Ensuring Availability with Modern DB2 Backup and Recovery Strategies

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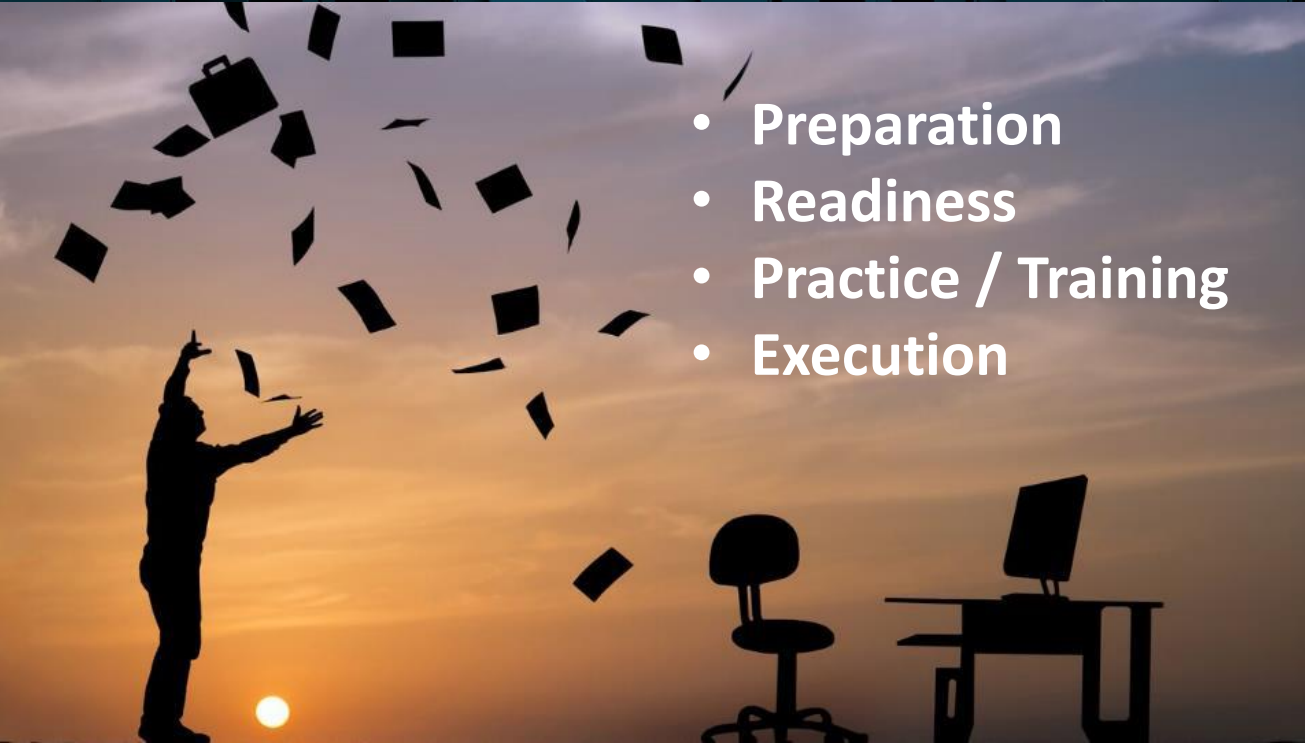
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Recovery Challenges

- **Preparation**
- **Readiness**
- **Practice / Training**
- **Execution**

Why do our bosses worry about Recovery ?
- Regulations
- Customer Satisfaction
- Revenue
- THE BUSINESS
  - Self imposed mandate

# Your World Today - *IT Data Management Responsibilities*

- **Ensure** Data Integrity
- Provide **Full** Data Availability
- Provide **Optimized** Data Access

