Highlight the differences betwwen HA and Snapshots

M81 IBM i EDITOR

FLASH for i for Business

Who is M81 IBM i EDITOR

- European ISV (Independent Software Vendor)

- Specialised on System Software for IBM i
  - **Flash for i**
    - Perform a SAVE21 every day without stopping production (and many more features)
  - **Control for i**
    - Include IBM i partitions in the enterprise monitoring infrastructure

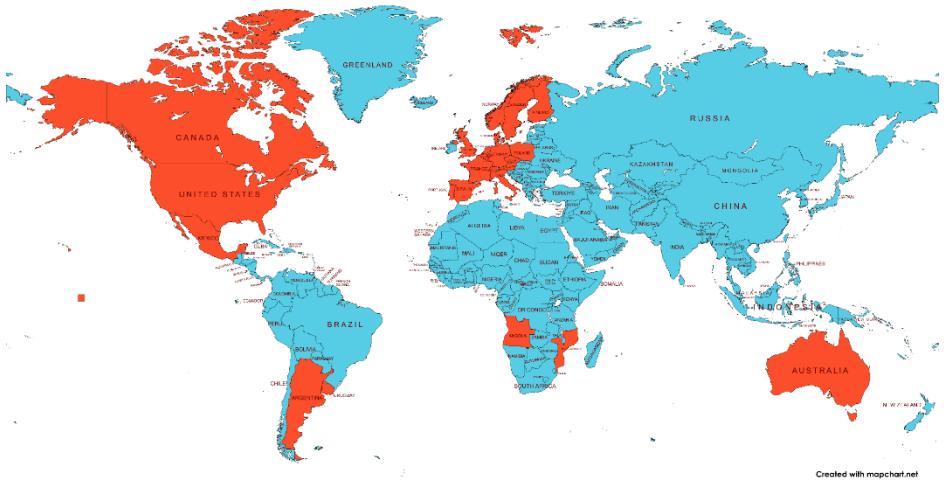
12 years old company

54 partners in **28** countries

800+ end customers

2 000+ partitions

Developed entirely **in-house**



Objectives of this webinar

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Highlight the differences between HA and Snapshots

- Definitions
  - Replication
  - Snapshots
- Purpose of Flash for I
- What happens in case of disaster ?
- How to make backups (to tape or VTL) ?
- Data corruption or Ransomware

Comparison of HA and Flash for i

First of all, let's clear up a common mistake

Many people think that
Flash for i is a competitor to high-availability products.

That is incorrect

They are complementary

What is “Replication”

What is “Replication”

Data replication is the process of

Creating and maintaining multiple copies of the same data

In different locations

Remote copy is updated continuously

In order to ensure the

availability, reliability and resilience of data

within an organisation.

What is “Replication”

When multiple copies of the same data exist
in different locations,
even if one copy becomes inaccessible
due to an incident, a failure or for any other reason,
another copy can be used with the latest data.

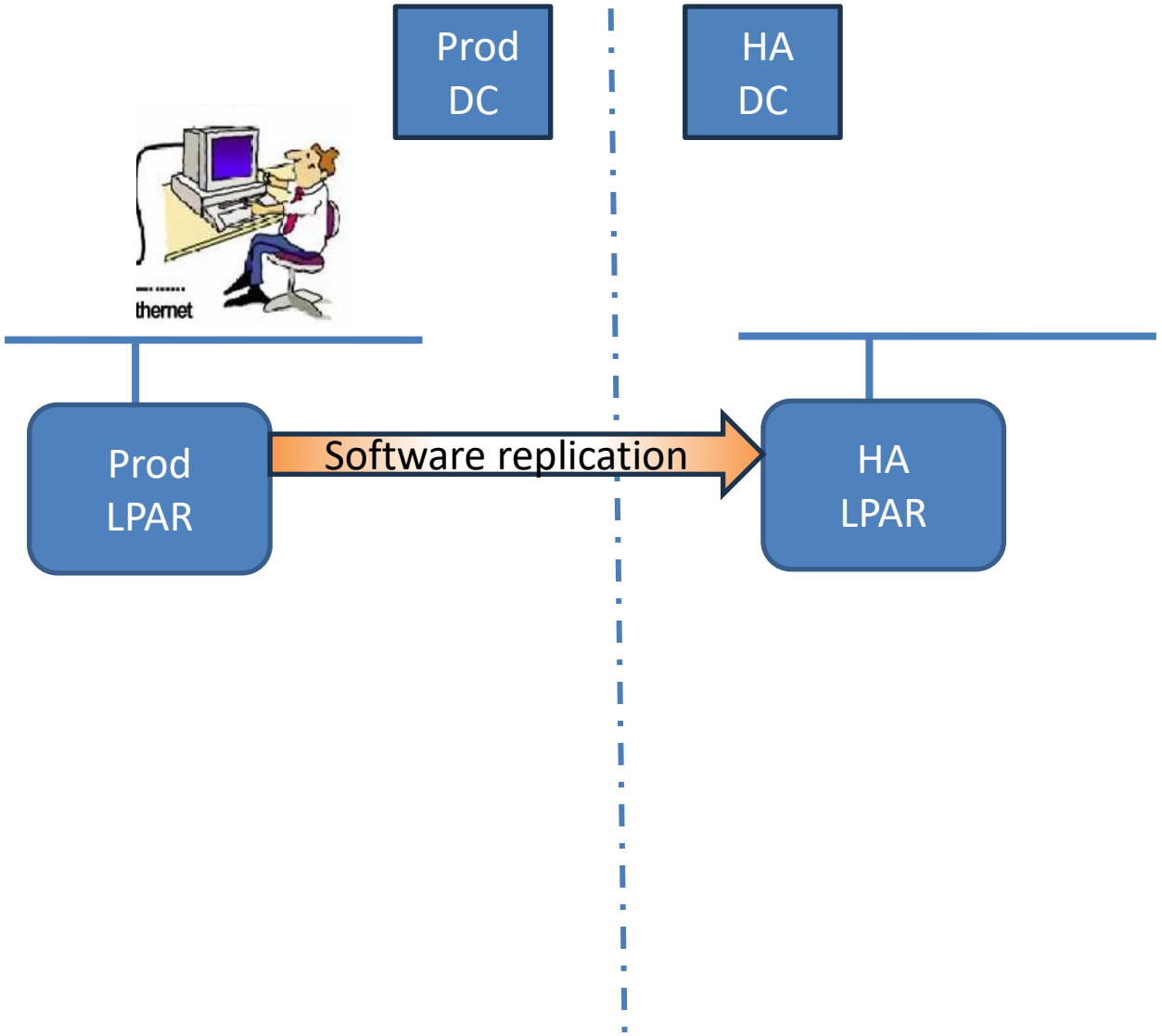
This redundancy enables organisations
to minimise downtime and data loss
and improve business continuity.

What is “Replication”

- In clear
  - The production data is stored on one site
  - It is replicated in real time (as far as possible) to another site
  - The aim is for the two sets of data to be as identical as possible at all times

- In IBM i world, replication is known as High Availability (HA)
- 2 type of HA
  - Software HA
  - Hardware HA

