Université IBM i 2017

17 et 18 mai – IBM Client Center de Bois-Colombes

S47 – Sauvegarde avec IBM Cloud Storage Solutions for i

Mercredi 18 mai – 15h15-16h45

Bertrand Guibert – IBM

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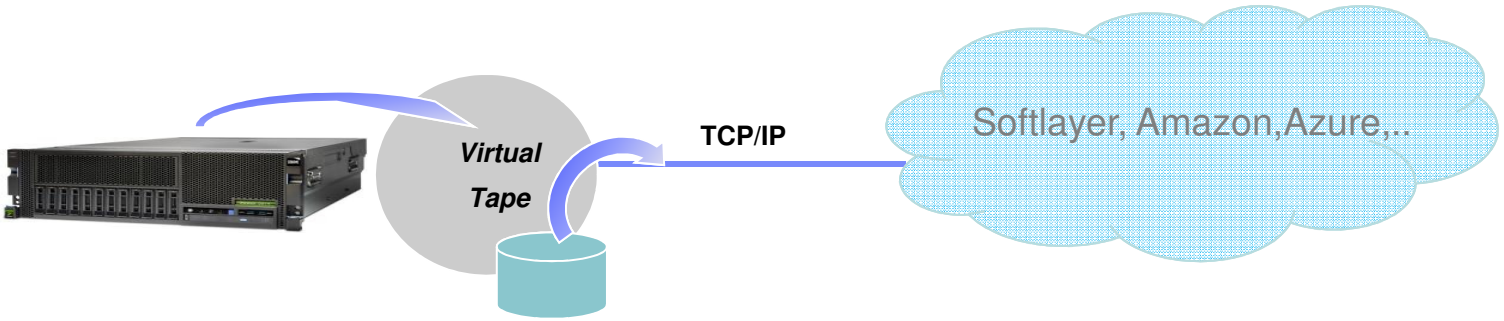
Agenda

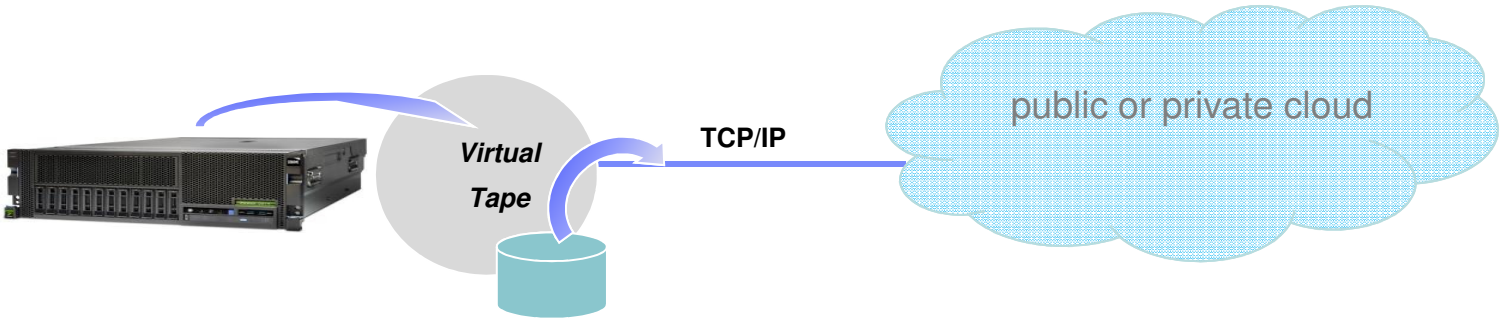
- Introduction to Cloud Storage Solutions for i
- What is it who's for
- How does it work
- How much does it cost
- Considerations
- Getting started
- BRMS turn-key

Cloud Storage Solutions for i



- Cloud Storage Solutions for i is an API that enables deployment of IBM i data to a public cloud
  - Initially targeted for customers with under 1 Tbyte of data
  - Initial public cloud provider: Softlayer
- Initial product offering will feature
  - Turn-key BRMS setup and run with virtual tape management
  - Security via VPN
- Auto save and synchronize files in the IBM i IFS directory (future plan)
  - Roll your own backup/recovery (bandwidth considerations)

Cloud storage – cached backup IBM i environment



- Foundational topology is enabled via Virtual Tape
  - Physical storage cache via a disk pool
  - Data is saved from i as tape objects into the storage cache
- Tape objects in the storage cache are converted to cloud objects (objects are containers recognized by cloud provider)
  - Cloud provider has an object format (SWIFT) initially that enables saves to generic disk of any kind
  - To deploy to the cloud, Cloud Storage Solutions groups the tape objects into cloud objects
- Cloud objects will be transmitted asynchronously to a cloud provider
  - IBM i will leverage BRMS to manage save process from virtual tape to public cloud

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NEW LPP: IBM i Cloud Storage Solutions – 5733ICC

- BRMS will use the Cloud Storage Solutions to do saves and restores.
  - TSM replacement (currently no support for TSM server)
  - Softlayer support
  - FTP support
    - Will be able to save and send media to another system or central system!
  - Could use with FlashCopy (particularly with PowerHA so your only flashing the IASP) to get 24 hours to the cloud between flashes to reduce bandwidth requirements.
- BRMS has made this as simple as possible to use (“Turn-key”).
  - BRMS will automatically create media class, storage location, move policy, control groups, etc.
- Visit this web page for latest news:
  - http://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/IBM%20Backup%2C%20Recovery%20and%20Media%20Services%20(BRMS)%20for%20i/page/Using%20Cloud%20Storage%20Solutions%20for%20i%20with%20BRMS

IBM i Cloud Storage Solutions for i

TCP/IP

Strategic Features (phased in over three GA cycles)
- Utilize Standard Cloud Object Storage
- Support for IFS File Mirror/Sharing
- Virtual tape with BRMS for backup recovery
- GUI management
- Secure connection with compression
- API for Hybrid Cloud capability
- Enablement for dedicated cloud MSPs
- Exploitation of IBM storage and solutions such as Spectrum expanding the market to medium and large enterprises

