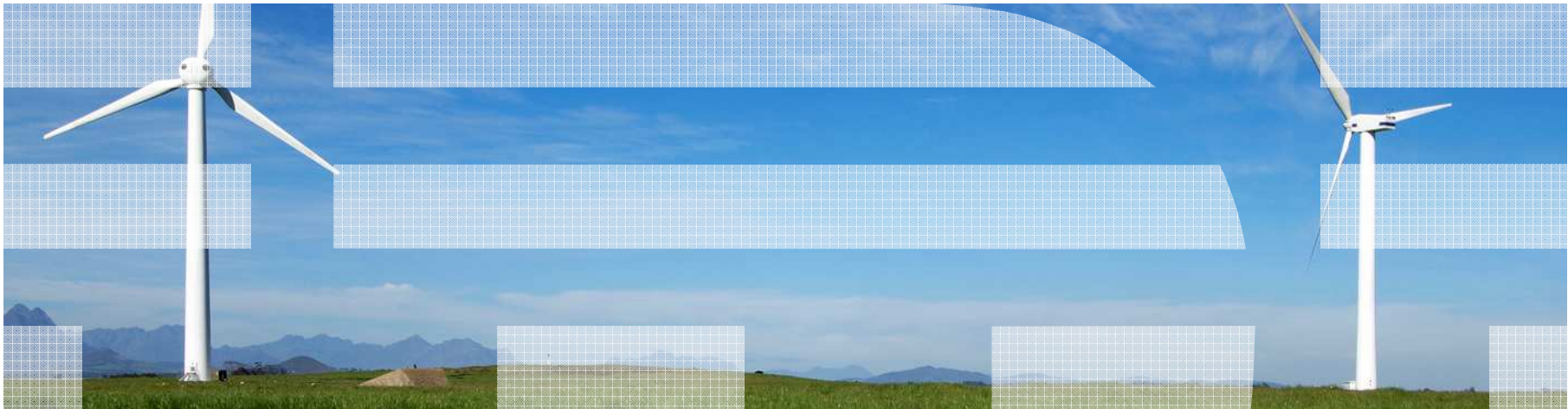


# DB2 for z/OS: Recovery concepts



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## Contents

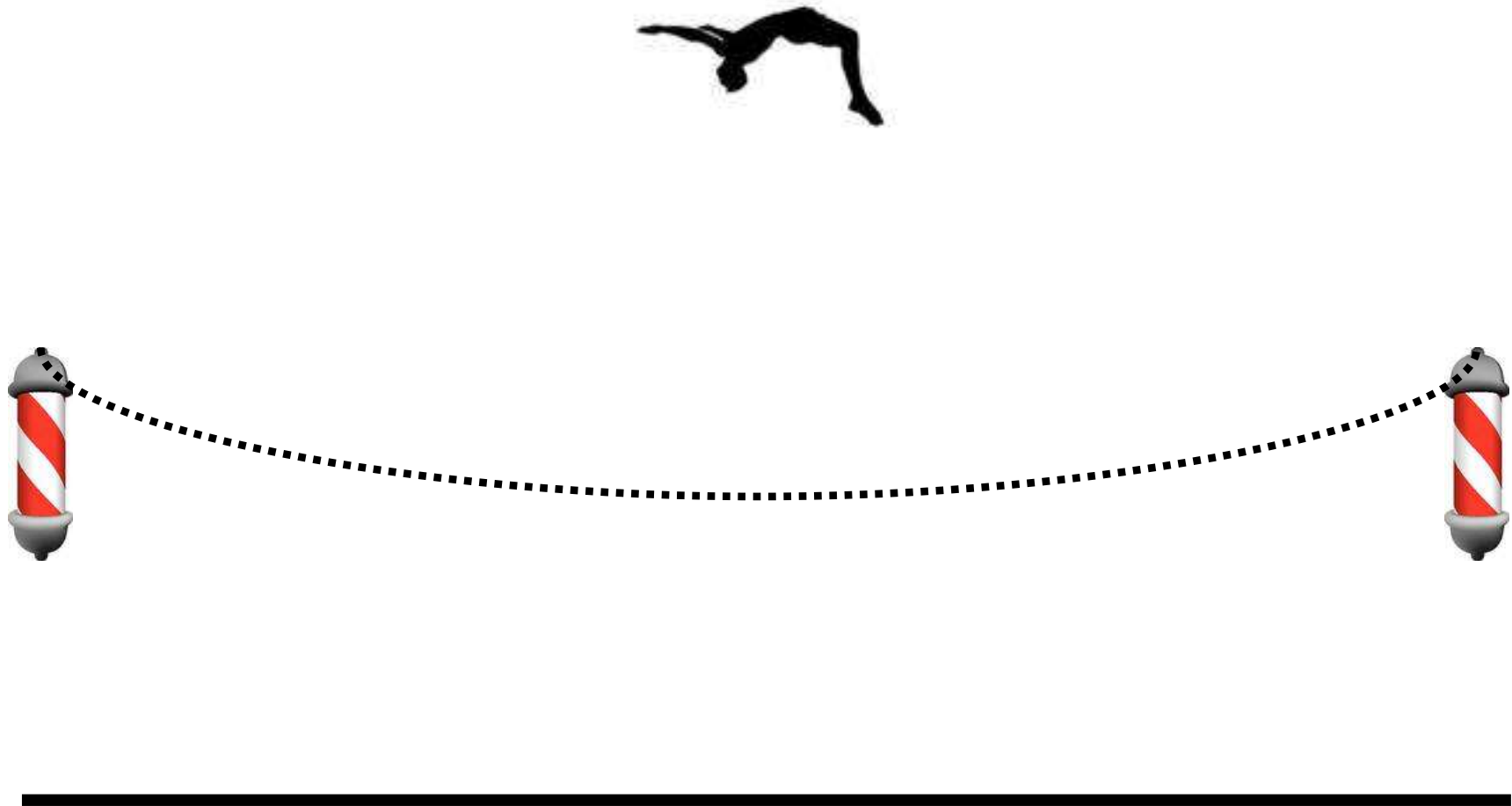
- Why is there a need for recovery concepts?
- Hardware and software considerations
- Which options could be considered?

