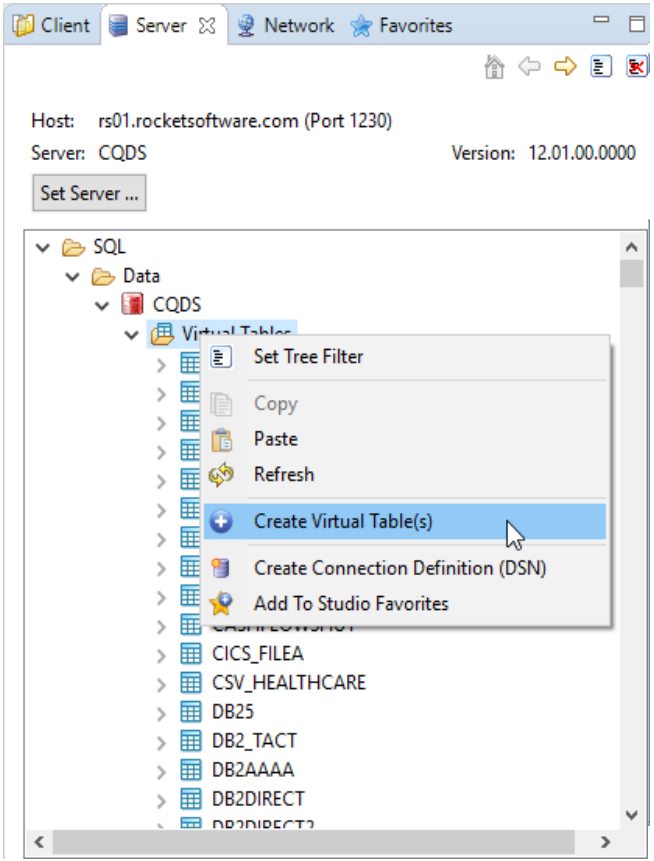
- DVM
- QDS
- IDAA Loader
- IBM Open Data Analytics for z/OS (IZODA)

Connecting to Data Sources



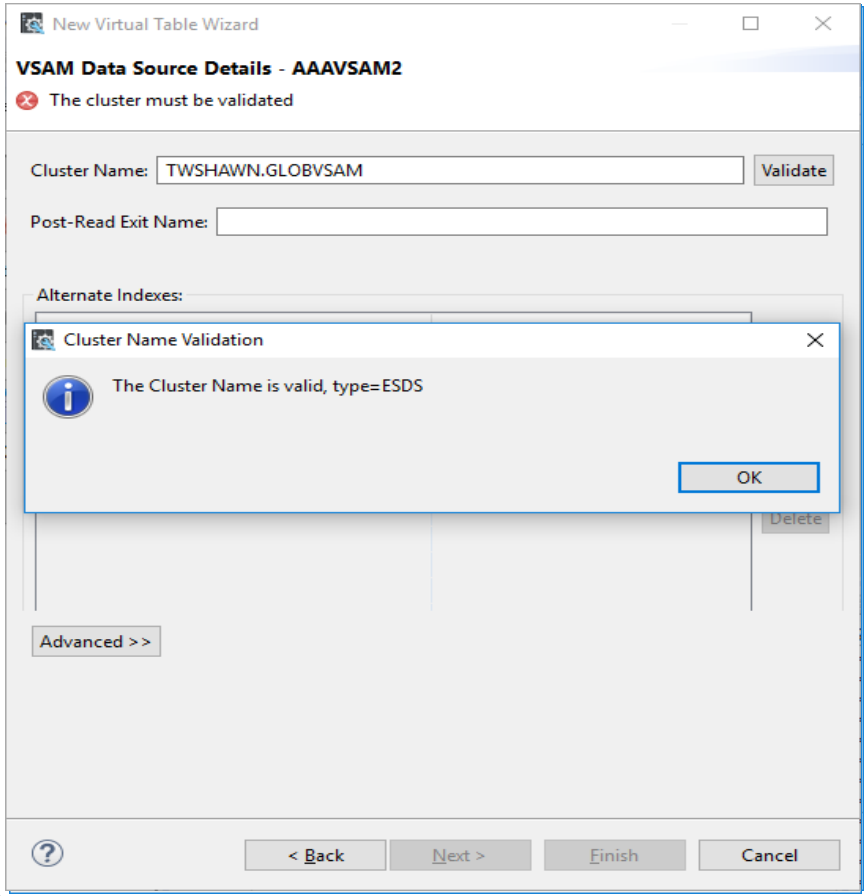
- Connect to the server where the DVM engine is installed.

Virtualizing Data Sources



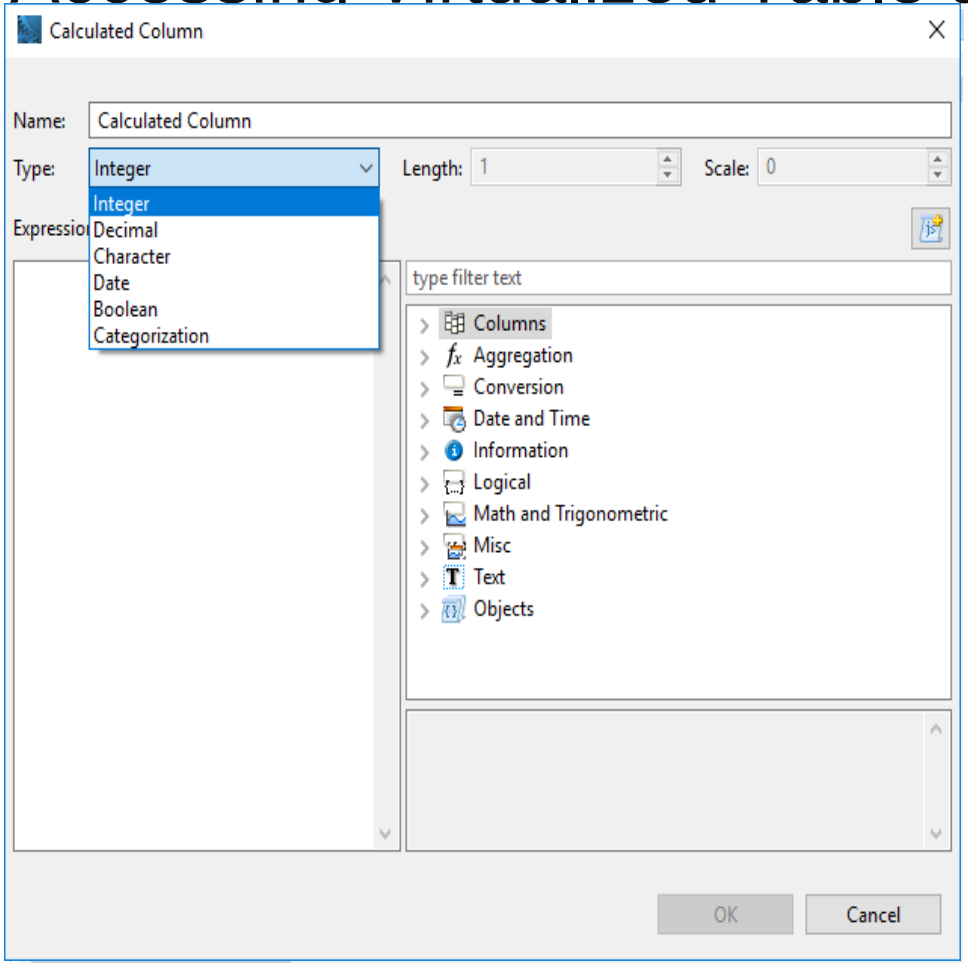
- Expand SQL, Data, Server and then Virtual Tables
- Right mouse click and select Create Virtual Table(s)