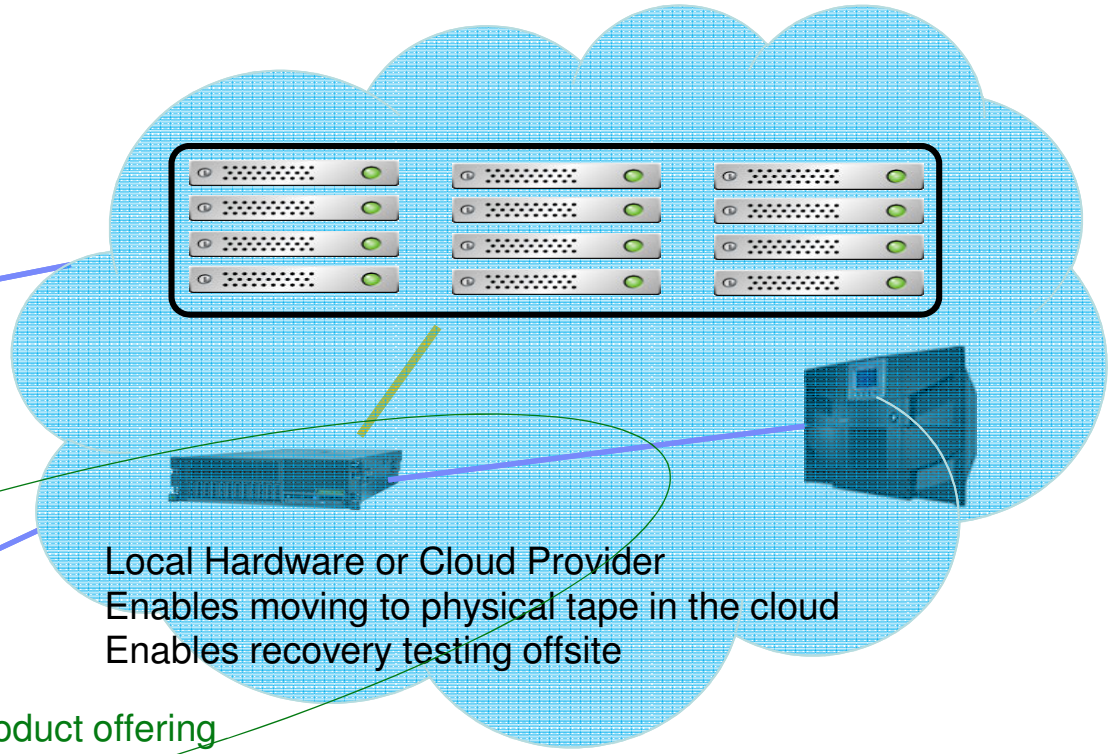
Value Proposition
- Do it yourself backup/archive operations to a public cloud
- Gets data off site automatically
- Eliminates the need for a full service 3rd party
- Enables easy to use recovery operations
- Enables file sharing
- Advanced backup recovery services to dedicated MSPs
- Can eliminate the need for a local tape device

Initial Target Market: 1&2 Core IBM i systems with 1 TB or less of Storage to back up

Product is GA Oct 28, supports V7.1 and later

Cloud Storage Solutions usage concepts

Object sharing among multiple systems
- PTFs
- ISOs
- Files
- others



Local Hardware or Cloud Provider
Enables moving to physical tape in the cloud
Enables recovery testing offsite

current product offering

Backup / Archive
- BRMS manages data backup operations automatically

Cloud Storage Solutions offering price/licensing

PID: 5733 ICC	Feature 1	Feature 2	Feature 3
Data transfer	unlimited transfers	unlimited transfers	Advanced function
One time charge	3 082 €/single VM	6 420 €/unlimited VM	TBD

France. prices

- Priced per VM (partition)
- Cloud storage: Softlayer or BP cloud providers
  - Softlayer storage $40/month/Tbyte for storage and $90/month/Tbyte for downloading
- BRMS turn-key for backup/recovery automation
  - BRMS will auto configure and set up storage backup profile
  - Not required if one chooses to roll their own manually or via scripts
- Announce 10/11/16, GA 11/16/2016
- V7.1 and above

Considerations for Cloud Storage Solutions for i

- The initial Cloud Storage Solutions offering is English language only, consider this as the beta version
- A key consideration will be your data volume/transfer time requirements which will dictate the bandwidth that you will need. Consider creating an off line backup copy, for example a flash copy image that can be uploaded to the cloud over a longer period of time and can be kept around for a local backup copy
- Initial use cases will range from archiving to actual backup recovery operations, future options to enable drag and drop file sharing is planned as well further cloud provider options
- Individual customers or business partners looking to provide cloud storage solutions should be interested in this technology

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Getting Started

1a. Need to get a Softlayer Account with Object Storage

- Once you have your Softlayer Account, you will need to set up your **object storage** at the location of your preference.
- This will allow you to access the web interface to check what is in Softlayer or create other users.
- You will need to create a Softlayer Container name like: **backups2016**
- You need to look for your Connection info under the credentials tab.
  - Use this info to allow IBM i to Connect to Softlayer
  - Authentication Endpoint – indicates where the storage is located
    - Public: https://***dal05***.objectstorage.softlayer.net/auth/v1.0/
    - Private: xxxxxxxxxx
  - Username/Account Name:
    - Used by IBM i Cloud Connector to Connect to Softlayer
    - Example: IBMOS999687-2:xxxxxxxxxx
  - API Key (Password):
    - xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

1b. Or need to have a central system with a FTP server

2a. Need to put Softlayer account information in IBM i Cloud LPP

- Using Create SoftLayer Resource (**CRTSLRICC**)
- Parameters
  - Resource name: Name you wish to call this cloud.
  - Resource description: Your words to describe Resource name.
  - Authorized user: This is the Username in previous chart
  - Authorization Key: This is the API Key from previous chart
  - Container: This will be the Softlayer container you created (can have multiple)
  - Resource URI: This will be the endpoint from previous chart
  - Example of creating a Softlayer Resource named Cloud
    - ***CRTSLRICC RSCNM(CLOUD) RSCDSC('drbhas container') AUTHUSR('yyyyyyyyyyy:xxxxxxxxx') CONTAINER(backups2016) RSCURI('https://dal05.objectstorage.softlayer.net/auth/v1.0/')***
    - ***AUTHKEY(xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx)***

