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**Dynamic Solutions**  
INTERNATIONAL

# Backup Solutions for IBM i

International i-Power 2019

# Dynamic Solutions International

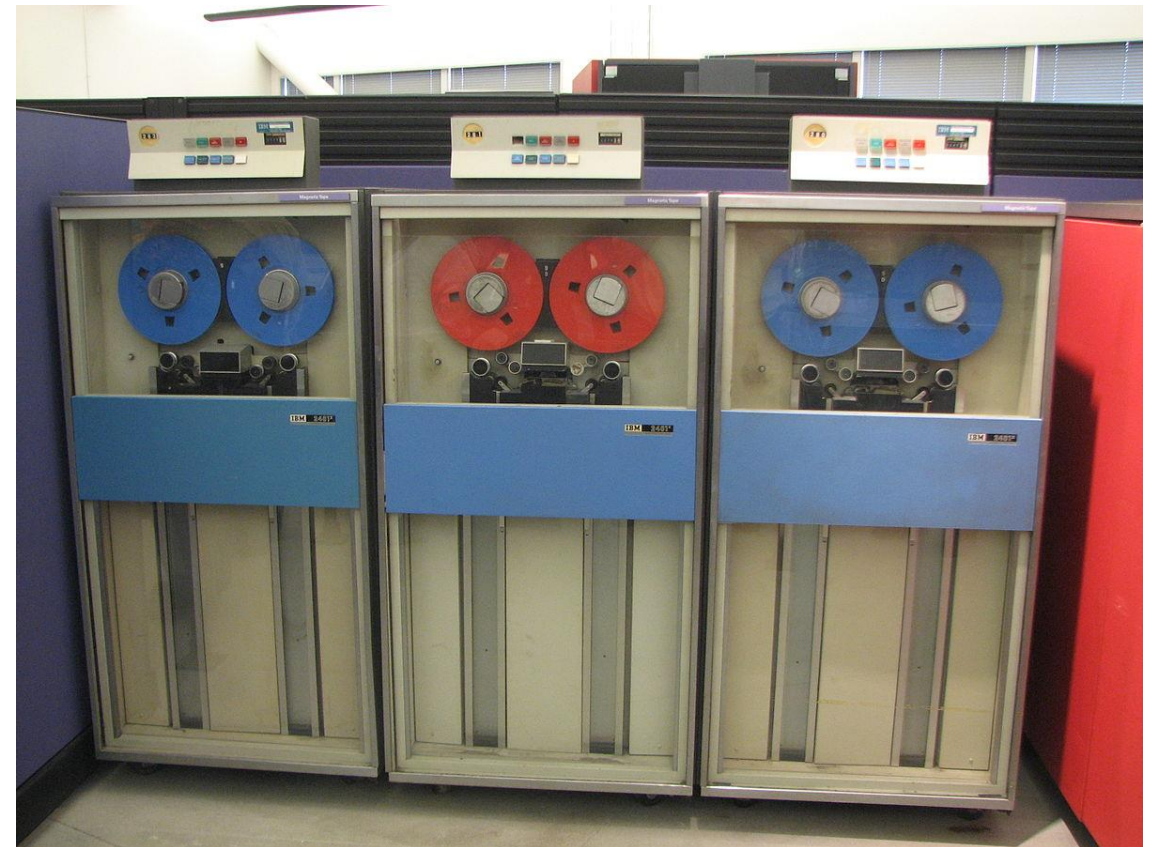
## **Our History and Who We Are**

- » **Founded in 1973 we have over 45 years of experience with high availability, high performance architectures**
- » **Headquartered in Englewood, Colorado, U.S.A.**
- » **We specialize in enterprise and enterprise class backup and disaster recovery solutions for Banks, Businesses and Governments worldwide**
- » **Partners with IBM, Dell, HPE/Systems and FalconStor Software**
- » **Our solutions are qualified for IBM i, Open Systems, VMWare and Unisys Mainframe Platforms**
- » **Selected by IBM as the official IBM ProtecTIER replacement**

# Dynamic Solutions International

**Chris Bremer**

- » **Dynamic Solutions International CTO**
- » **Has worked with just about every backup device in 40+ years**



# Backup Solutions for IBM i

## Agenda

- » Backup considerations
- » Backup basics
- » Backup methods
- » Testing
- » Conclusions