Db2 Virtualized VSAM



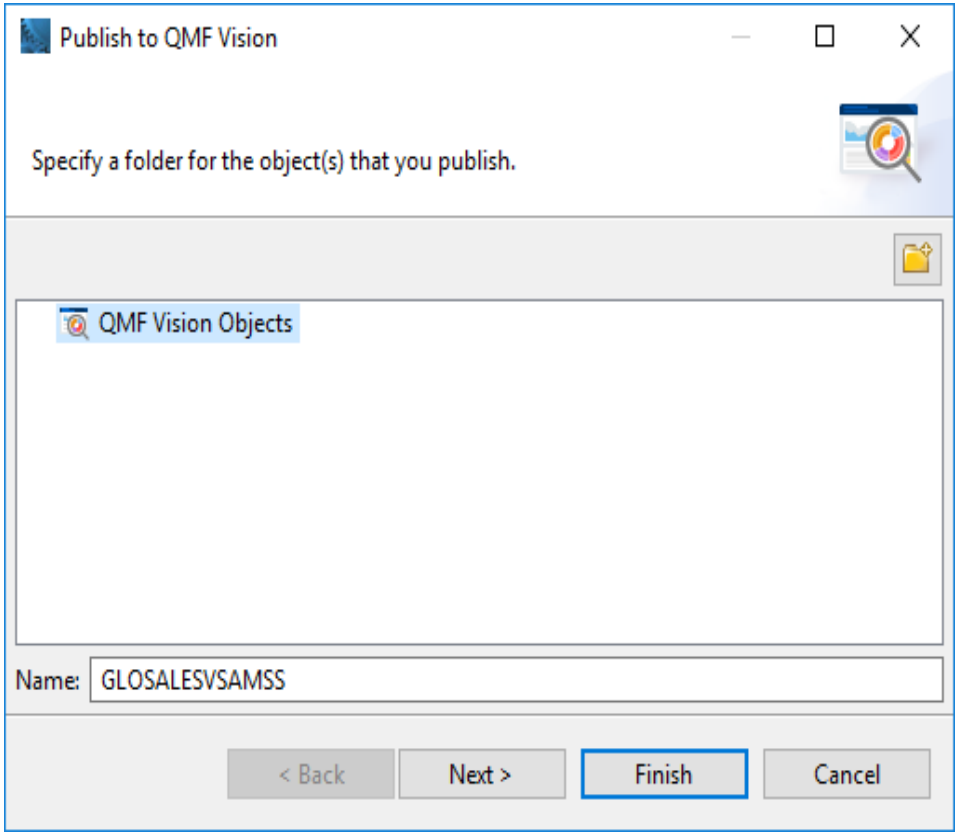
- Select the source type for the virtual table.
- Assign a Name the end user will see for the source library
- Select an Available Source Library
- Select and download the source library
- Expand the Source to view the fields defined in the copybook
- Provide the name of the cluster

Accessing Virtualized Table and Data assembly



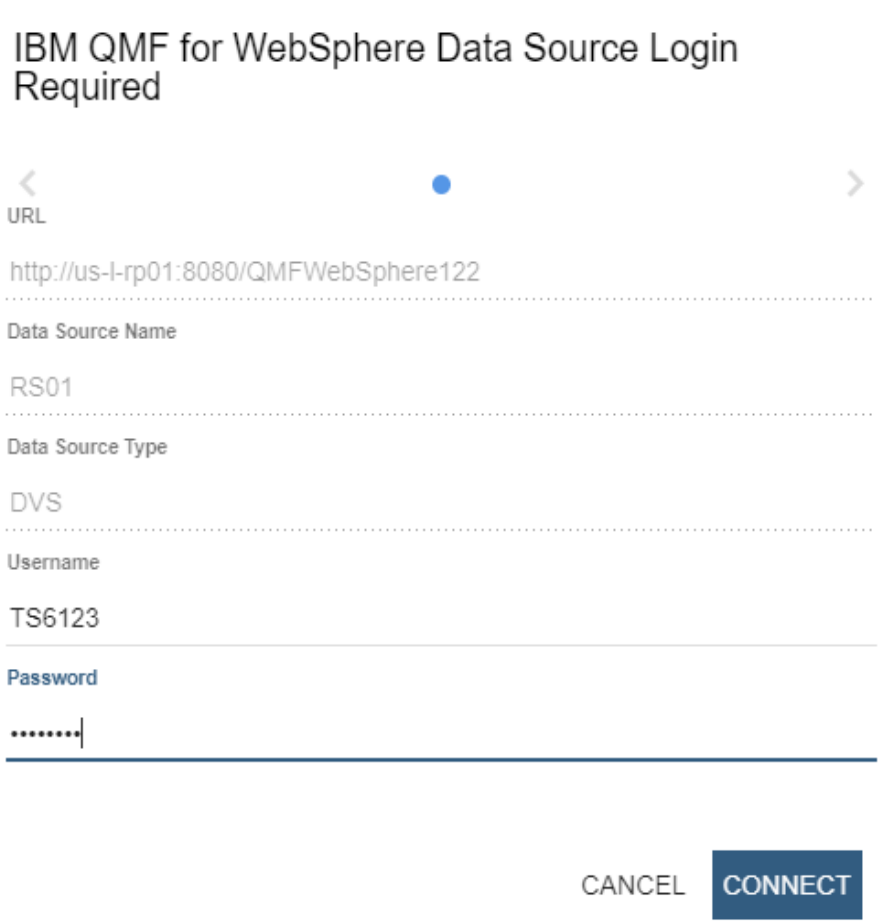
- Multiples of ways to access virtualized tables and views.
- Connect to the QMF Data Service.
- Enter a Data Source name and connection parameters.
- Filtered to only show GLOSALES%
- Prep data in IBM technologies
- Generate queries and utilize Analytic Queries and calculated columns to assemble the data.
- Save the query and construct to make available to users.

