VS01 - z/VSE Lösungen im kognitiven Umfeld

Ingo Franzki

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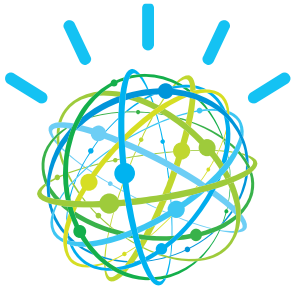
What is Cognitive Computing ?

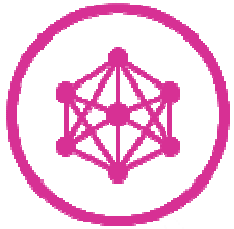
***Cognitive**: Psychological processes involved in acquisition and understanding of knowledge, formation of beliefs and attitudes, and decision making and problem solving.*

Cognitive computing =
Digital Business +
Digital Intelligence

Data understanding
& interpretation



Learn &
adapt



Decision

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Watson Technology – the Digital Intelligence for Cognitive Computing

Cognitive Computing = Digital Business + Digital Intelligence

- Watson is the first commercially available cognitive computing capability, representing a new era in computing.
- Watson analyzes high volumes of data and processes information more like a human than a computer
  - by understanding natural language,
  - generating hypotheses based on evidence,
  - learning as it goes
- The three pillars of Watson:

Watson Explorer

Search, visualize, and explore information across enterprise applications through **360° views of any topic**

Content Analytics

Analyze, visualize, and discover insight in structured and unstructured data through **NLP and content mininig**

Watson Developer Cloud

Enhance, scale, and accelerate human expertise through **user modeling, relationship extraction, and more**

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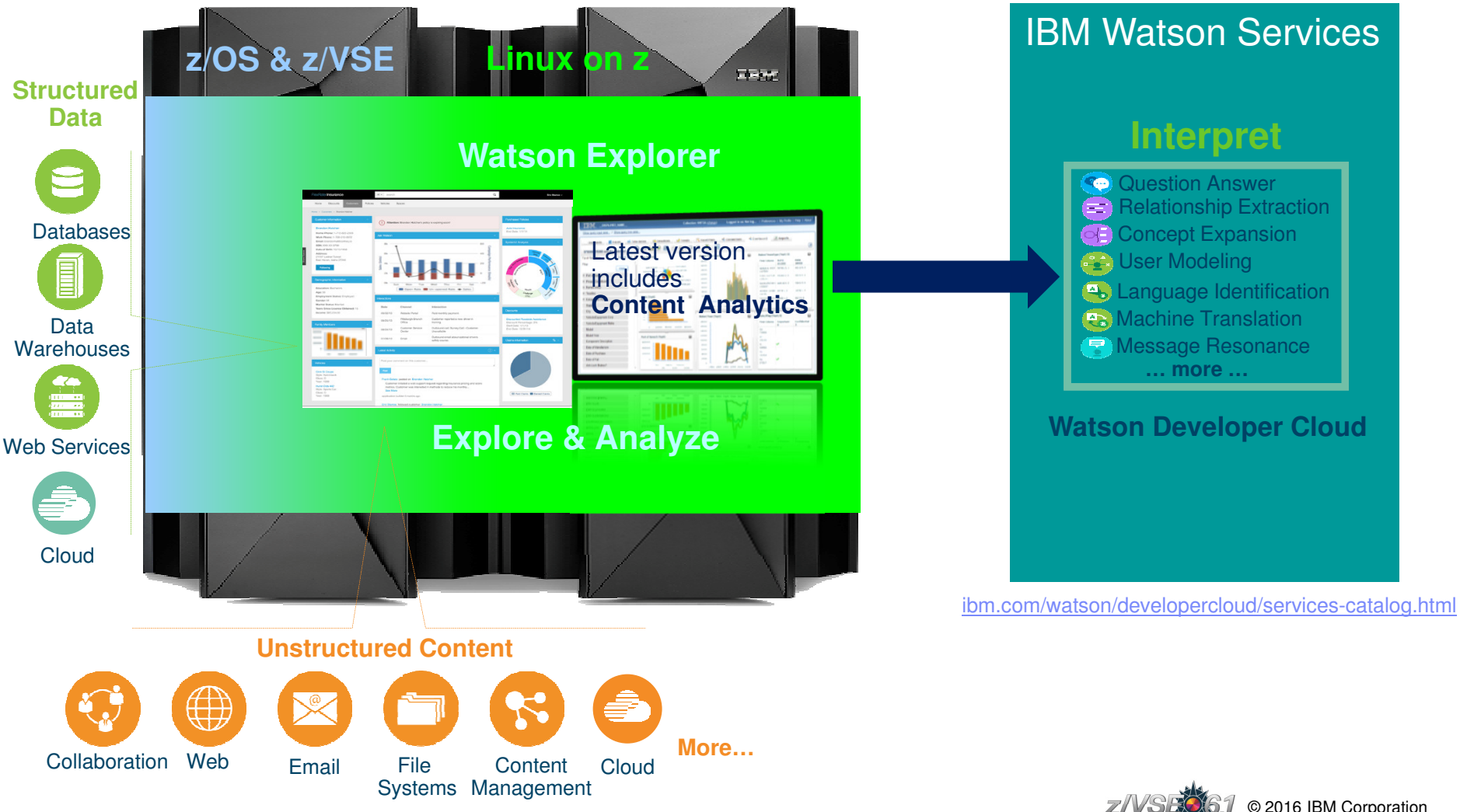
Watson Explorer is running on z Systems

Makes data from enterprise and non-enterprise silos easily accessible



ibm.com/watson/developercloud/services-catalog.html

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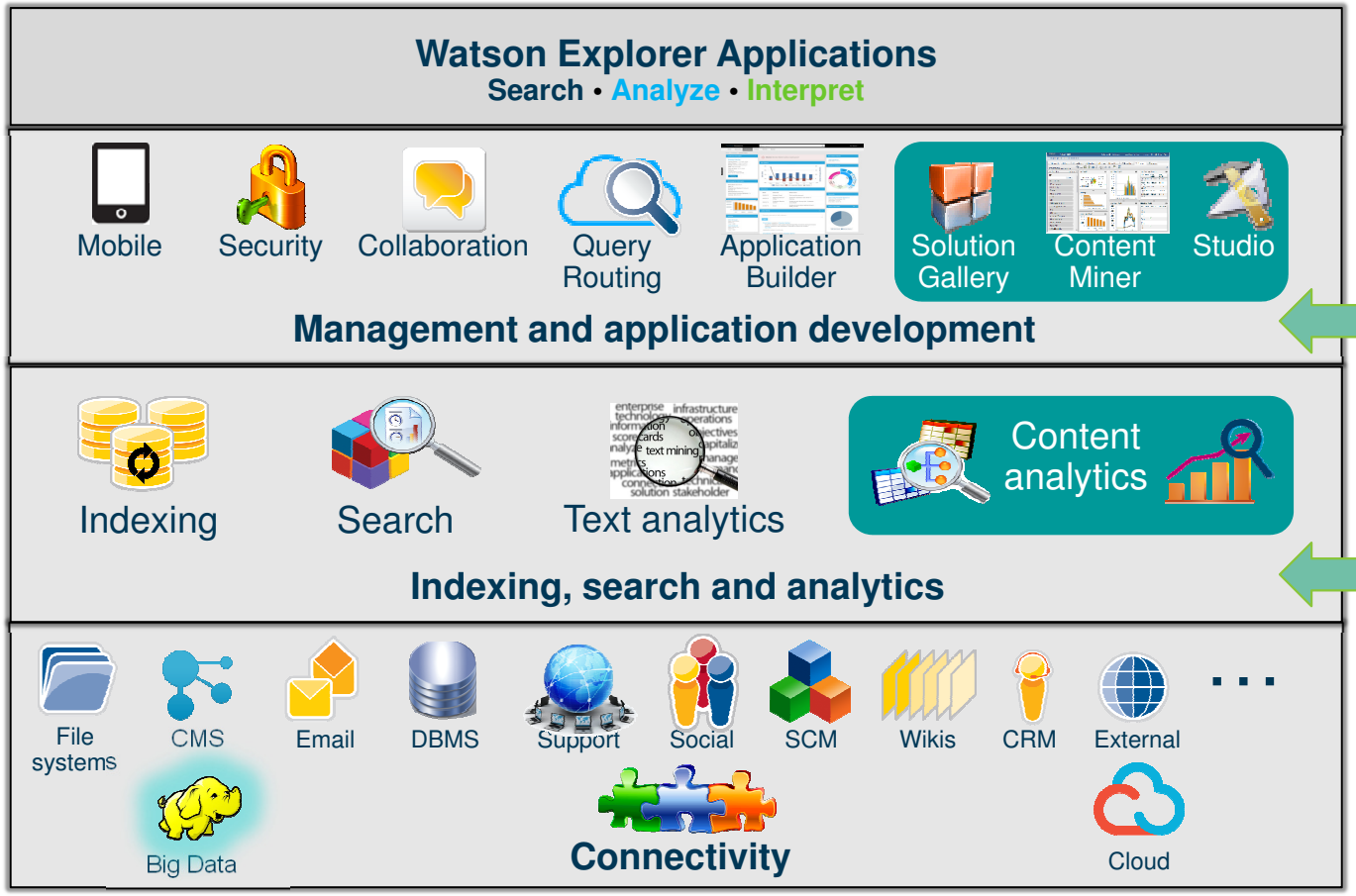
Watson Explorer Component View



