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Stronger, Smarter Operations:

How a Large Italian Bank Reinvented Data Resiliency Management with IZBR

Salon 24 - Rosen Centre Hotel Orlando
February 24, 2026 - Orlando, FL

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DATA RESILIENCY CHALLENGES

Data Resiliency challenges

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Comply with regulations & audits

Address the skills gap

Reducing processing costs

Quickly identify data at risk

Automate resiliency processes

Single source of truth for backups

Surgically recover any data set

Perform forensic analysis

Data Resiliency Journey

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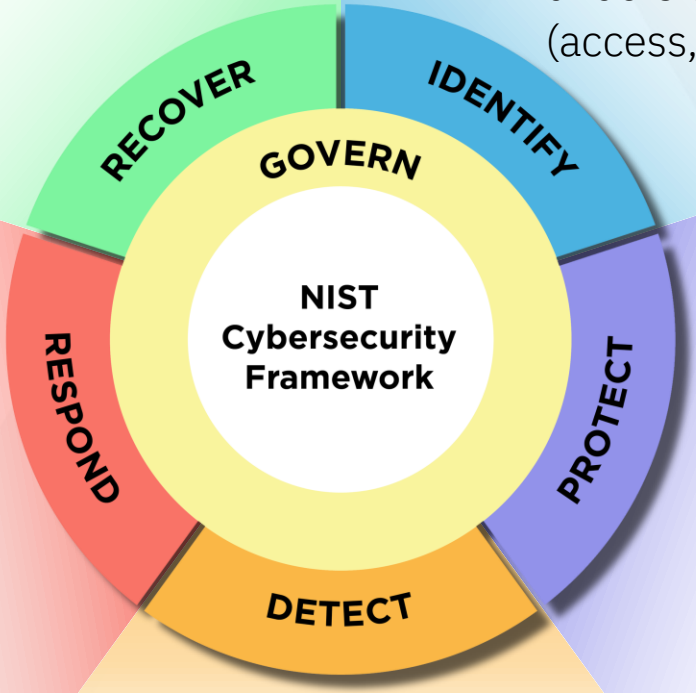
Recover
Intelligent & automated with a faster mean time to recover

Identify
Establish a clear & comprehensive understanding of your data (access, backups, resilience)



Respond
Ensure a swift, thorough & clearly communicated resolve across all levels

Protect
Secure your data from external & internal threats

Detect
Proactively identify threats with AI & automation to minimize the time required to detect potential issues

IZBR supporting Data Resiliency Journey

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Recover

Intelligent & automated with
a faster mean time to recover

IZBR Foundation

Simplify Recovery

Identify

Establish a clear & comprehensive
understanding of your data
(access, backups, resilience)

IZBR Foundation

Identify critical data and its flow
Identify data relation with Db2

IZBR

Respond

Ensure a swift, thorough
& clearly communicated
resolve across all levels

New IZBR Foundation

Integration with TDz to respond
to Cyber Events[1]

Protect

Secure your data from
external & internal threats

IZBR Foundation

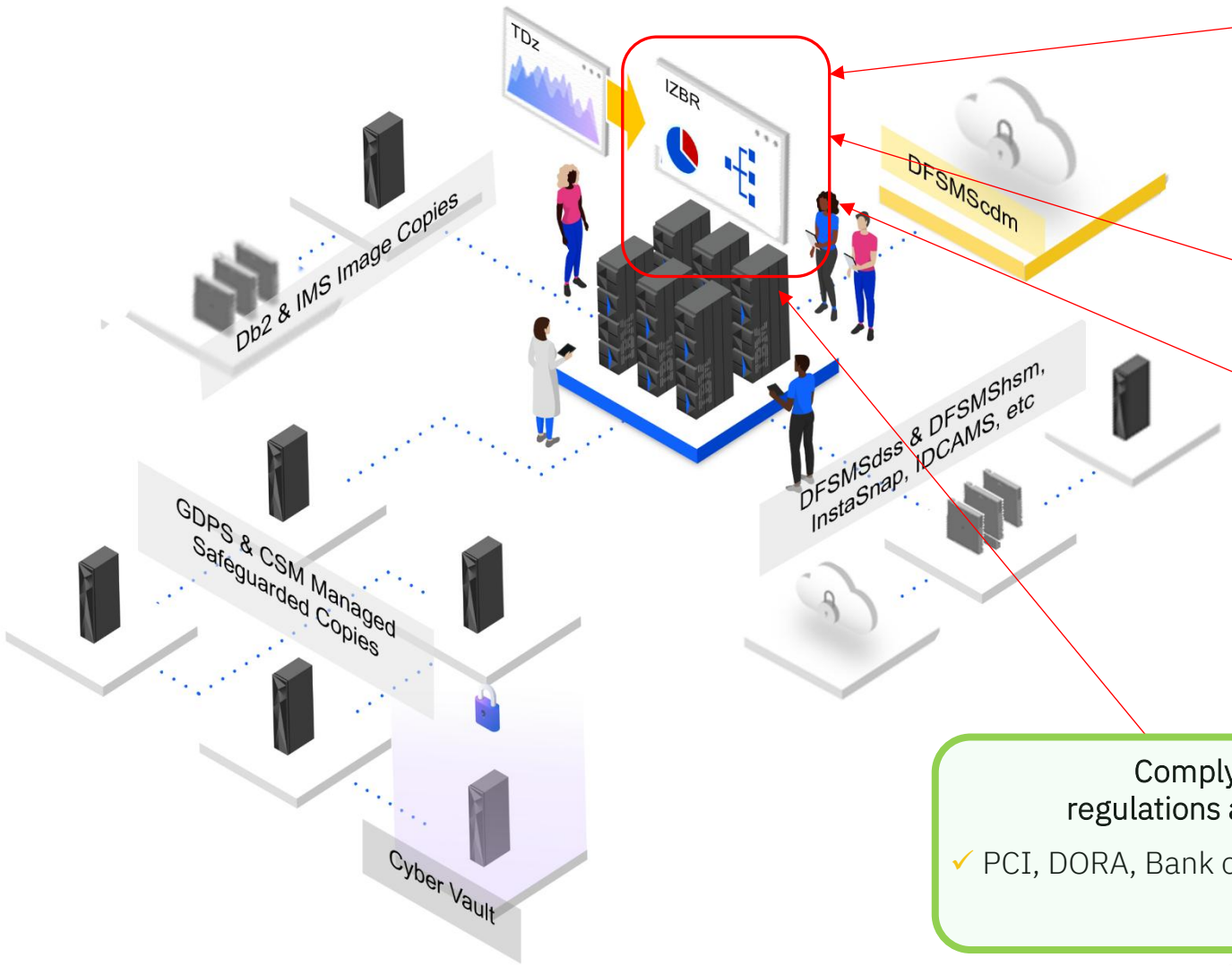
Identify and report on classic
and immutable backup copies.
Identify unexpected accesses

Detect

Proactively identify threats with AI & automation to
minimize the time required to detect potential issues

[1] Statement of Direction AD25-0976 8 Apr 2025

Simplified, Centralized, Persona-Driven Data Resiliency



Single source of truth leveraged by *All Personas*

Persona based dashboards:

- ✓ LOB Owner
- ✓ Compliance Team
- ✓ Application Owners
- ✓ Storage Admins

Simplification
Reduce processing cost

- ✓ Reduce excessive backups, etc

Robust Data Resiliency

- ✓ Identify critical data
- ✓ Identify missing backups
- ✓ Identify all downstream jobs that may need to rerun after a restore to complete recovery
- ✓ Forensics aids

Comply with regulations and audits

- ✓ PCI, DORA, Bank of England , etc

Regulatory compliance

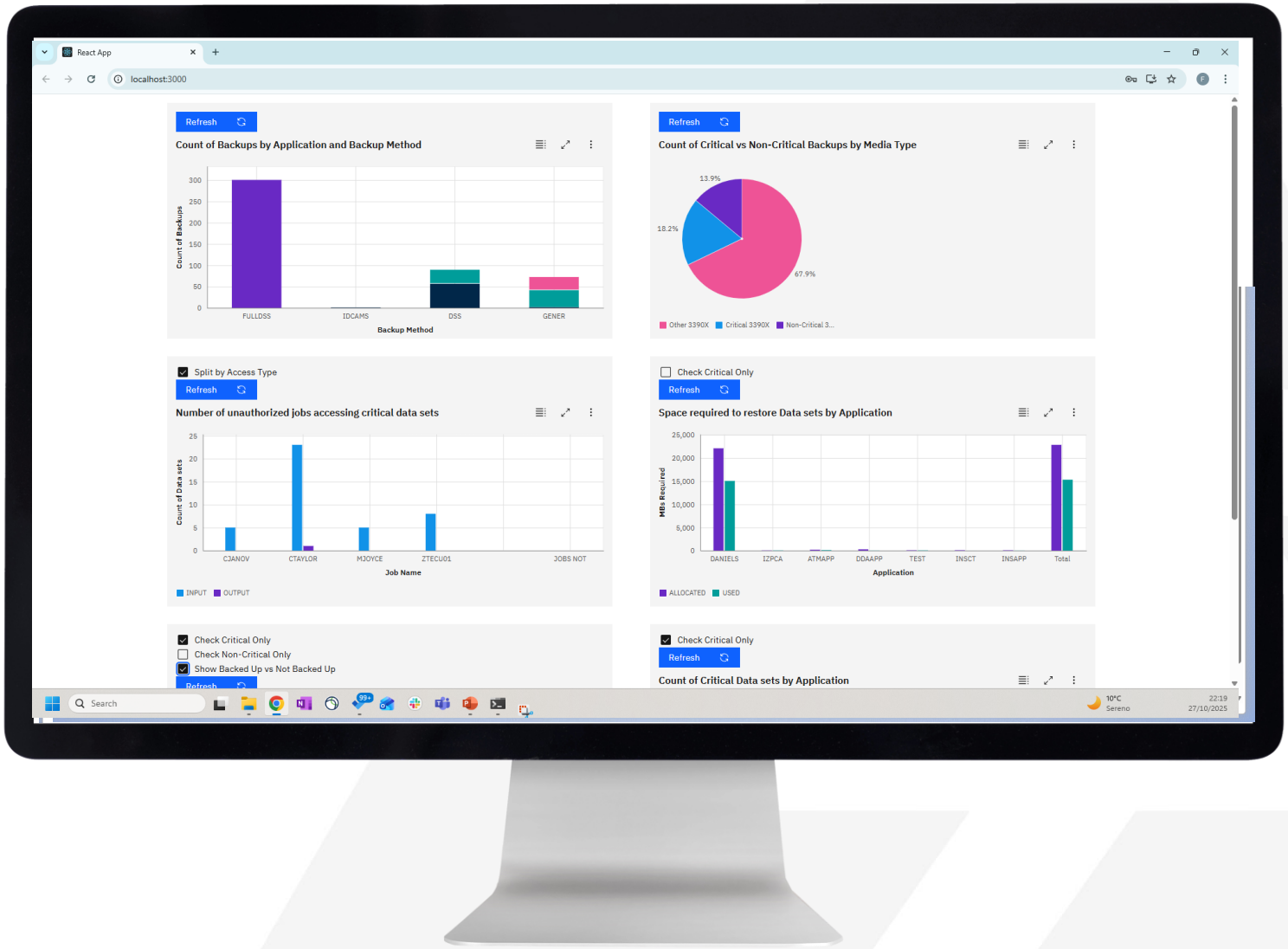
IZBR can assist with the following compliance items.

- **Full inventory of datasets backups**
- **Analysis and inventory of datasets usage**
- **Audit reporting to prove compliance**
- **Complete inventory of datasets in Safe Guarded copies (3D Virtual Catalog)**
- **Determining jobs/users that read or updated files using Timeliner Cascade reports**

Comply with
regulations and audits

✓ PCI, DORA, Bank of England , etc

Resiliency dashboards



Use the **web reporting REST API** to extract your IZBR data for use in off-platform reporting or graphical tools.

Sample graphs, charts, and code are provided to help you use the RESTful API.

Comply with regulations and audits

✓ PCI, DORA, Bank of England , etc

Simplification & Cost reduction: avoid duplication

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   Menu  Utilities  Compilers  Help
 BROWSE    DB2GCFG.IZBR.V1R2.REPORTS(BKUPDUP) - 05.94                   Line 0000000000 Col 001 132
 Command ===> _                                                                  Scroll ===> CSR
********************************************** Top of Data **********************************************
                              IZBR - IBM Z BATCH RESILIENCY                      25 OCT 2025 15:45:26 PAGE:     1
                         5698-BR1 COPYRIGHT TERACLOUD APS  1993,2023
                        BACKDUP: LIST OF FILES WITH DUPLICATE BACKUPS

DATA SET NAME                                 APPLID   BKUPMETH BKUP JOB BKUP JOB# BACKUP DATE/TIME LAST CHANGED DATE/TIME
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IZBRDEMO.TESTING.CT1.PS                       INSCT    GENER    INSCT07A JOB01304  2025294 10:56:11 2025297 10:56:11
IZBRDEMO.TESTING.CT1.PS                       DDAAPP   DSS      BACKDDA  JOB00752  2025293 15:05:17 2025297 10:56:11
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IZBRDEMO.TESTING.CT1.PS                       DDAAPP   DSS      BACKDDA  JOB00030  2025292 15:05:19 2025297 10:56:11
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IZBRDEMO.TESTING.LOADLIB                      ATMAPP   DSS      BACKATM  JOB09321  2025291 15:00:16
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Simplification
Reduce processing cost
✓ Reduce excessive backups, etc