Publishing to Other Applications



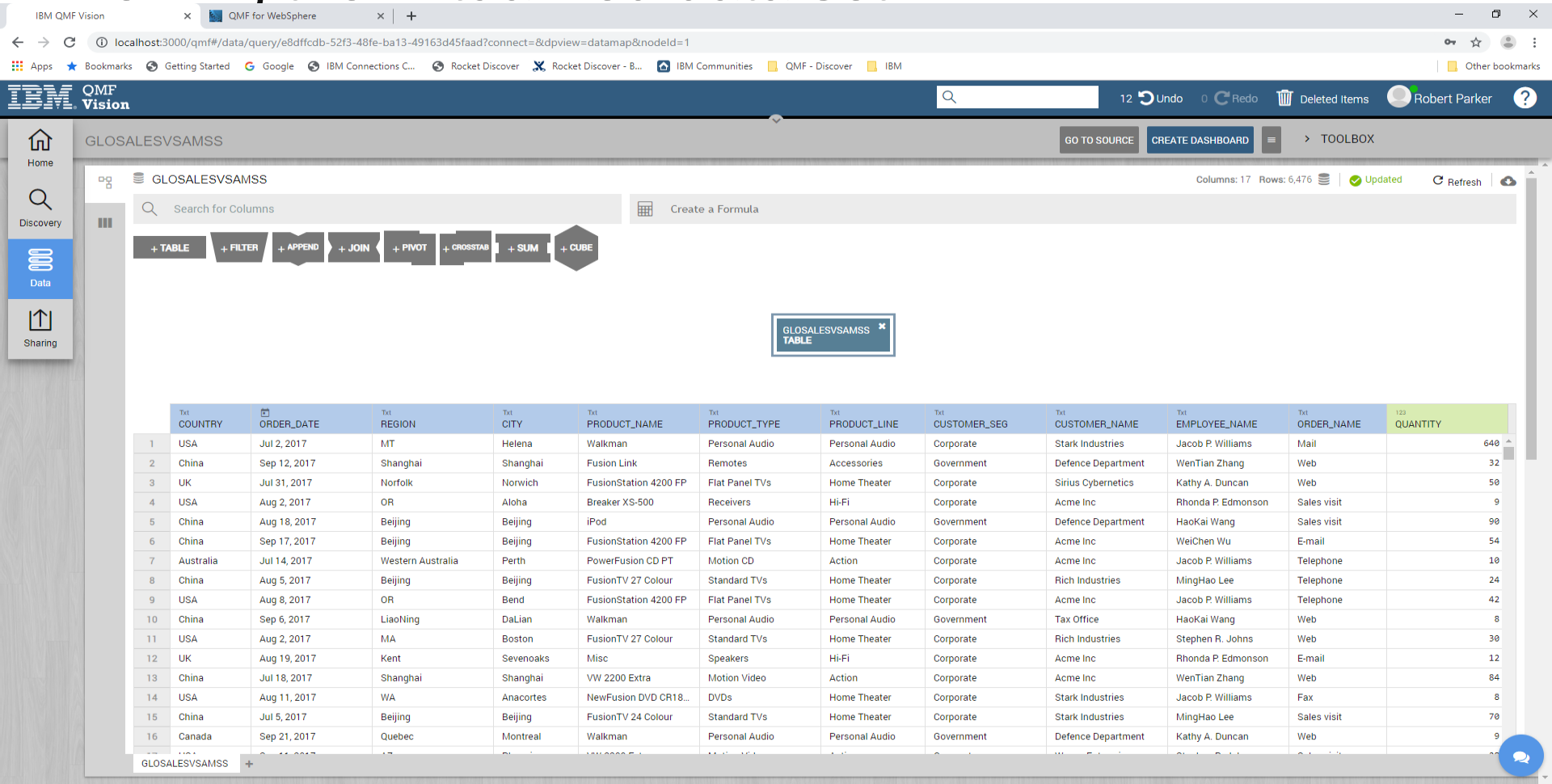
- Publish queries to QMF Vision

Dashboard Data Connection



- Connect to QDS via IBM technologies: QMF for WebSphere, QMF for Workstation, QMF Vision
- Directly connect to Db2.
- Create a query and enter the server side user credentials
- Retrieve data live