2b. Need to put FTP information in IBM i Cloud LPP

CRTFPRICC RSCNM(CLOUD) RSCDSC('Send virtual volumes to P6 from any system') USRID(drbhas) PASSWORD() ROOTDIR('/QIBM/UserData/BRMS/cloud') RSCURI(xxxxxxP6.xxx.xxxxxxxx.xxx.xxx)

3. BRMS Turn-key set up

- Run **STRMNTBRM RUNCLNUP(*YES)** for BRMS to create required BRMS objects!
- BRMS will create the following objects when it detects the Softlayer and/or FTP Resource Name:
  - Media Class – One for Virtual Tape (if MSE on system) and one for Virtual Optical
    - QCLDVRTOPT
    - QCLDVRTTAP
  - Storage Location - based on Resource Name
  - Move Policy – based on Resource Name
    - Used to indicate to move to cloud during backup if possible.
  - Media Policy – based on Resource Name
  - Four Backup Control Groups
    - QCLDBIPLnn – Backs up what is minimally needed for a system D-IPL.
      - This will need to be burned to a DVD.
    - QCLDBSYSnn – Backs up all system data except *SAVSYS
      - paired with QCLDBIPLnn
    - QCLDBUSRnn – Backs up all user data incrementally.
    - QCLDBGRPnn – Backs up what is minimally needed for a recovery to get to the cloud and user data.
      - except no *SAVSYS
      - paired with QCLDBUSRnn
      - Will need to be burned to a DVD should be last backup daily.
  - Recovery report will re-order libraries,etc.
    - For Cloud Connection Recovery (volumes needed to be burned to DVD)
    - Rest can be recovered from the cloud.

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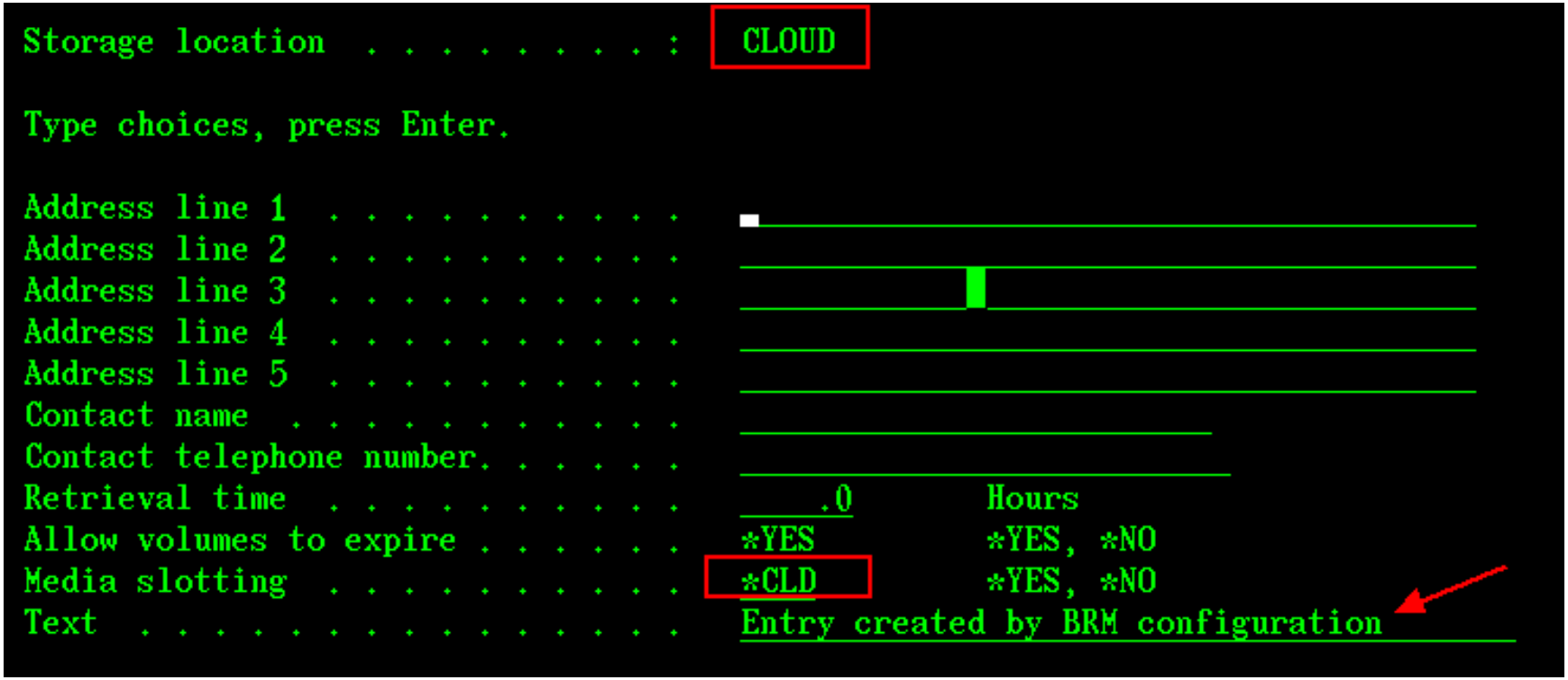
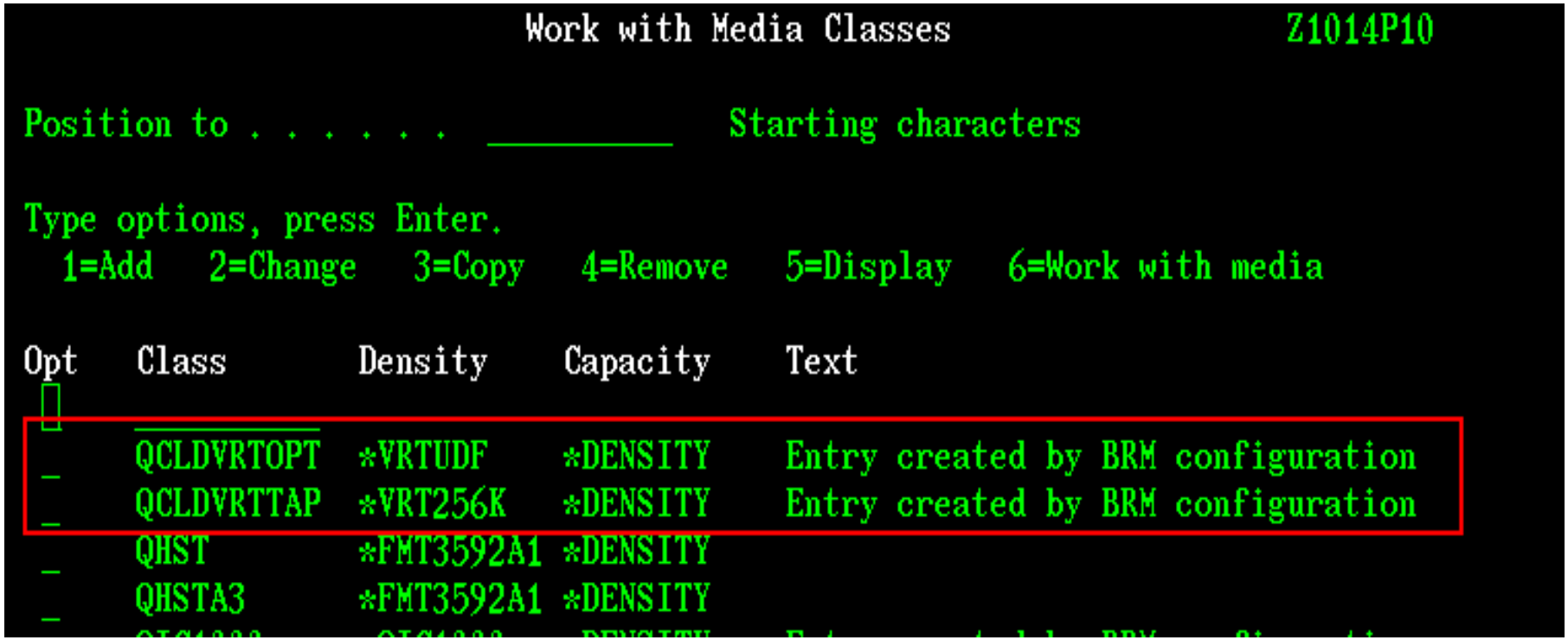
BRMS will create the location.