Watson Developer Cloud

Cognitive and information analysis services

- Question Answer
- Relationship Extraction
- Concept Expansion
- User Modeling
- Language Identification
- Machine Translation
- Message Resonance

… **more** …

= available with Advanced Edition

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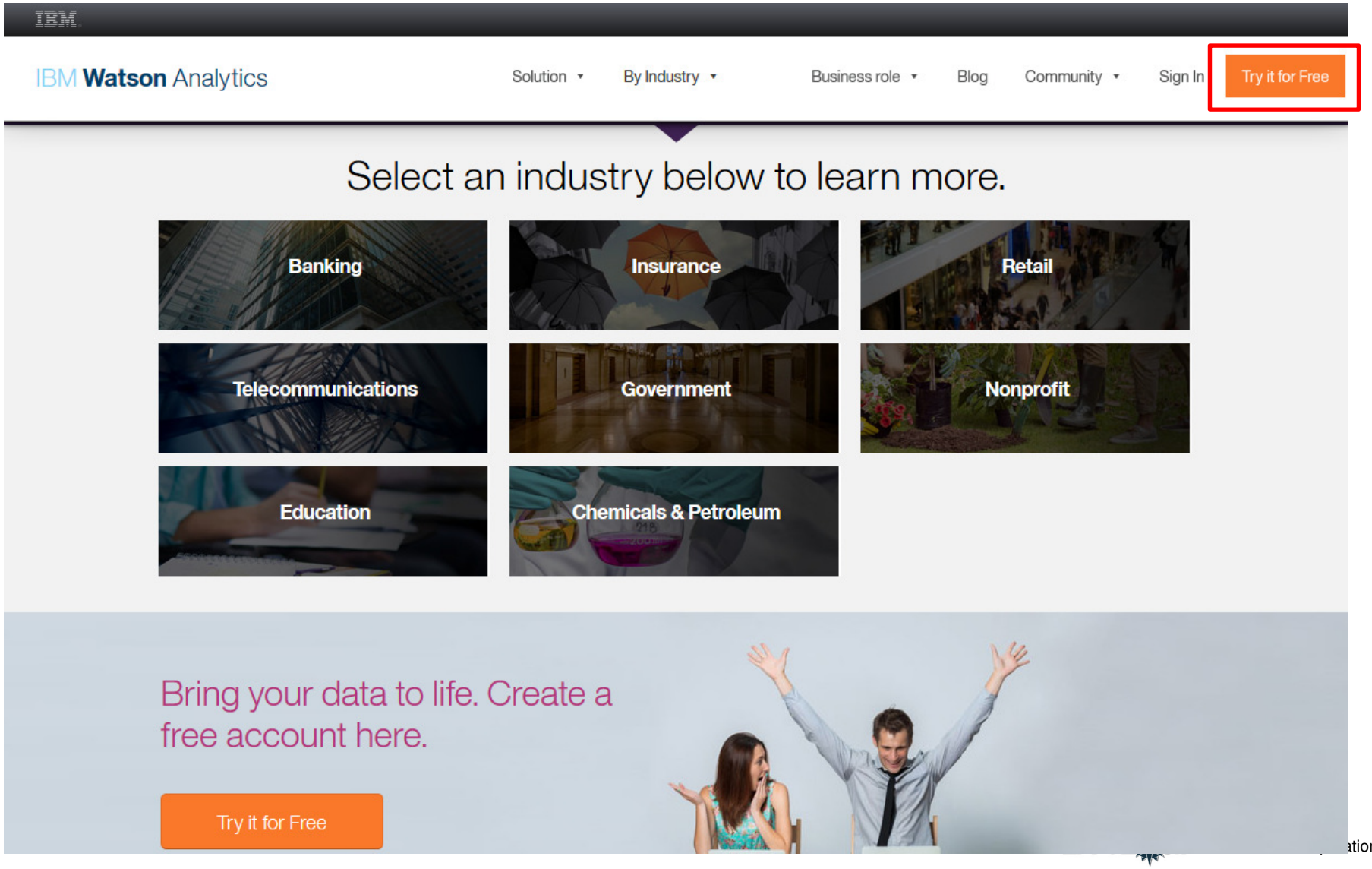
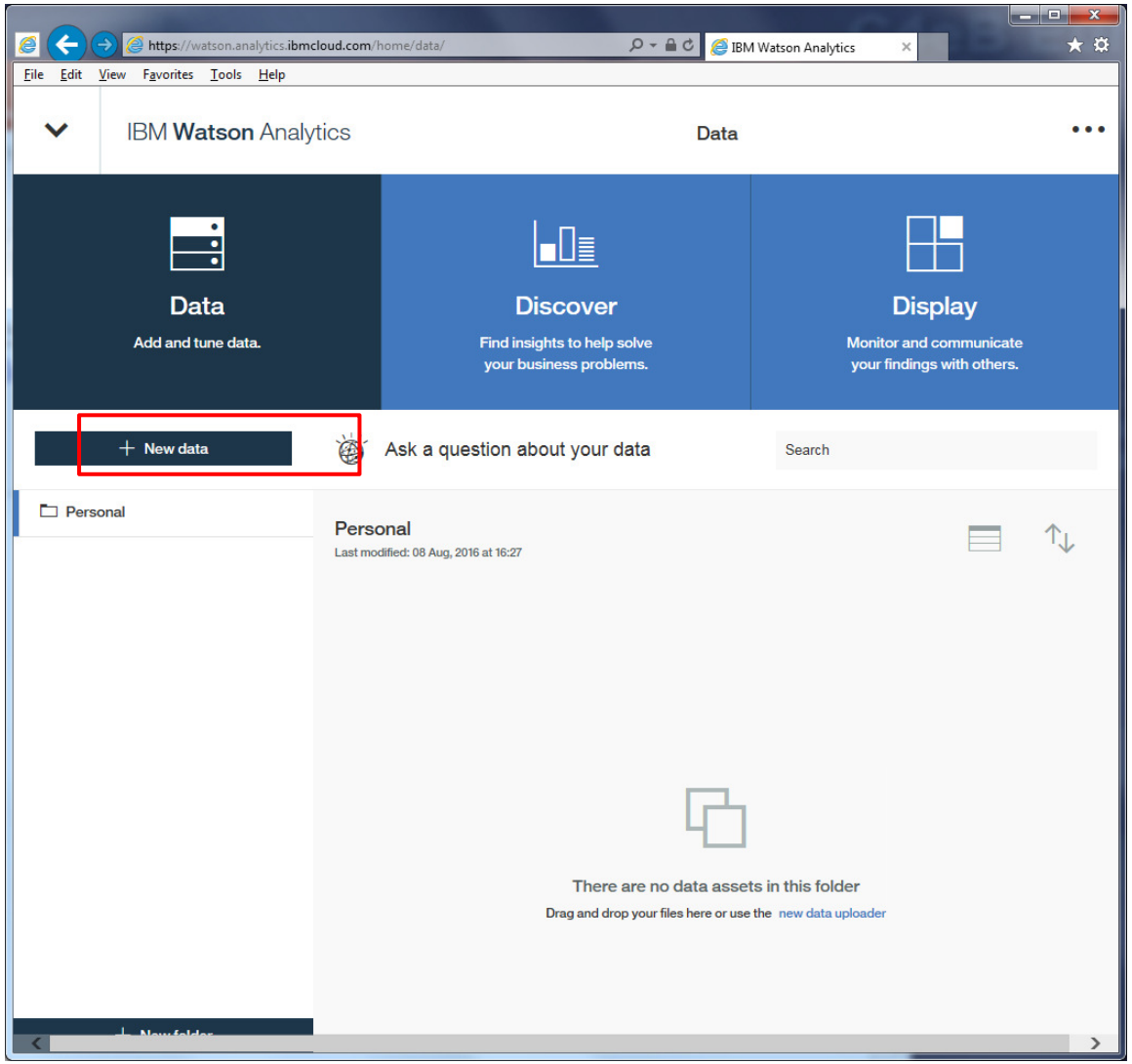