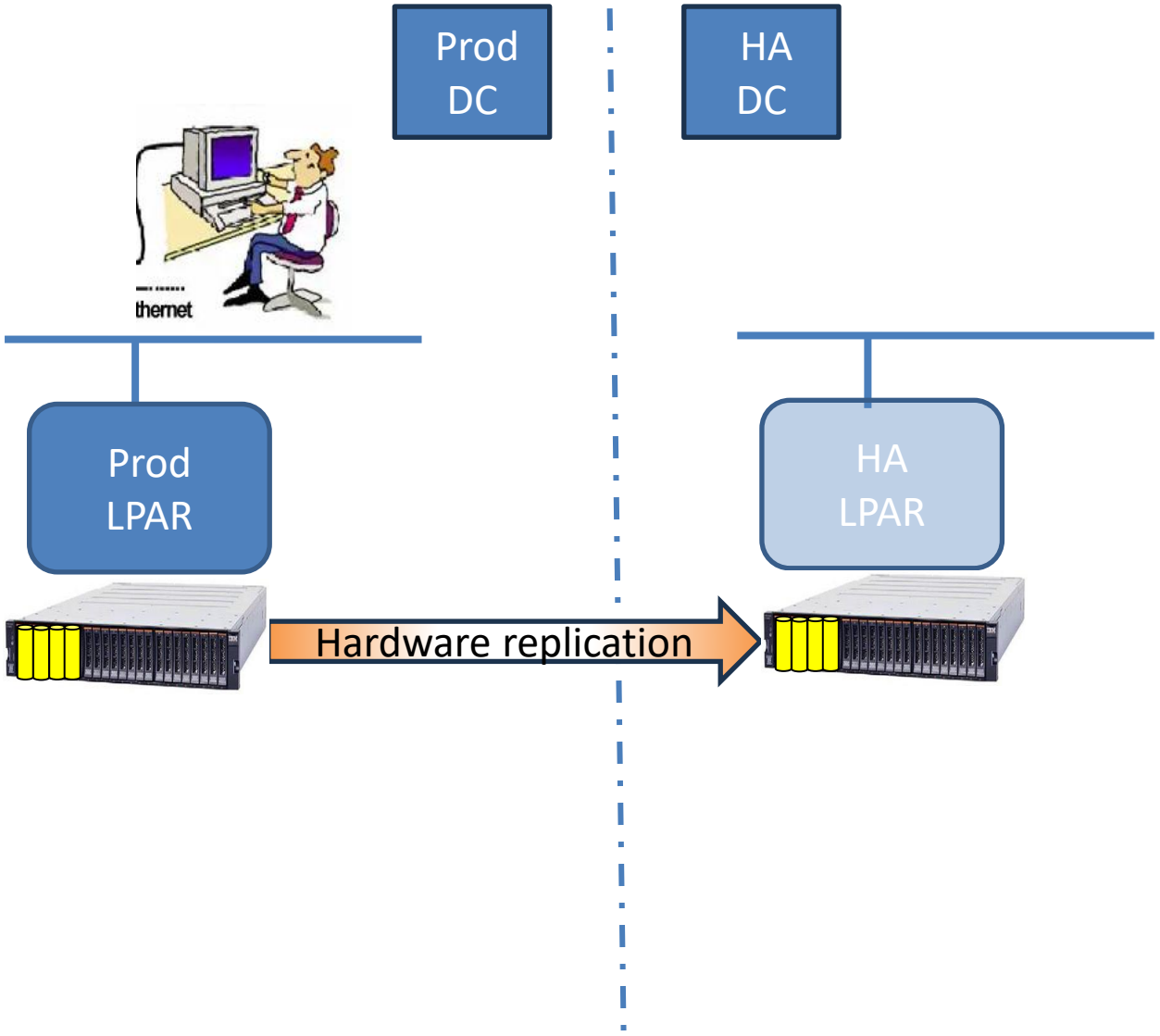
Software HA



Software replication

- HA partition is active with its own system
- Software: Mimix, EDH, Bus4i, eCluster, etc
- Data is replicated between the two Prod and HA partitions based on Journals and QAUDJRN
- 2 process
  - Replicate data (remote journals, …)
  - Apply changes to remote database
- Remote Database can be used in read only mode.

Hardware HA



Hardware replication

- Need external storage
  - SVC, FlashSystem, DS8K, …
- HA partition is NOT active
- Operated by external storage
  - Metro/Global mirror
  - PBR (Policy Based Replication)
  - Hyperswap / PBHA
- Byte's level replication
  - Independent of the actual data
  - Entire system (SLIC, QSYS, Libraries, …)

- HA partition can NOT be used for any purpose
  - Unless you stop replication

What is “Replication”

- The purpose of High Availability
  - Having two (almost) identical infrastructures
    - In different Data Centers, located at a distance from one another
  - Ensuring that all data modified on the production server is copied to the backup server as quickly as possible
  - Ensuring that the data on both sites (production and backup) is always identical
  - In the event of a disaster at the production site
    - The latest modified data is available on the backup server
    - The roles of the two servers are switched (the backup server becomes the production server)
    - Users can work on the backup server, using the latest data

What are “FlashCopy” and “Snapshot”

What are “FlashCopy” and “Snapshot”

- Snapshot and FlashCopy are 2 different technologies with a very similar result
  - FlashCopy is the old technology on IBM storage systems
  - Snapshot (or Policy based Snapshot) is the new technology
  - The way to configure and use them is different
  - But the result is the same.

What are “FlashCopy” and “Snapshot”

A snapshot is

An instant photography (or clone) of the data

Of a server or a disk

At a specific point in time.

Initial content is identical

Clone disks don’t change while production continues to change

What are “FlashCopy” and “Snapshot”

A snapshot is

An instant photography (or clone) of the data

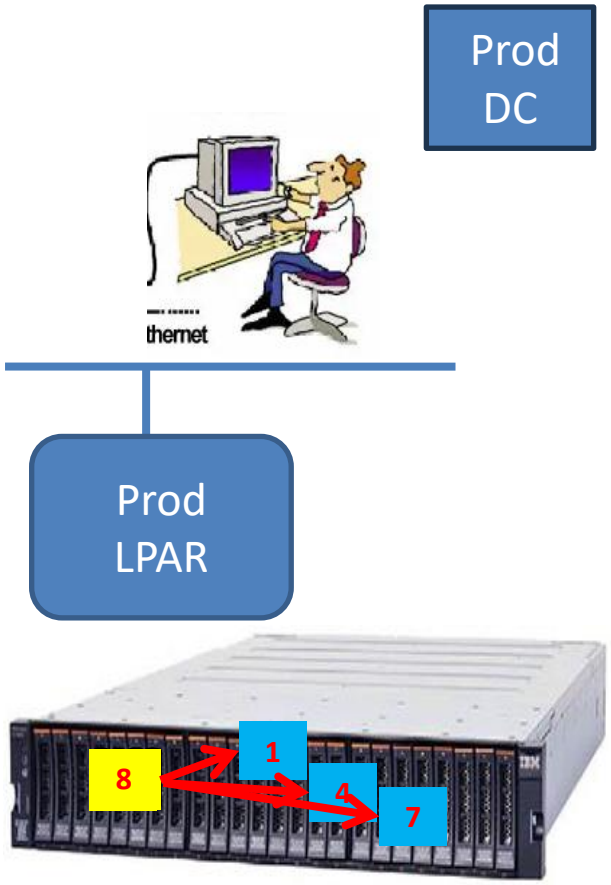
Of a server or a disk

At a specific point in time.

It allows you to

- Use the clone for another purpose (save, test, …)
- Restore the disks of this “point in time”

What are “FlashCopy” and “Snapshot”



Snapshot

- Need external storage
  - SVC, FlashSystem, DS8K, …
  - Not possible with internal disks
- Native function of the storage
- Users change the data on Prod
- Take a Snapshot
- The prod data change but don’t change in the Snapshot
- It’s possible to take several Snapshots at different times

- Note that the Snapshots are in the same hardware and same DataCenter than the production

What are “FlashCopy” and “Snapshot”

- In clear
  - The production data is stored on only one site
  - When a Snapshot is created, an instant copy of the data is made
  - The production data continues to be changed
  - The data in the Snapshot don’t change.
    - It remains unchanged as it was at the time of the snapshot

- Function integrated External storage (SVC, FlashSystem, DS8K, …)
  - Independent from IBM i
  - No impact on the system or users

FlashCopy (Snapshot) technology

- Instant copy?
  - It is possible
  - No actual copy of the data
    - Use between 5% and 20% of the original disk size
  - The word “FlashCopy” is not the best word for this
    - Because there is not always a “copy”

- Operating system independent
  - Used for a very long time on Windows, Linux, Unix
  - Can also be used on IBM i
    - Some rules to follow

Use FlashCopy with IBM i

Specific for IBM i

- Due to Single level storage:
  - Clone all or none of the disks
  - Need to start a new partition
    - New QSTRUP, New IP configuration, ...
  - Force write memory to disk (CHGASPACT)

- Adapt the resources for *TAP and *TAPMLB

Purpose of “Flash for i”

What are “FlashCopy” and “Snapshot”

- The purpose of **Flash for i**
  - To use the FlashCopy/Snapshot function of the disk array
    - This function is local and requires the use of the same disk array as the one containing the production disks
  - To duplicate all production disks instantly (create a clone)
    - Without interrupting users
    - The contents of the cloned disks will no longer change, even as users modify the data on the production disks
  - Use the cloned disks for various purposes
    - Back up data to tape without disrupting users
    - Create a pre-production or acceptance partition automatically and very quickly
    - Create a backup that will remain unchanged in the event of a ransomware attack.