BRMS will create the media classes
One for virtual tape and one for virtual optical



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BRMS will create the move policy.

```
Move policy . . . . . :  CLOUD
Home location . . . . . .  *ORIGIN      Name, *SYSPCY, *ORIGIN, F4 list
Use container . . . . . .  *NO          *YES, *NO
Verify moves . . . . . .  *YES          *YES, *NO
Calendar for working days . . .  *ALLDAYS    Name, *ALLDAYS, F4 for list
Calendar for move days . . . . .  *ALLDAYS    Name, *ALLDAYS, F4 for list
Move marked for duplication . .  *NO          *NO, *YES
Text . . . . . .  Entry created by BRM configuration

Type choices, press Enter.

  Seq    Location      Duration    Container Action

   10    CLOUD         *EXP
```

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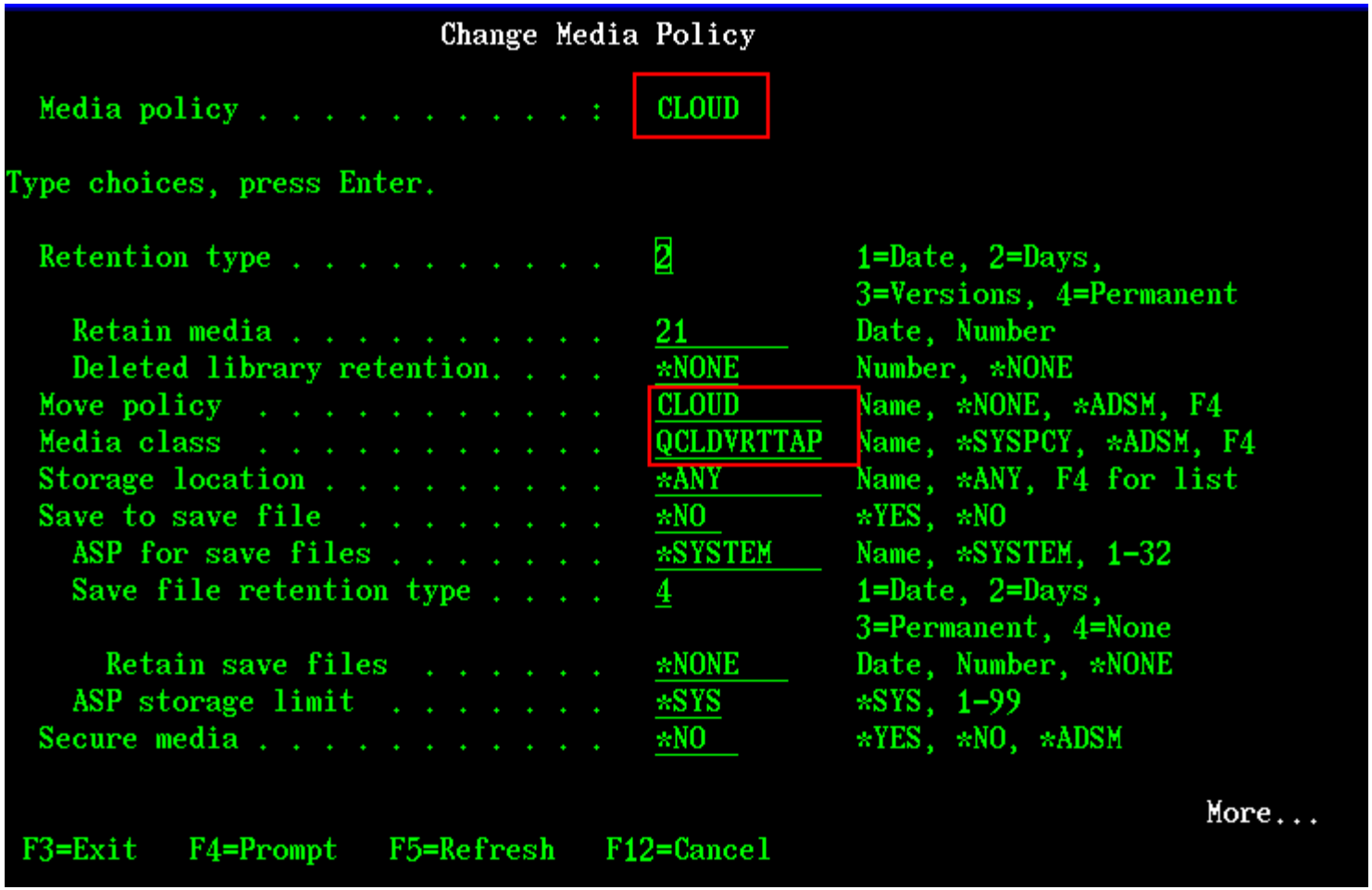
BRMS will create the media policy.