IBM Watson Analytics – try it for free

https://watson.analytics.ibmcloud.com/login



- An IBM-ID is needed for registration
- Free Edition:
  - 1 user
  - 1 MB of storage included
  - Professional single user trial for first 30 days
  - Limited access to IBM Analytics Exchange offerings
- Additional offerings are available, too

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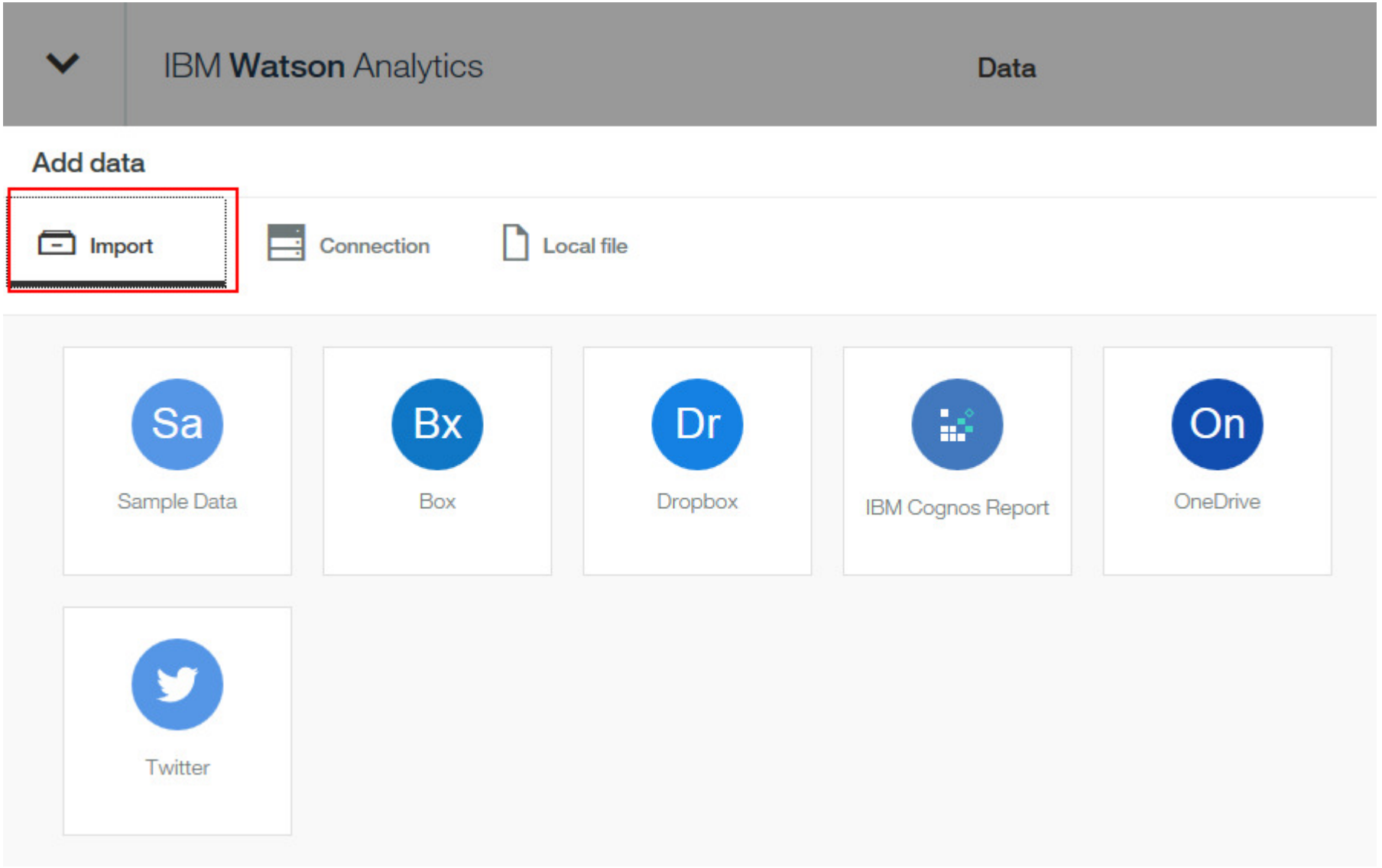

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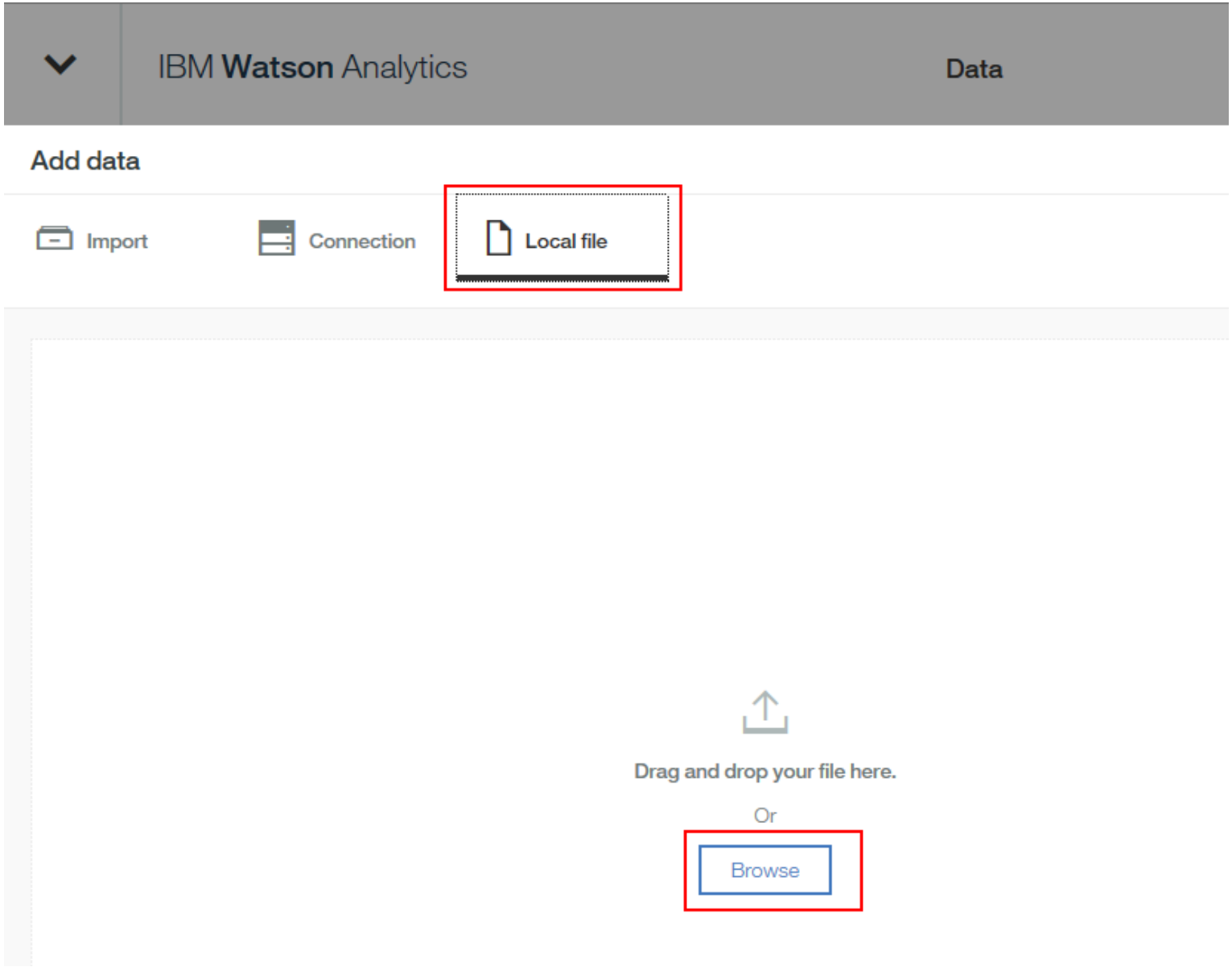