Key features of Flash for i

- Core product
  - Enables the use of the FlashCopy or Snapshots functions on external storage
  - Installed on the production partition itself. No need for an additional control partition
  - Compatible with IBM SVC, FlashSystem, Storwize, DS8K, DELL EMC Vmax, PowerMax, Unity, PureStorage, ...
  - Available on IBM Cloud (PowerVS) and Google Cloud
  - Compatible with HMC and Novalink
  - Automatic management and control of cloned partitions
  - Support for backups using BRMS, the system SAVE21 or a specific program. Easy to integrate with any other backup product
  - Secure access to the product
  - Cloning progress status and internal log to facilitate monitoring.
  - Numerous logs are automatically transferred from the clone to the production partition and are easy to read.
  - Includes commands for automatic monitoring

Key features of Flash for i

- Alerts
  - Via email, via a message in MSGQ or by calling a program
- Reconfiguration
  - Use cloned partitions for purposes other than backup
  - Automatic reconfiguration without programming
- Secure copy
  - Automatic creation of a SafeGuarded Copy (SGC)
  - 2 levels of copy content testing
- Automated switchover for DRP
- Central management
  - When Flash for i is installed on multiple partitions
- Proxy partition
  - Enables separation between the client partition and the infrastructure network

Version history

- History
  - V1 12/2015
  - V2 09/2016
  - V3 02/2019
  - V4 01/2021
  - V5.01 10/2023
  - ….
  - V5.07 01/2025
  - V5.08 03/2025
  - **V5.09** 12/2025 **(Required to use BRMS BR2)**
  - V5.10 **04/2026**
- SAVF and documentation available on our website www.M81.eu

- IBM i version
  - The same version of Flash for i is compatible with 7.3, 7.4, 7.5 and 7.6
  - For V7R1 or V7R2, use V4.14 from 08/2023

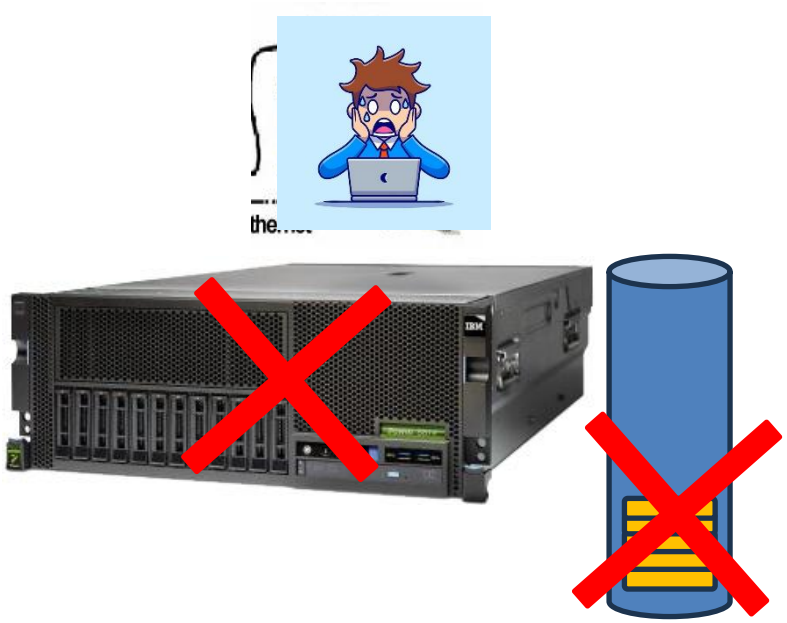
- For further details, see the 'Release Notes' document on the website www.m81.eu

Comparison between HA and Flash for i

What happens in case of disaster ?

What happens in case of disaster ?

Classical use, without HA or Snapshots



Production

Power failure

➔ Repair the Power

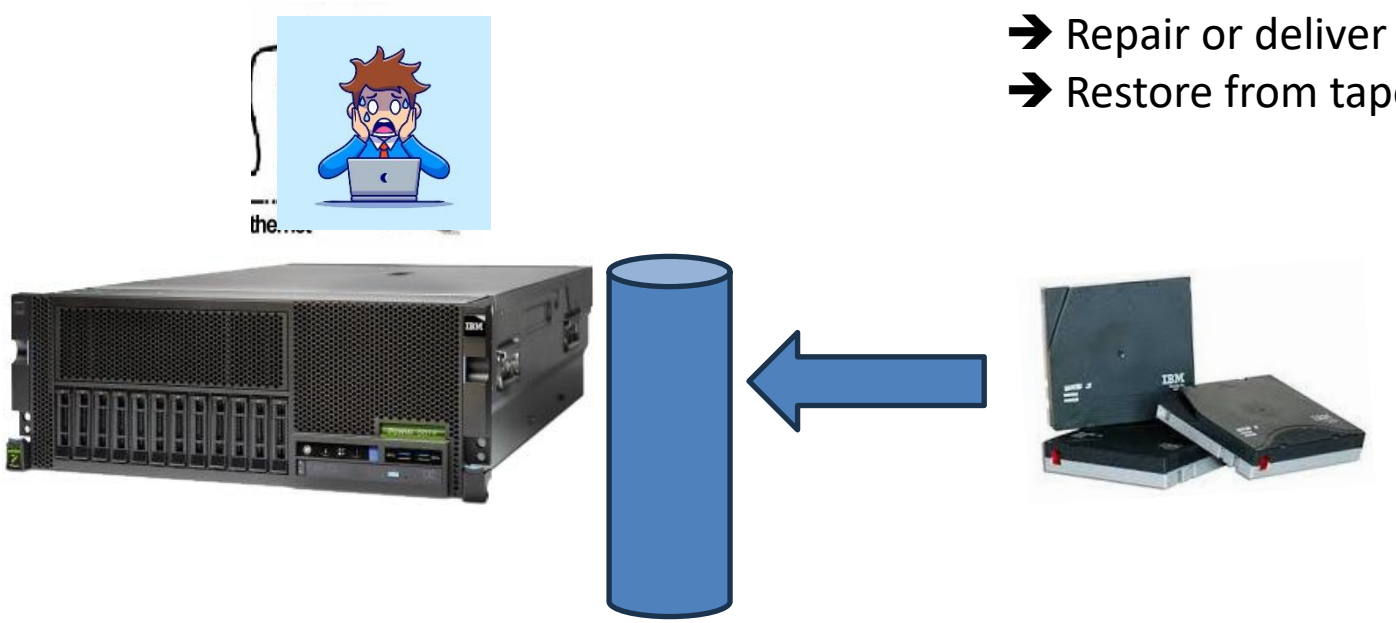
Disks failure

DC out of order

➔ Repair or deliver new hardware

What happens in case of disaster ?

Classical use, without HA or Snapshots



Production

Power failure

➔ Repair the Power

Disks failure

DC out of order

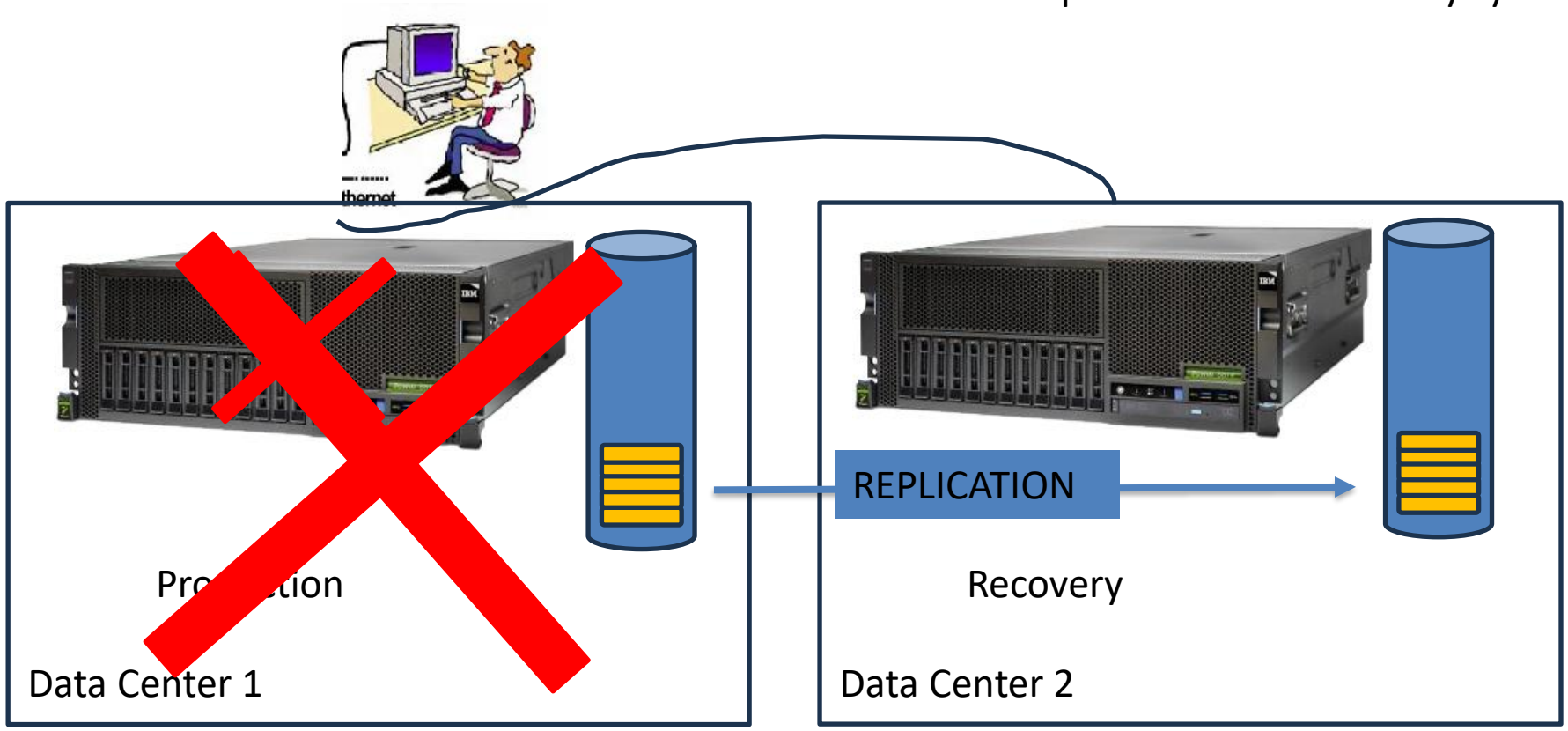
➔ Repair or deliver new hardware

➔ Restore from tapes

What happens in case of disaster ?