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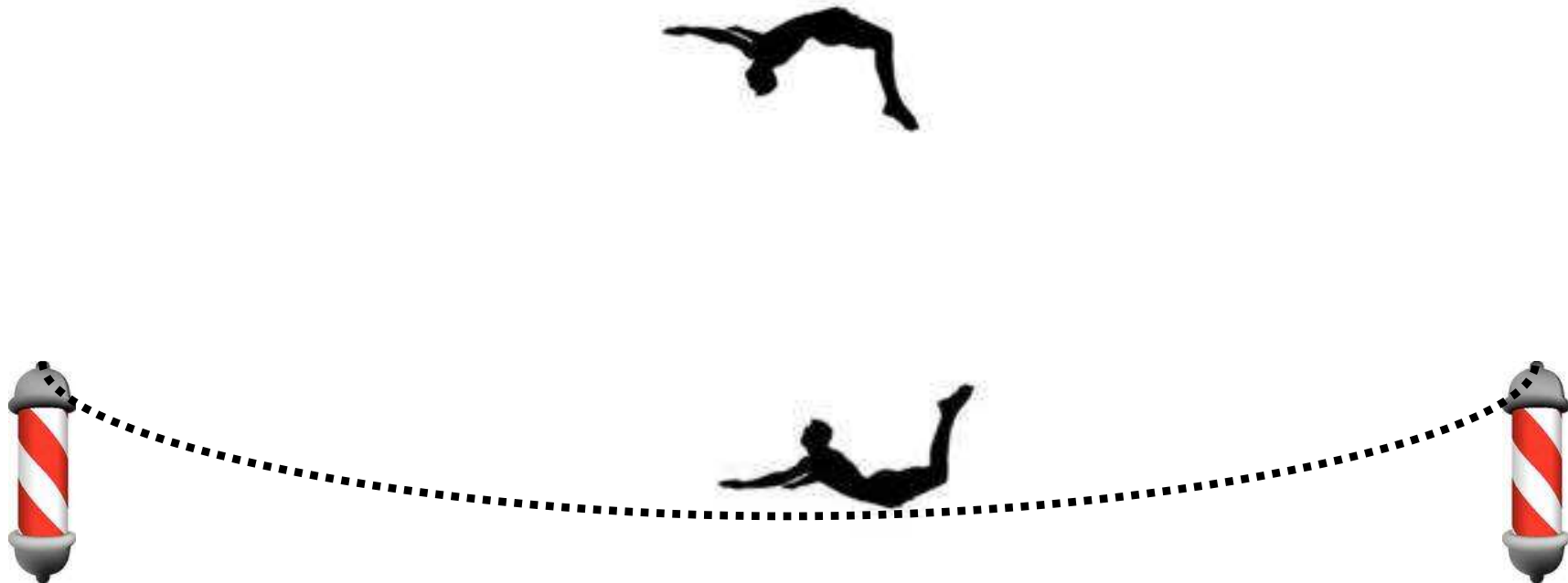
Daily business = Great things are done by customers