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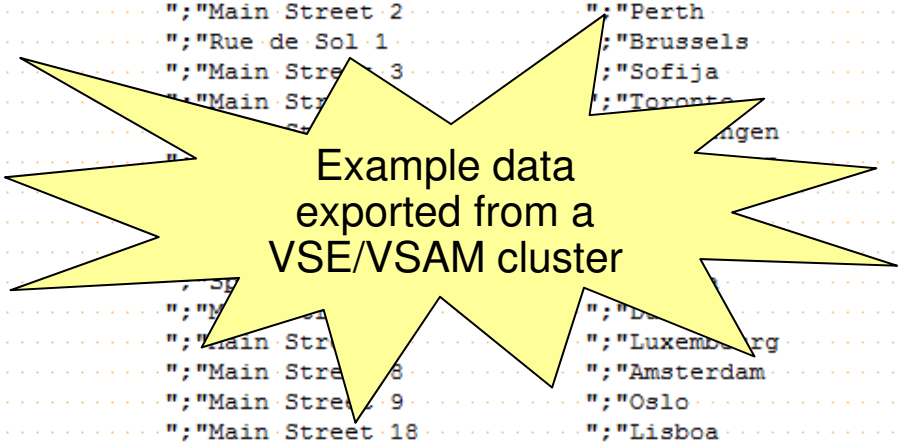
Example data exported from a VSE/VSAM cluster



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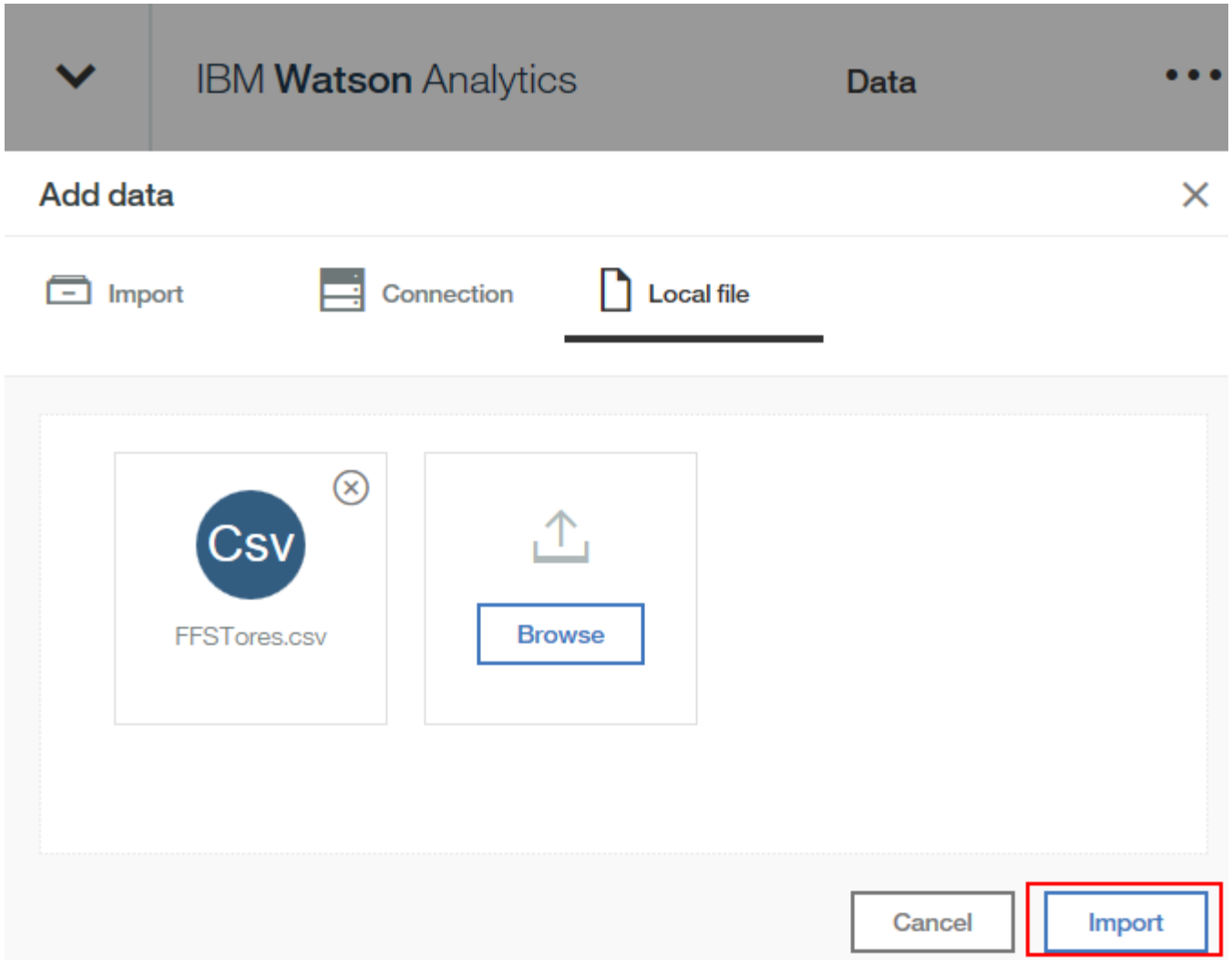

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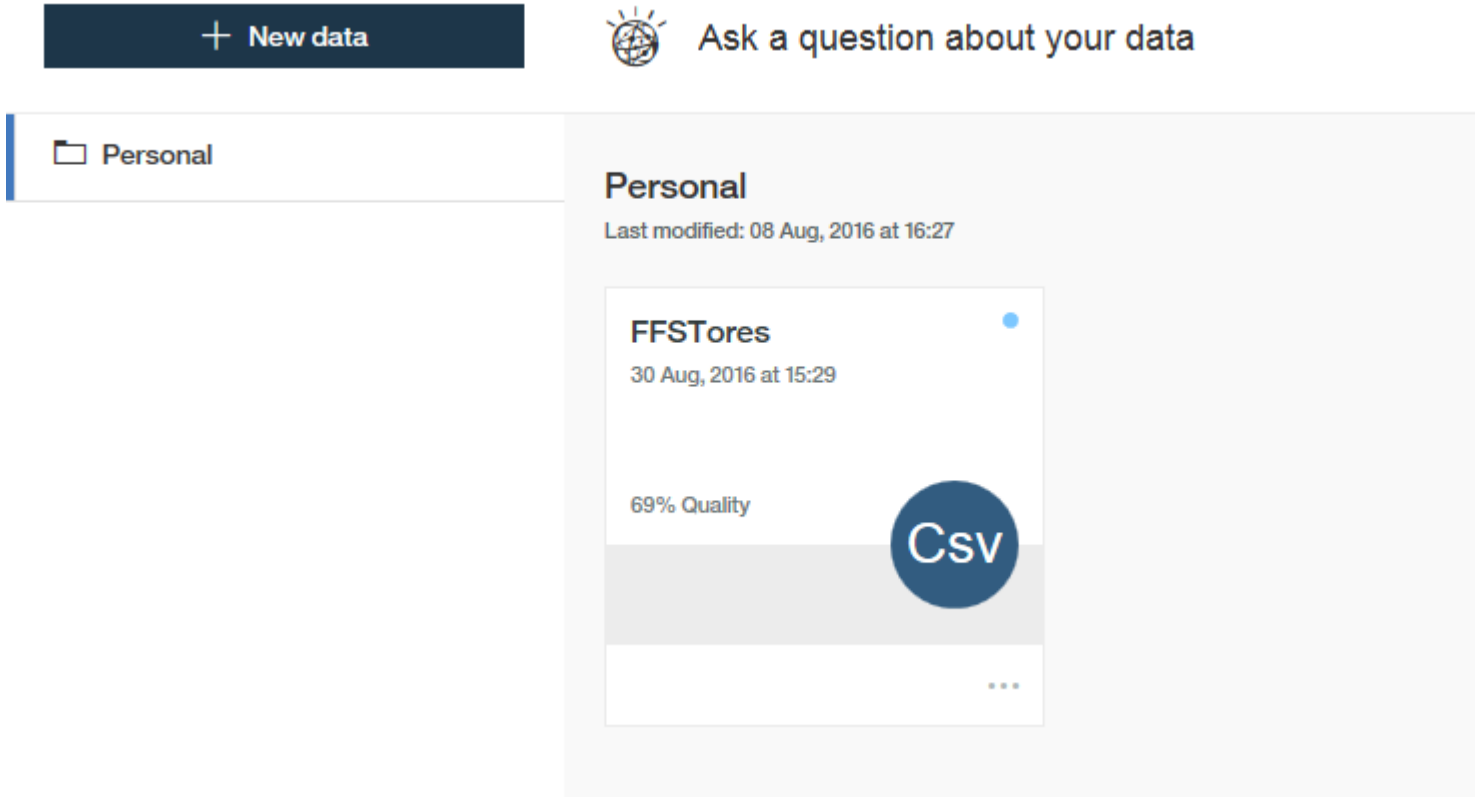