- **Legal** and **Compliance** Management
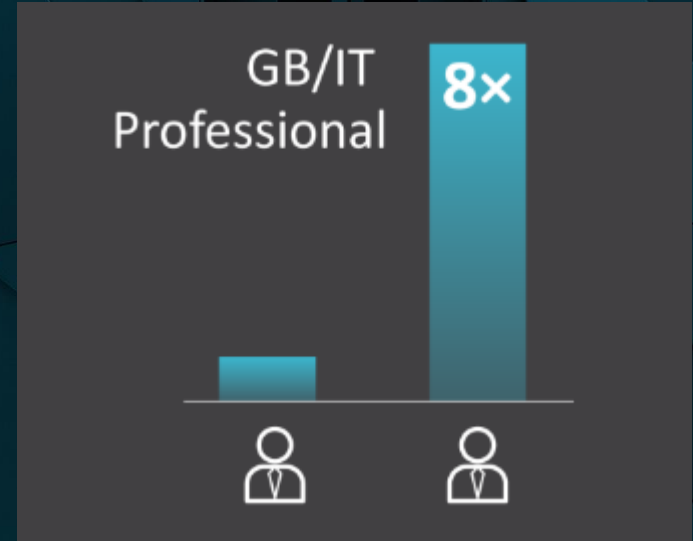- **Ensure** and **Test** Recoverability
- **Minimize** Costs

The Expectation

Digital Business Drives Data Volume and Complexity

Data Growth: 50 Fold growth from 2010 to 2020

(Exabytes)

40000
30000
20000
10000
0

2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
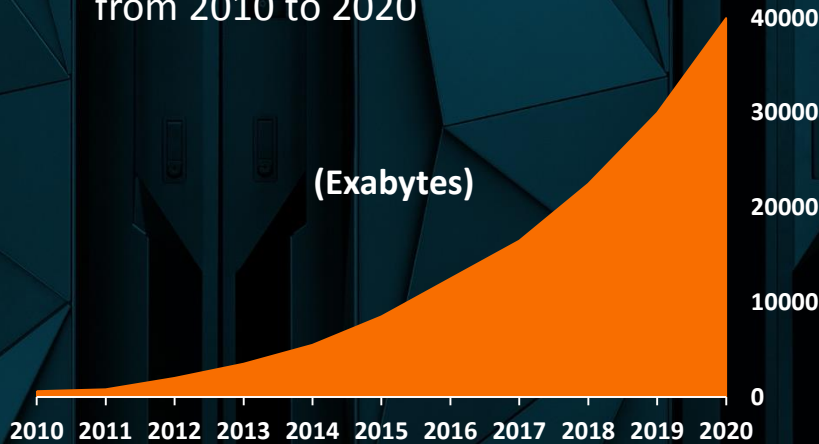
*IDC Digital Universe Study, Dec. 2012

GB/IT Professional

8×

What does this mean to your recovery strategy?

Recovery is a Real Challenge

- Cost of Downtime varies

- Exploding Data Volumes
  - Not to mention number of DB2 Objects

- Staff Productivity and Expertise pressures
  - Recovery is a 'part time' job, skills may wane
  - A lot of hours can go into DR test 'preparations'
  - More applications online, how about more DBAs?
  - Practice makes perfect … when do we practice recovery?

- Planned downtime (backups) pressures
  - Consistent Copies/Dumps require outage
    - Greatly reduces maintenance windows … if any.
  - Even a brief outage may impact business

- Unplanned outages happen at painful times

… Really is all about availability

Being a solider is like DB2 Recovery

- **99.9% of the time nothing happens**

- **But … when called into ACTION**
  - Time Matters
  - Quickly Assess the issue
  - Heart is pounding
  - Different Techniques depending on situation
  - Lots of people looking on

- **Why are the Military Successful**
  - Training and Preparation
  - Practice
  - Continuing Training
    - New Techniques
    - Refresher
    - Changes in Environment

Sorry … We don't do DB2 Recoveries anymore

- **Remote Data Center**

- **Mirrored DASD Environment**

- **When was last time hardware failed**

- **24 x 7 – 100% Availability Requirements**

Lots of danger lurking for Soldiers

- Oh … thought I was in development
- DASD Controller goes bad
- Addition of new DASD Devices
- Movement of DASD Devices
- Application Problem
- Any others out there ??

We are covered …

- **Test Disaster Recovery Every Quarter … whether we need to or not**

Are you ever done with your DB2 Recovery Planning?

- Fast Recover and to the correct point in time (PIT)?
  - Are you meeting your SLA

- Have you practiced your recovery strategy?
  - But what did you practice? Disasters?

- Do you have recovery **compliance** requirements?
  - Are there penalties for non-compliance?

- Can we use those recovery resources?

Preparation, Readiness, Practice, Execution

Questions For Recovery

Readiness

- Prepare for the Worst

- Are we Battle Ready ?
  - Backup strategy meet our needs?
  - How much log do we have to apply ?
  - Do we have enough log available locally to recover from last image copy?