# Backup Solutions for IBM i

## What do you need to recover from?

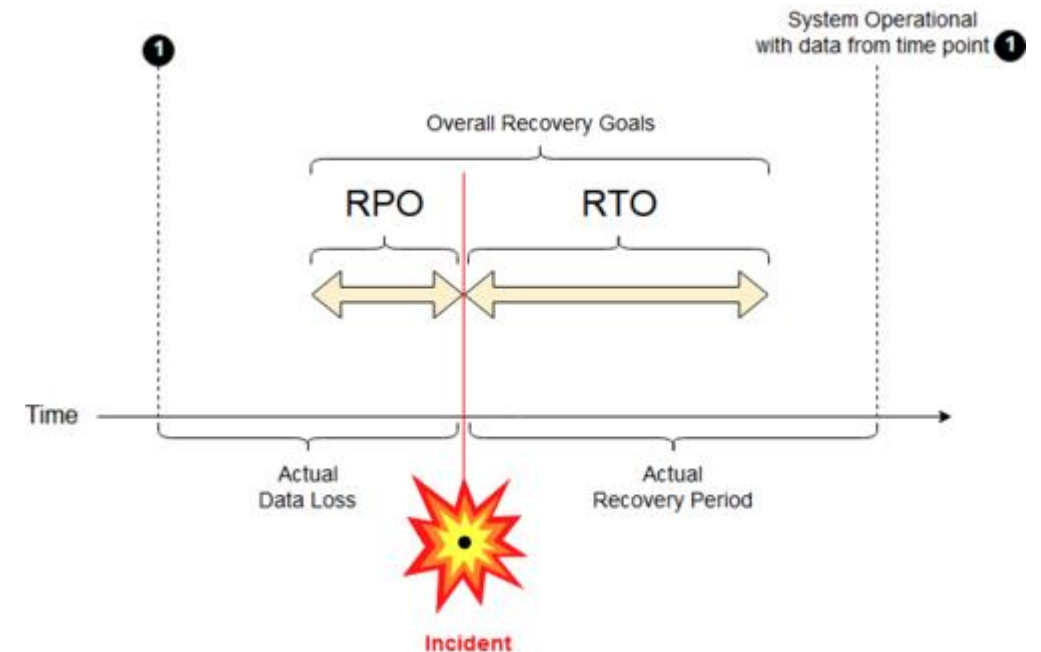
- » **Software failure**
  - » Can you roll back?
- » **Hardware failure**
  - » Processing environment
  - » SAN
  - » Network (Local or provider)
- » **Site disaster**
  - » Fire
  - » Flood
  - » Earthquake
  - » Meteor strike



# Backup Solutions for IBM i

## Considerations

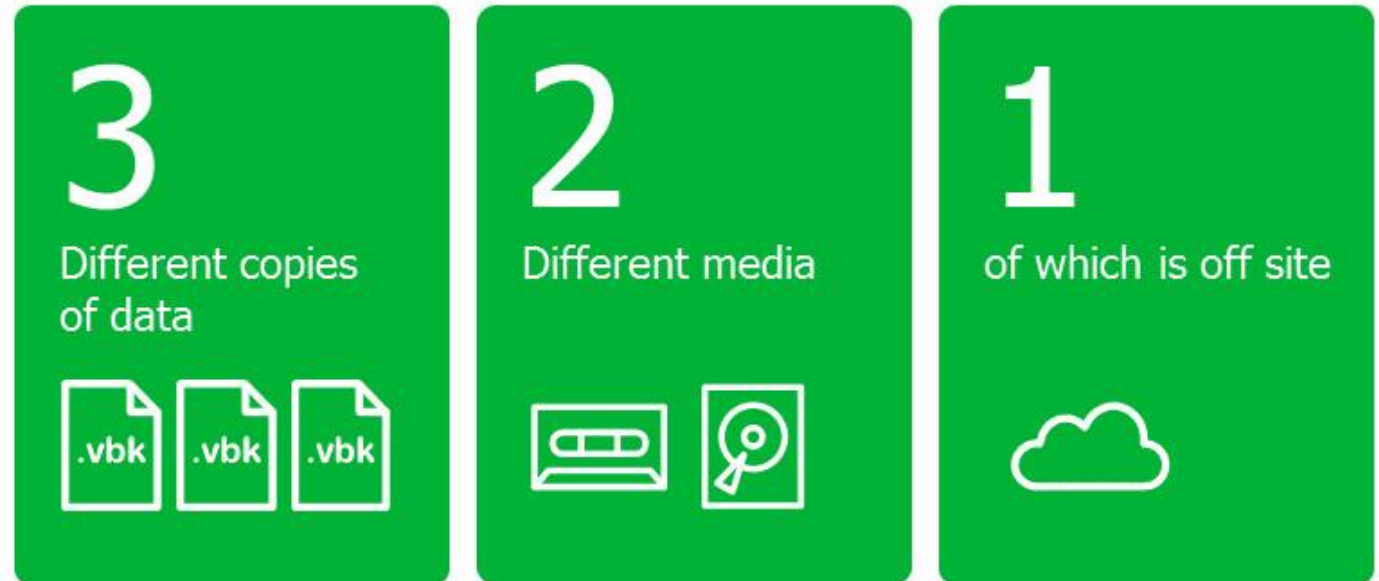
- » Time to do backup
  - » Backup window
- » RTO – Recovery Time Objective
  - » How fast do I need to be up and processing?
- » RPO – Recovery Point Objective
  - » How much data can I afford to lose?
- » RTO and RPO may be different for different applications
- » Cost vs. RTO and RPO
- » Point in time vs. continuous



# Backup Solutions for IBM i

## Backup Basics

- » Are you following the 3-2-1 rule?
- » 3 copies of your data (minimum)
  - » Primary copy
  - » Local secondary copy
    - On different media
  - » Offsite copy