With HA

Power failure
Disks failure
DC out of order
➔ Swap users to the Recovery system



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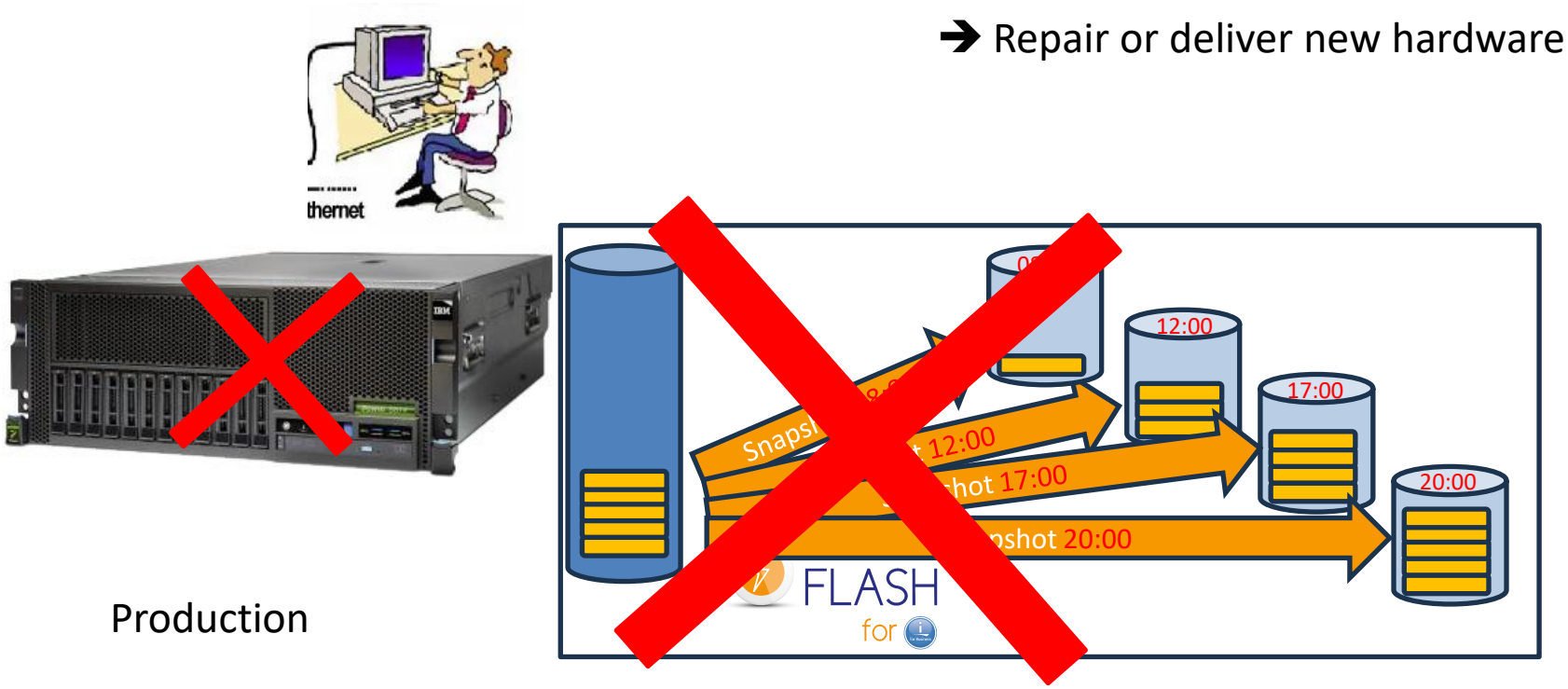
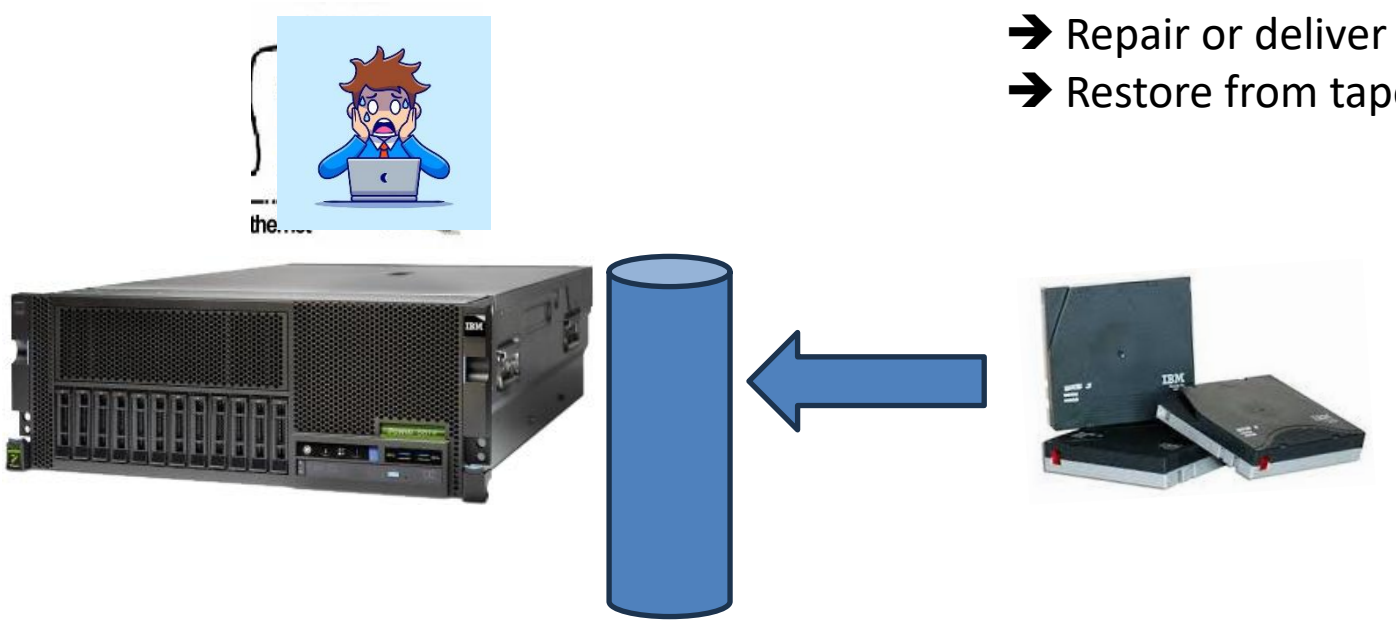


Production

What happens in case of disaster ?