Preparation

- What spaces are logically / physically connected
  - Application RI / DB2 RI
  - What if the DBA on call doesn't know
- Application SLA
  - Are our recoveries fast enough
  - How do we make them meet the need of the business
    - What gets Recovered First?
- JCL canned ready to go … want to go to the manual?
  - What if a recovery is our only option
- Can we even do a recovery

Who do we need to work with?

- **DB2 System Programmers**
  - **DB2 Catalog / Directory**
  - **DB2 Logging**
- **Database Administrators**
  - **Doing the Application Recovery?**
- **Application Owners**
  - **Take the Image Copies**
  - **Critical Processing**
- **Others**
  - **Storage Management**
  - **Performance Group**

Who is in charge of the plan ?

Are we ready to recovery …

Does our Backup and DB2 Log Strategy meets our Recovery Requirements

- **Catalog and Directory Backups**
  - Full Image Copies of the DB2 Catalog and Directory
  - How often

- **DB2 V10 … regular DB2 objects**

- **DB2 V11 … faster DB Catalog Recovery**

Are we ready to recovery …

- **Application Database Backups**
  - Verify that our objects are recoverable to our needs
  - Verify the DB2 Resources are still out there
  - Manually build queries to check
    - Third Party Software provides VERIFY function with copies
- **Are we taking Image Copies Frequent enough?**
  - Log Processing to use these image copies
- **Incremental Copies**
  - Affect Recovery Time
- **Verify object recoverability and optionally trigger image copies**
  - This feature will allow you to evaluate the "recoverability" of objects based on 3 criteria:
    - The MINIMUM number of image copies that need to exist
    - The MAXIMUM number of days since the last image copy
    - The MAXIMUM number of logs since the last image copy
  - If any of those conditions are true, you can choose to simply issue a WARNING, or you can choose to make an image copy.

Recovery Resource Not Found !!!

- **Recovery Resources better match how we perceive Recovery**

- **Local / Remote Recovery**

- **Subsystem or Application Level Recover**

- **Validate our Application Recoveries**
  - Many types of Recovery Points
    - TOCOPY, TIMESTAMP, QUIESCE, LOGPOINT
  - Can we support each with our Readiness

- **Products on the market**
  - Recovery Expert, Recovery Analyzer, Recovery Manager … probably more

bmc
Workbench for DB2

Workspace Manager

BMC*

- Chad Work
- Claims
- MetLife
- chubb
- claims test
- db2briefing

BMC*

DB2 Navigator | File Locator | Job Browser | Performance | Schema Management | **Recovery Management** | Scratchpad

▼ 📁 **Recoverability Reports**
- 📄 CR APPLICATION to copy
- 📄 CR Application to current

▼ 📁 **Time Estimation Reports**
- 📄 cr application backup time
- 📄 cr application recovery time

▼ 📁 **Progress Reports**
- 📄 bmc application group

CR Application to current

DB2 Subsystem: DJJ
Generated: 6/23/2017 8:47 AM

Definition | **Recoverability Report** | Details

Recoverability Exceptions for Backout: NO

27	⚠	UNRECOVERABLE EVENT	View Details
3	⚠	DATA SET NOT YET DEFINED	View Details
1	⚠	MISSING RESOURCE(S) FROM MVS CATALOG	View Details

DB2 Logging Environment

- **Be in sync with System Programmers**
- **Active Log Pairs**
  - More the better
- **DB2 V10 – Add Active Logs on the fly**
- **Recovery Readiness**
  - Write Archive Logs to DASD allow HSM to migrate
    - Attempting to avoid tape contention when needed for recovery
    - Quicker recovery to DASD
- **Recovery Readiness Question**
  - How long do we need to keep the logs around.

DB2 Personnel need to know how to operate

- **Recovery Time – Outage**

- **Recovery Point – Data Loss**

- **Types of Recovery**
  - Application
    - Different Points in Time
  - Subsystem Level
    - Typically think about Disaster Recovery
      - Plan B
      - Image Copies and Logs offsite
    - Local System Recovery
      - Bring back local system to a previous point in time

Application Recovery – Decisions, Decisions

- **Determine what objects need to be recovered.**
  - By Plan, Volume, Database
  - What objects are included in the above

- **Where do I need to recover to?**
  - Image Copy (which one)
  - Quiesce Point
  - Timestamp
  - Current

- **Build the process …**
  - One recovery job or multiple
  - Log being used in recovery
  - Recover Indexes or Rebuild
  - Recover Backout an option?
  - Do all spaces actually need to be recovered

- **Run the jobs**
  - Sit and wait … hopefully no abends.