Simplification & Cost reduction: avoid duplication

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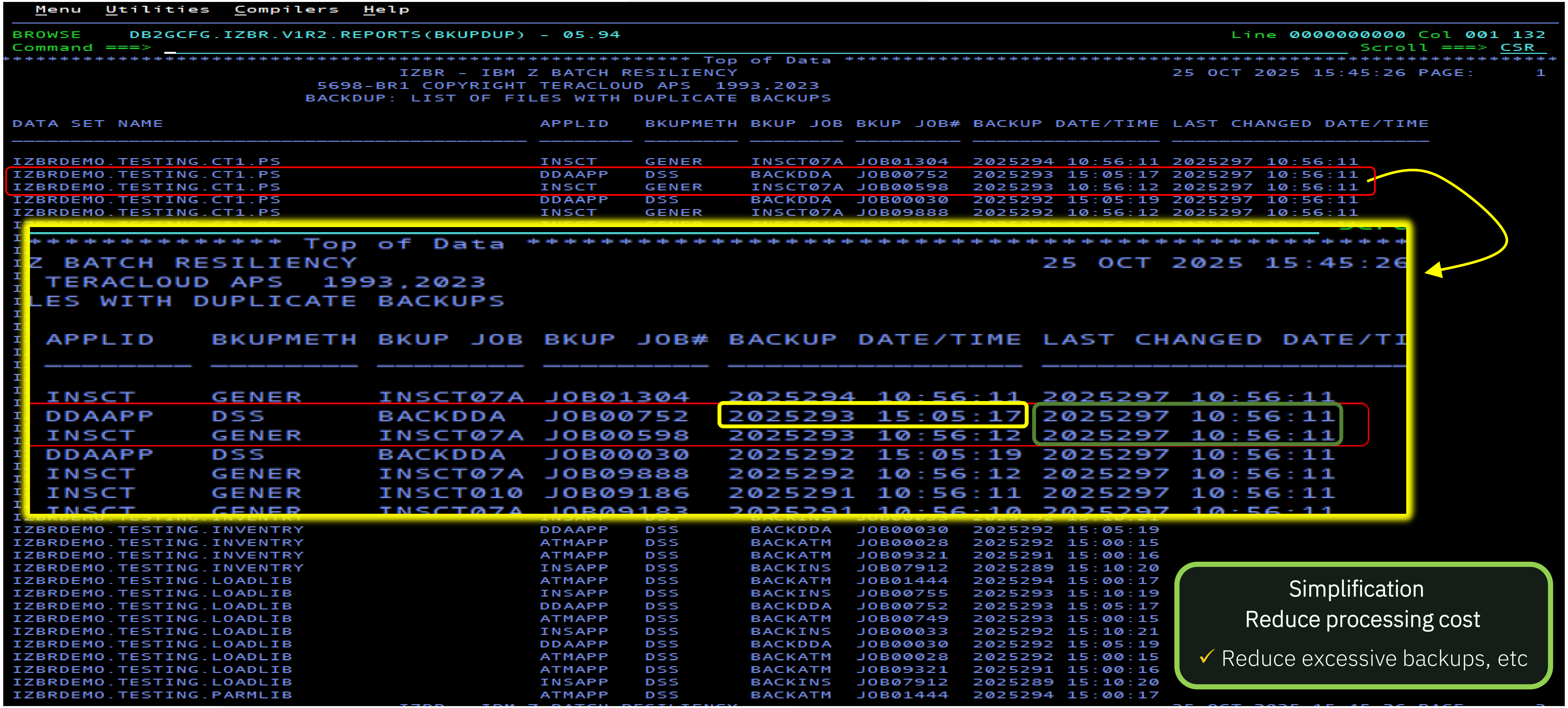
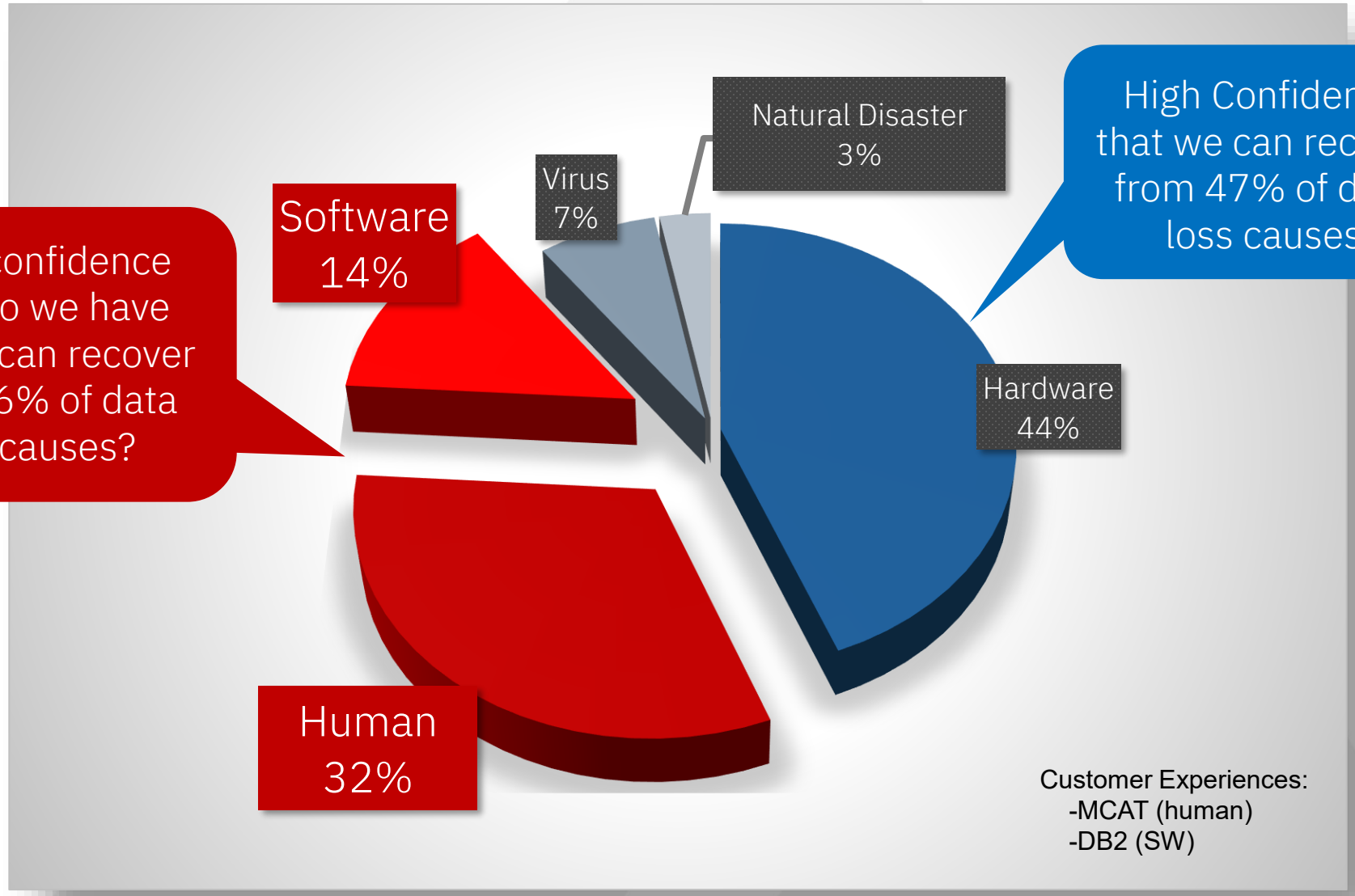


IZBR AS DATA RESILIENCY MANAGER FOR Z/OS

Causes of data loss



What confidence level do we have that we can recover from 46% of data loss causes?

High Confidence that we can recover from 47% of data loss causes

Customer Experiences:
-MCAT (human)
-DB2 (SW)

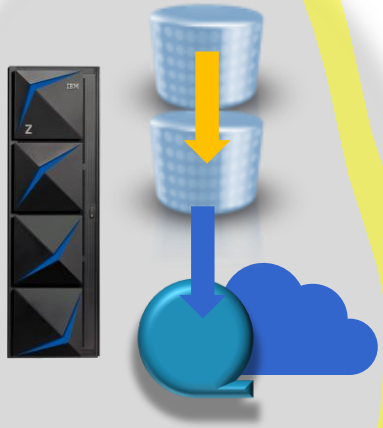
Source: https://www.researchgate.net/figure/Analysis-of-causes-of-data-loss-Figure-3-How-Denial-Of-Service-DOS-attack-works_fig2_311470799

Courtesy of
Glenn Wilcock
z/OS DFSMS Chief Product Owner

Protecting against Software and Human Caused Data Loss - Point in Time Captures

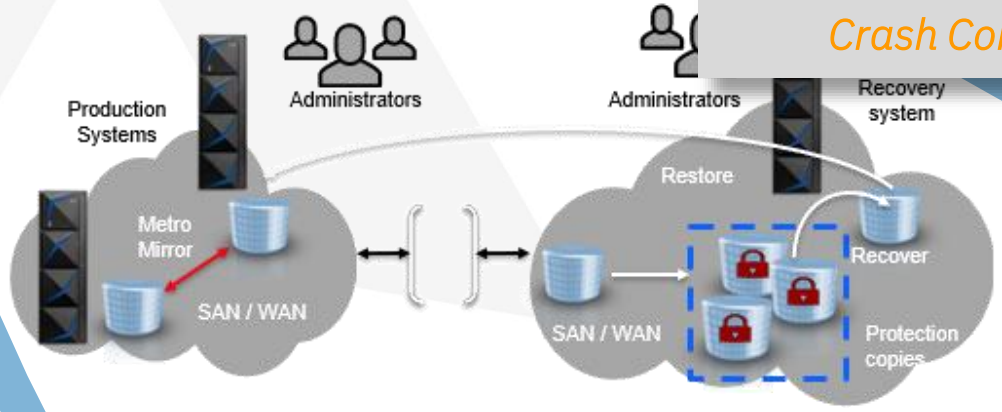
Classic

Optimized for Granular Recovery from *Accidental Data Corruption* - *Data Consistent*

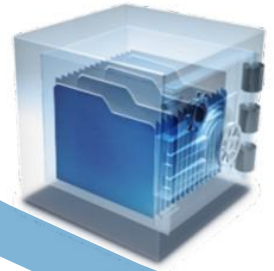


FlashCopy & Cloud Backup

Optimized for Large Scale Recovery from *Malicious Data Destruction* – *Crash Consistent*



Safeguarded Copy
Managed by GDPS LCP or CSM



IBM Z Cyber Vault

- ✓ Data Validation
- ✓ Forensics Analysis
- ✓ Catastrophic Recovery
- ✓ Offline Backup

Courtesy of
Glenn Wilcock
z/OS DFSMS Chief Product Owner

‘Data Aware’ Data Resiliency with IZBR

Protections against Software and Human Caused Data Loss:

Classic, FlashCopy, Cloud Backup

Data Resiliency

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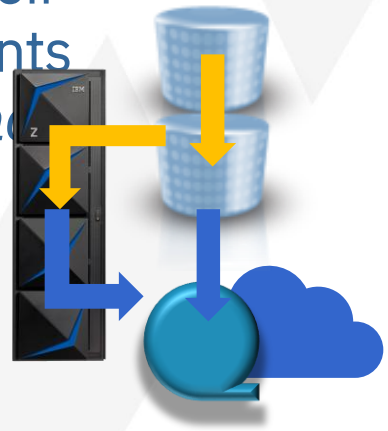


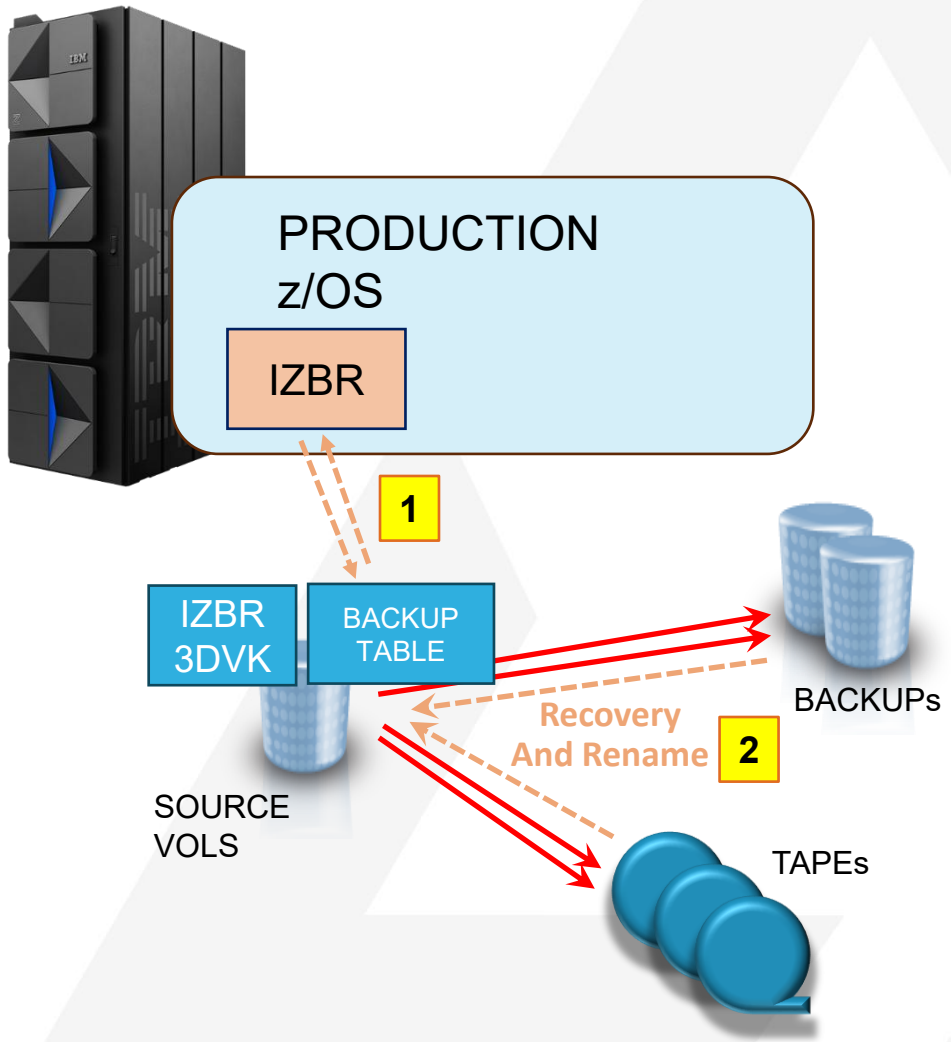
Discrete, individual backup copies optimized for *Granular Recovery* from *Accidental Data Corruption*

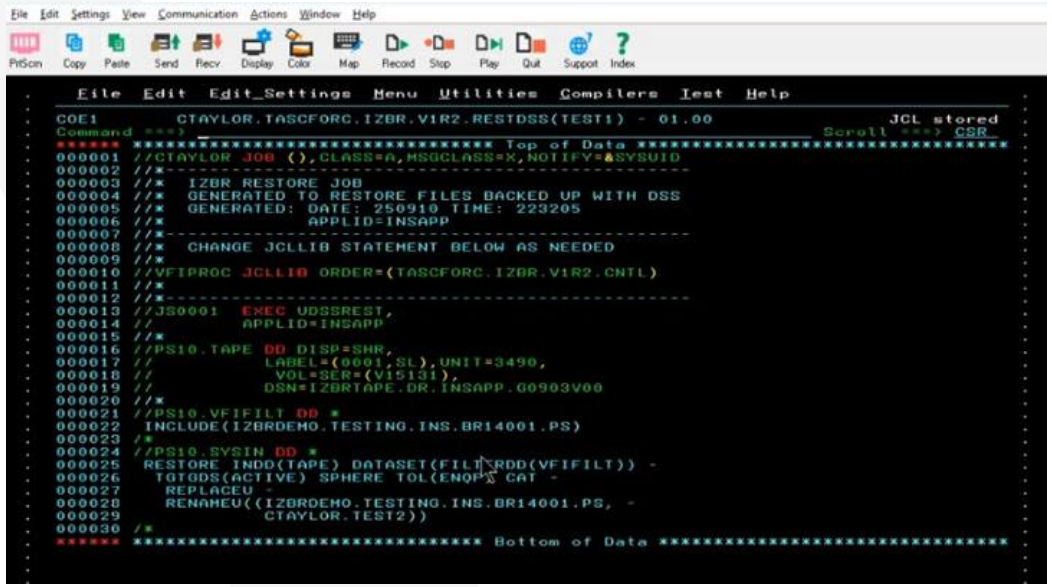
Discrete, individual backup copies *and* surgical recovery from Safeguarded Copy / Cyber Vault environments

Many, enterprise-wide undo logs, optimized for *Large Scale Recovery* from *Malicious Data Destruction*