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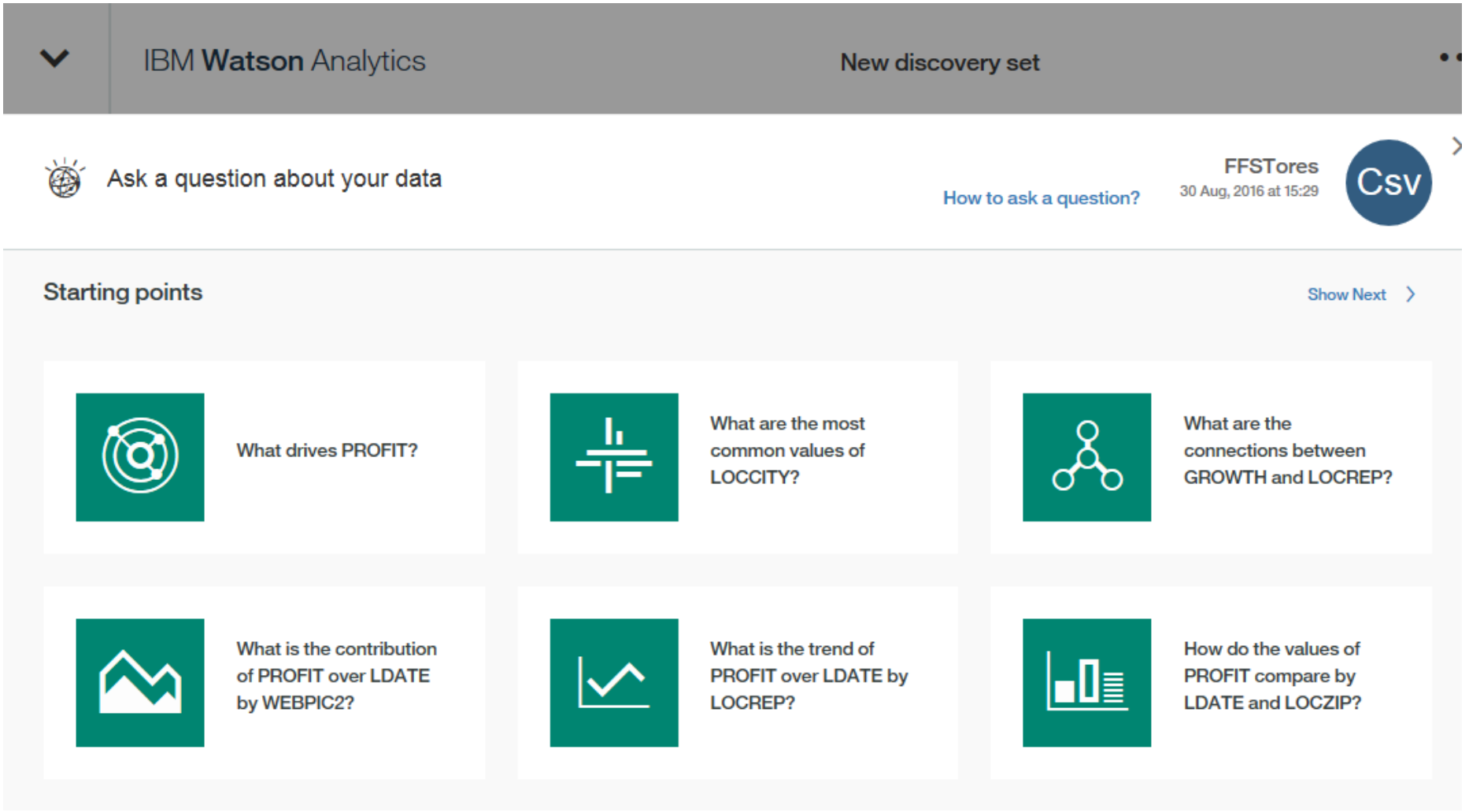

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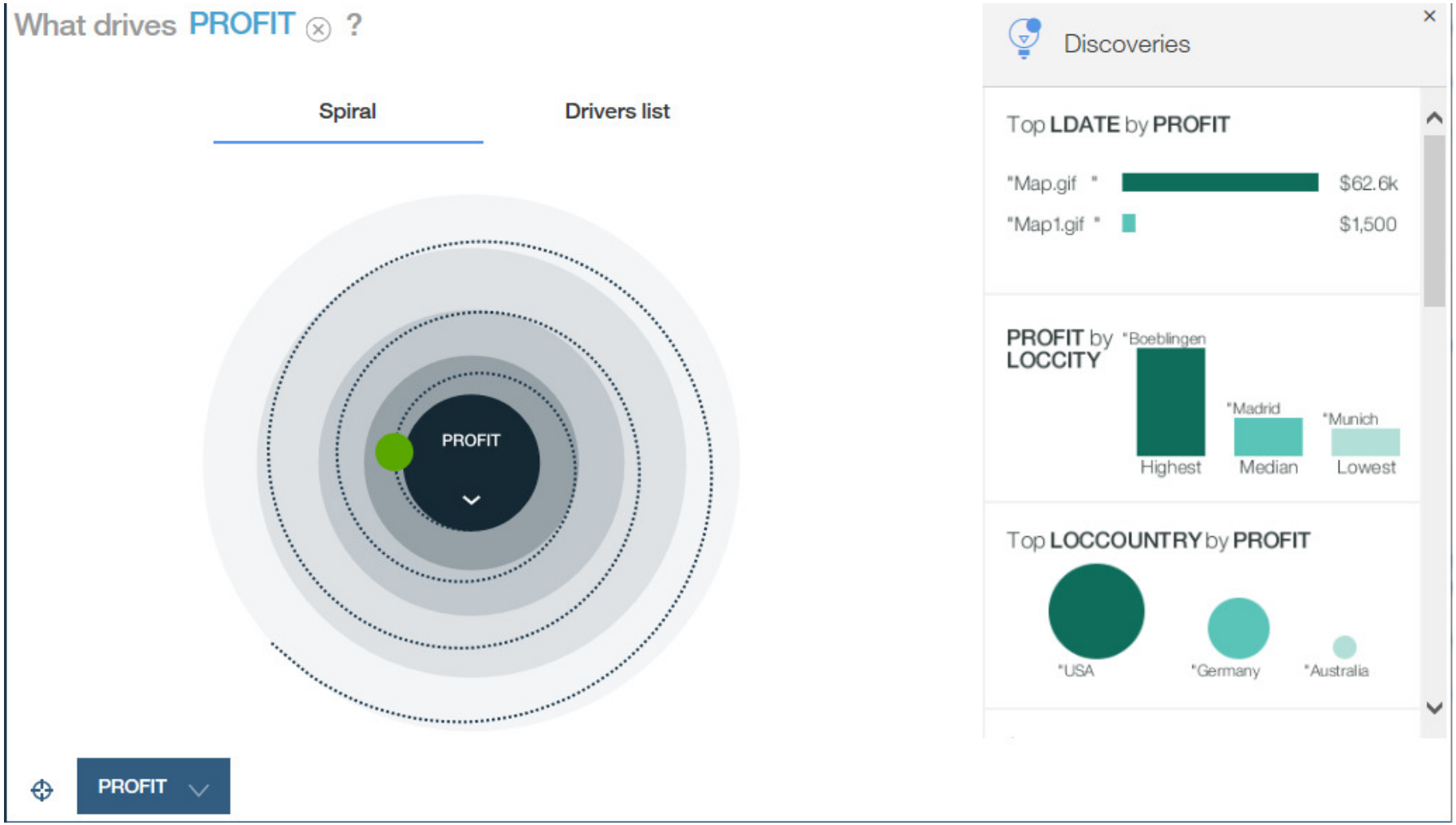