With Snapshots



Power failure

➔ Repair the Power

Disks failure

DC out of order

➔ Repair or deliver new hardware

➔ Restore from tapes

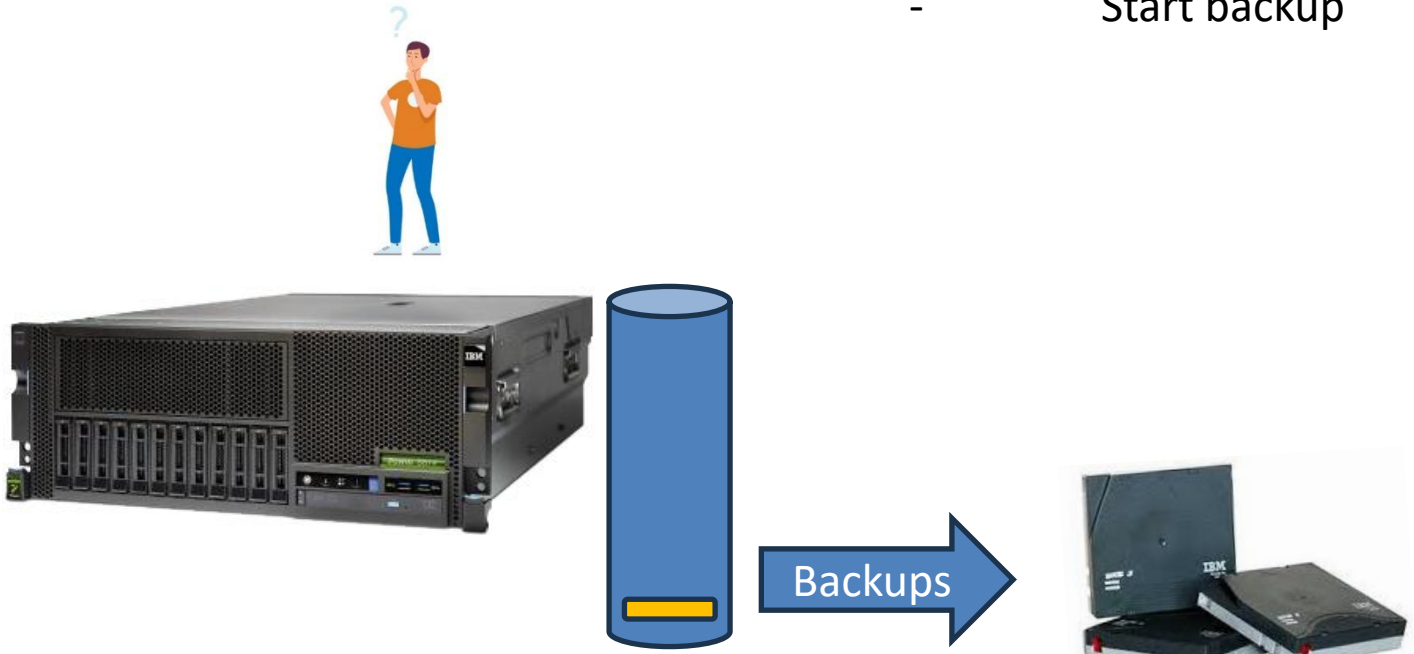
Comparison between HA and Flash for i

How to make backups (to tape or VTL) ?

Backups

Classical use, without HA or Snapshots

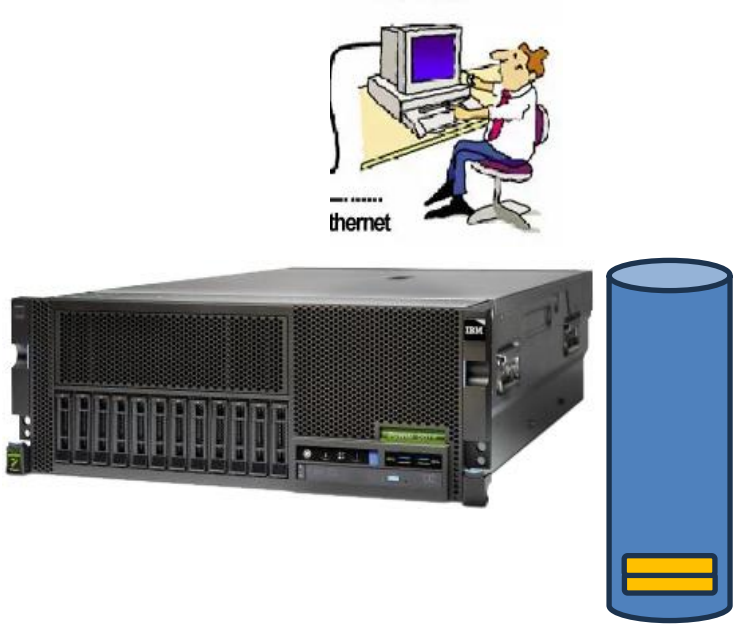
- Users work all Day
  Except during backups
- 02:00 Stop the users
- Start backup



Production

Backups

Classical use, without HA or Snapshots



Production

- Users work all Day
  Except during backups
- 02:00 Stop the users
- Start backup
- 04:00 End of backup
- Users can work

Option “Save While Active”

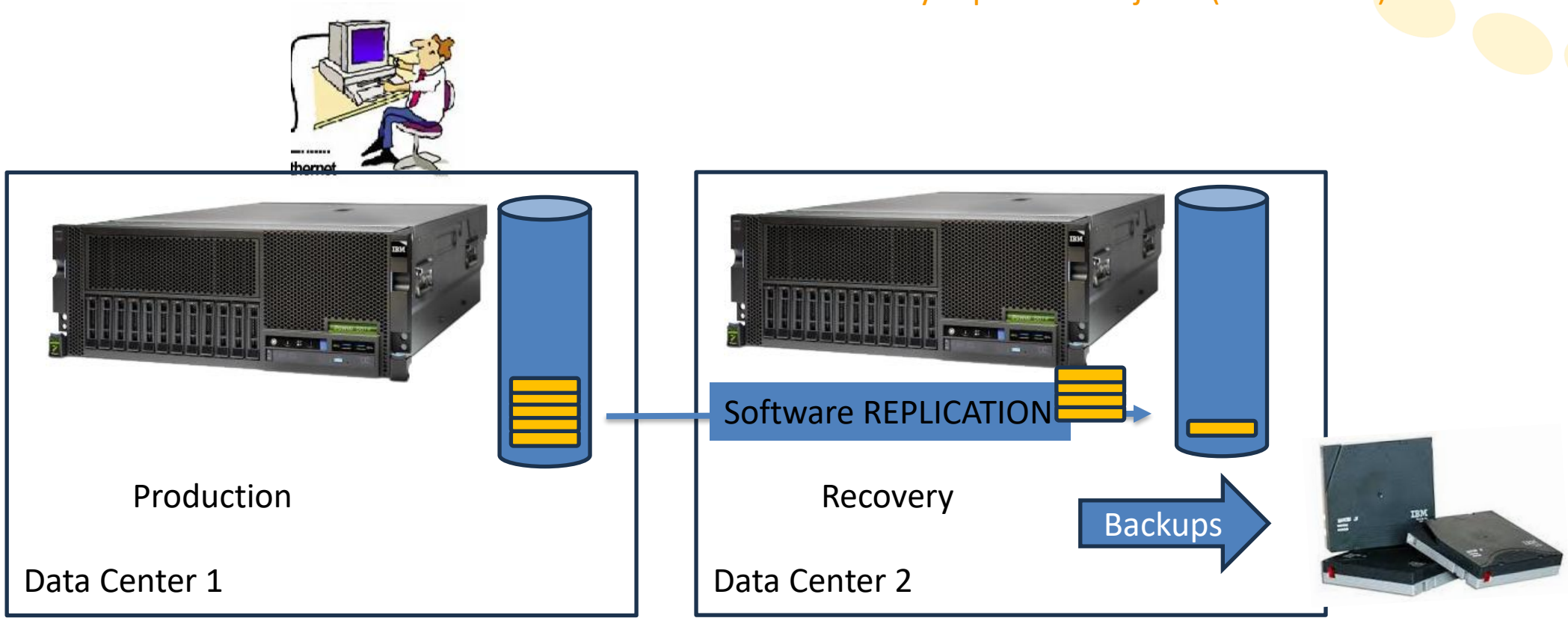
Still need to wait for Synchro point

Risk if files are locked

Backups

With Software HA

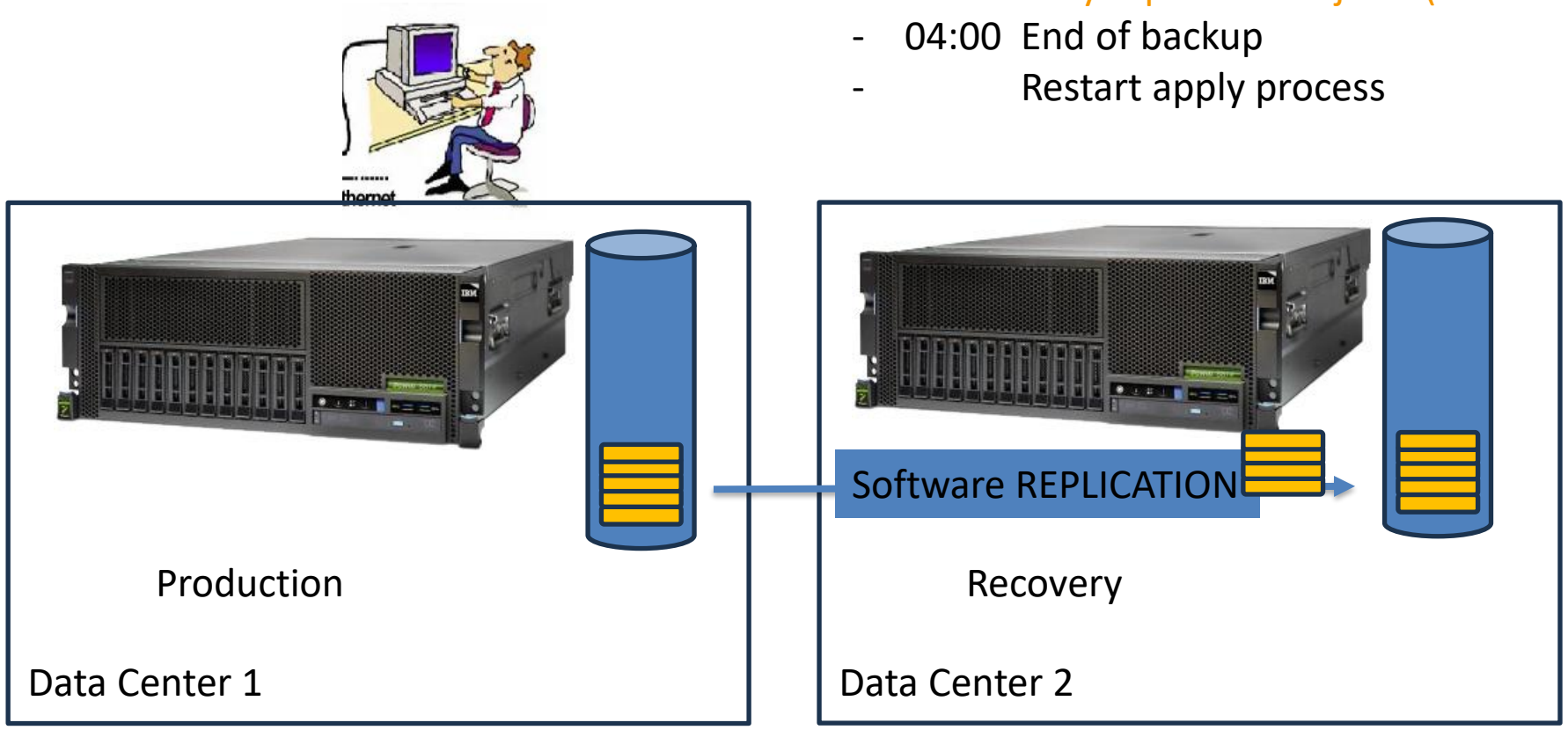
- Users work all Day
- 02:00 Stop apply process
- Start backup on Recovery partition
- Only replicated objects (No SAVSYS)