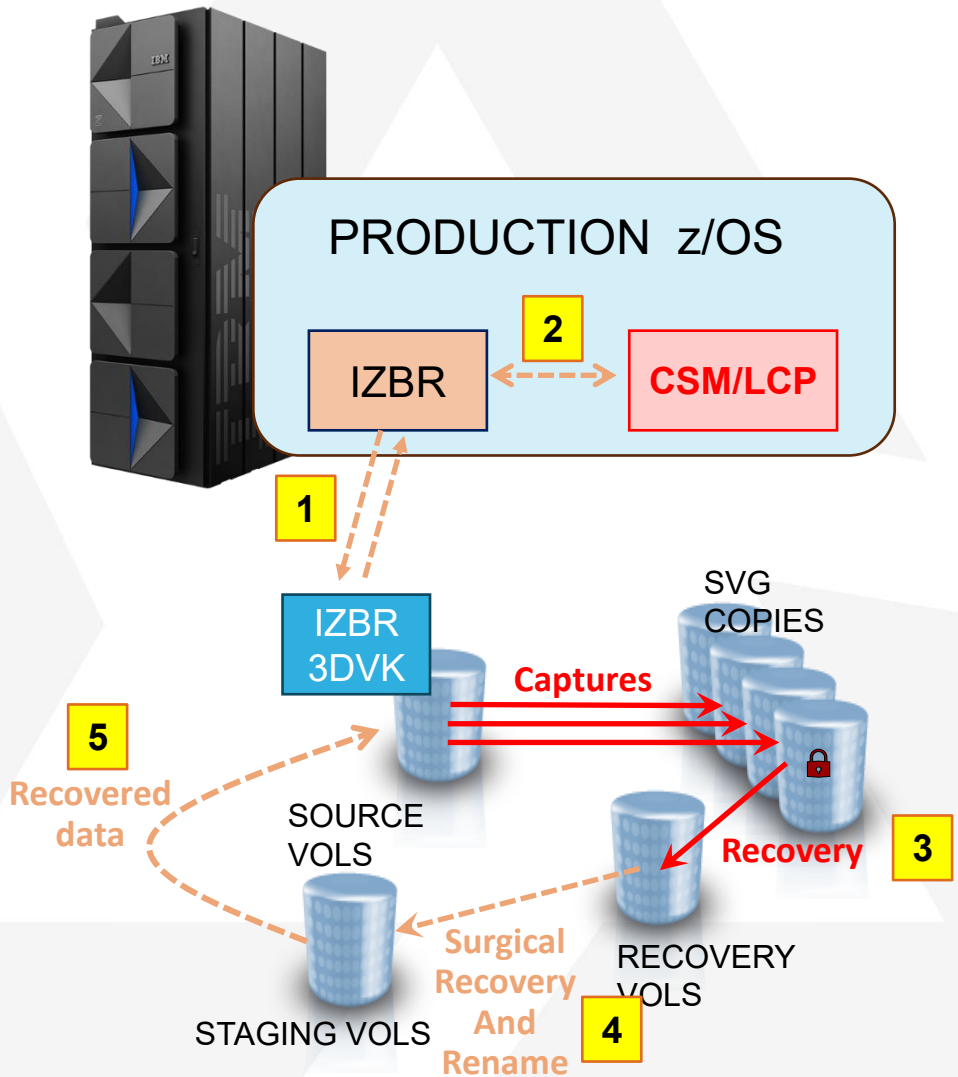
Courtesy of
Glenn Wilcock
z/OS DFSMS Chief Product Owner

Recovery with IZBR – automatic JCL creation

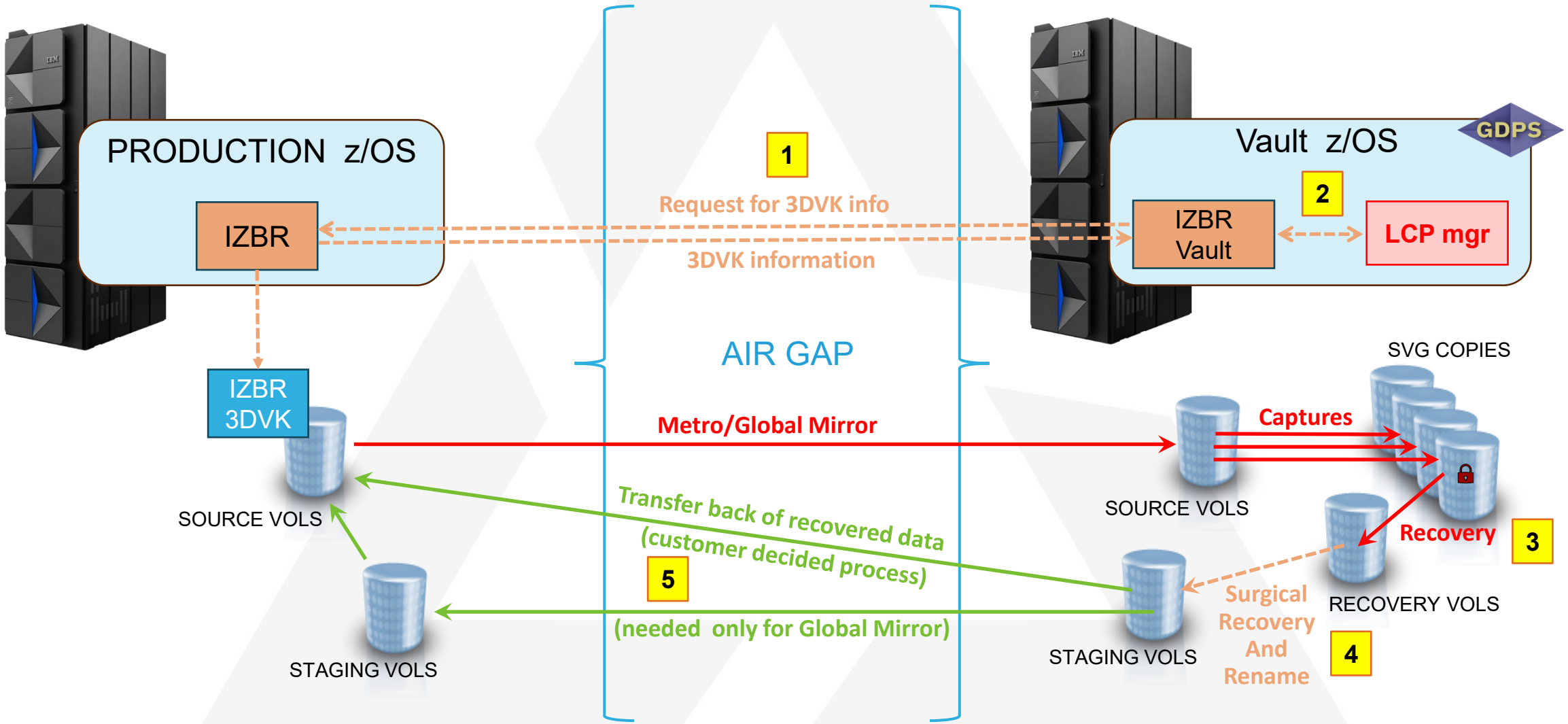




Surgical Recovery with IZBR (single system)



Surgical Recovery with IZBR from LCP Captures



CUSTOMER USE CASE

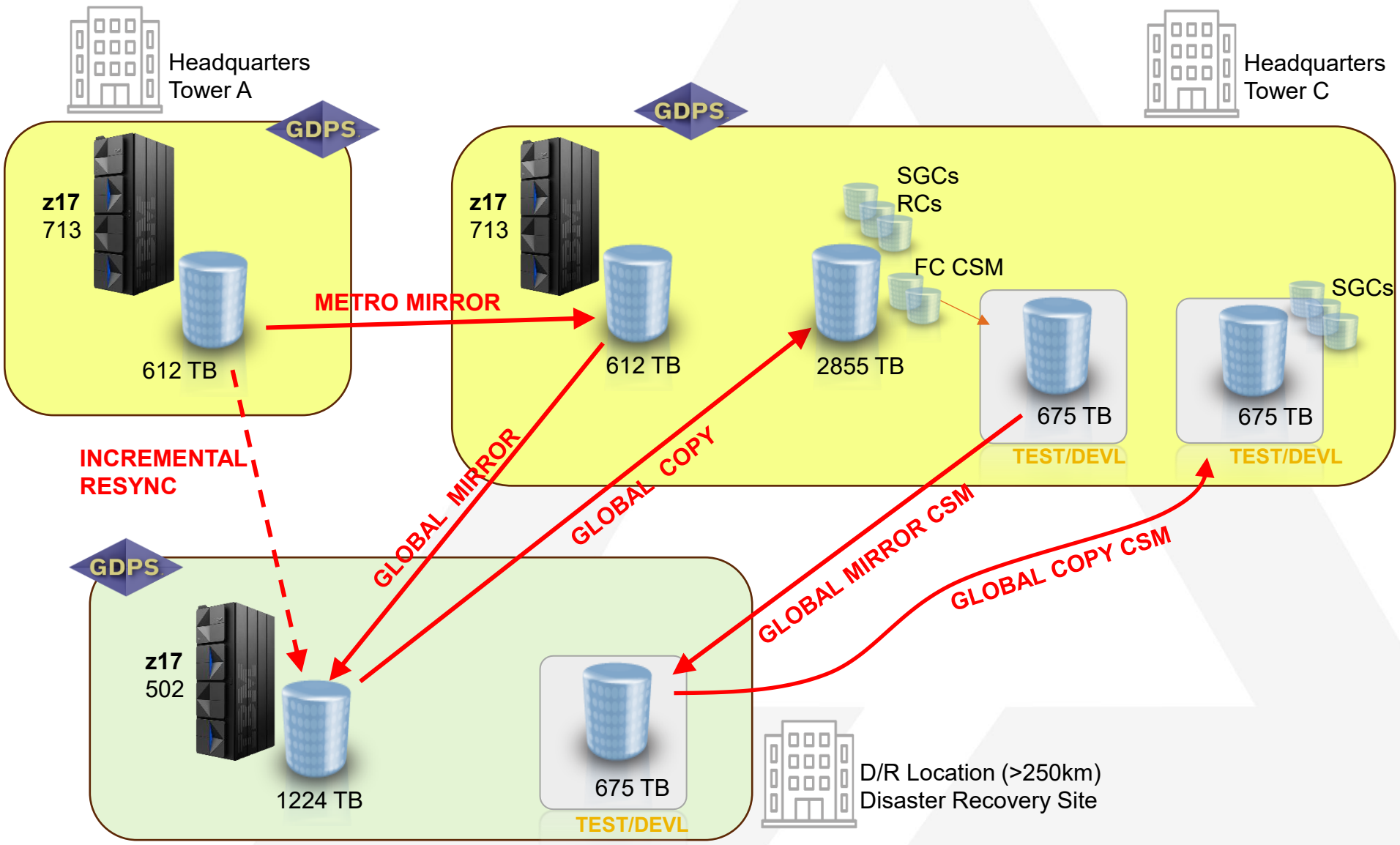
Italian Bank

The Customer is one of the most important banking institutions in Italy, having a long history of supporting the territory and local communities.

Today, Customer is a joint stock company listed on the Italian Stock Exchange and represents one of the largest banking group in terms of size and capital strength.

Customer has **3 mainframe** machines with **52,000 MIPS** total. In 2025 they upgraded all the z/Systems to **z17** machines, reducing power consumption by 18% for processors and 25% for I/O.

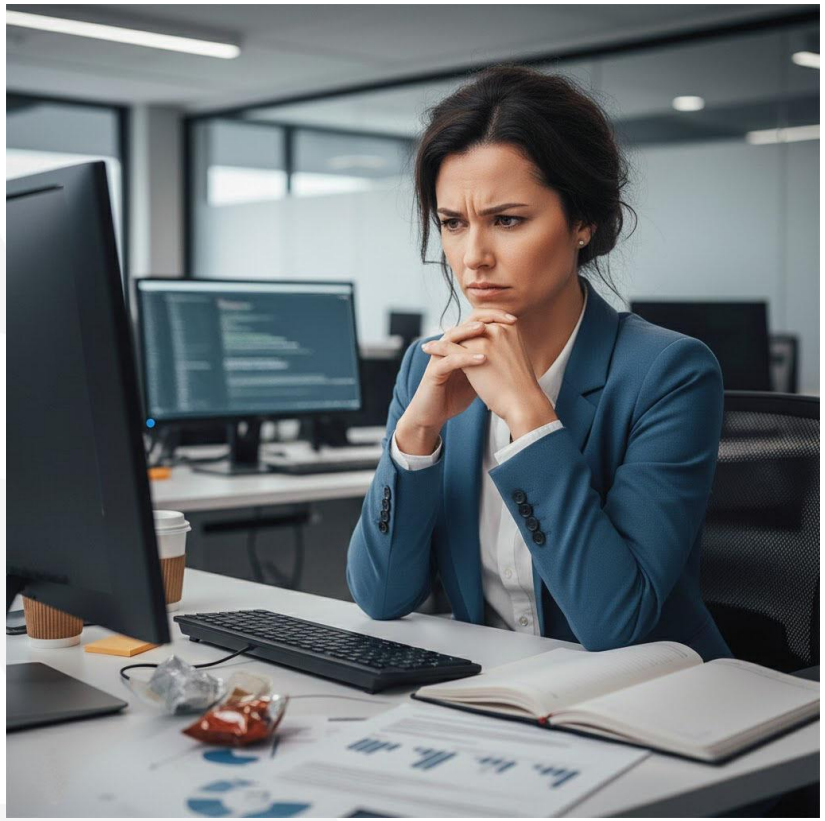
Customer configuration



The initial problem

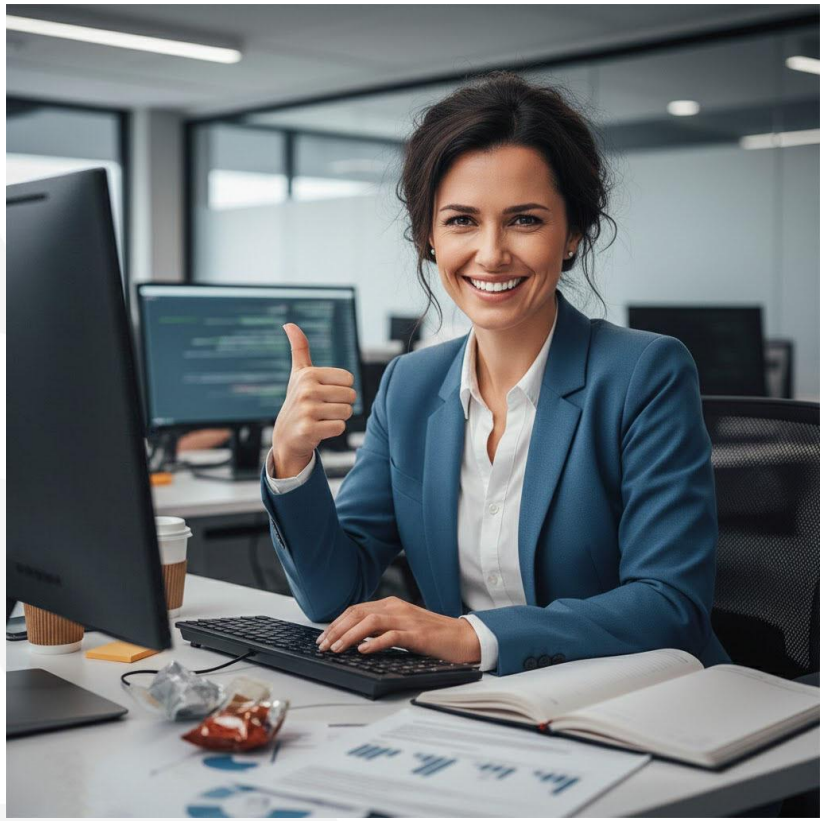
In the past, the Customer used DFSMS/dss as a backup method for application datasets. This solution, although technically OK since it was based on established IBM technology also used by other customers, had some disadvantages:

- First, the **problem of identifying in which backup file a specific dataset was to be recovered**. In fact, the customer was using successive levels of GDG for successive levels of RMM saving and reporting to identify the tapes on which the backups were present. So, the procedure of recovering one or more datasets from such backups became laborious, having to identify which was the correct GDG level and which tapes to use, before doing restore.
- The restore activity mandatorily required the intervention of an experienced technician (sometimes even a systems engineer). This led to delays and use of valuable system resources, as it was not directly managed by the application owner. This led to **taking critical skills away from the systems maintenance activity**, having to spend time on unexpected operational requests.
- The restore activity required manual activity for some steps of the procedure, **increasing the possibilities that human error could occur**.