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BRMS will create the control groups to backup to the Softlayer or FTP Resource

- Notice the QCLDBxxxnn - QCLD**B** indicates **B**RMS owned
  - Entries shouldn't be changed.
  - Attributes can be changed.
- **We do have support for user created ones…see next chart**.
- The "01" is the number of the cloud resource found
- Four Backup Control Groups
  - QCLDBIPLnn – Backs up what is minimally needed for a system D-IPL.
    - This will need to be burned to a DVD.
  - QCLDBSYSnn – Backs up all system data except *SAVSYS
    - paired with QCLDBIPLnn
  - QCLDBUSRnn – Backs up all user data incrementally.
  - QCLDBGRPnn – Backs up what is minimally needed for a recovery to get to the cloud and user data.
    - except no *SAVSYS
    - paired with QCLDBUSRnn
    - Will need to be burned to a DVD should be last backup daily.

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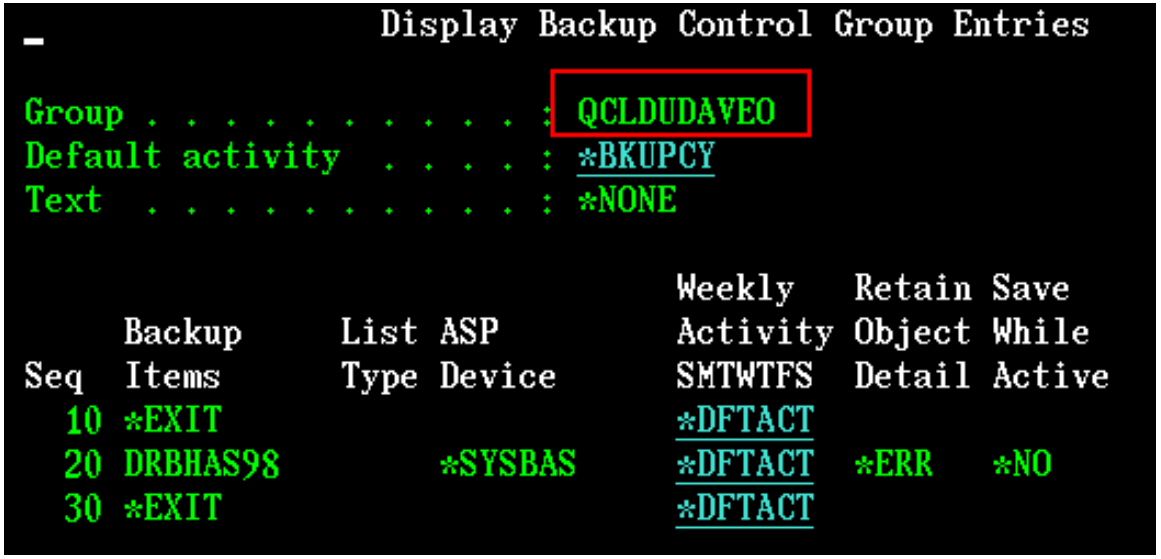
BRMS turn-key automated cloud transfer demo

https://www.ibm.com/developerworks/community/wikis/form/api/wiki/c6360d90-8724-4322-b2eb-481f0c81bd7c/page/5821263f-0b0b-4f5a-8c52-7b6d9001790c/attachment/ab0f4c6a-f94a-4954-b101-8a1cab906b7c/media/BRMS_Automatic_cloud_transfers.mp4