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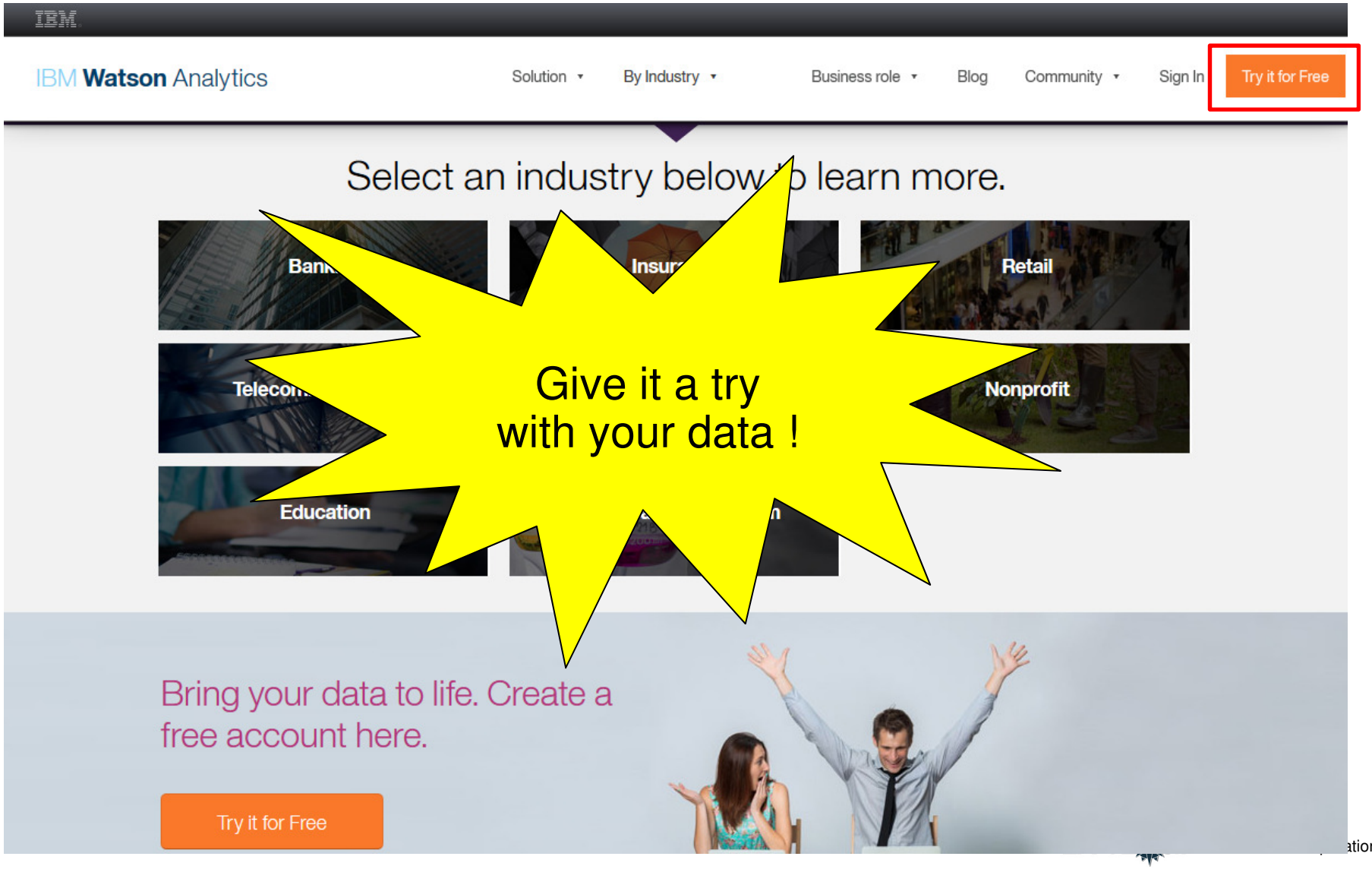

What is Hadoop ?

Apache Hadoop is an open source software project

- Enables distributed processing of large data sets across clusters of commodity servers.
- It is designed to scale up from a single server to thousands of machines, with very high degree of fault tolerance.
- Rather than relying on high-end hardware, the resiliency of these clusters comes from the software's ability to detect and handle failures at the application layer.

The project includes these modules:

- **Hadoop Common:** The common utilities that support the other Hadoop modules.
- **Hadoop Distributed File System (HDFS):** A distributed file system that provides high-throughput access to application data.
- **Hadoop YARN:** A framework for job scheduling and cluster resource management.
- **Hadoop MapReduce:** A YARN-based system for parallel processing of large data sets.

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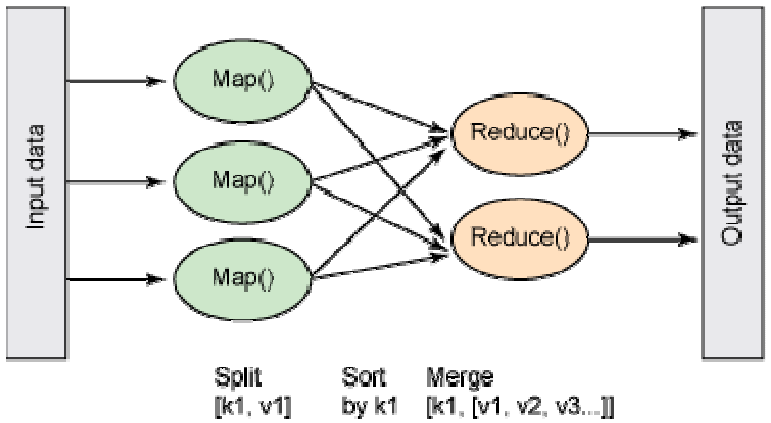
What is MapReduce?

MapReduce is the heart of Hadoop

- It is this programming paradigm that allows for massive scalability across hundreds or thousands of servers in a Hadoop cluster.
- The term **MapReduce** actually refers to two separate and distinct tasks that Hadoop programs perform.
- The **map job**
  - takes a set of data and converts it into another set of data
  - where individual elements are broken down into tuples (key/value pairs).
- The **reduce job**
  - takes the output from a map as input
  - combines those data tuples into a smaller set of tuples.
- As the sequence of the name MapReduce implies, the reduce job is always performed after the map job.



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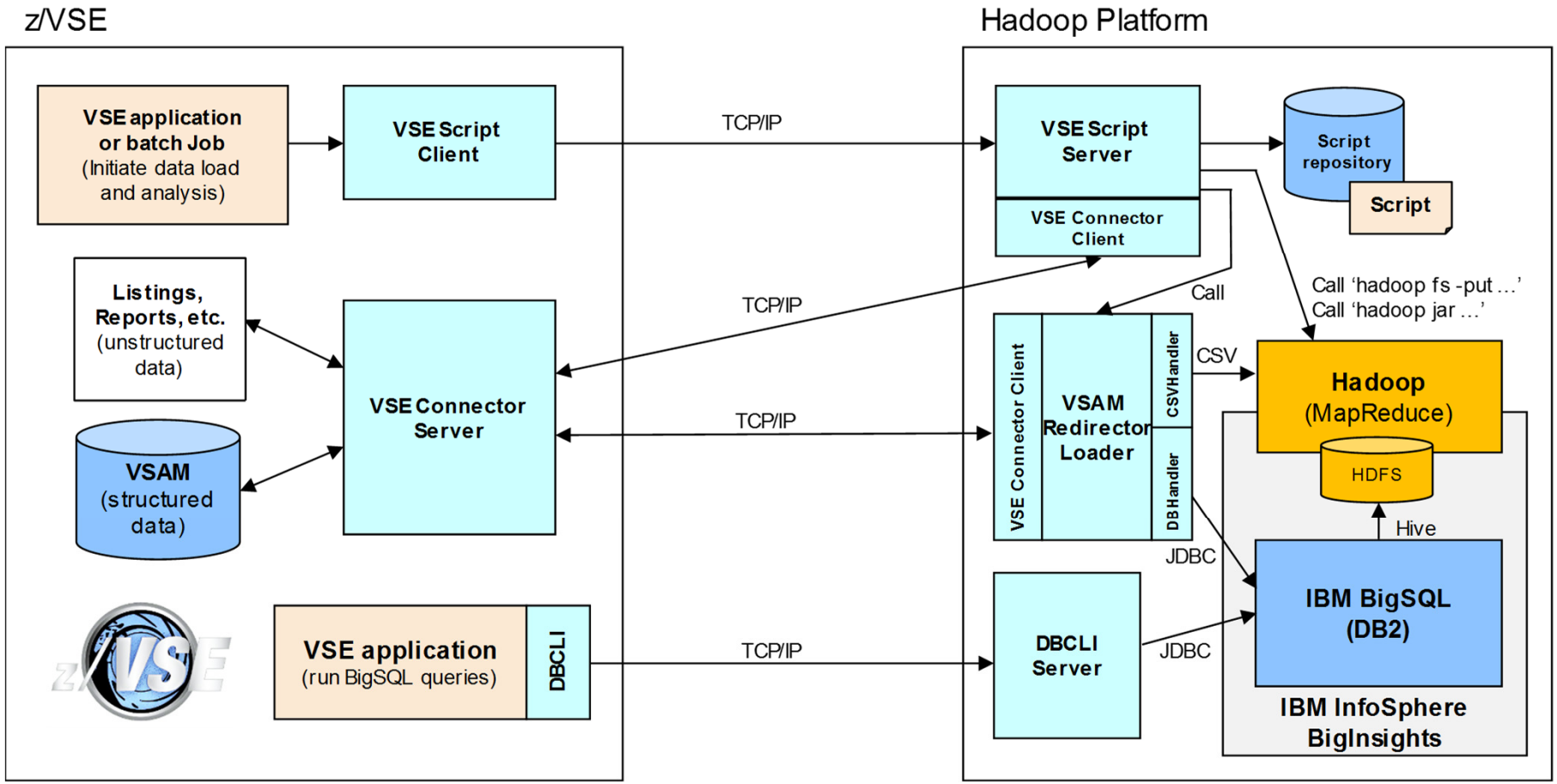
Using the z/VSE Connectors to analyze VSE data with Hadoop