The initial use of IZBR

The use of IZBR allowed the client to **automatically keep track of where the backup of datasets were saved**, regardless of the medium used (disk, tape, etc.) and the method used for taking backup.



This facility greatly helped **reduce the time to identify** the correct media or level of backup to be used. In addition, the **automatic restore JCL generation** function present in IZBR made it possible to **eliminate the possibility of human error in recovery.**

Another added value is **the reduction of the need to have expert sysprogs** dedicated to restoring application data: by having a product that provides this level of help, the **function of recovering corrupted datasets can be managed directly by the application owner**. In fact, all steps of the procedure are executable from ISPF panels that the product completes with the specific info related to the requested restore.

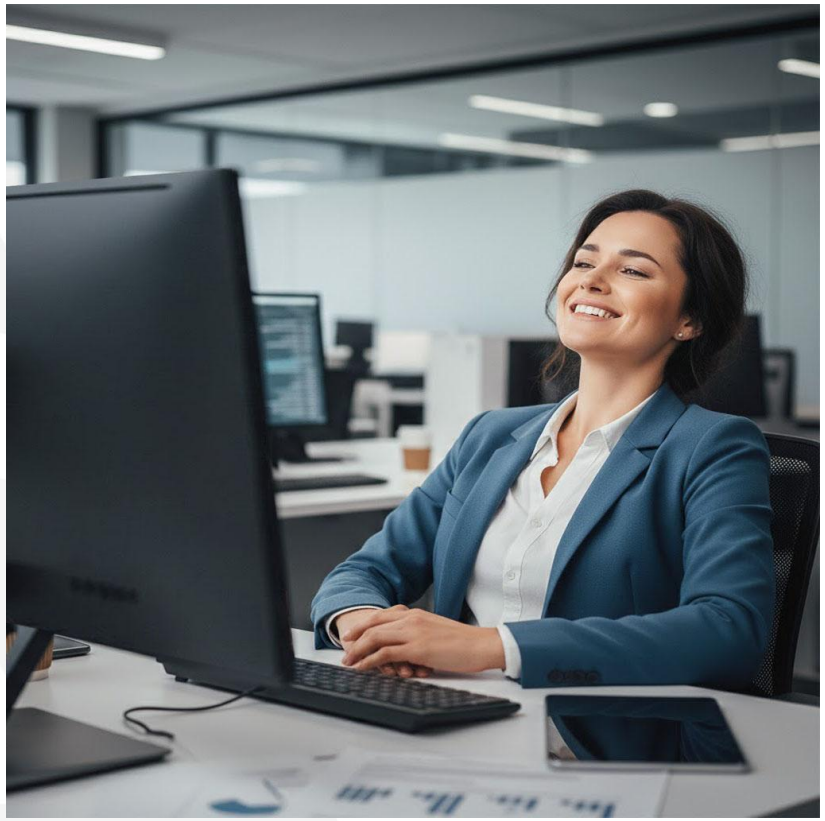
Extending the use of IZBR

The customer then made a further improvement in the backup/restore management activity by starting to use the DFSMS/hsm product for automatic management of backup, instead of depending on JCL DFSMS/dss managed by application owners.

IZBR has helped in this activity, as it is **able to have a single view of backups with a single interface, regardless of the type of backup used**: IZBR tracks both saves made with DFSMS/dss and with DFSMS/hsm.

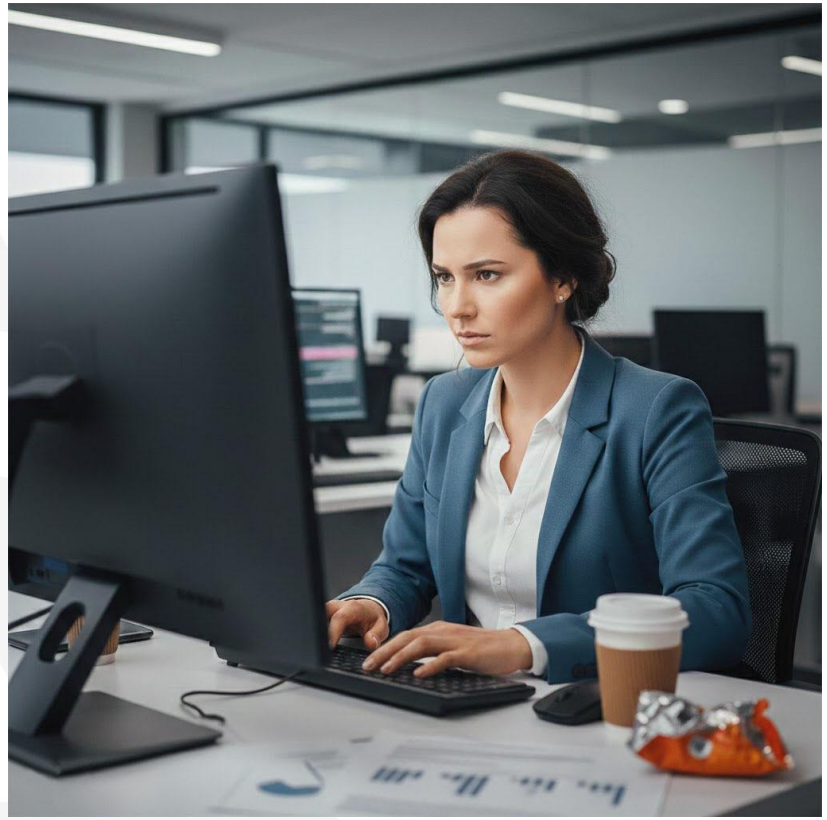
This facility made it easier to migrate backup management to DFSMS/hsm, as it was possible to do the migration by managing both methods in parallel, **always using IZBR for restores** (in case of restore for backups made with dss, IZBR will create JCL that invokes dss, in case you used hsm it will create JCL that calls hsm).

With this solution there is also an advantage that many times is not considered: the fact that **no product-specific skill is required to do these restore tasks**. It will be IZBR that will choose what parameters to use and what statements to include in the restore JCL, without requiring specific skills on the product used.



What we're working on now

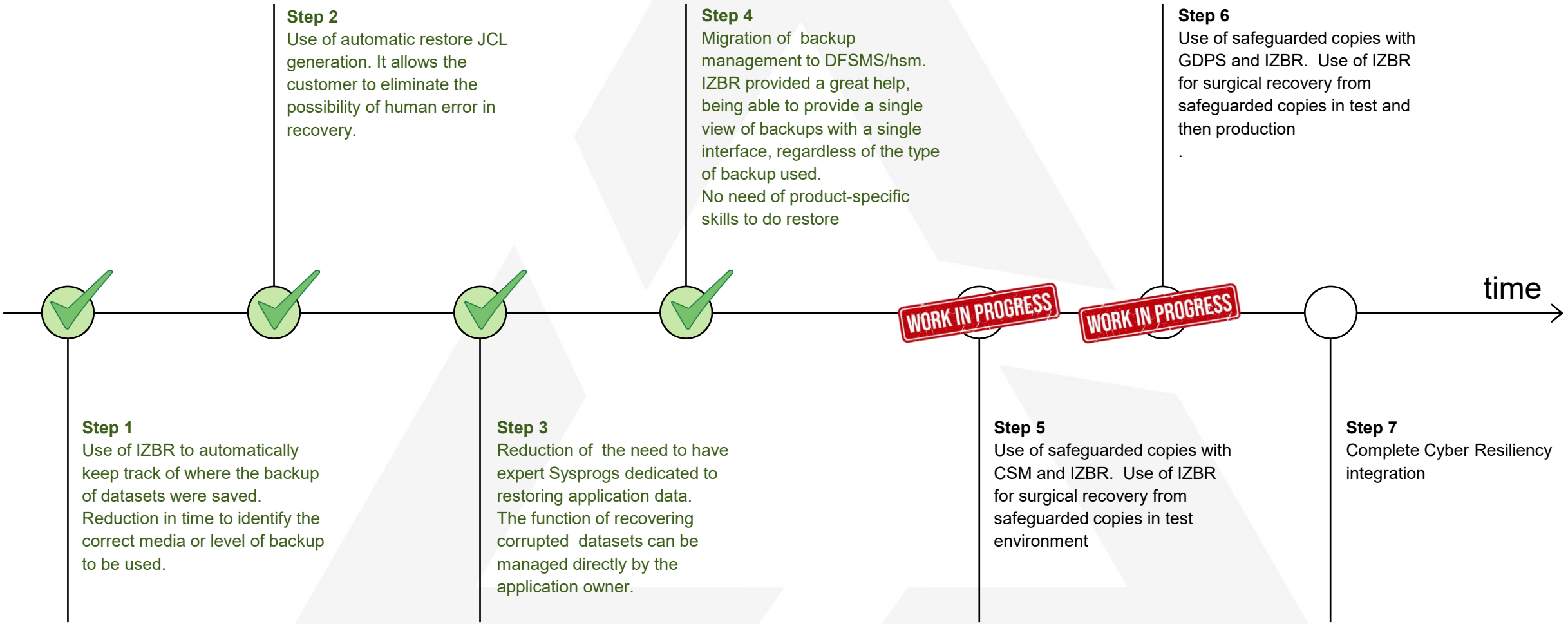
The next step in the journey toward greater data resilience was then taken with the **adoption of the use of safeguarded copies**. The customer now takes a safeguarded copy every hour, and with the dedicated resources currently in place is able to have 4 days of backups available. This provides a high level of reliability, as the client is able to retrieve datasets (in addition, clearly, to the saves in the DB2 environment) with the granularity of one hour.



Initially, the IBM CSM solution was used to manage safeguarded copies but, to move toward a more resiliency solution towards a CyberVault solution, customer decided to fully adopt IBM GDPS solution.

IZBR will be of great help in this. Through the information provided by IZBR, it will be possible to do a **surgical recovery of datasets from SGC**, knowing which save contains backups of unopened datasets. All of this also using the automatic creation of recovery JCLs and the other facilities described earlier.

The journey from Operational to Cyber Resiliency



Current Status and Next Steps

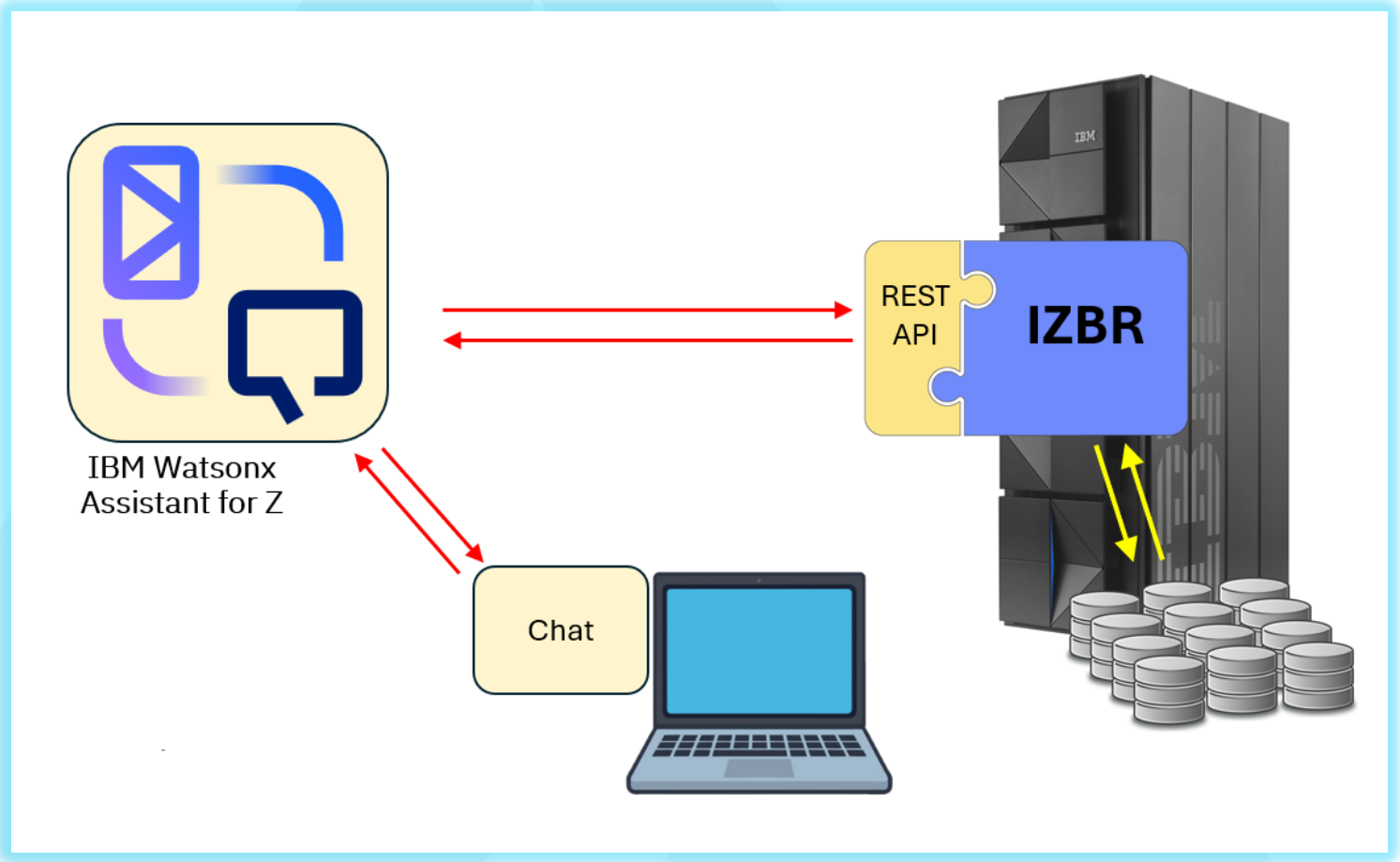
- IBM–Customer collaboration in activating IZBR surgical recovery functions from safeguarded copies (both with IBM CSM and IBM GDPS)
- It's a Win-Win situation:
  - Customer: possibility to have direct connection with labs for support and help in installation/setup, also influencing future directions
  - IBM: Possibility to test new functions/development directly in customer test environment, validating the solution 'on the field' against large complex installation:
    - 4200 volumes for each Safeguarded copy in Test/Devl
    - 7400 volumes for each Safeguarded copy in Production
- Next step will be the test of the use of the new WatsonX Assistant for Z