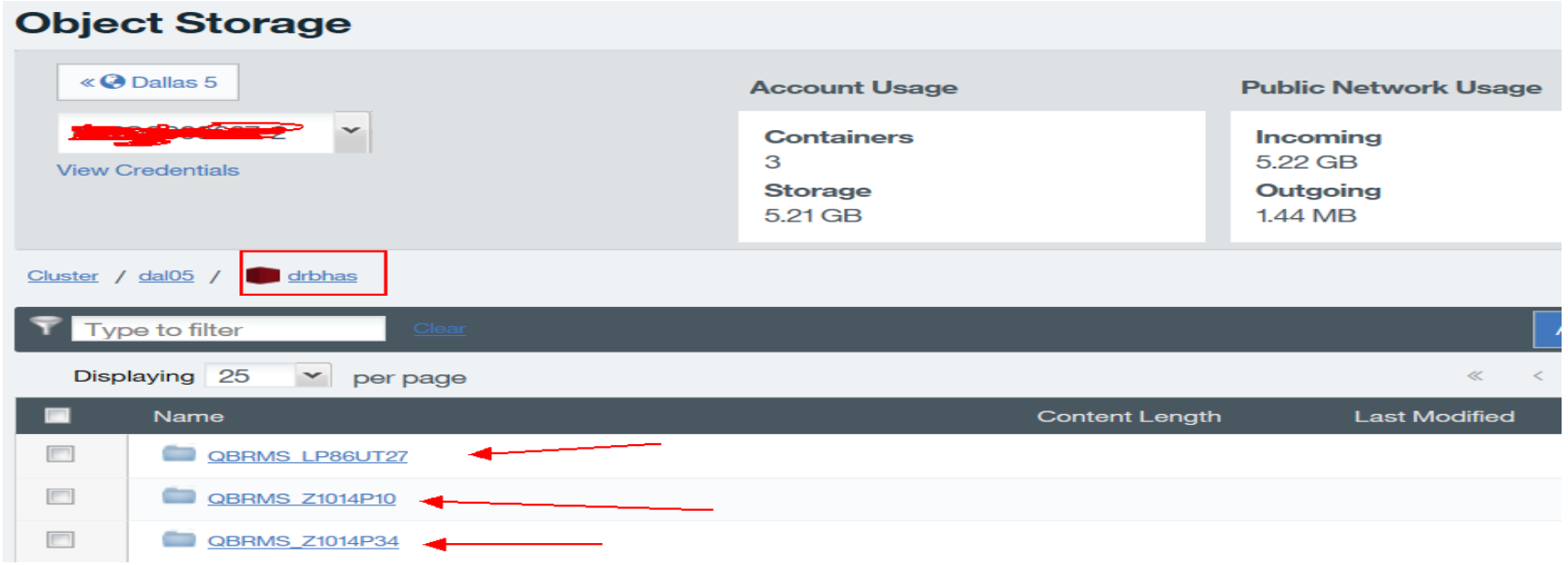
Setting up your own “Turn-key” for your backup needs

- You can create a QCLD**U**xxxxx control group.
  - The QCLD**U** tells BRMS this is a **U**ser “Turn-key” control group.
  - Need to create “virtual” media policy with a move policy to the cloud.
    - Can copy from BRMS turn-key ones
  - BRMS **will** create the virtual devices and media for you.



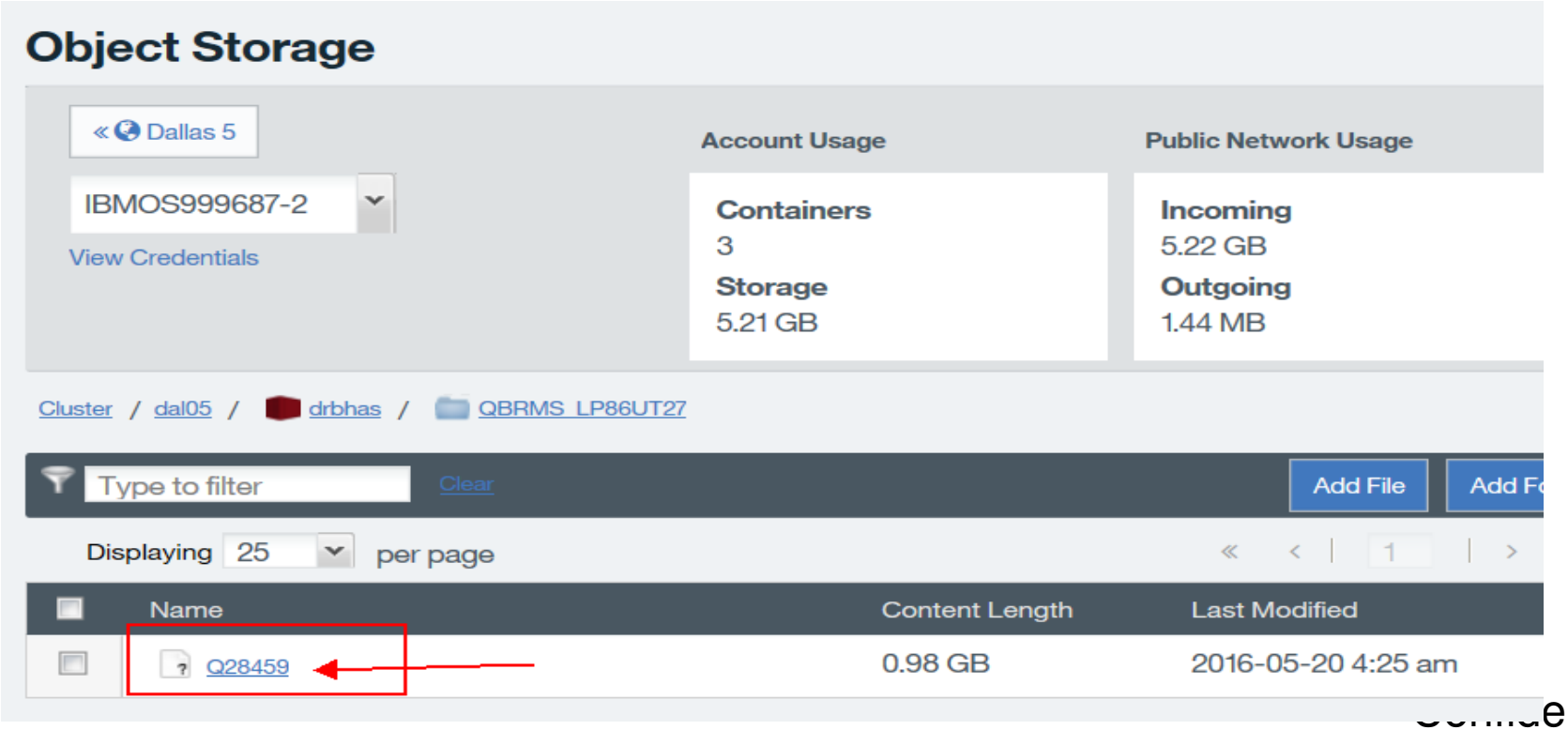
What it looks like on Softlayer after control group is run.

- You will need to sign on to your Softlayer Account and go to your container
  - **https://control.softlayer.com/**
  - BRMS will create a directory for each system you have in your BRMS network(QBRMS_xxx)



On Softlayer you can drill down to look at the media that transferred.