Backups

With Software HA

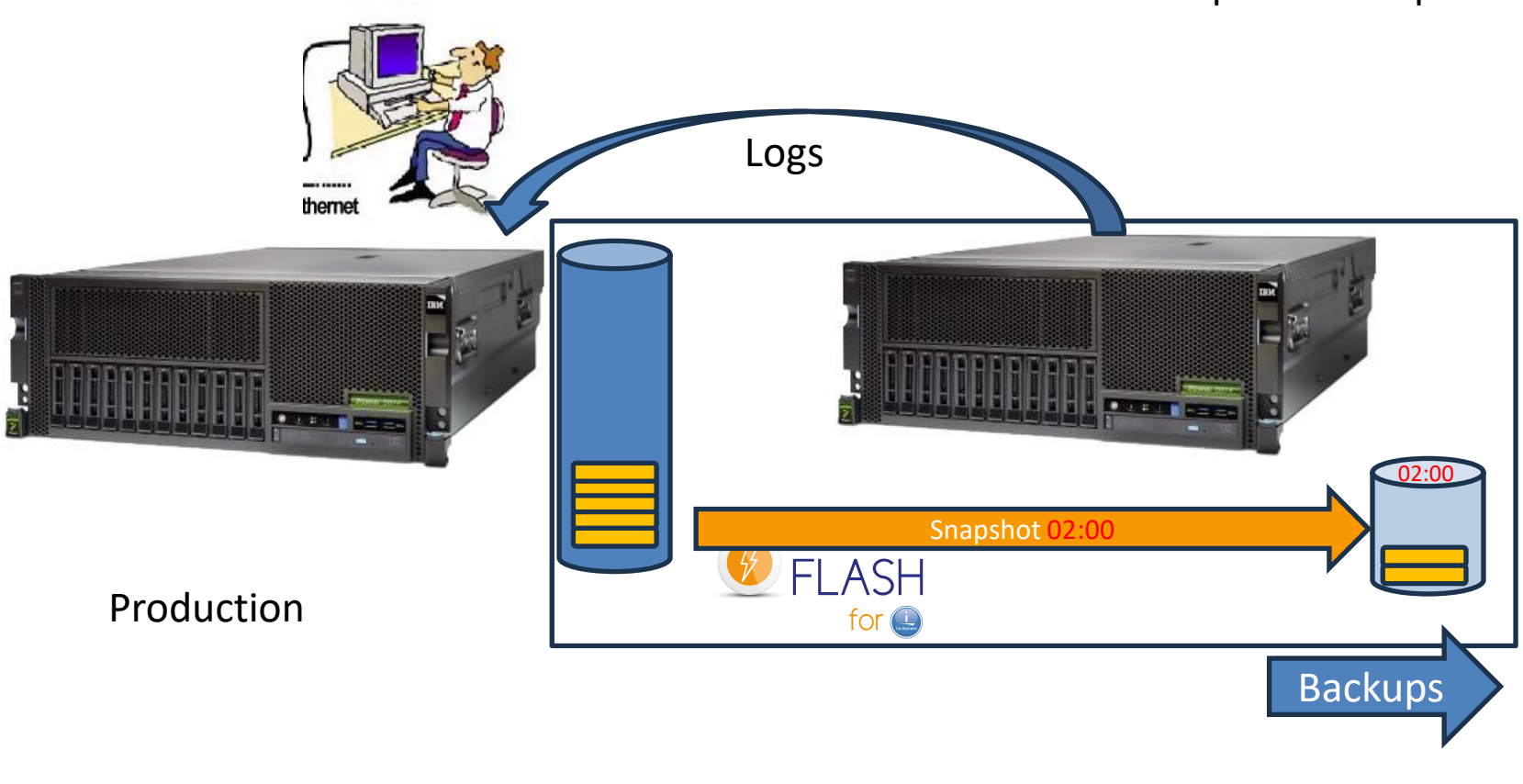
- Users work all Day
- 02:00 Stop apply process
- Start backup on Recovery partition
- Only replicated objects (No SAVSYS)
- 04:00 End of backup
- Restart apply process



Backups

With Snapshots

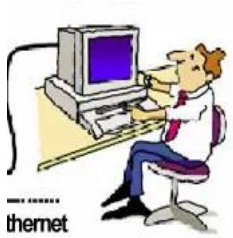
- Users work all Day
- 02:00 Create Snapshot
- Start a Clone partition
- Start backup on Clone partition



Backups

With Snapshots

- Users work all Day
- 02:00 Create Snapshot
- Start a Clone partition
- Start backup on Clone partition
- 04:00 End of backup
- Stop clone partition
- Delete Snapshot



Production

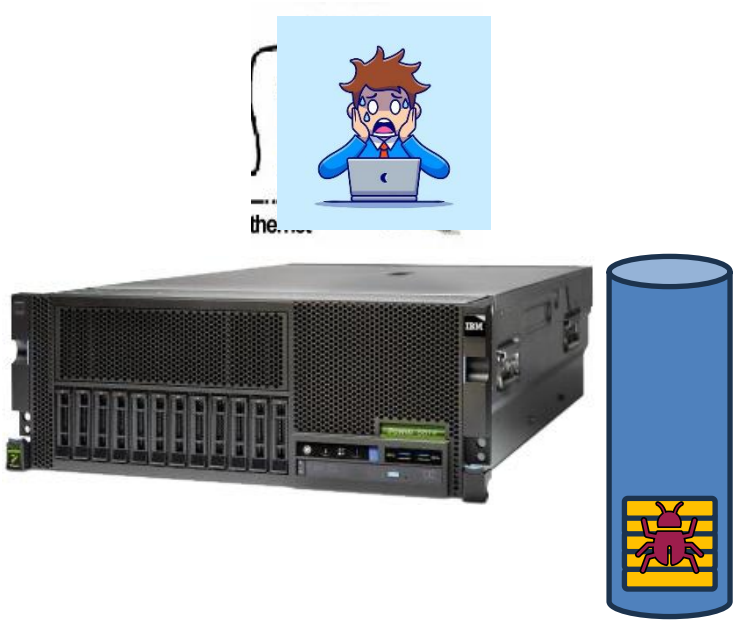
Comparison between HA and Flash for i

Data corruption or Ransomware

What happens in case of disaster ?