Backup strategy = The net is spanned

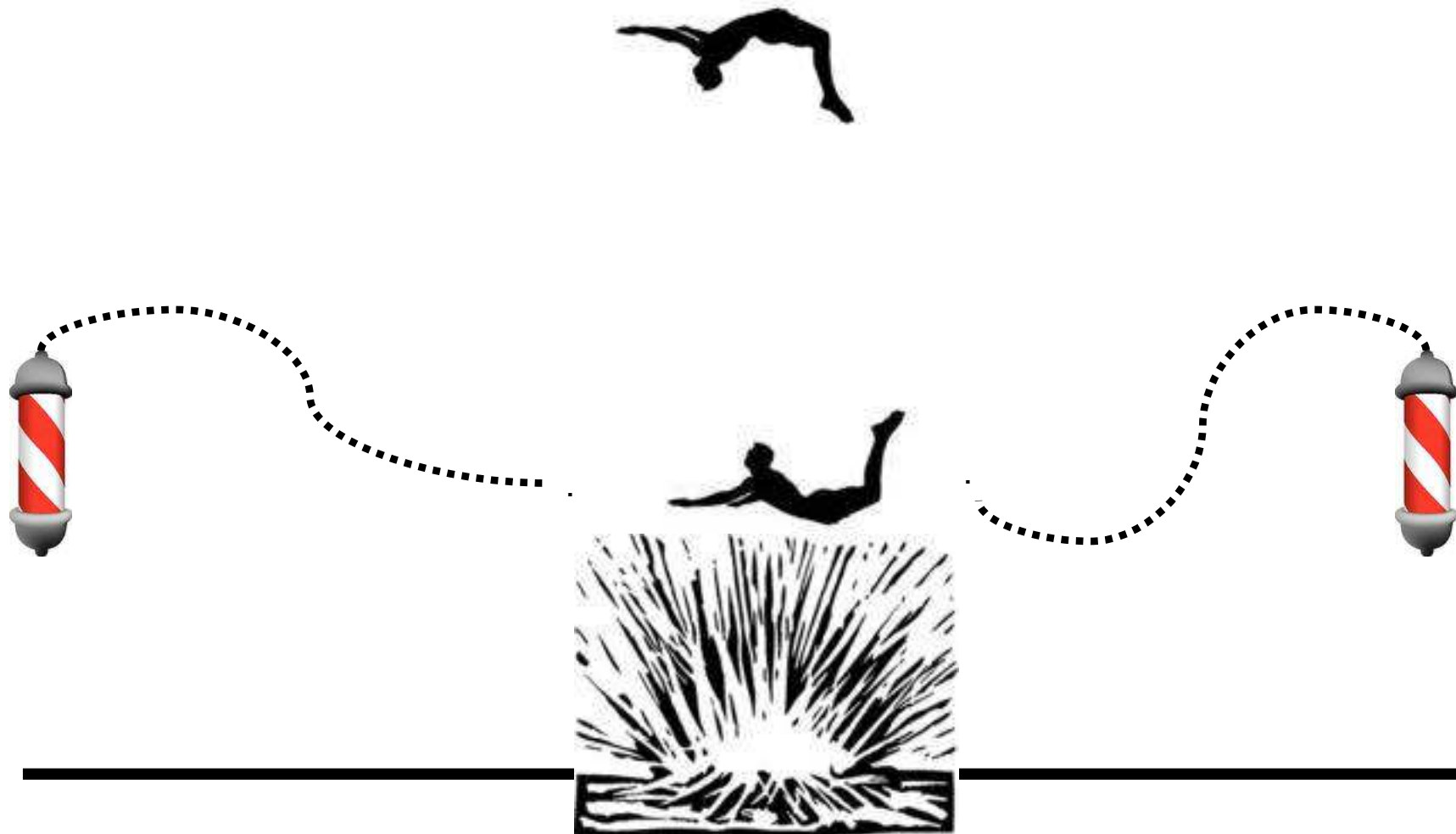


Recovery = Does the net do what is supposed? Yes



Recovery = Does the net do what is supposed? No

= Disaster



## Deep dive recovery

A large rectangular area with a blue-to-dark-blue gradient background, resembling an underwater scene. A white rectangular