- In this case virtual media Q28459 was saved and transferred from system System Name.



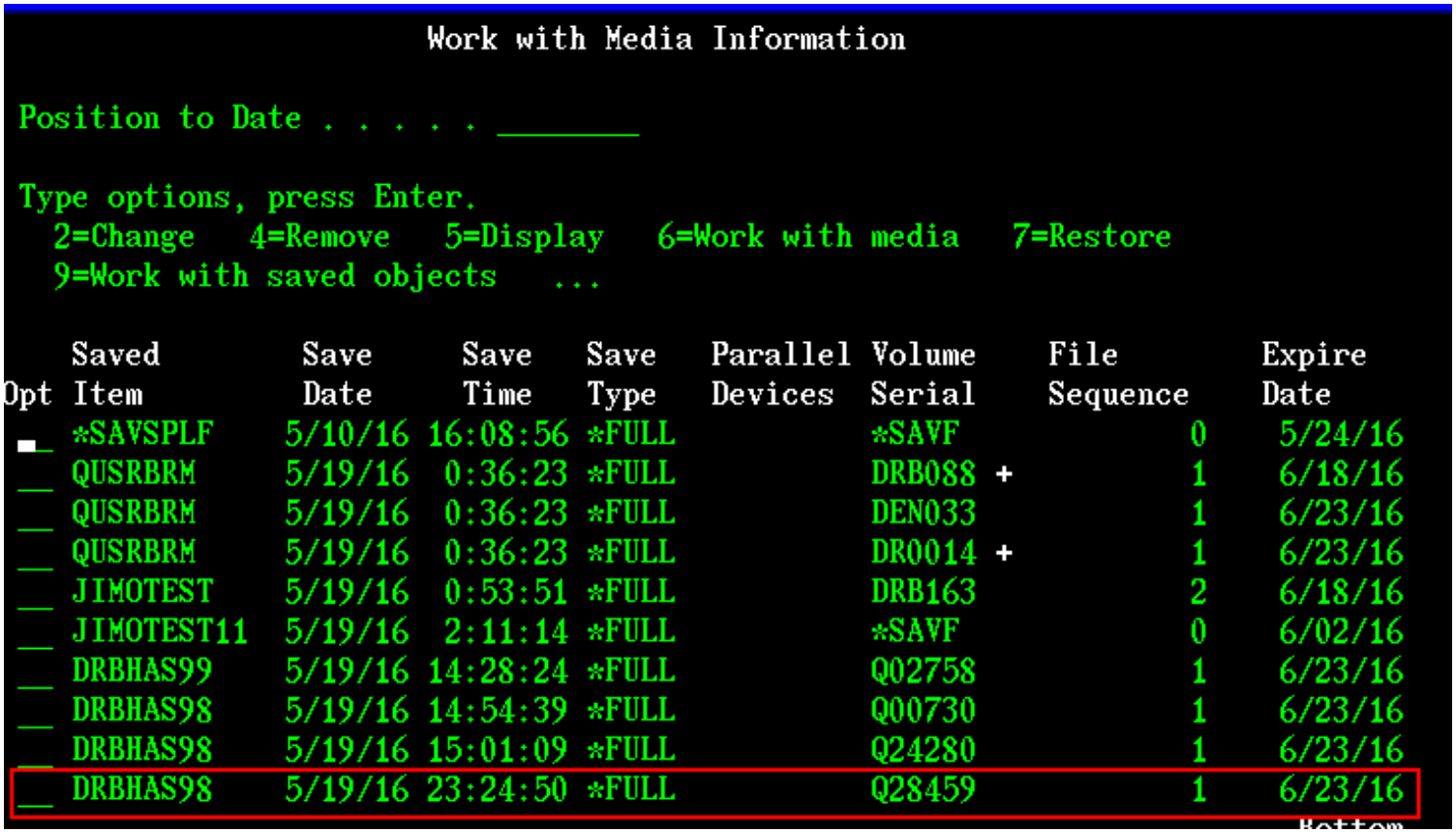
What it looks like on FTP resource after run.

Note: Ignore .mta file used internally by IBM i Cloud Solutions LPP.