Classical use, without HA or Snapshots

- Users work all Day
- 13:00 Ransomware attack

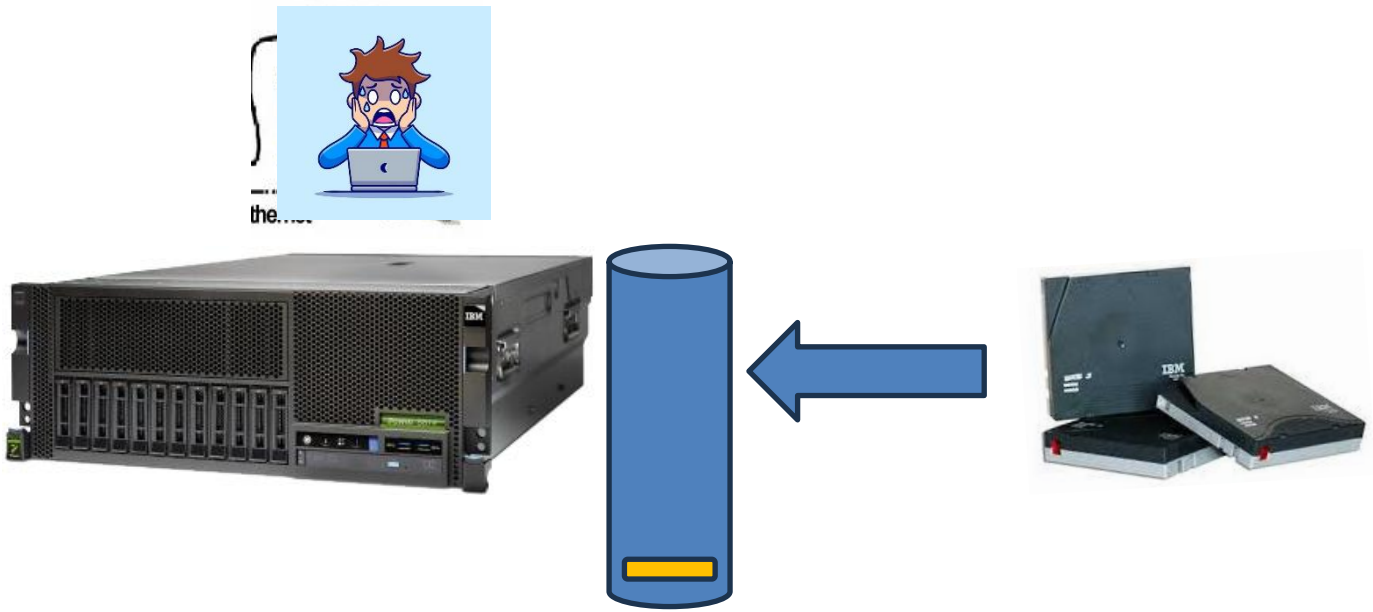


Production

What happens in case of disaster ?

Classical use, without HA or Snapshots

- Users work all Day
- 13:00 Ransomware attack
  ➔ Restore from tapes (hours)
  Data from last night

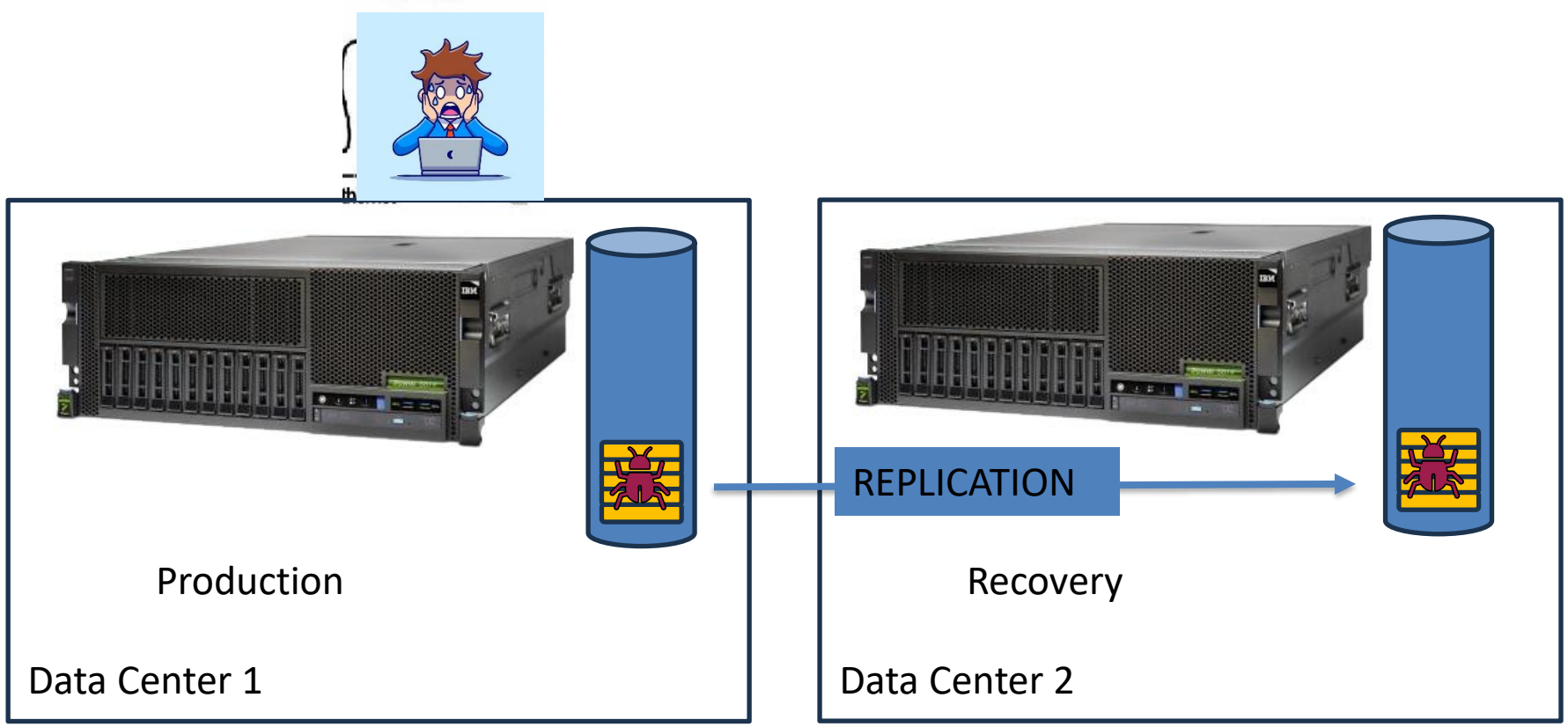


Production

What happens in case of disaster ?