box is positioned in the upper center, containing the text 'Standard recovery'. Another white rectangular box is positioned in the lower center, containing the text 'Non-standard recovery ~ data inconsistency' in red.

**Standard recovery**

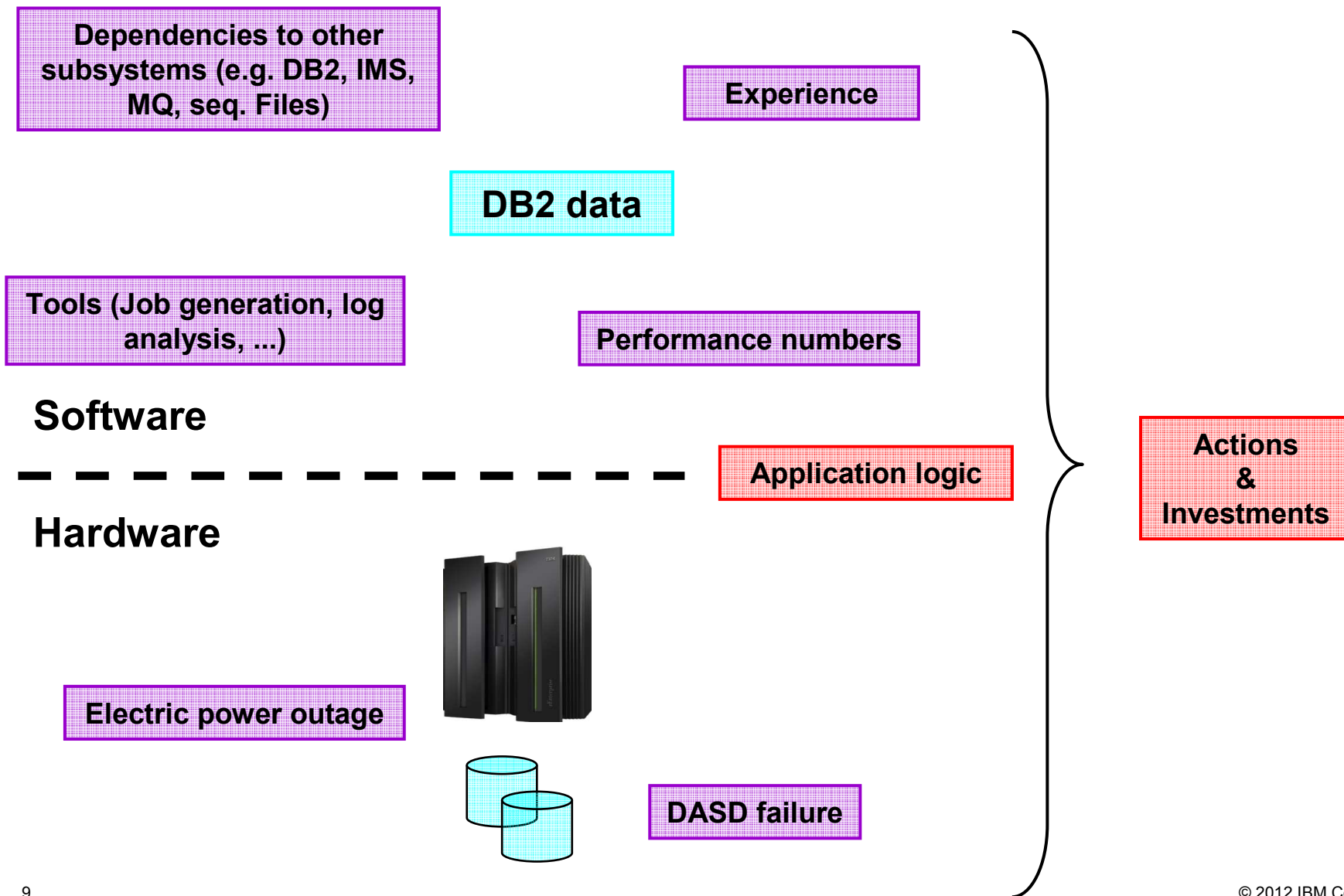
**Non-standard recovery  
~ data inconsistency**