Viewing the virtualized data set

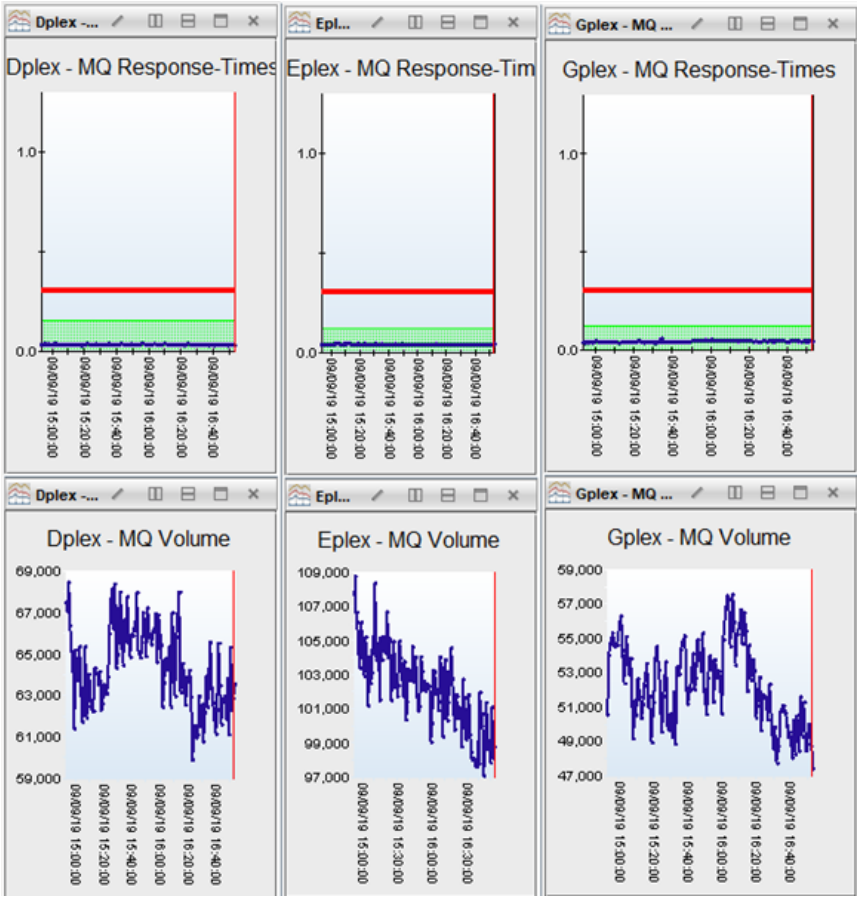


	COUNTRY	ORDER_DATE	REGION	CITY	PRODUCT_NAME	PRODUCT_TYPE	PRODUCT_LINE	CUSTOMER_SEG	CUSTOMER_NAME	EMPLOYEE_NAME	ORDER_NAME	QUANTITY
1	USA	Jul 2, 2017	MT	Helena	Walkman	Personal Audio	Personal Audio	Corporate	Stark Industries	Jacob P. Williams	Mail	640
2	China	Sep 12, 2017	Shanghai	Shanghai	Fusion Link	Remotes	Accessories	Government	Defence Department	WenTian Zhang	Web	32
3	UK	Jul 31, 2017	Norfolk	Norwich	FusionStation 4200 FP	Flat Panel TVs	Home Theater	Corporate	Sirius Cybernetics	Kathy A. Duncan	Web	50
4	USA	Aug 2, 2017	OR	Aloha	Breaker XS-500	Receivers	Hi-Fi	Corporate	Acme Inc	Rhonda P. Edmonson	Sales visit	9
5	China	Aug 18, 2017	Beijing	Beijing	iPod	Personal Audio	Personal Audio	Government	Defence Department	HaoKai Wang	Sales visit	90
6	China	Sep 17, 2017	Beijing	Beijing	FusionStation 4200 FP	Flat Panel TVs	Home Theater	Corporate	Acme Inc	WeiChen Wu	E-mail	54
7	Australia	Jul 14, 2017	Western Australia	Perth	PowerFusion CD PT	Motion CD	Action	Corporate	Acme Inc	Jacob P. Williams	Telephone	10
8	China	Aug 5, 2017	Beijing	Beijing	FusionTV 27 Colour	Standard TVs	Home Theater	Corporate	Rich Industries	MingHao Lee	Telephone	24
9	USA	Aug 8, 2017	OR	Bend	FusionStation 4200 FP	Flat Panel TVs	Home Theater	Corporate	Acme Inc	Jacob P. Williams	Telephone	42
10	China	Sep 6, 2017	LiaoNing	DaLian	Walkman	Personal Audio	Personal Audio	Government	Tax Office	HaoKai Wang	Web	8
11	USA	Aug 2, 2017	MA	Boston	FusionTV 27 Colour	Standard TVs	Home Theater	Corporate	Rich Industries	Stephen R. Johns	Web	30
12	UK	Aug 19, 2017	Kent	Sevenoaks	Misc	Speakers	Hi-Fi	Corporate	Acme Inc	Rhonda P. Edmonson	E-mail	12
13	China	Jul 18, 2017	Shanghai	Shanghai	VW 2200 Extra	Motion Video	Action	Corporate	Acme Inc	WenTian Zhang	Web	84
14	USA	Aug 11, 2017	WA	Anacortes	NewFusion DVD CR18...	DVDs	Home Theater	Corporate	Stark Industries	Jacob P. Williams	Fax	8
15	China	Jul 5, 2017	Beijing	Beijing	FusionTV 24 Colour	Standard TVs	Home Theater	Corporate	Stark Industries	MingHao Lee	Sales visit	70
16	Canada	Sep 21, 2017	Quebec	Montreal	Walkman	Personal Audio	Personal Audio	Government	Defence Department	Kathy A. Duncan	Web	9

Dashboards for DBA's

- Data for the Lines of Business are not of interest. Why do I want to see Profit or Sales of product?
- I want to see what's occurring on my server, what process are happening and utilization.
- How is my system performing? Inserts, updates, deletes and commits per second.
- How are log files being consumed?
- What dataset is important to capture?

Daily Mission Control

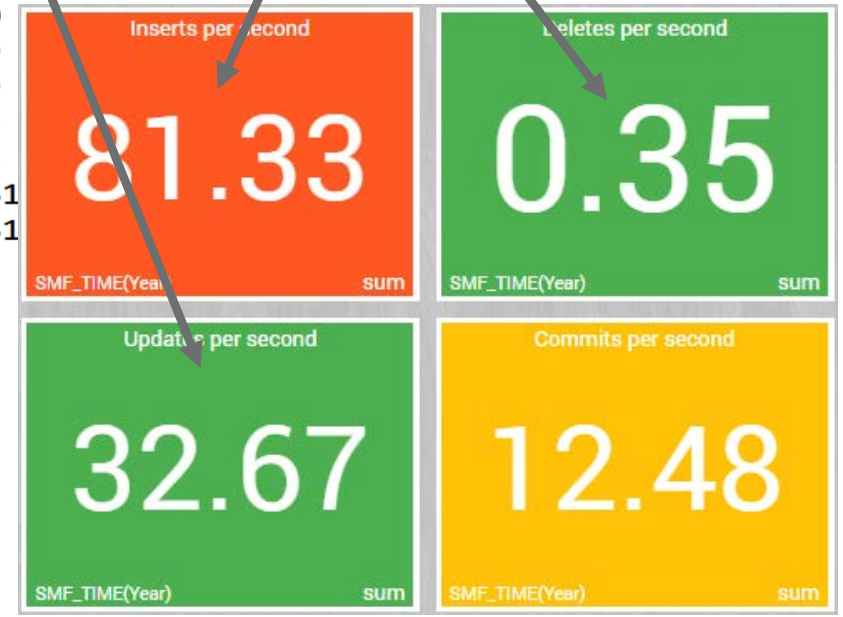


- Observing CPU utilization
- Times of the day with most activity
- Dashboard contains multiples charts
- Data sourced from log files
- Queries are run every minute