Whitepaper: Big Data and Hadoop with z/VSE
ftp://public.dhe.ibm.com/eserver/zseries/zos/vse/pdf3/BigData_with_zVSE.pdf

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CSV Export of VSAM data

- **Most Analysis tools allow to import CSV data**
  - IBM Watson Analytics
  - Hadoop
  - Others…

```
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"000002";"Hugo                    ";"Reeperbahn 15
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"000014";"Cafe Dehaene            ";"Rue de Sol 1
"000015";"Cafe Stojanow           ";"Main Street 3
```

- **CSV = Comma Separated Values**
  - Stores tabular data (numbers and text) in plain text
  - Each line of the file is a data record
  - Each record consists of one or more fields, separated by commas (or semicolons)

- **The VSE Connectors provide tools to export VSAM data as CSV**
  - VSAM Redirector Loader with CSVFileHandler
  - VSE Navigator

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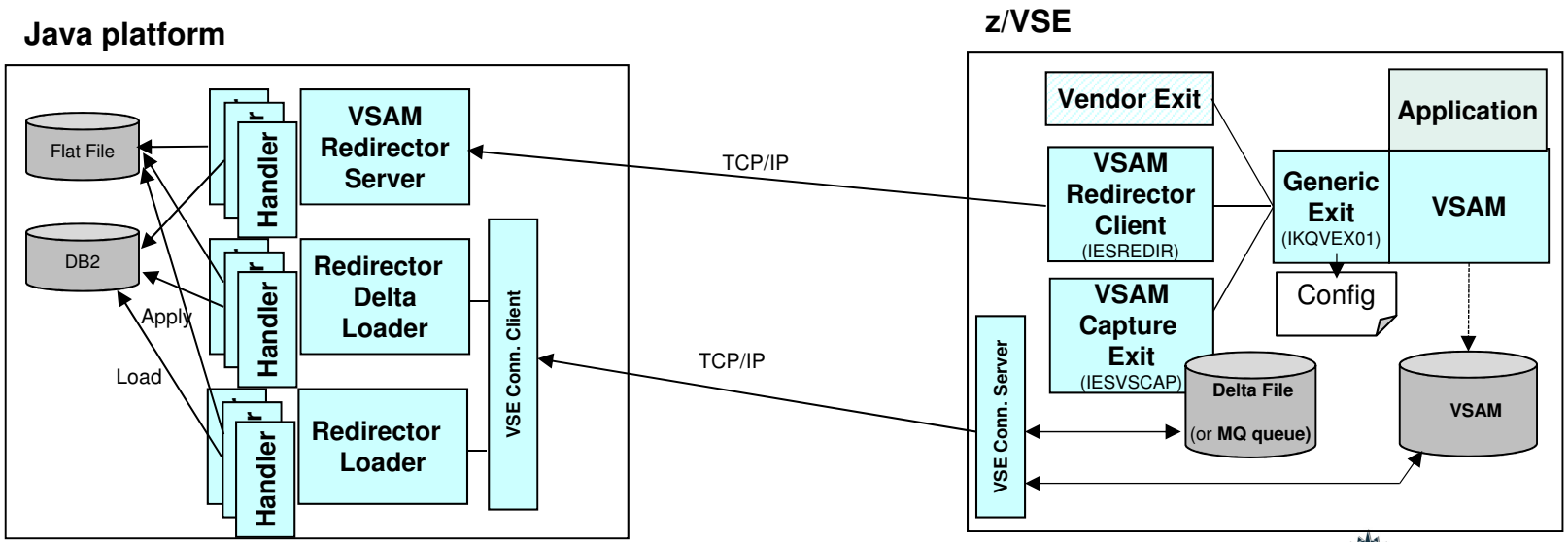
VSAM Redirector

- Synchronization of VSAM data with a database
- **Real-time:** VSAM Redirector Client/Server
  - **OWNER=VSAM:**
    - any INSERT, UPDATE or DELETE request is immediately replicated into the database
    - Read requests go against the VSAM dataset on z/VSE
  - **OWNER=REDIRECTOR:**
    - All VSAM requests are sent to the database.
    - No access to the VSAM dataset anymore (except OPEN / CLOSE).
- **Near real-time:** VSAM Capture Exit
  - Data changes are collected in a delta file or MQ queue
  - Delta file is downloaded and applied to database from time to time



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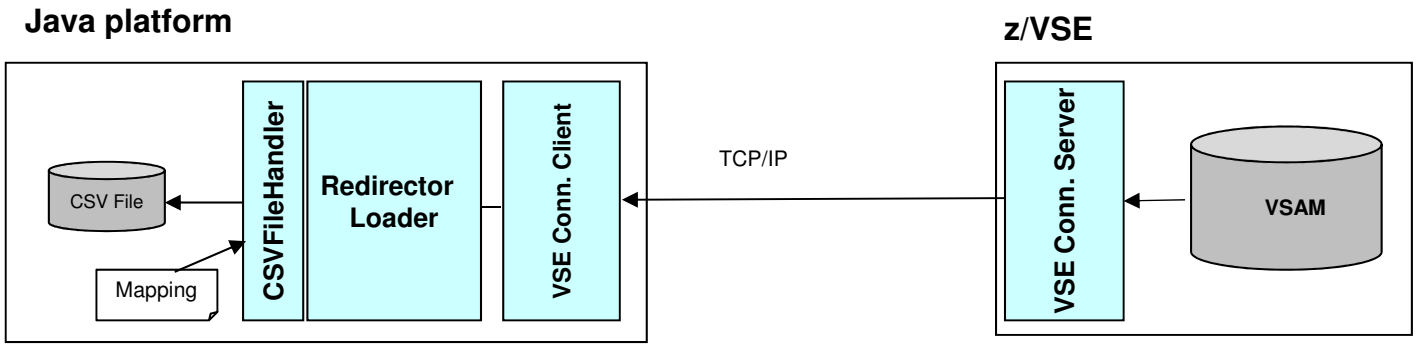
VSAM Redirector Loader with CSVFileHandler



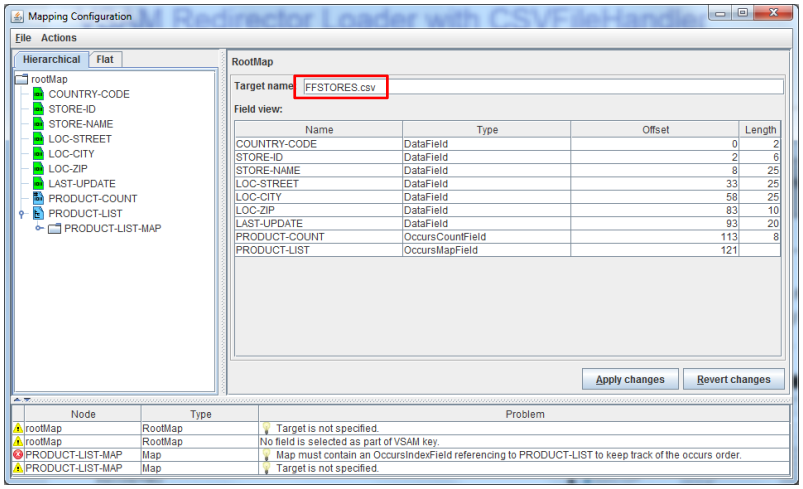
- Sample Loader Config file:

```
VSEHOST=myhost.domain.com
VSEUSER=HUGO
VSEPASSWORD=mypasswd
LDAPSIGNON=NO
VSAMCATALOG=VSESP.USER.CATALOG
VSAMCLUSTER=MY.TEST.CLUSTER
HANDLER=com.ibm.vse.csvfilehandler.CSVFileHandler
OPTIONS="configfile=mapping.csv;allowreuse=no"

# Optional parameters
REUSE=NO
TRACE=YES
SHOWPROGRESS=YES
MAX-PREFETCH-COUNT=100
STOP-ON-DUPLICATE-RECORD-ERROR=YES
STOP-ON-OTHER-ERROR=YES
CLOSE=YES

CONVERTERDIRECTORY=converters
```

- File mapping.csv contains the Field mapping
- Mapping can be created using the MapperConfigGUI tool
- Target Name specifies the output CSV File name
- For complex mappings (e.g. record types) there can be multiple output CSV files.