SOME EXAMPLES OF IZBR USAGE: #1

USING WATSONX ASSISTANT FOR Z

IBM Watsonx Assistant for Z

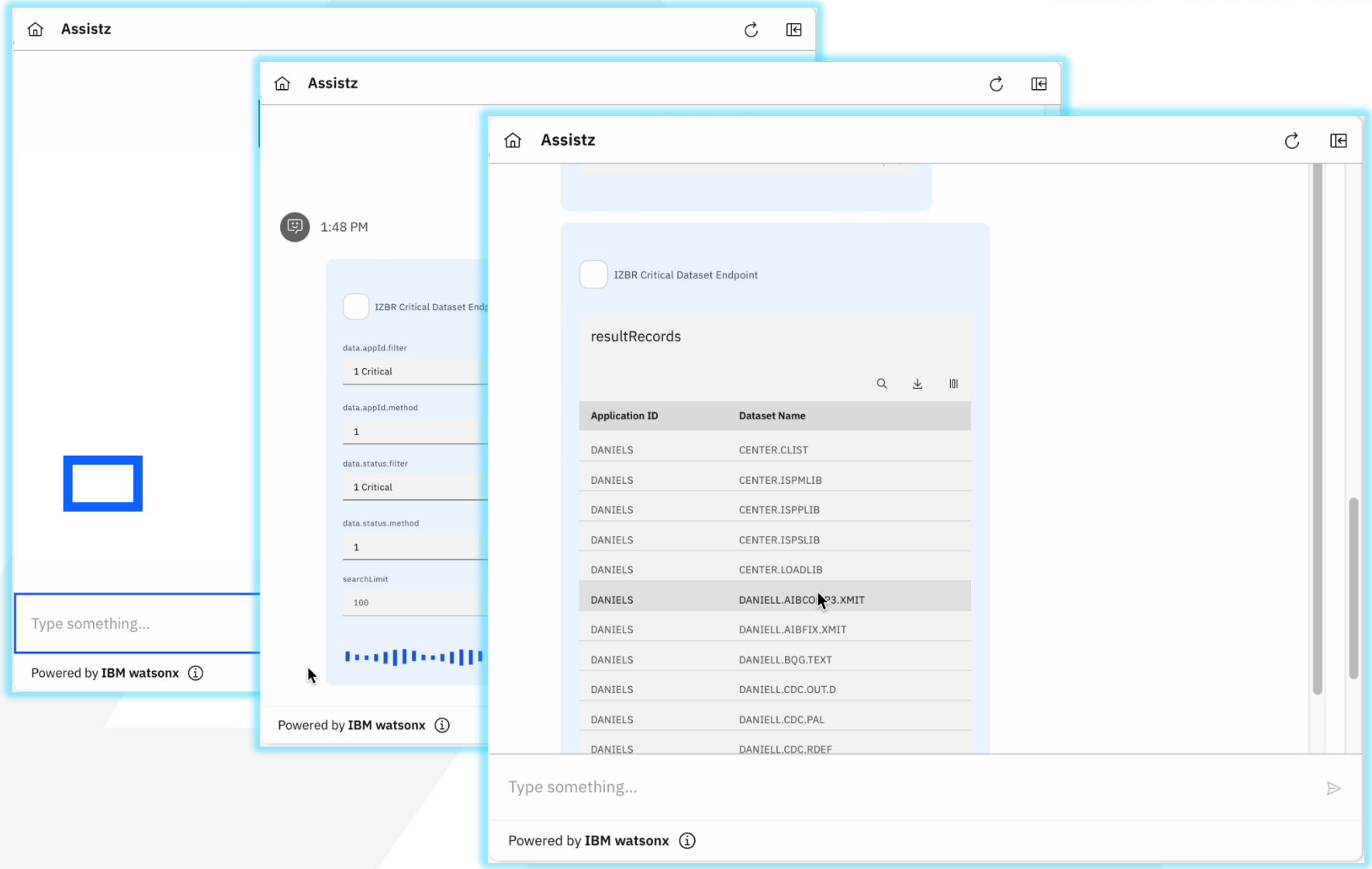
Leveraging IBM Watsonx Assistant for Z



Example 1: interaction with WatsonX Assistant 4 Z

Obtain the list of **critical datasets**

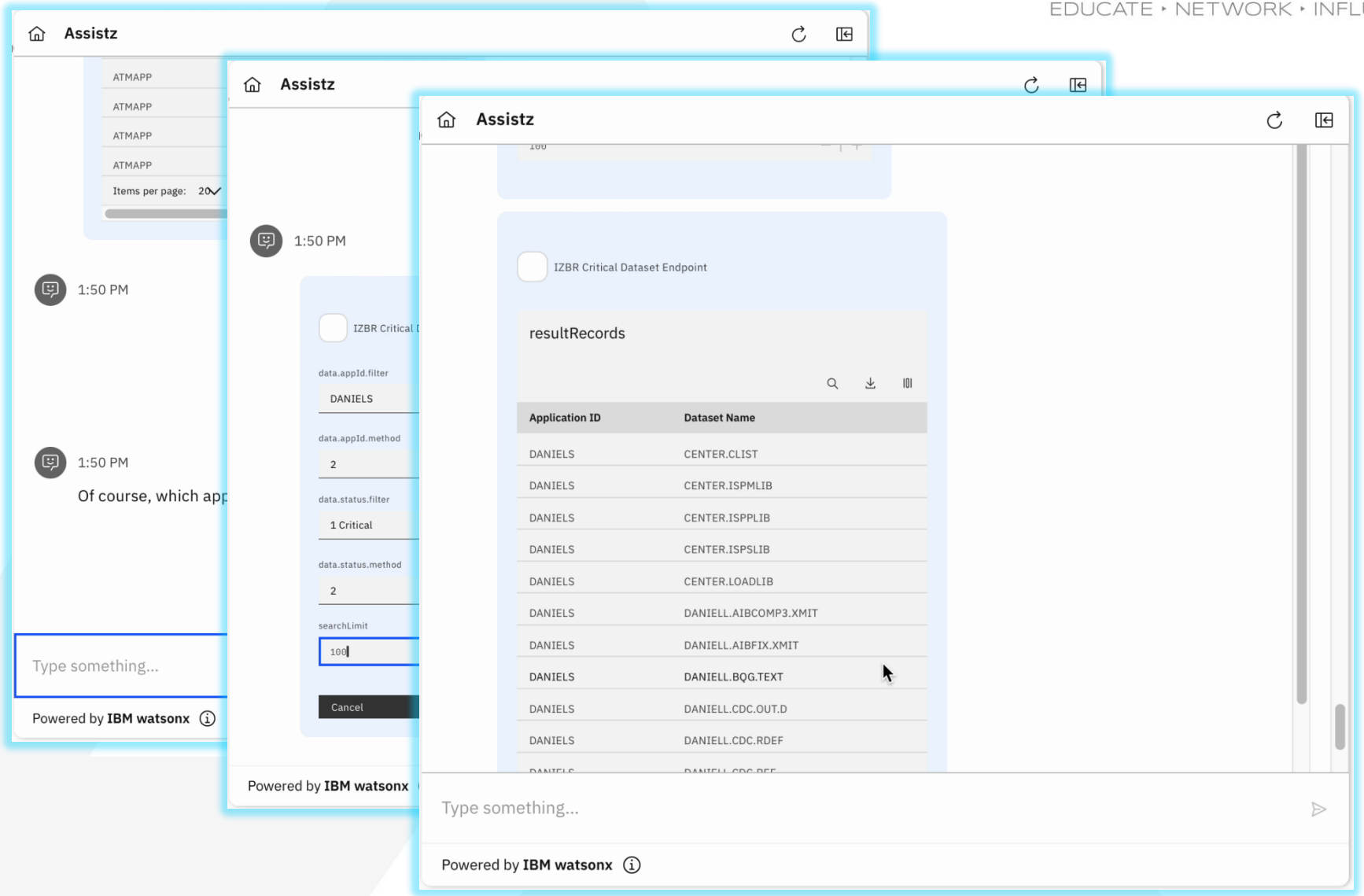
#1 of 4



Example 1: interaction with WatsonX Assistant 4 Z

Obtain the list of **critical datasets** for a specific application

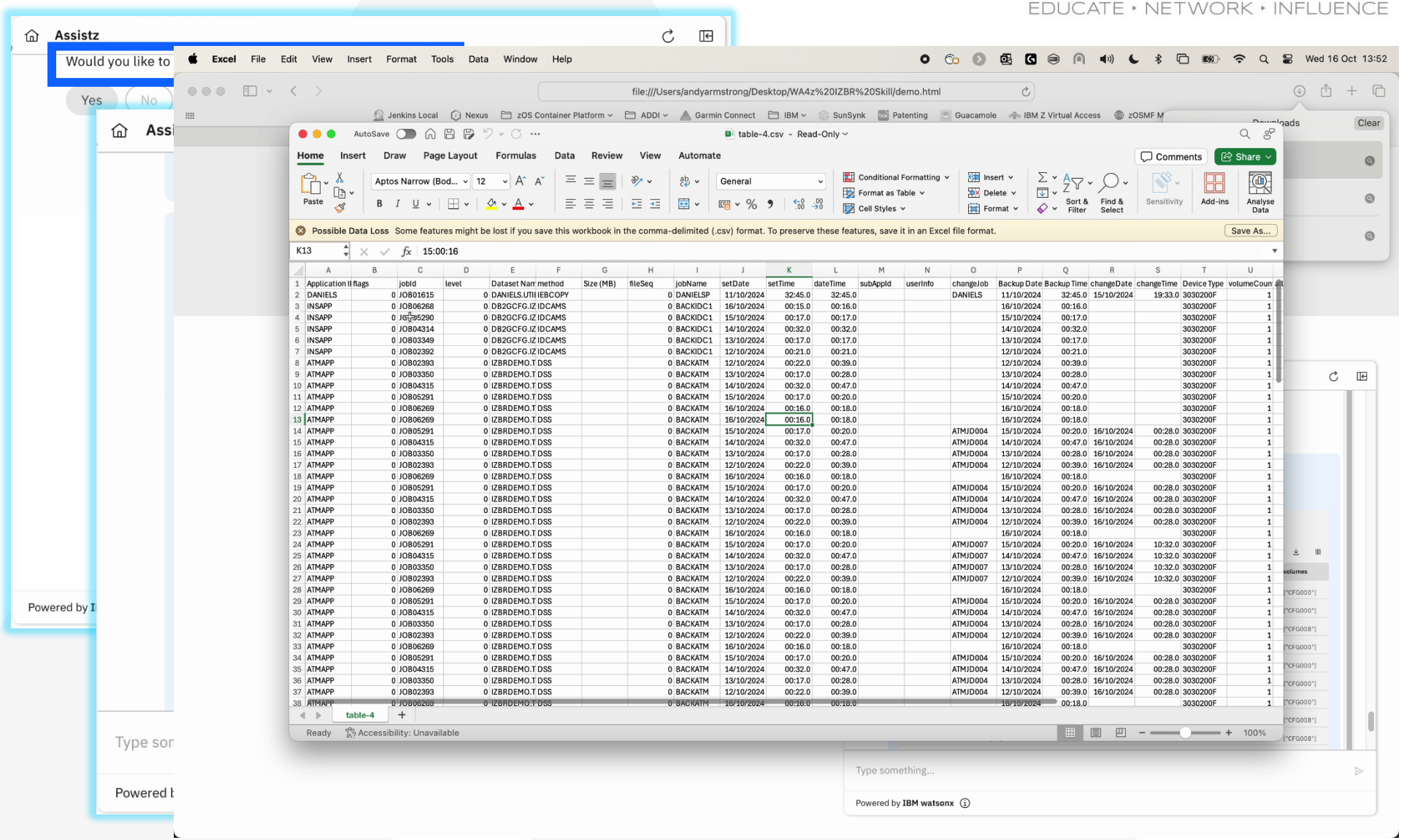
#2 of 4



Example 1: interaction with WatsonX Assistant 4 Z

Obtain the list of **backed-up datasets**

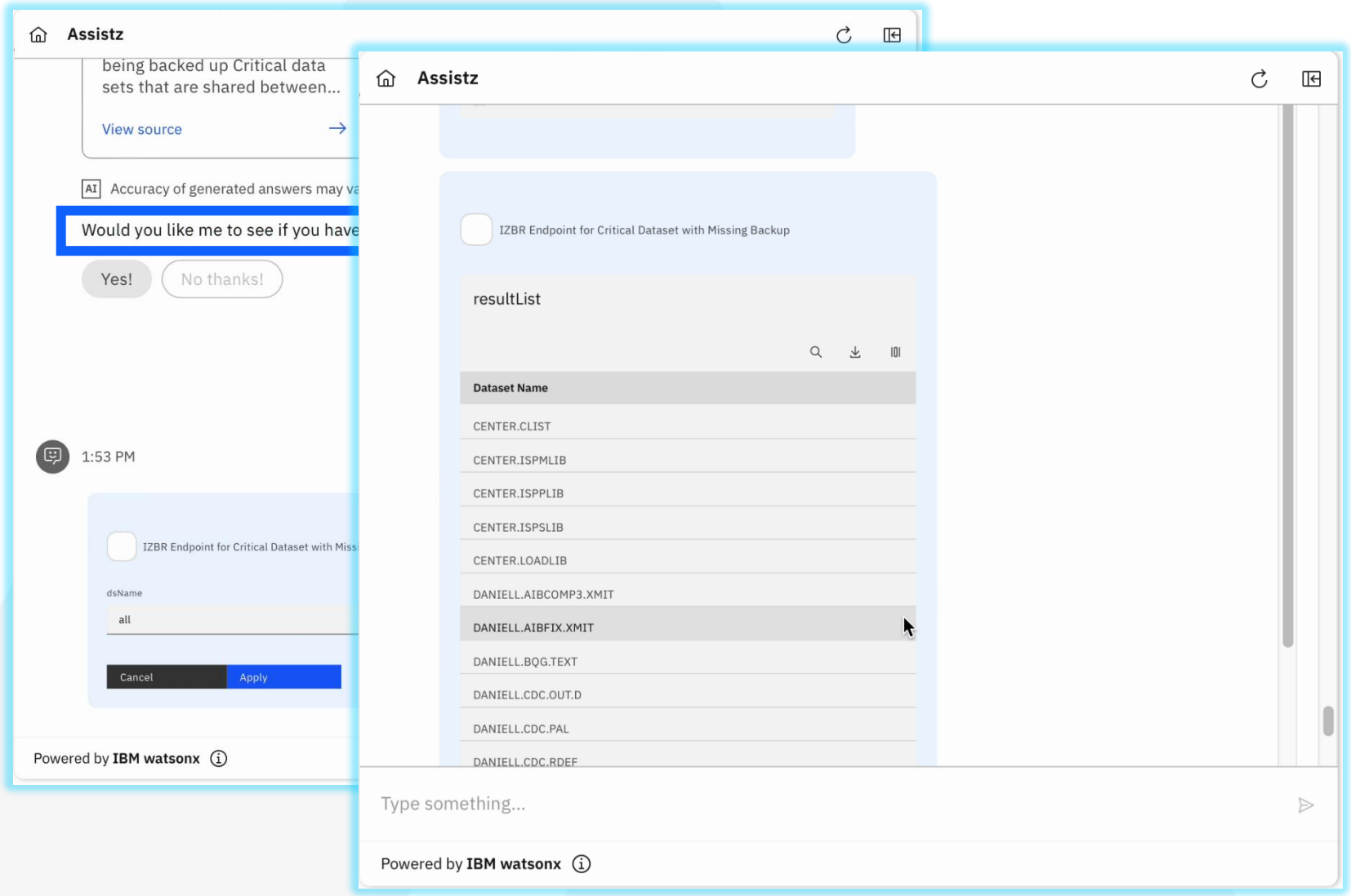
#3 of 4



Example 1: interaction with WatsonX Assistant 4 Z

Obtain the list of critical datasets **NOT BACKED-UP**

#4 of 4

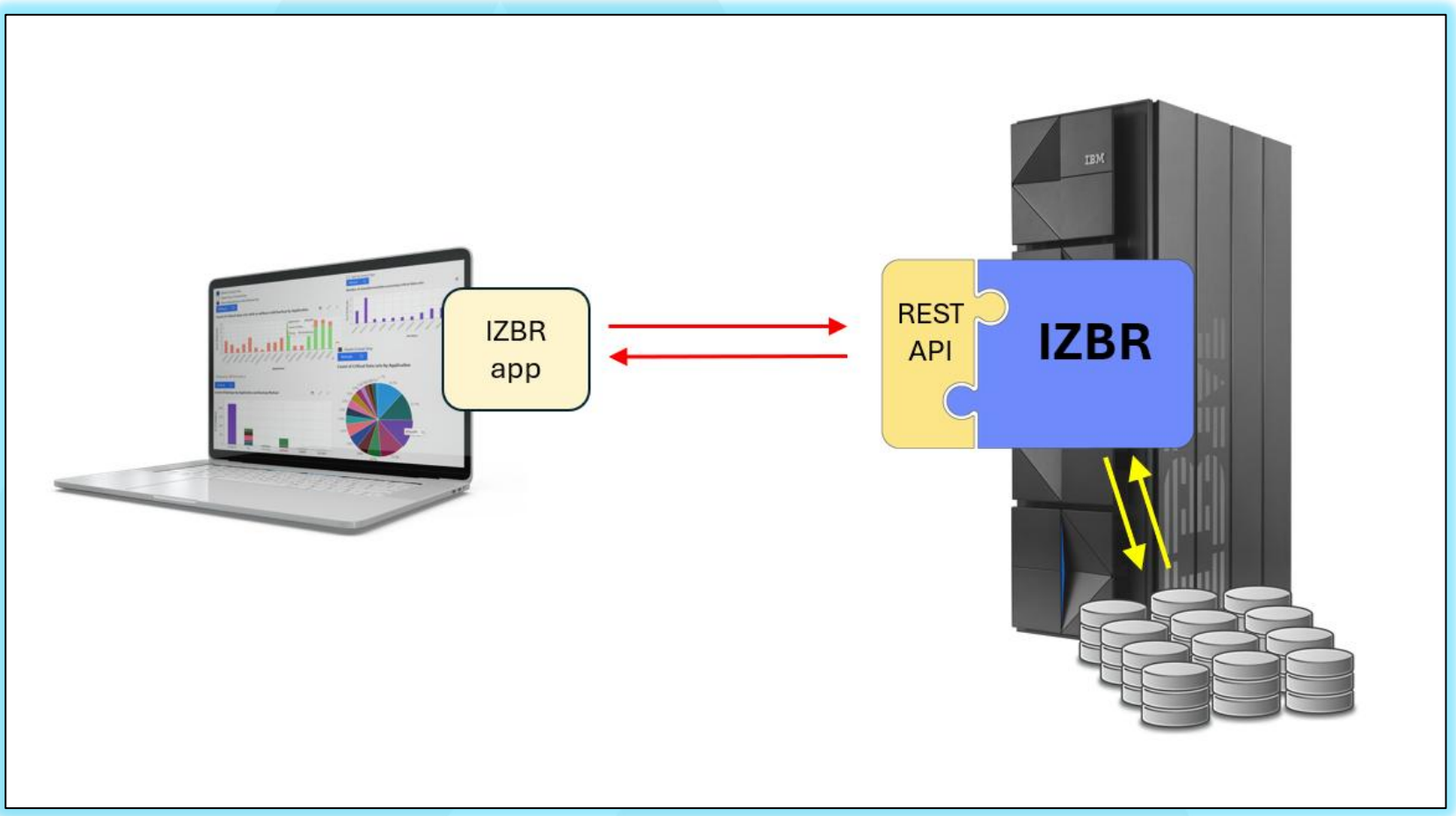


SOME EXAMPLES OF IZBR USAGE: #2