With HA

- Users work all Day
- 13:00 Ransomware attack
- Data corruption is replicated



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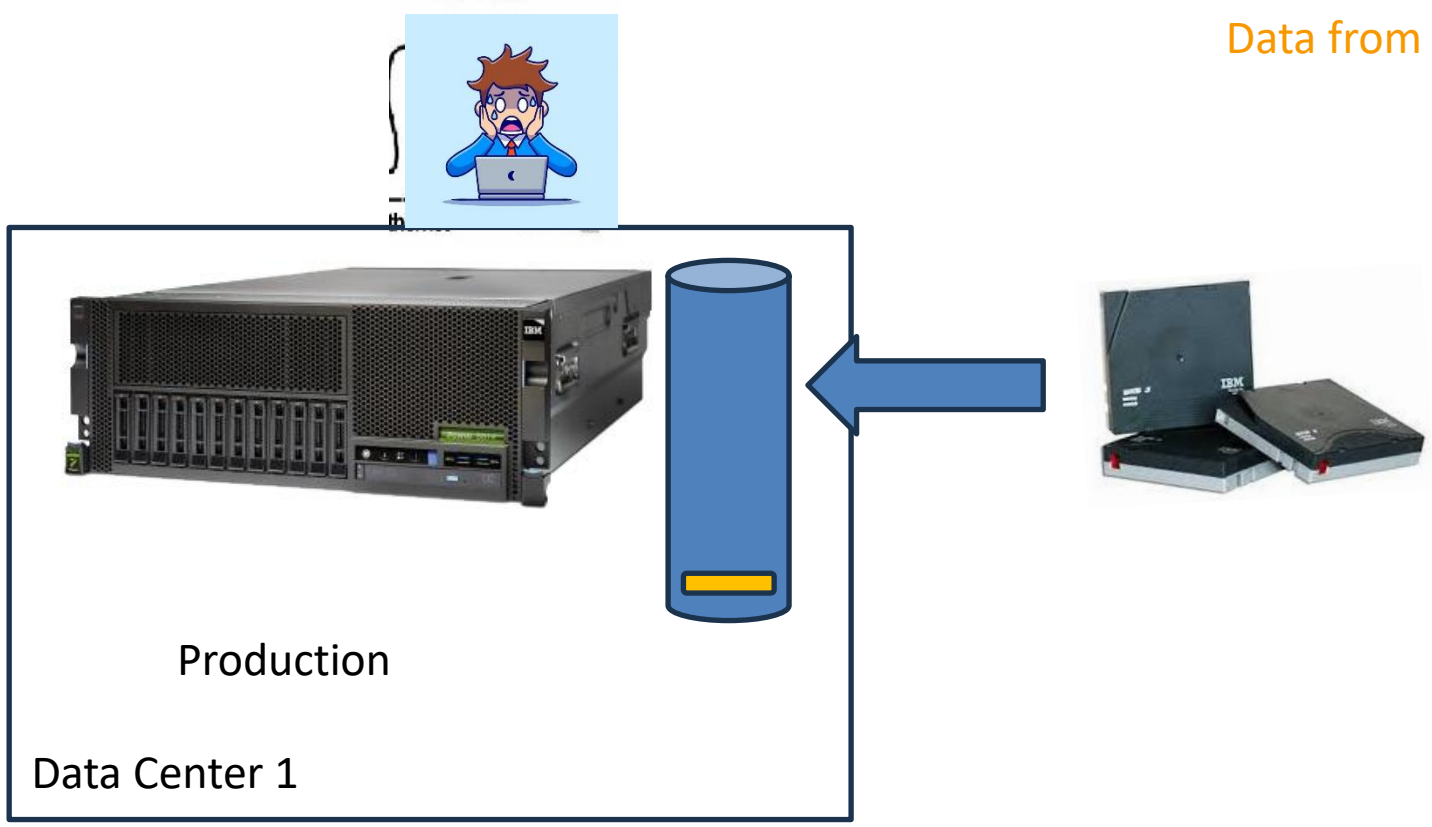
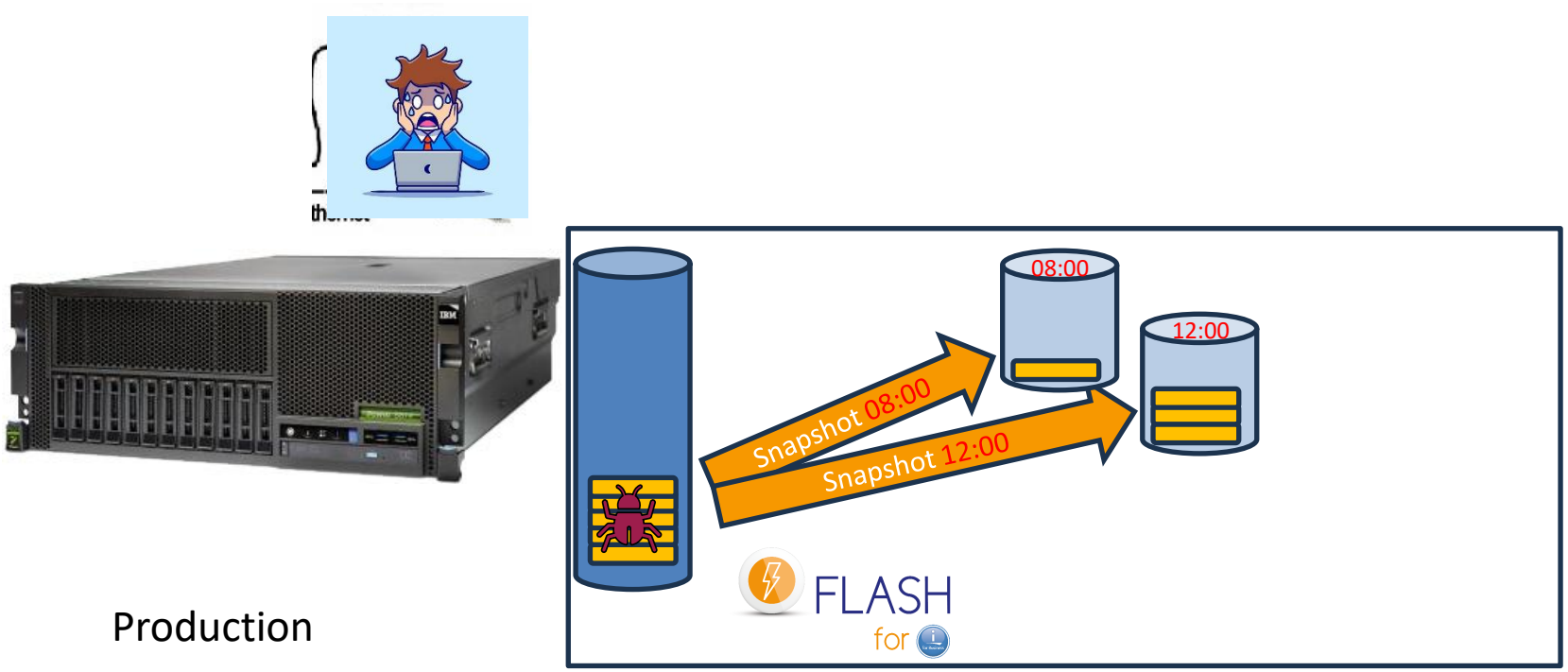


What happens in case of disaster ?

- Users work all Day
- 13:00 Ransomware attack

With Snapshots

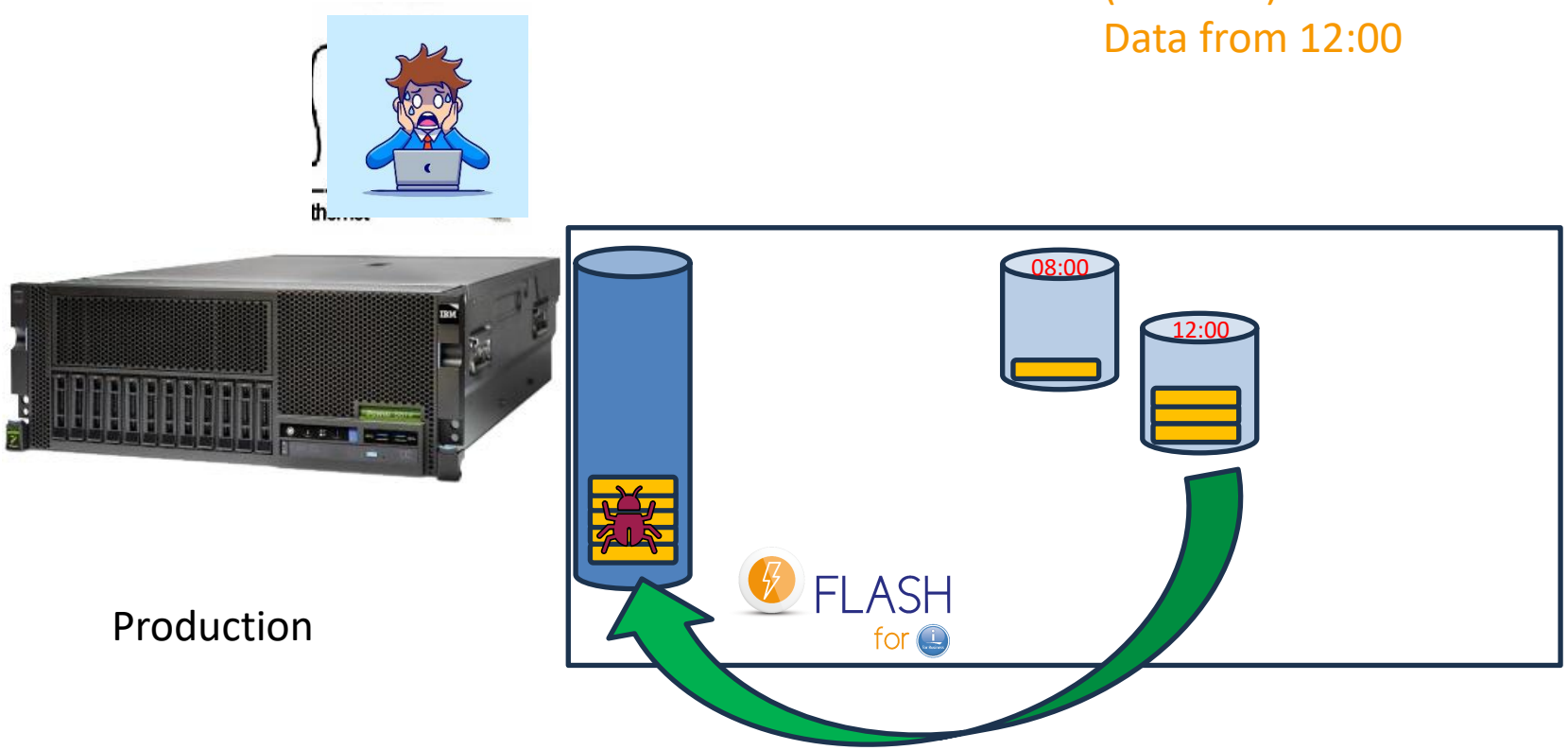


Production

What happens in case of disaster ?

With Snapshots

- Users work all Day
- 13:00 Ransomware attack
  ➔ Restore from last snapshot (seconds)
  Data from 12:00



Production

Comparison of HA and Flash for i

HA software

- Data on the HA server is continuously updated
- In the event of a disaster at the production site
  - Users access the latest data at the backup site
- In the event of a ransomware attack
  - Encrypted data is replicated to the backup site. Both copies are unusable

Flash for i

- Data on the cloned disks no longer changes
- In the event of a disaster at the production site
  - Both copies (production and clone) are lost
- In the event of a ransomware attack
  - The data on the clone disks has not changed. They can be used to restart very quickly

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The End

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