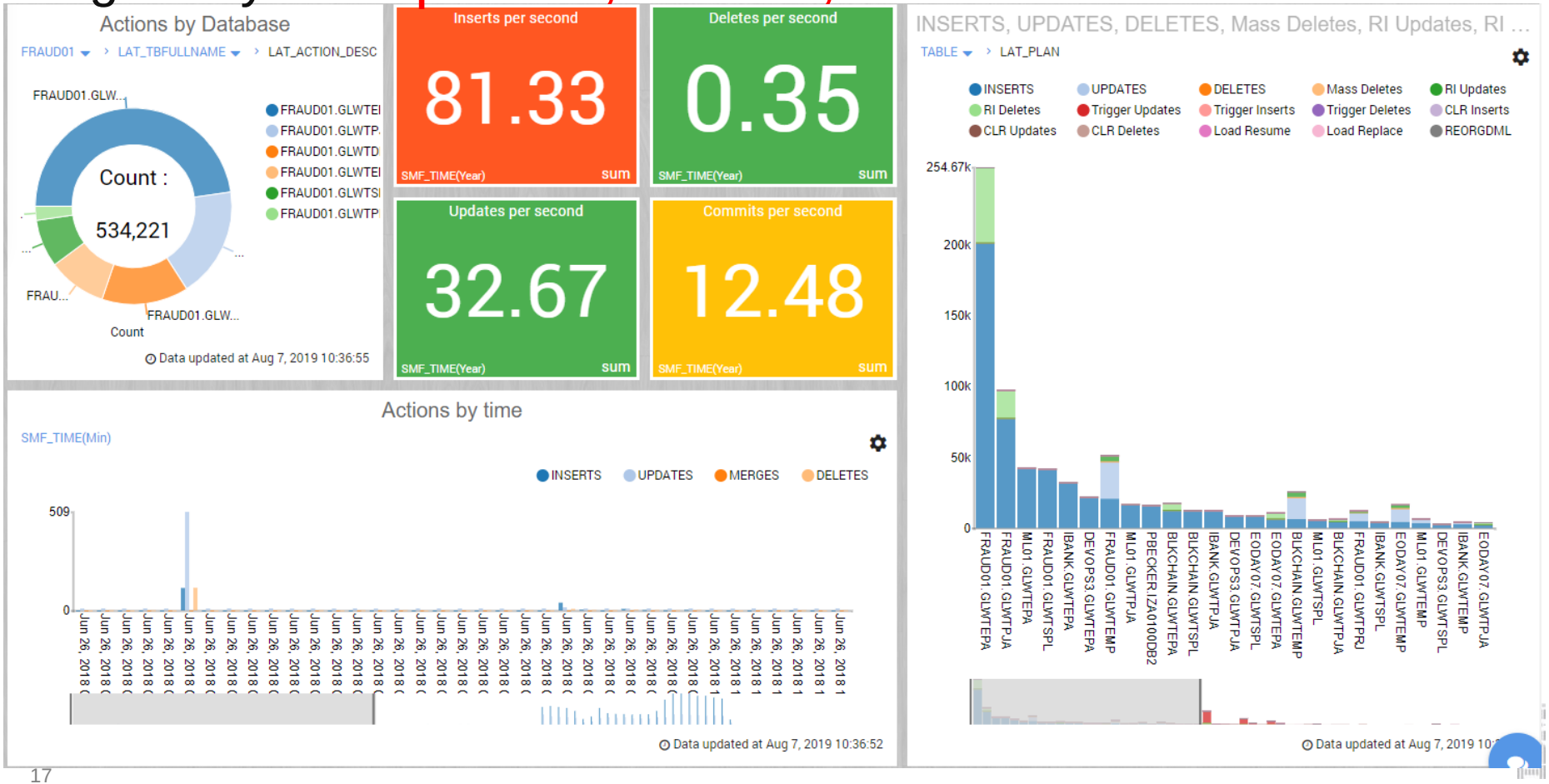
Log File Reports

```
******************************
* COMMITTED ACTIVITY         *
******************************

OBJECT TYPE/NAME                                UPDATES     INSERTS     DELETES     MD
----------------------------------------------- ----------- ----------- ----------- --
TABLE..... SYSIBM.SYSTABLESPACESTATS            560         4           0
TABLESPACE. SYSTSTSS                            560
TABLE..... SYSIBM.SYSINDEXSPACESTATS            669
TABLESPACE. SYSTSISS                            669
TABLE..... SYSIBM.SYSSTATFEEDBACK               283
TABLESPACE. SYSTSSFB                            283
TABLE..... SYSIBM.SYSSEQUENCES                  1061
TABLESPACE. SYSSEQ                              1061
TABLE..... SYSIBM.SYSTABLESPACE                 8
TABLESPACE. SYSTSTSP                            8
TABLE..... SYSIBM.SYSTABLEPART                  0
TABLESPACE. SYSTSTPT                            0
TABLE..... SYSIBM.SYSTABLES                     8
```