USING IZBR DATA VIA REST API

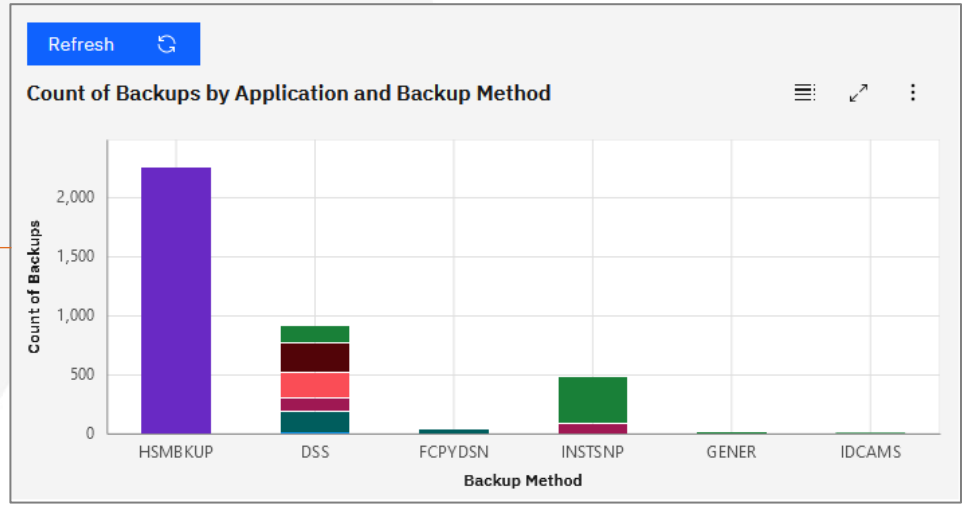
Example #2: IZBR provided application

Using the IZBR provided app to access data via REST API

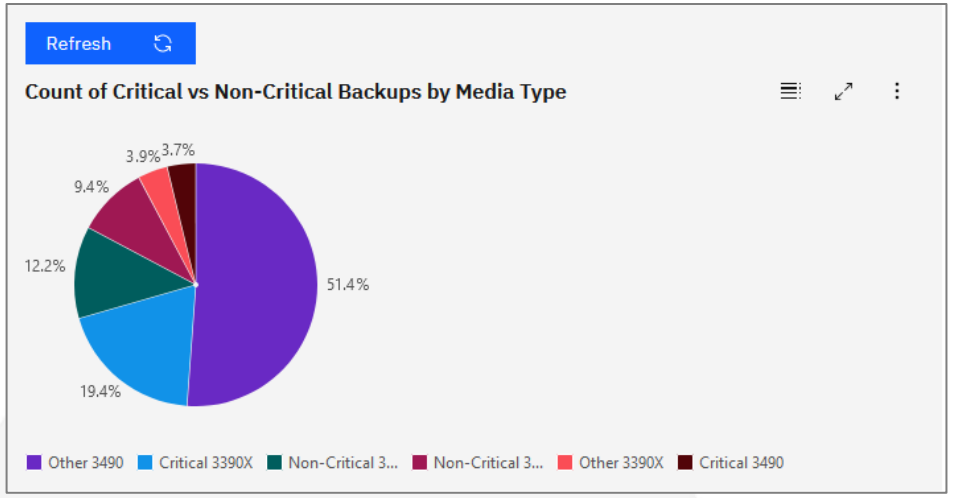


Example #2: IZBR provided application

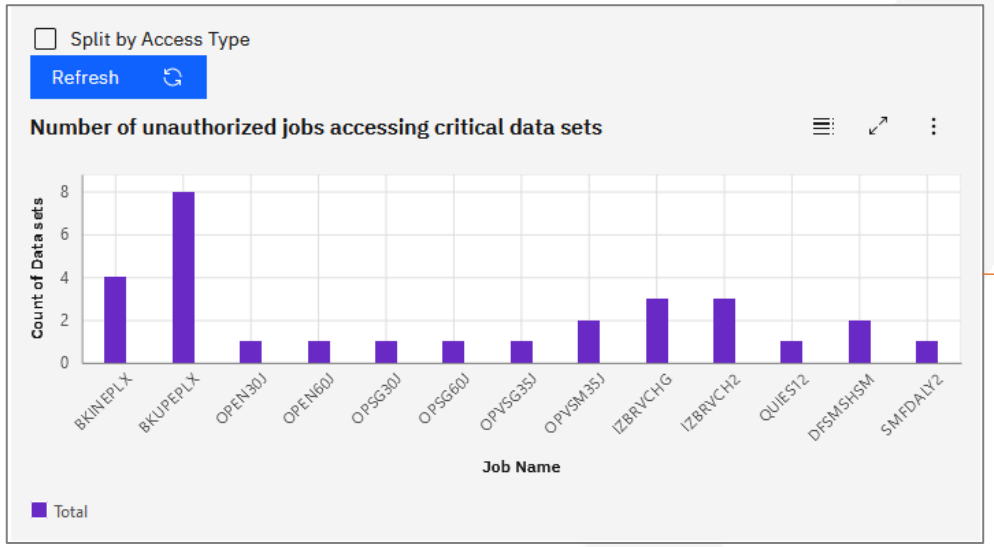
Number of backups, shown by application and backup method



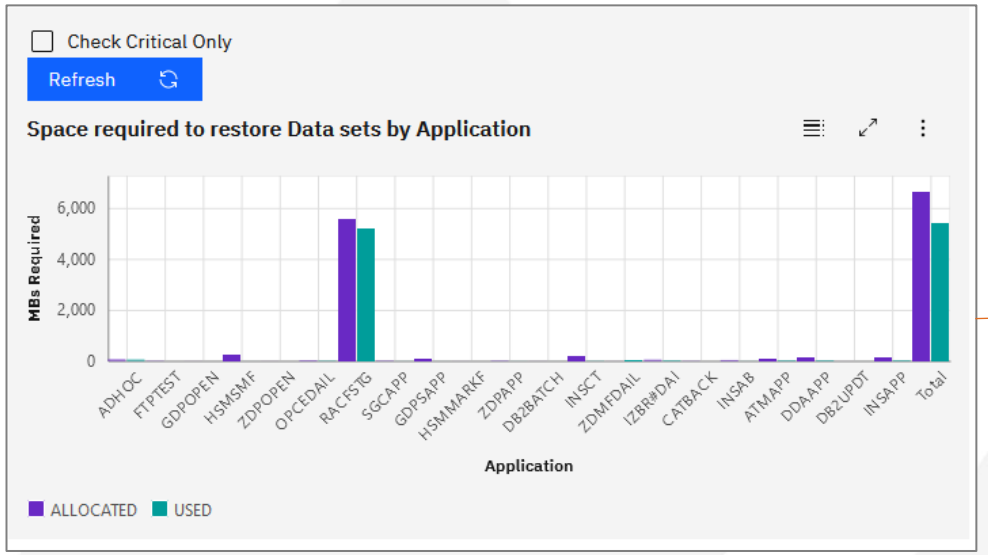
Backups of critical and non-critical data, shown by media type



Example #2: IZBR provided application



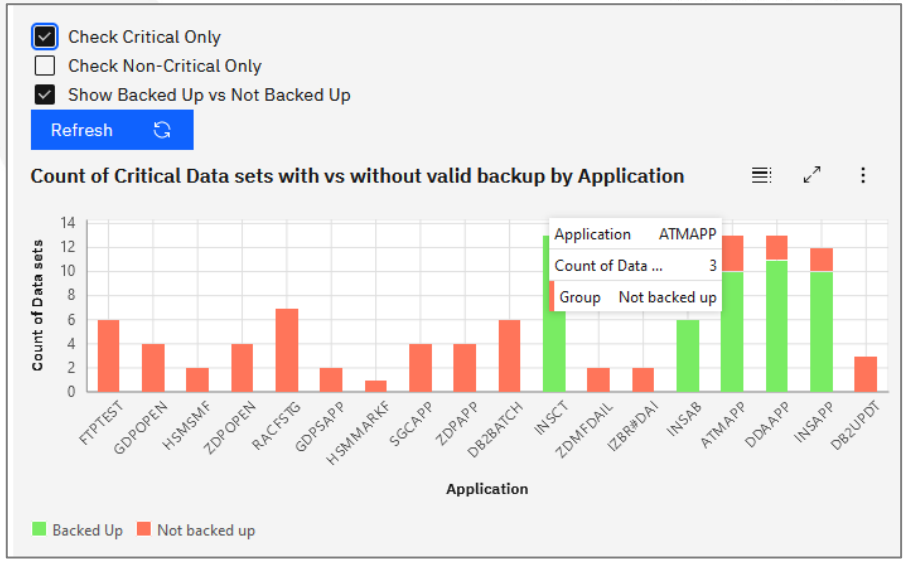
Jobs accessing critical data sets that are not defined in the scheduling system



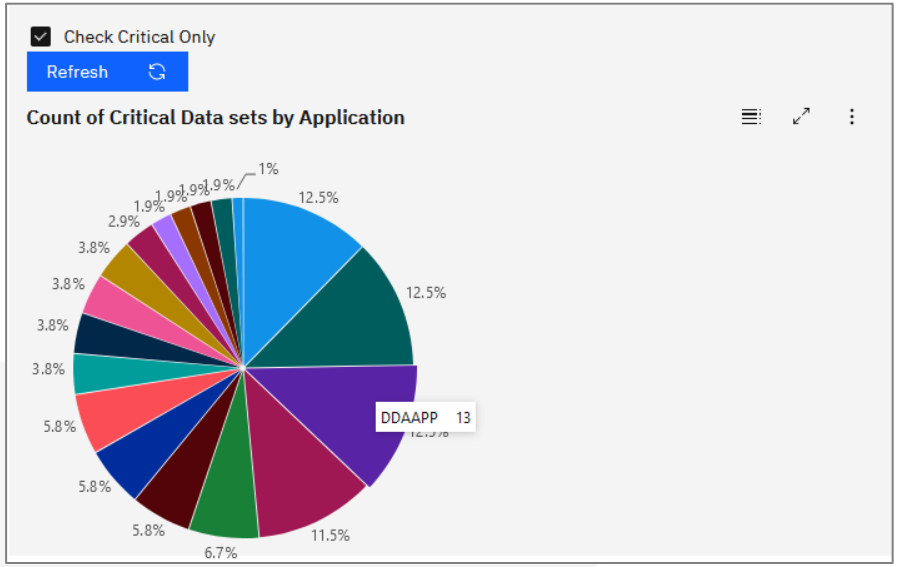
Space needed to restore an application, shown in MBs

Example #2: IZBR provided application

Backup status of critical data sets, showing whether or not current backups are available