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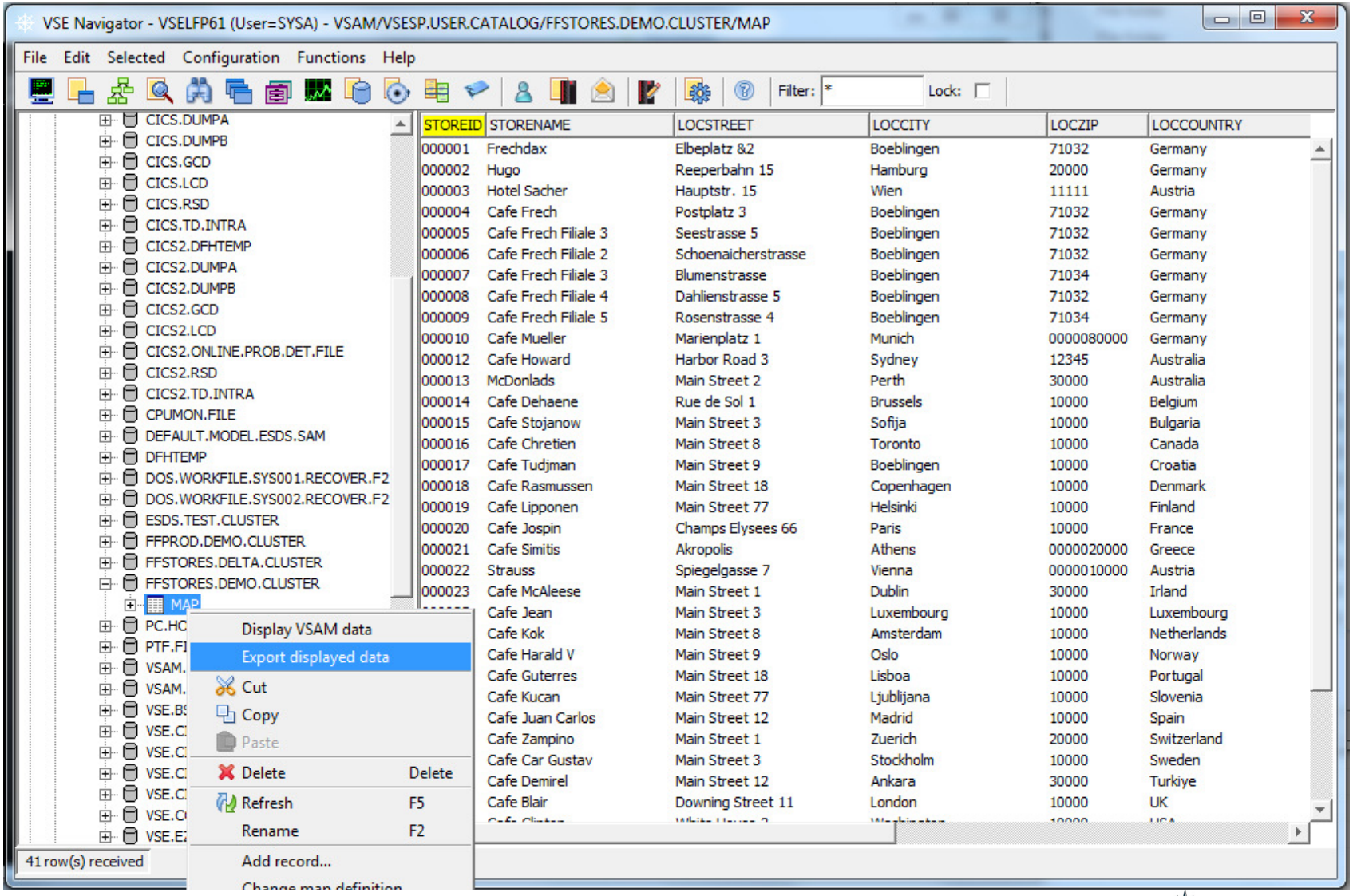
VSE Navigator – Export VSAM data



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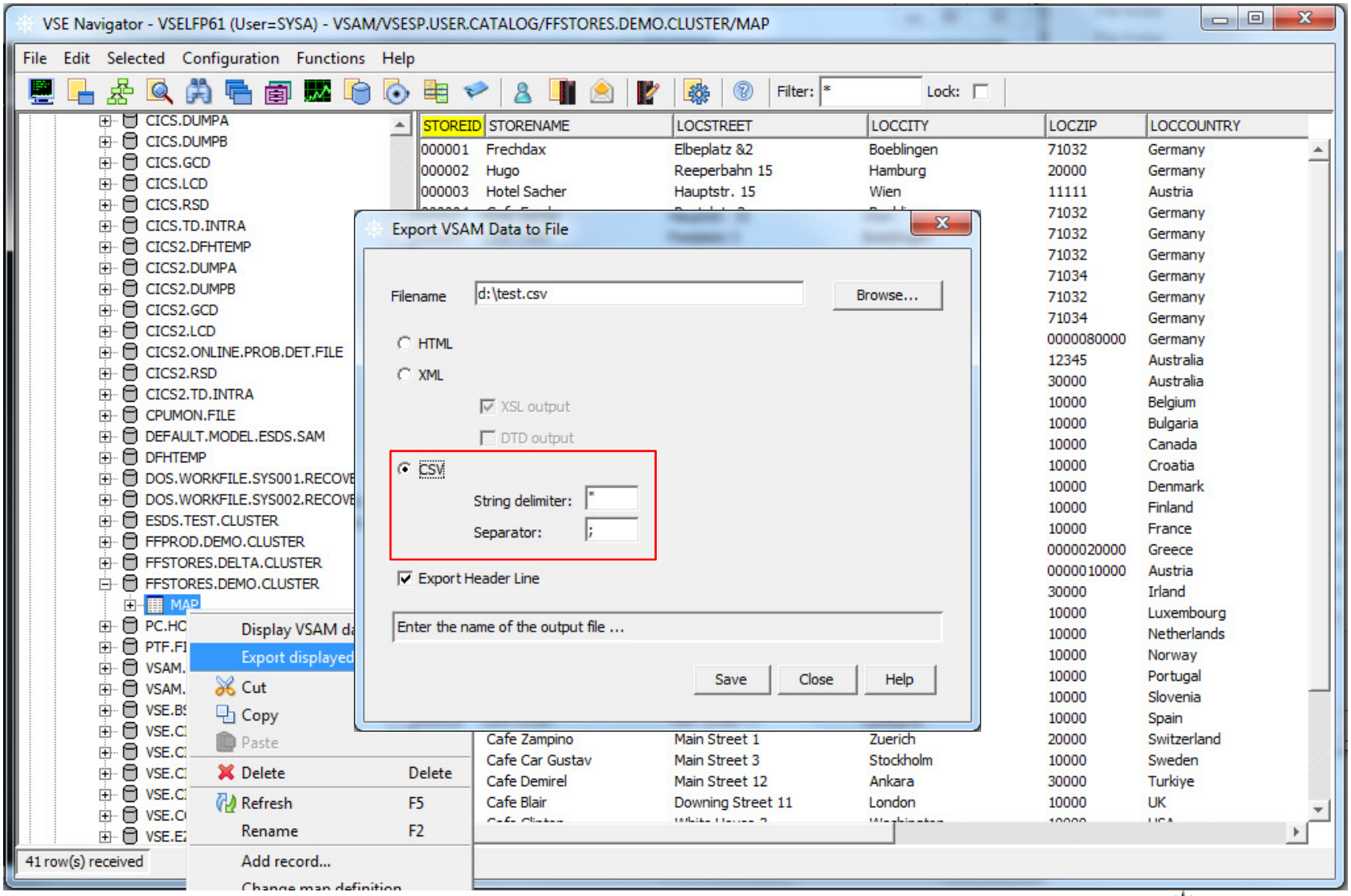
VSE Navigator – Export VSAM data



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"000028";"Cafe Guterres           ";"                        ";"Lisboa                  ";"10000     ";"Portugal
"000029";"Cafe Kucan              ";"Main Street             ";"Ljubljana               ";"10000     ";"Slovenia
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"000033";"Cafe Demirel            ";"Main Street             ";"Ankara                  ";"30000     ";"Turkiye
"000034";"Cafe Blair              ";"Downing Street 11       ";"London                  ";"10000     ";"UK
"000035";"Cafe Clinton            ";"White House 3           ";"Washington              ";"10000     ";"USA
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"000037";"IBM Cafeteria           ";"South Road              ";"Poughkeepsie            ";"21000     ";"USA
"000038";"Cafe Gates              ";"Main Street 18          ";"Seattle                 ";"30000     ";"USA
"000039";"Cafe Diegel             ";"Main Street 77          ";"Denver                  ";"35000     ";"USA
"000040";"Cafe Hemigway           ";"Harbor Road 4           ";"Key West                ";"67840     ";"USA
"000041";"Cafe Orban              ";"Main Street 3           ";"Budapest                ";"10000     ";"Hungary
```

Import the CSV data into an analysis tool

- IBM Watson Analytics
- Hadoop
- Others…

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Questions ?

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