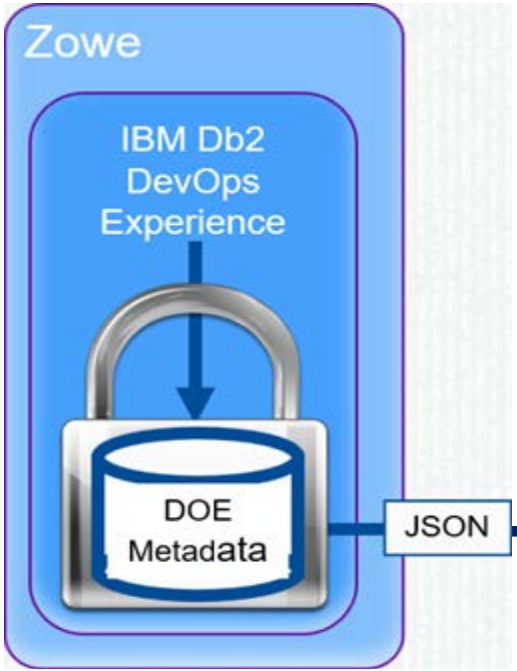


Log Analysis - updates, inserts, deletes and commits



DevOps Processes

.yaml returned as JSON and then loaded into Db2

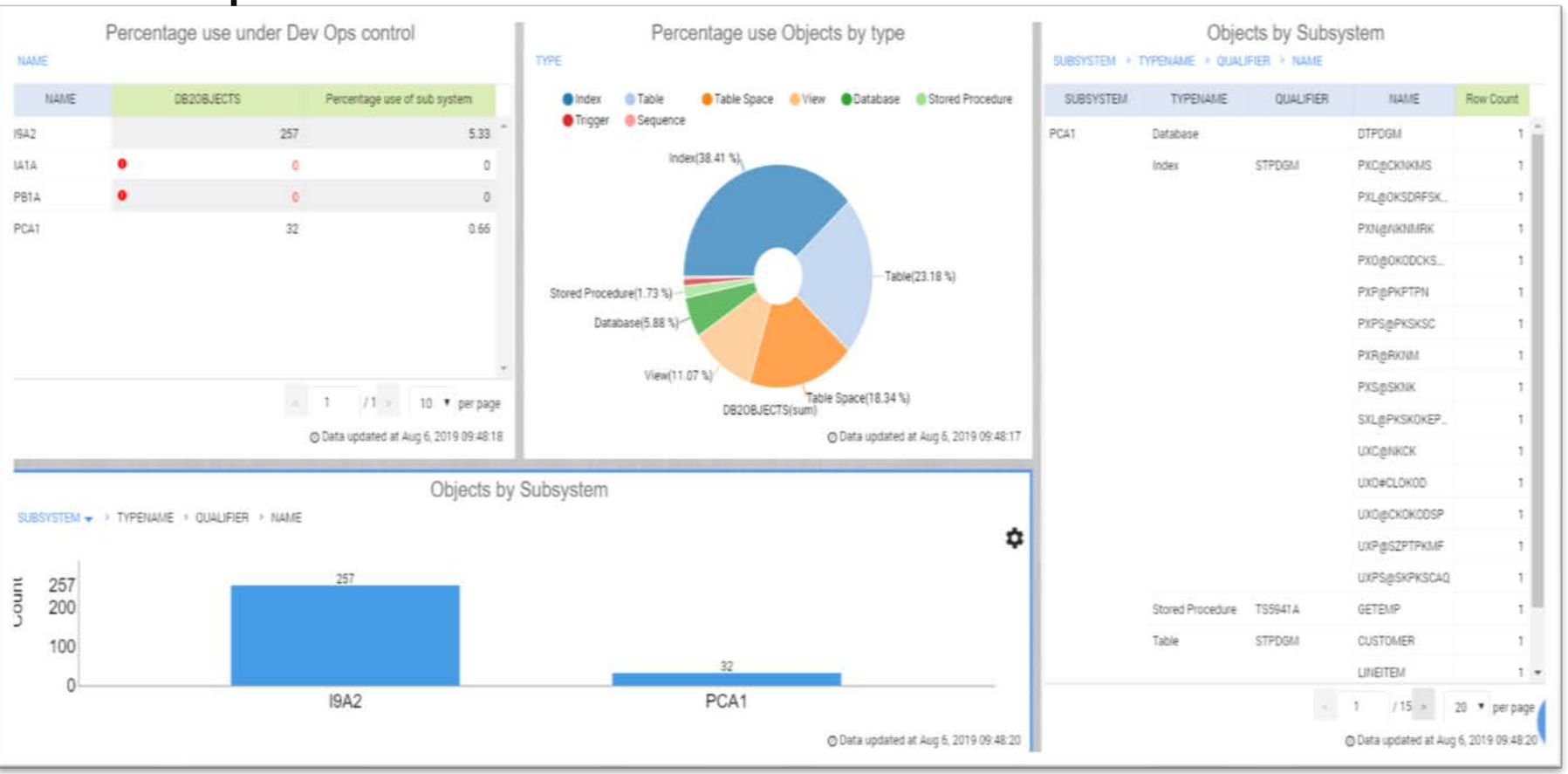


GET http://10.99.102.15:12023/ws/policy/teams

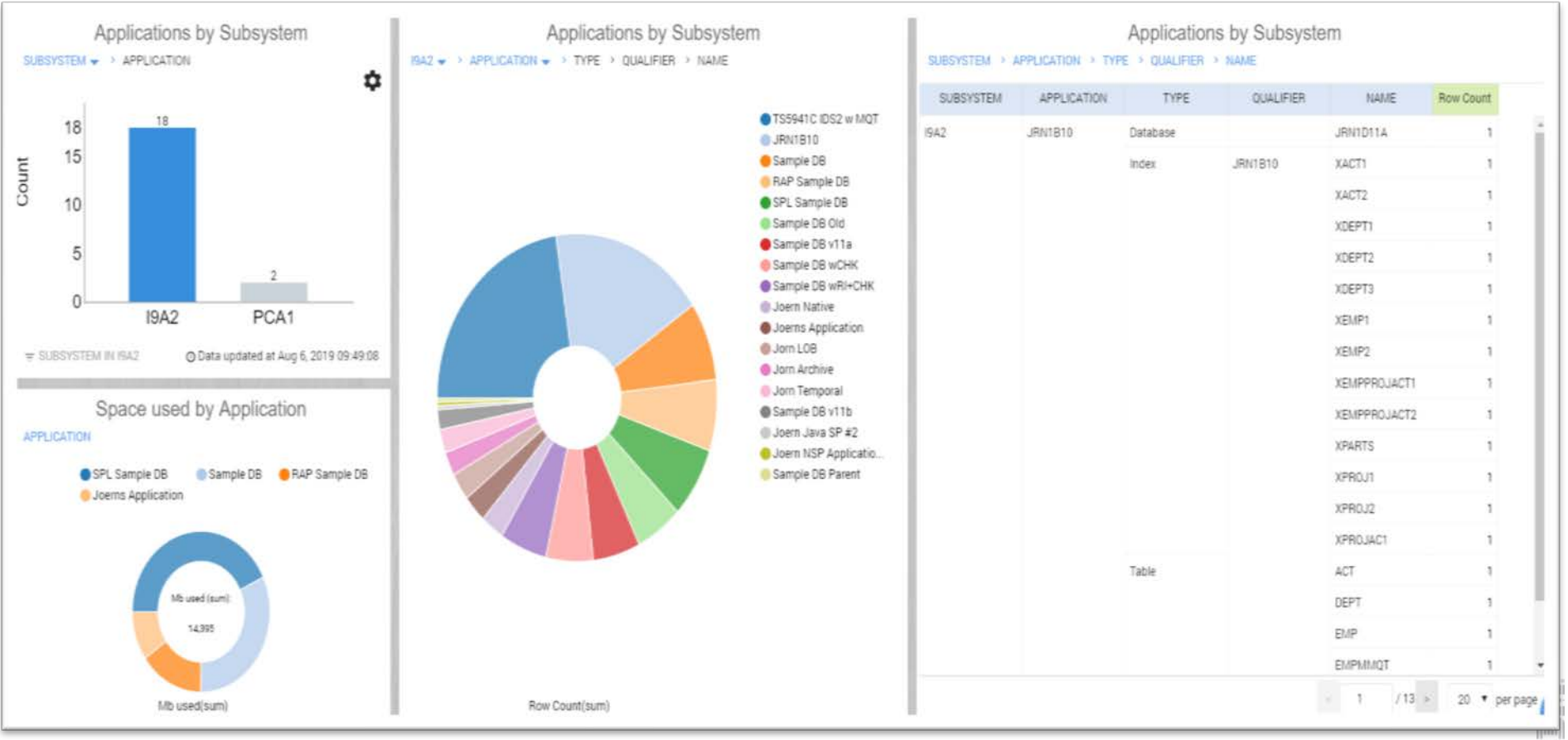
Pretty Raw Preview JSON


```
                    "__yamlClass": "com.rocketsoft.newton.policy.ProvisionRule",
                    "objectName": "policy.provisionrule",
                    "rule": "DEX",
                    "ruleType": "starts_with"
                },
                "storageLimit": 0,
                "subsystemIds": [
                    "c05e5224-daf8-436b-8366-82ff698ec678"
                ],
                "userProvisionedInstanceLimit": 2
            },
            {
                "__yamlClass": "com.rocketsoft.newton.policy.Environment",
                "databaseRule": null,
                "id": "9d0ba450-e764-4784-ab21-115539b4934f",
                "name": "Env2 DBBC",
                "objectName": "policy.environment",
                "provisionedInstanceLimit": 100,
                "schemaRule": null,
                "storageLimit": 0,
                "subsystemIds": [
                    "511eef8d-6a72-4668-bb00-9d9dcf55d72e"
                ],
                "userProvisionedInstanceLimit": 50
            }
        ],
        "id": "8d2839ce-84c9-44c7-8e99-17ad37807030",
        "name": "DevOps Team",
        "objectName": "policy.team"
    }
]
```