Number of critical data sets, shown by application

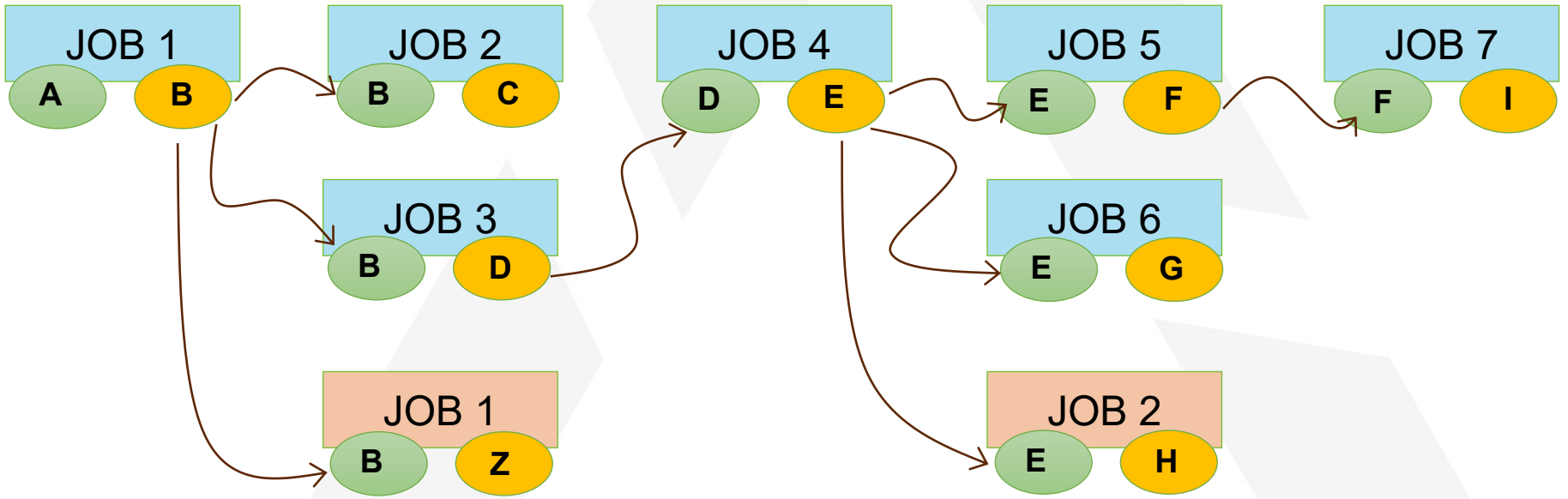


SOME EXAMPLES OF IZBR USAGE: # 3

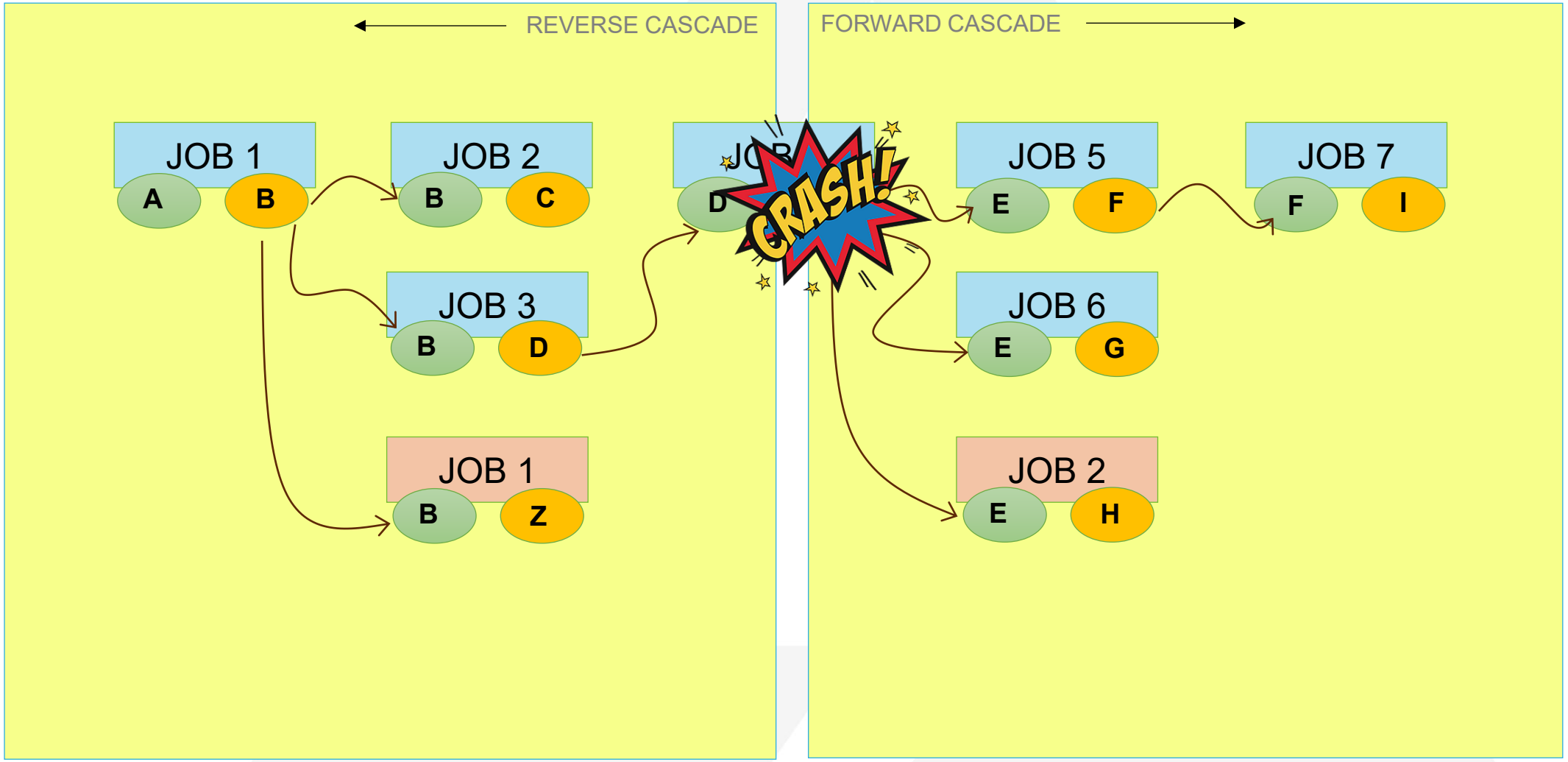
FORENSIC ANALYSIS + QUICK REACTION TO THREATS

Forensic analysis with IZBR

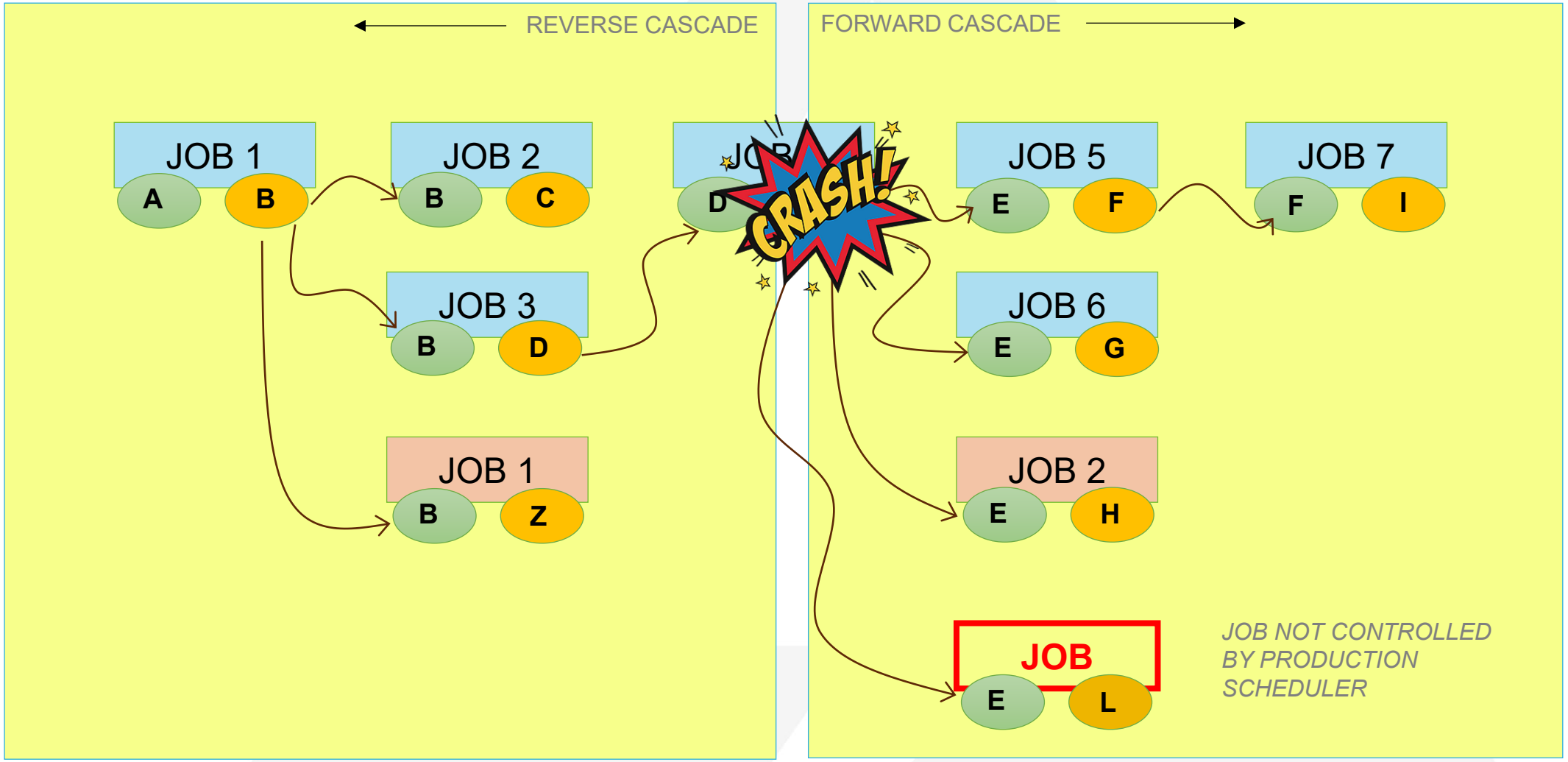
Forensic analysis with IZBR



Forensic analysis with IZBR



Forensic analysis with IZBR

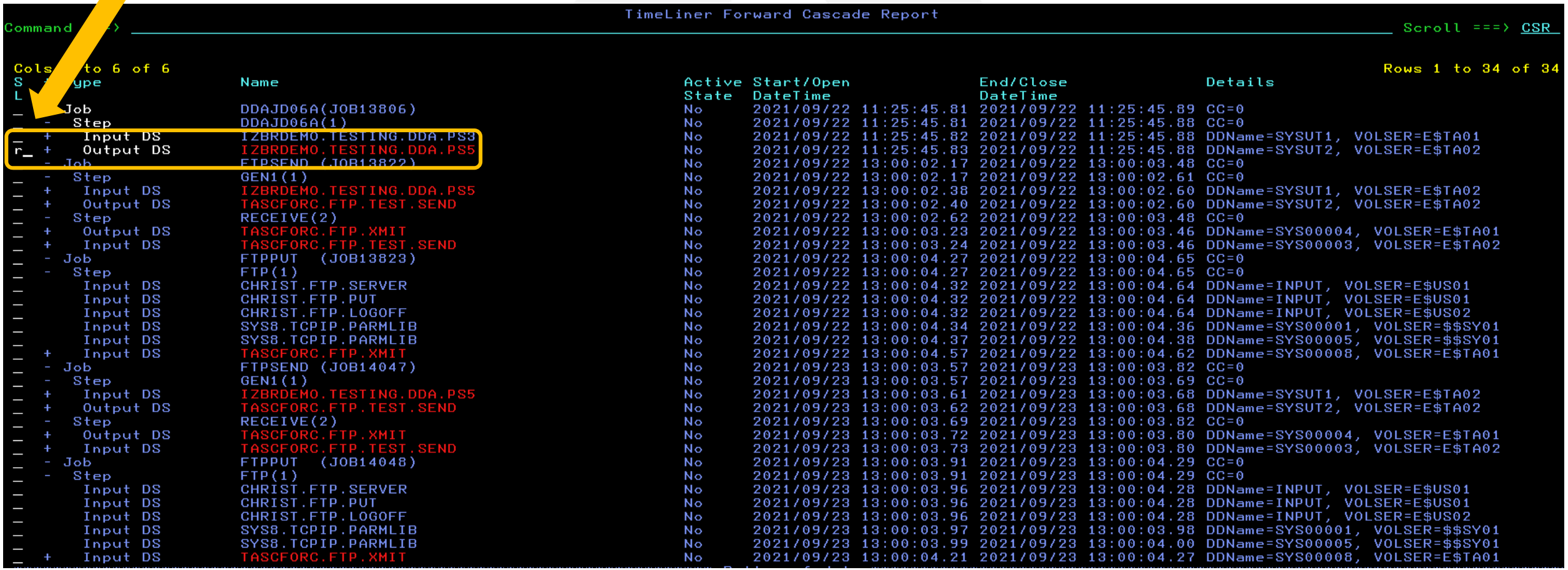


Forensic analysis with IZBR – Forward Cascade

Forward Cascade report shows who read my outputs looking forward in time

Red: Shows jobs who used the data sets created in the job

Use “R” command to generate restore JCL



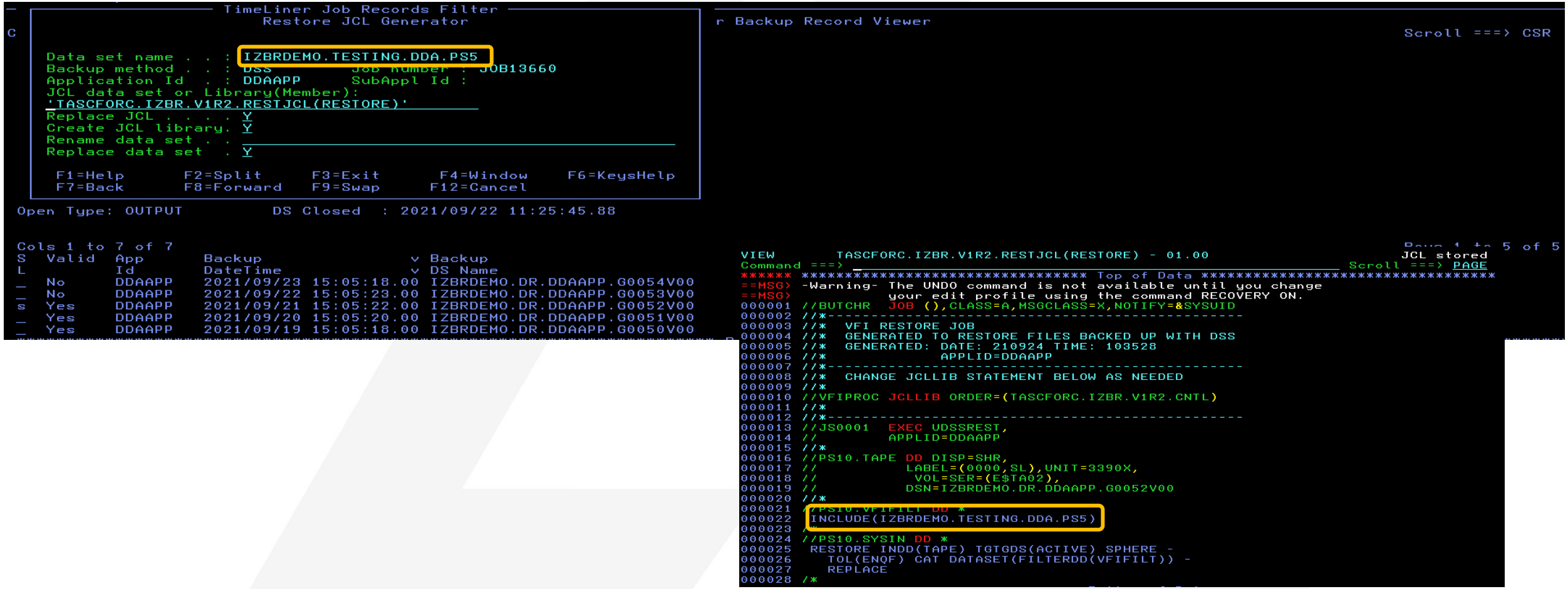
Forensic analysis with IZBR – Forward Cascade