Soldiers always have the best equipment

- **Recovery Readiness and Preparation**
  - RECOVER/REBUILD Utility
  - COPY Utility
  - CHECK
  - Log Tool
  - Unload / Load
  - Reorg
  - Report Recovery

  - DSN1LOGP
  - DSN1PRNT
  - DSN1COPY

The DB2 Log is your friend …

- **Log Tool / Log Master**
  - Can everyone build and run the Log Tool ?
    - Easy to Simulate
  - What if you lose updates to your DB2 Objects
  - Recovery Point prior to Current
    - DB2 Logs were lost or compromised
  - Verify Data on Databases
    - Review the log activity
  - Find Recovery Points
    - Daily or Application Process

- **Important Equipment in today's Recovery Fight**

Other Facilities to Assist with Recoveries

- **Recovery Tools**
  - OUTCOPY ONLY
    - Build a Image Copy on demand
  - INDEP OUTSPACE
  - DROPRECOVERY

- **Infamous Drops**
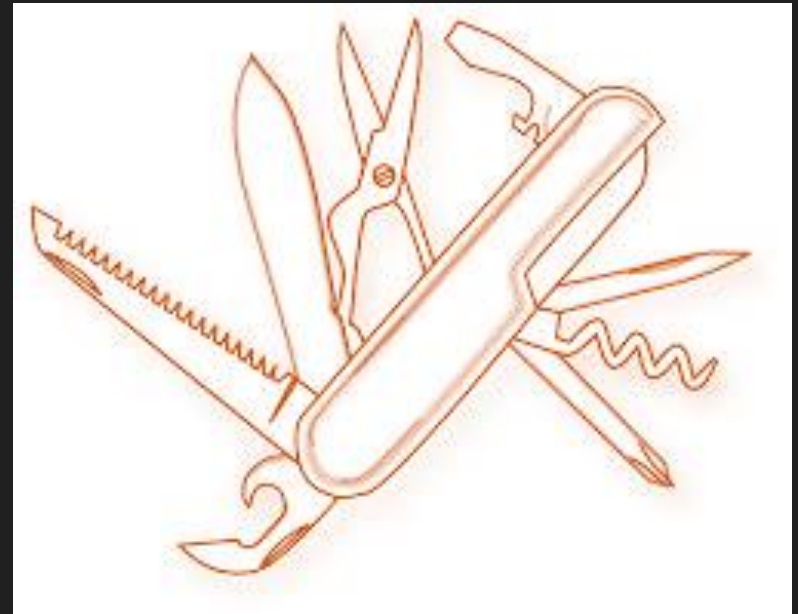 - DROP RECOVERY
    - FULL Support
      - CREATE
      - RECOVERY
      - BIND, etc.

Looks good on paper ... let Practice Recovery!!!

- **Who practices recovery?**
  - "We never do Recovery !!!"

- **Why Practice Recovery**
  - Recovery Time – Application Recovery SLAs
  - Software Functionality
  - Backup Strategy Confirmation
  - Other Recovery Options

- **What should I practice**
  - Recovery Utility
  - Log Tool
  - Building Recovery/Log JCL jobs

BMC Can help with Recovery Practice ...

- **BMC Software Recovery Management Solution**
  - Simulation
    - Actual Recovery Execution
  - Estimation
- **Simulation - Recoveries**
  - Disaster Recovery
  - Local Subsystem Recovery
  - Local Application Recovery
- **Estimation**
  - Disaster Recovery
    - Find problem objects
  - Application Recovery
- **Data Stored in DB2**
  - Reports Available

It is not always about Recovery

- **Recovery Resources used for other reasons**
  - Unloading DB2 Testing Data
  - Automated Drop Object Recovery
  - Migrating / Propagating Data Sources
    - BMC Copy Migration Feature
  - Auditing changes
  - Replay / Backout testing updates

Summary

- **No one should be a recovery expert**

- **However …**
  - Recovery Readiness
  - Recovery Preparation

- **Recovery Equipment**
  - Exercise that equipment
    - It gets rusty
  - Need to be able to act quickly
  - Trust the Resources are Available
  - Meet the need of the business

THANK YOU