## Why also deep dive recovery?

- In an ideal world data inconsistency never happens!
- In reality...
  - A number of high profile data corruption and data recovery issues
  - Why ?
    - Hardware problems
    - Software defects, whether in DB2 code or other components
    - User errors



## Recovery concepts must be tested !

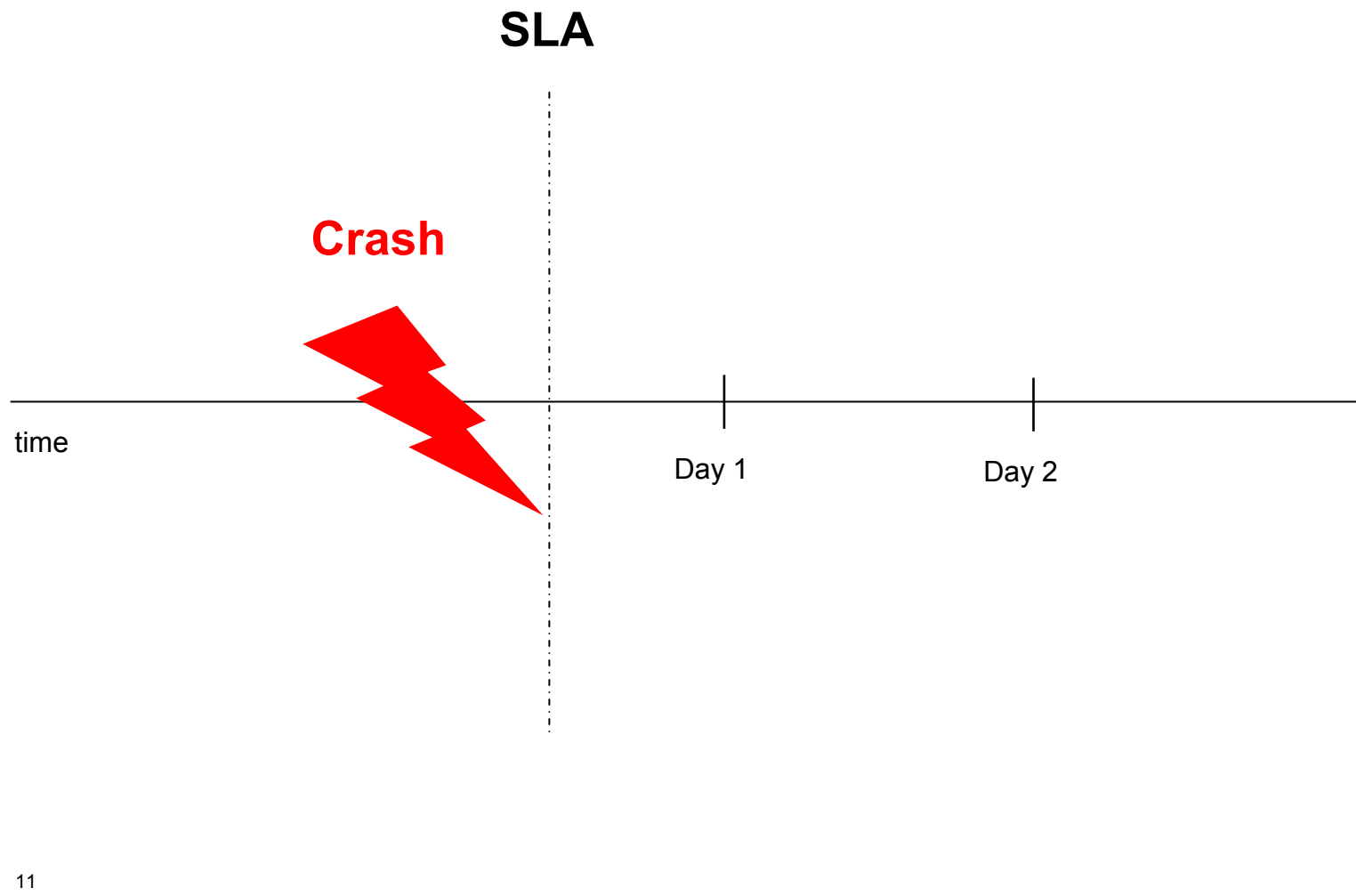


## Recovery concepts must be tested – Other point of view

- Past:
  - Volume is no longer accessible (e.g. Boxed), but data is ok
    - Recovery of all objects on that volume
- Today:
  - Volume on the secondary side (PPRC) as alternate
    - So such a recovery (primary volume is not available) is no longer needed
    - But when data is logical broken ?

Recovery concepts must be tested !

**Hit the wall:  
What happens then?**



## Performance

- How long does the recovery to current take for
  - the most important object
  - the largest object
  - the most important application
  - the whole DB2 subsystem
- Do you have a plan „B“ ?
  - E.g. PIT recovery
- Are the resources available?
  - Dependency on high skilled people

---

## Performance

- DB2 utilities will be enhanced in functionality, but not in performance
- If better performance is needed: Hardware solution = FlashCopy
  - Since DB2 V8: Volume based FlashCopy (required)
    - BACKUP SYSTEM/RESTORE SYSTEM
  - Since DB2 V9: Dataset level recovery on SLB (System level backup)
    - RECOVER on SLB
  - Since DB2 V10: Full dataset level support for backup and recovery in all utilities, e.g.
    - COPY, LOAD, REBUILD, REORG, RECOVER
  - Cascaded FlashCopy is not supported:
    - Target of a FlashCopy could not be a source at the same time

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## Hardware considerations

- 2 data centers