- Select valid backup from list
- Version in white is most current from when selected job ran

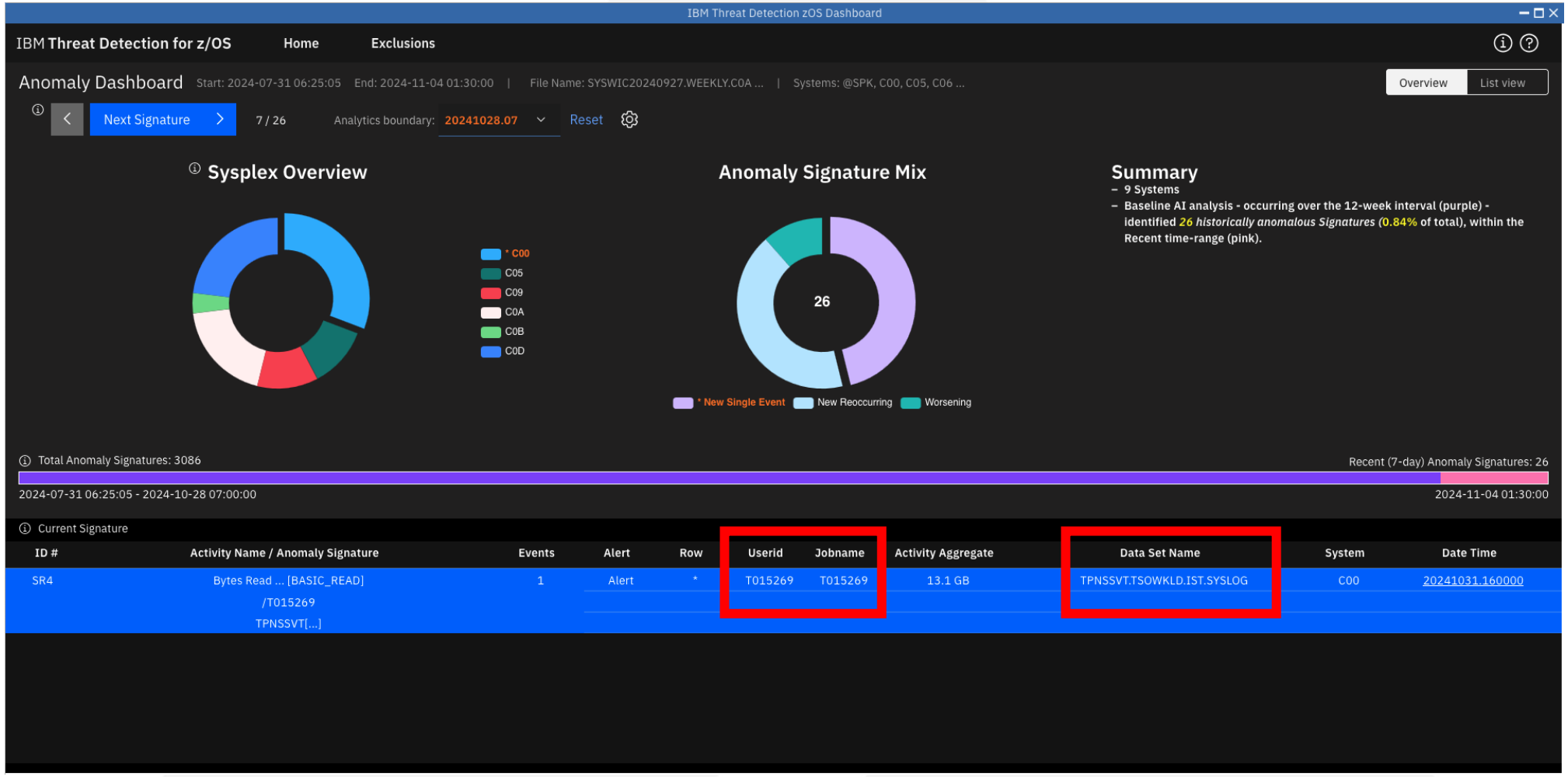
```
                                        TimeLiner Backup Record Viewer
Command ===> _                                                                            Scroll ===> CSR

 System ID: COE1
 Job Name : DDAJD06A          Job Active : No
 Job Id   : JOB13806          Job Start  : 2021/09/22 11:25:45.81
 Job CC   : 0                 Job End    : 2021/09/22 11:25:45.89

 Step Name: DDAJD06A          Step Active: No
 Step Num : 1                 Step Start : 2021/09/22 11:25:45.81
 Step CC  : 0                 Step End   : 2021/09/22 11:25:45.88

 DS Name  : IZBRDEMO.TESTING.DDA.PS5
 DS DD    : SYSUT2            DS Active  : No
 DS Volser: E$TA02            DS Open    : 2021/09/22 11:25:45.83
 Open Type: OUTPUT            DS Closed  : 2021/09/22 11:25:45.88

 Cols 1 to 7 of 7                                                                         Rows 1 to 5 of 5
 S Valid  App      Backup                 v Backup                          Backup  Change               Change
 L        Id       DateTime               v DS Name                         Method  Job                  Date/Time
 _ No     DDAAPP   2021/09/23 15:05:18.00 IZBRDEMO.DR.DDAAPP.G0054V00       DSS     DDAJD06A(JOB13806)   2021/09/22 11:25:45.81
 _ No     DDAAPP   2021/09/22 15:05:22.00 IZBRDEMO.DR.DDAAPP.G0053V00       DSS     DDAJD06A(JOB13806)   2021/09/22 11:25:45.81
 _ Yes    DDAAPP   2021/09/21 15:05:22.00 IZBRDEMO.DR.DDAAPP.G0052V00       DSS
 _ Yes    DDAAPP   2021/09/20 15:05:20.00 IZBRDEMO.DR.DDAAPP.G0051V00       DSS
 _ Yes    DDAAPP   2021/09/19 15:05:18.00 IZBRDEMO.DR.DDAAPP.G0050V00       DSS
```

Forensic analysis with IZBR – Restore DS

- Select options for restore – i.e. RENAME or REPLACE data set
- Restore JCL is automatically generated



Forensic analysis – connection with TDz

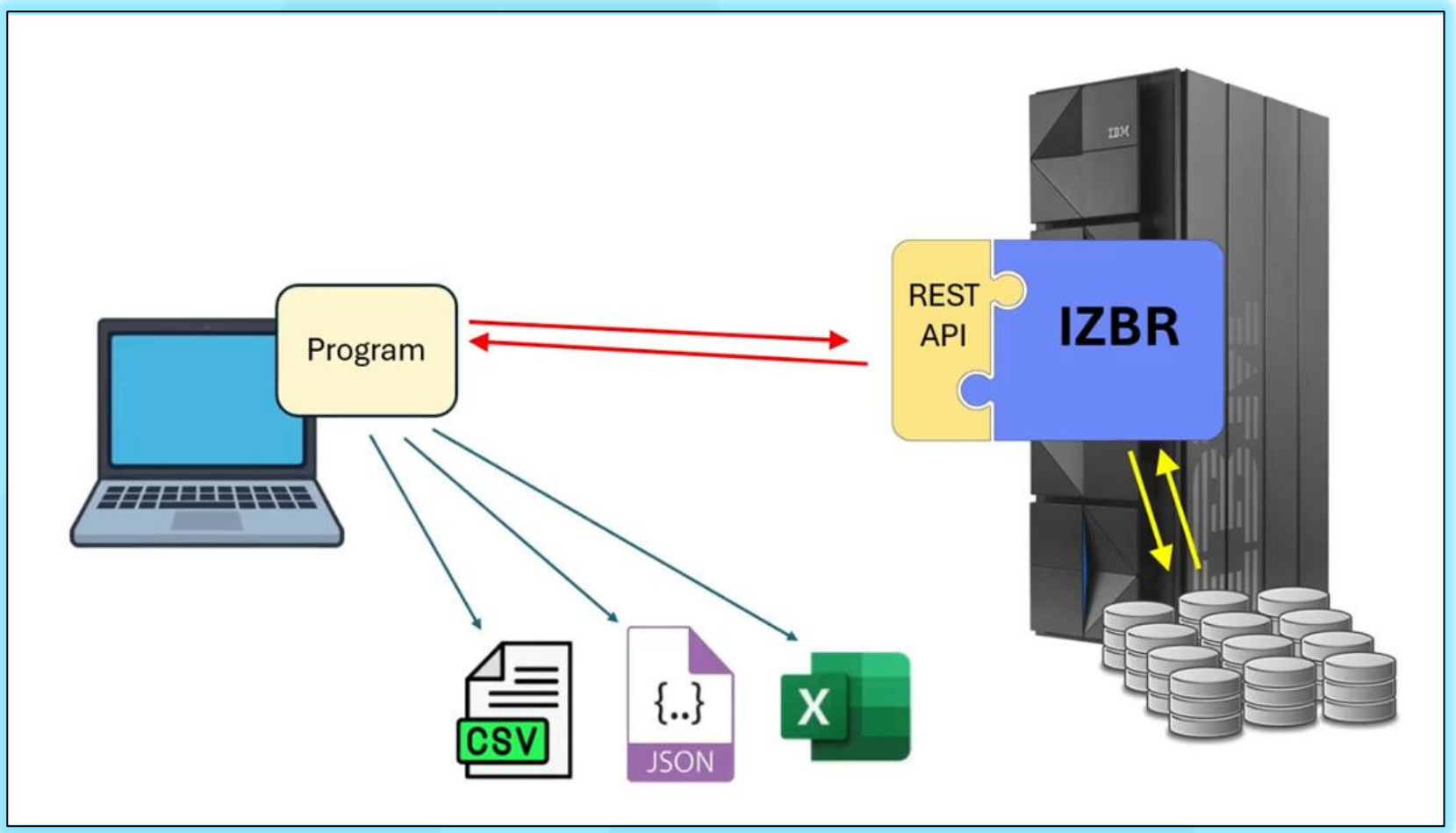


SOME EXAMPLES OF IZBR USAGE: # 4

ACCESSING IZBR DATA FROM LOCAL PROGRAM

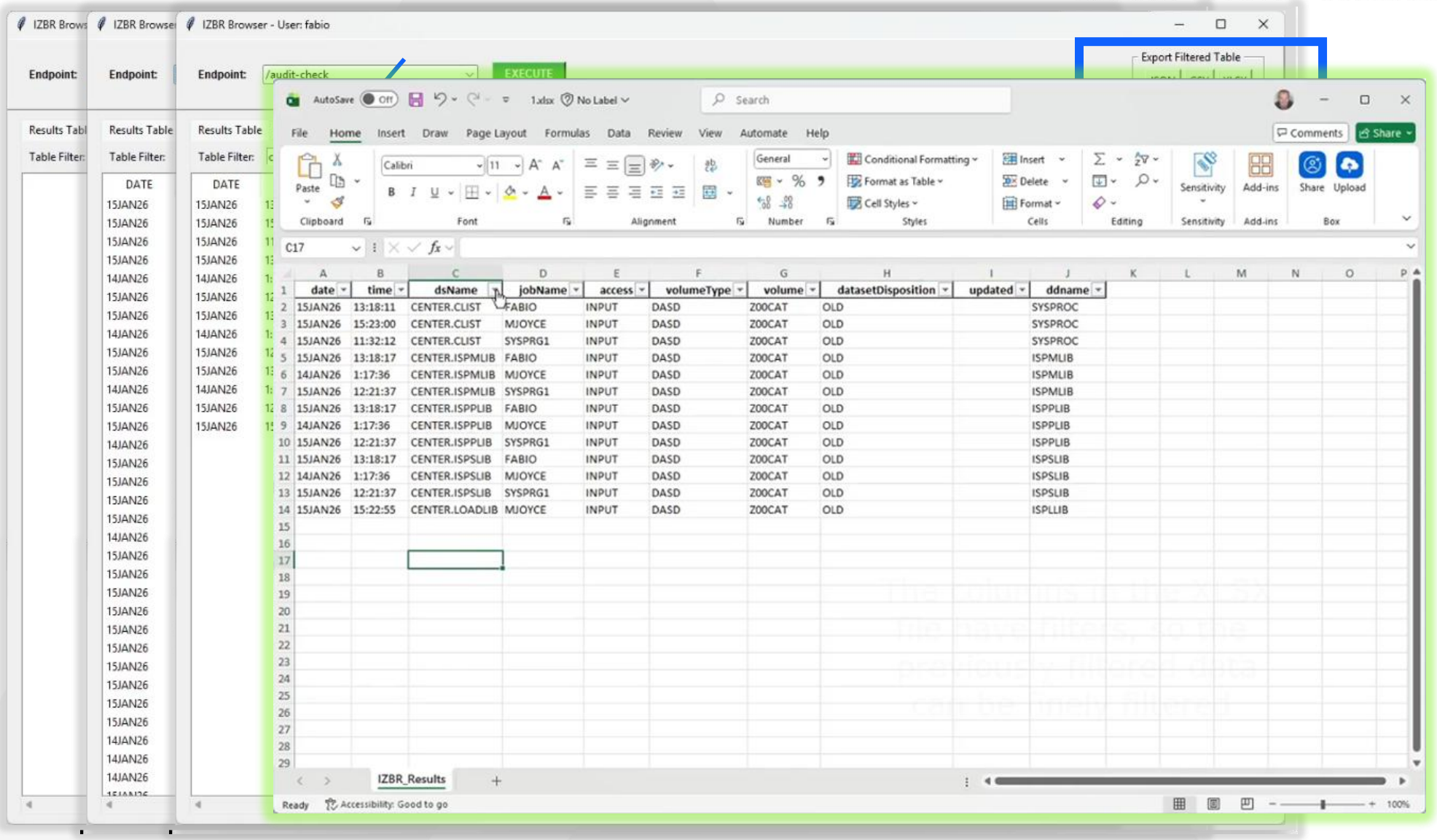
Example #3: Custom program to access IZBR

Example of local developed program to access IZBR info



Example #3: Custom program to access IZBR

Example of local developed program to access IZBR info



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