# Backup Solutions for IBM i

## Site Considerations

- » **Site location**
  - » **Relative to DR location**
  - » **Transportation if physical backup**
- » **Storage**
  - » **Performance**
- » **Network**
  - » **Bandwidth**



# Backup Solutions for IBM i

## Backup methods

- » Physical media
- » Virtual tape
- » Continuous Data Protection (CDP)
- » Cloud

**KEEP  
CALM  
AND  
BACKUP  
YOUR FILES**

# Backup Solutions for IBM i

## Physical media

- » For most physical tape
- » Must make 2 copies to satisfy 3-2-1 rule
- » Could be cost effective
- » Cartridges/drives subject to damage
- » Transport issues
  - » Loss
  - » Damage
  - » Is it encrypted?
- » Fully supported by IBM i
- » Point in time backup



# Backup Solutions for IBM i

## Physical media

- » Other physical media has been used
- » Same issues as physical tape
  - » Reliability
  - » Loss
  - » Damage
  - » Encryption



# Backup Solutions for IBM i

## Virtual tape

- » Also known as D-to-D
- » Looks just like physical tape to host
  - » So simple implementation on IBM i
- » Virtual tape features (not all products)
  - » Replication over IP to DR site
  - » Replication to cloud
  - » Physical tape creation
  - » Deduplicated storage
  - » Reliable
  - » Automatic



Instead of



# Backup Solutions for IBM i

## Virtual tape

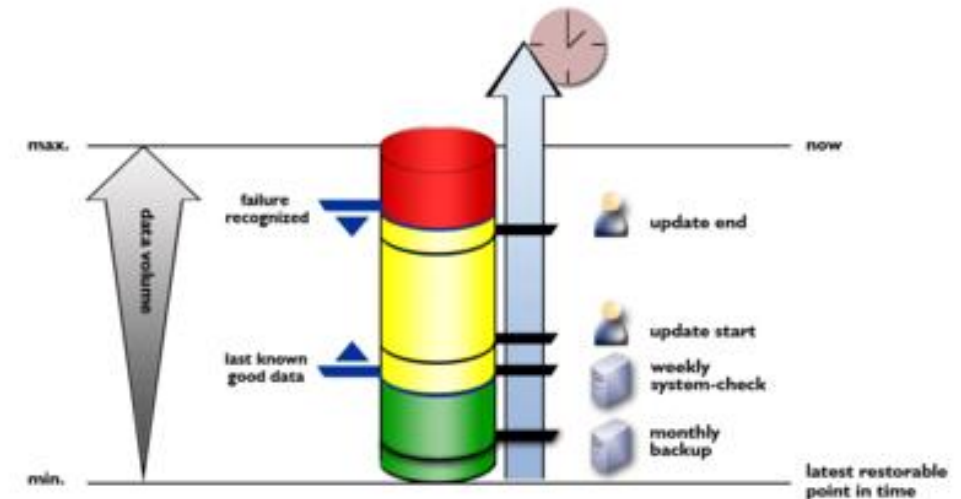
- » Point in time backup
- » Long term archive
- » Separate storage environment
  - » Compressed
  - » Raid
- » Some can IPL-D
- » Secure (not all vendors)
  - » Encryption at rest
  - » Encrypted replication
  - » Encrypted physical tape



# Backup Solutions for IBM i

## Continuous Data Protection (CDP)

- » Replicates data changes from primary to secondary storage
- » Considerations
  - » Additional storage (different system)
  - » Rollback (files and age)
  - » Fast recovery (RTO)
  - » Bandwidth
    - Replication location
    - Distance
  - » Synchronous or Asynchronous
  - » Error replication



# Backup Solutions for IBM i

## Continuous Data Protection (CDP)

- » Point in time images
  - » Still need backup/archive
- » IBM i disk journals
- » DB2 Mirror for i (7.4)
  - » Limited distance



# Backup Solutions for IBM i

## Cloud

- » **What is it?**
  - » **Standards?**
  - » **File vs. object**
  - » **Private vs. public vs. hybrid**
- » **Where is my data?**
  - » **What country?**
  - » **Regulatory issues**
- » **Bandwidth**
  - » **Backup**
  - » **Restore**



# Backup Solutions for IBM i

## Cloud

- » Is it encrypted?
  - » Who has the keys?
- » Do I have a local copy?
  - » Remember the 3-2-1 rule
- » How fast can I get it back? (RTO)
  - » Where do I recover to?
- » What if you need to IPL?



# Backup Solutions for IBM i

## Testing

- » Have you tested your DR plan?
- » Do you regularly test your backups?
  - » Can you read them?
- » Does your DR plan meet RTO and RPO objectives?
  - » How do you know?
- » If you have not tested your DR plan
  - » **YOU DON'T HAVE A DR PLAN!**



# Backup Solutions for IBM i

## Conclusions

- » Your RTO and RPO should determine your back and recovery processes
- » One size does not fit all
  - » Even within the same organization
- » More than one backup process may be used
  - » CDP and VTL
  - » VTL and physical tape
  - » VTL and cloud
- » If you have not tested your backup and recovery
  - you don't have a plan



# Backup Solutions for IBM i

## Did you know?

» March 31<sup>st</sup> is World Backup Day





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# Thank You!

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