- CPC (Central processor complex)
  - 2 separate boxes
- Coupling Facility
  - Internal CFs
  - External CFs
    - In a separate location
- DASD
  - 2-site or 3-site solution
  - PPRC
  - XRC

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## DB2 considerations – backup

- COPY YES for large indexes
  - CHECKPAGE for indices
- Archive logs on DASD (at least one day)
- Frequency of incremental image copies
- LOG NO objects
- Coordination of retention periods, e.g.
  - MODIFY RECOVERY DELETE AGE, RMM tapes, MGMTCLAS (HSM), #BSDS entries for archive logs

## DB2 considerations – parameter settings

- Coordination of coupling facility definitions
  - Group buffer pool duplexing (user-managed duplexing)
  - SCA and LOCK1 duplexing (system-managed duplexing): Performance!
- Group buffer pools
  - AUTOREC
  - GBPCACHE definitions for objects
- zPARM
  - PCLOSEN/PCLOSET
  - DEL\_CFSTRUCTS\_ON\_RESTART
- DB2 stop
  - CASTOUT(YES/NO)



## DB2 considerations - automation

- Long running units
  - DSNR035I (URCHKTH)
  - DSNJ031I (URLGWTH)
- DSNB250E
  - LPL or GRECP
  - STA DATABASE or RECOVER LOGONLY
- GRECP or LPL recovery
  - AutoGRECP since V9
- 00C9xxxx
  - Dumps (regular cleaning of DAE dataset)

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## DB2 considerations – data inconsistencies

- CHECK utilities
  - CHECK DATA, INDEX, LOB
- DSN1COPY with CHECK option

## Why tooling for RECOVER?

- Source of image copy could be
  - Sequential file
  - VSAM file created by DB2
    - Concurrent copy, native flashcopy, system level backup
  - VSAM file created outside of DB2
    - Offline copy (DFDSS, DSN1COPY)
- Log records
  - SYSLGRNX
    - LOGRANGES YES/NO
  - Archive logs (HRECALL)
  - Point of consistency
  - LOGONLY
- Parameters like
  - BACKOUT
  - RESTOREBEFORE
- ...