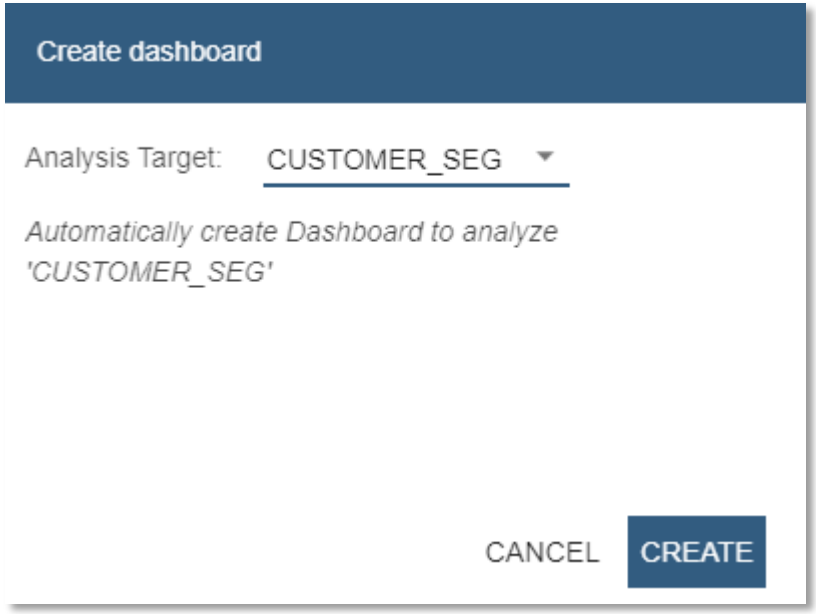

DevOps Process Dashboard



DevOps Process Dashboard

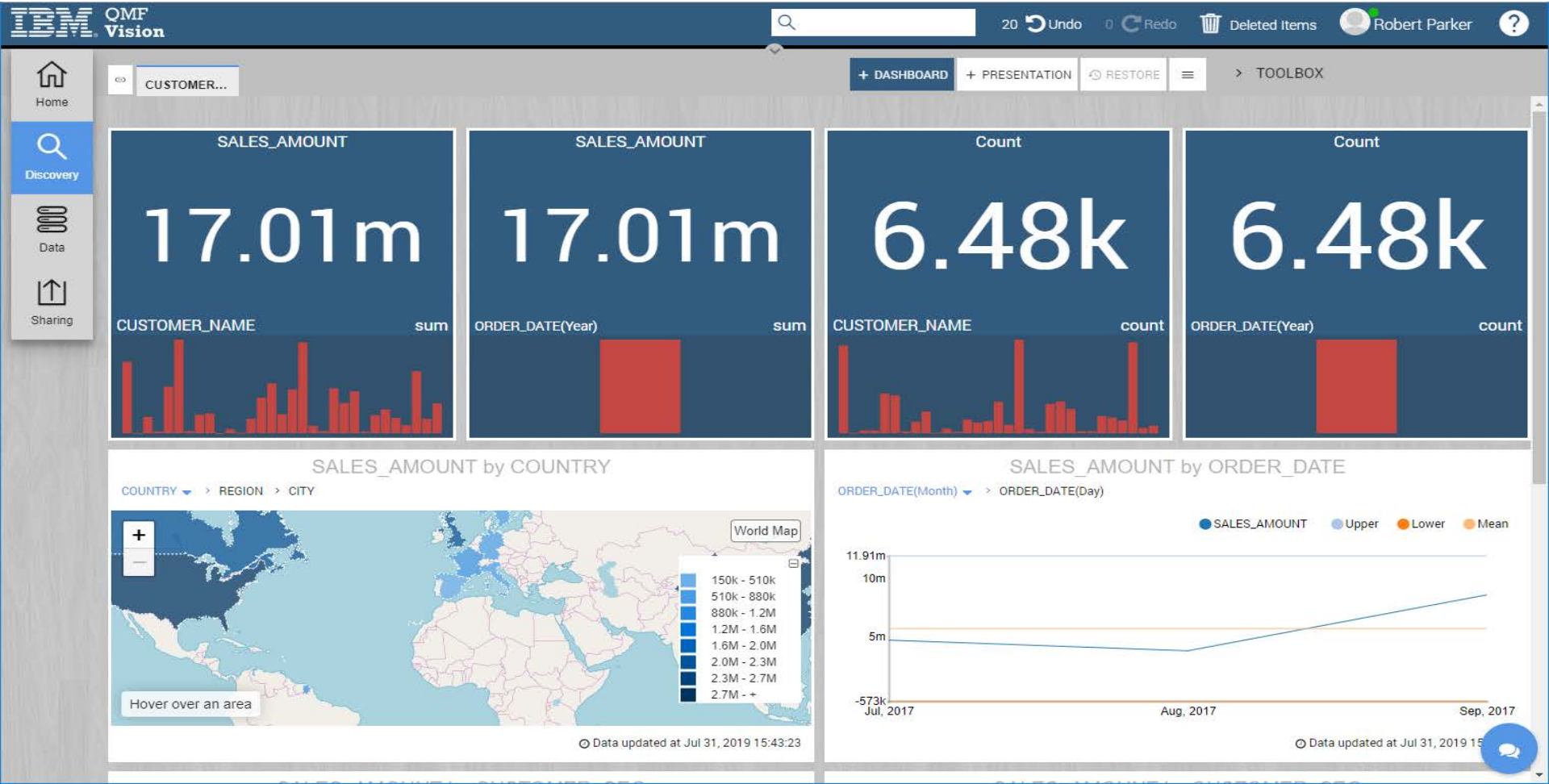


Dashboard Auto generation

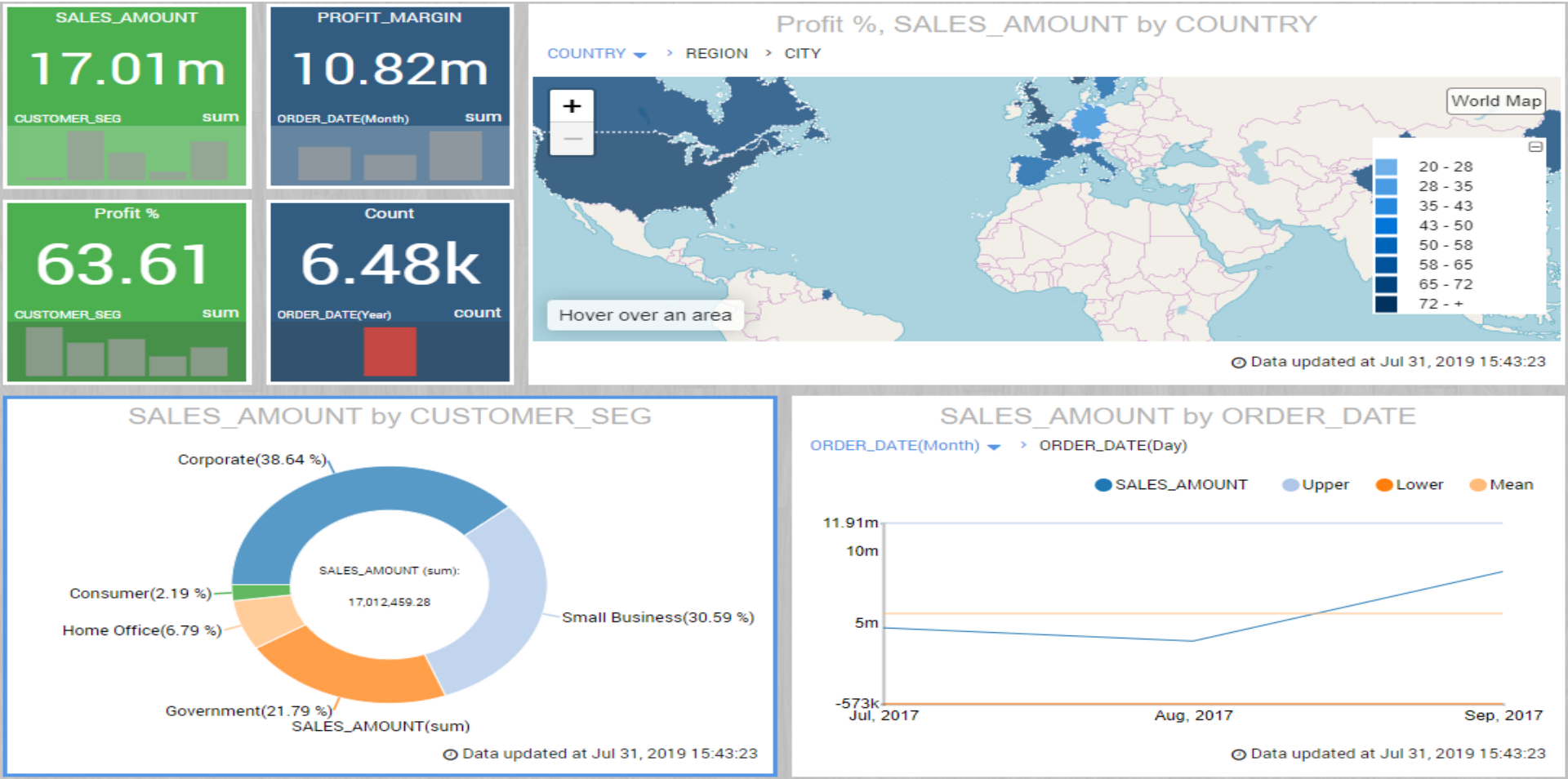


- Using GLOSALESVSAMSS
- Create a query and enter the user credentials
- Analysis Target can be either a measure or dimension

Dashboard Auto Generation



IBM QMF Vision



Resources

- QDS Installation:
  http://www.ibm.com/support/docview.wss?uid=swg27048346
- IBM Redbooks:
  http://www.redbooks.ibm.com/abstracts/sg248370.html?Open
- Youtube IBM QMF Channel:
  https://www.youtube.com/channel/UCZl1PSrK7lPZLWKjljsa_gQ
- Digital Technical Engagement Site (DTE):
  https://www.ibm.com/demos/collection/IBM-QMF/
- IBM Data Virtualization Manager for z/OS:
  www.ibm.com/support/knowledgecenter/SS4NKG_1.1.0/havuga10/topics/havuga10.pdf


Thank
You