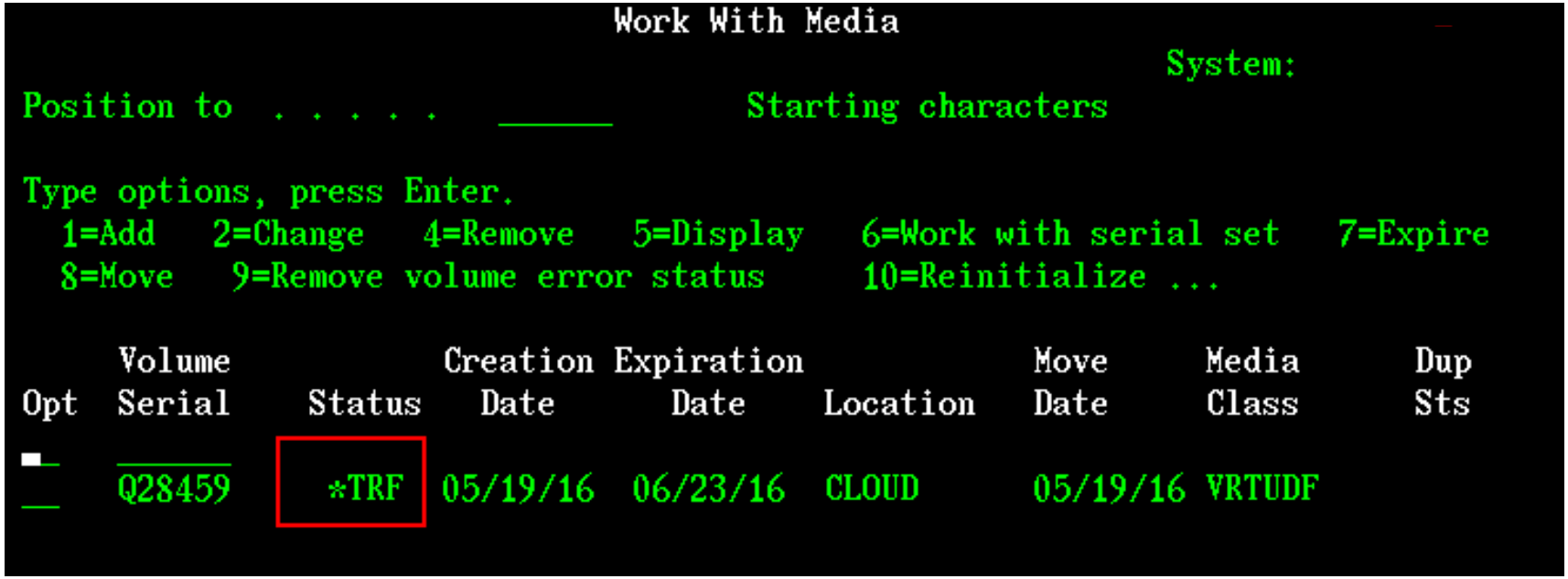
```
Directory  . . . . :   /QIBM/UserData/BRMS/cloud

Type options, press Enter.
  2=Edit    3=Copy    4=Remove    5=Display    7=Rename
  11=Change current directory ...

Opt    Object link                 Type       Attribute
__     a                           STMF
__     a.mta                       STMF
__     QBRMS_LP86UT27              DIR
5_     QBRMS_Z1014P10              DIR
__     QBRMS_Z1014P6               DIR
```

```
Directory  . . . . :   /QIBM/UserData/BRMS/cloud/QBRMS_Z1014P10

Type options, press Enter.
  2=Edit    3=Copy    4=Remove    5=Display    7=Rename    8=Display
  11=Change current directory ...

Opt    Object link                 Type       Attribute    Text
_      Q00408                      STMF
_      Q00408.mta                  STMF
_      Q01088                      STMF
```

WRKMEDIBRM will look like this:



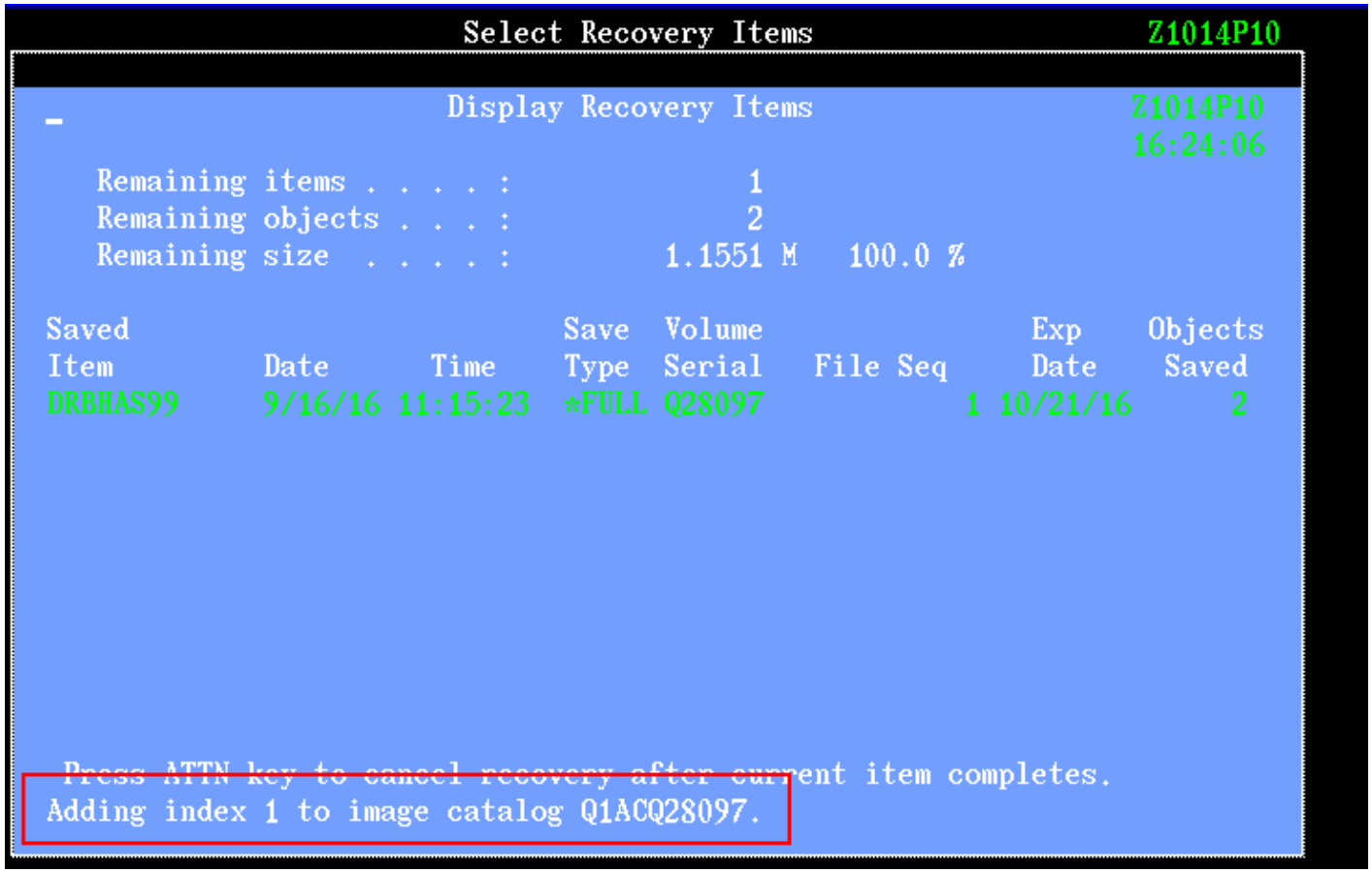
While it is transferring to the cloud - WRKMEDBRM will look like this:



- WRKSTSICC - Will also give you a list of transfers.

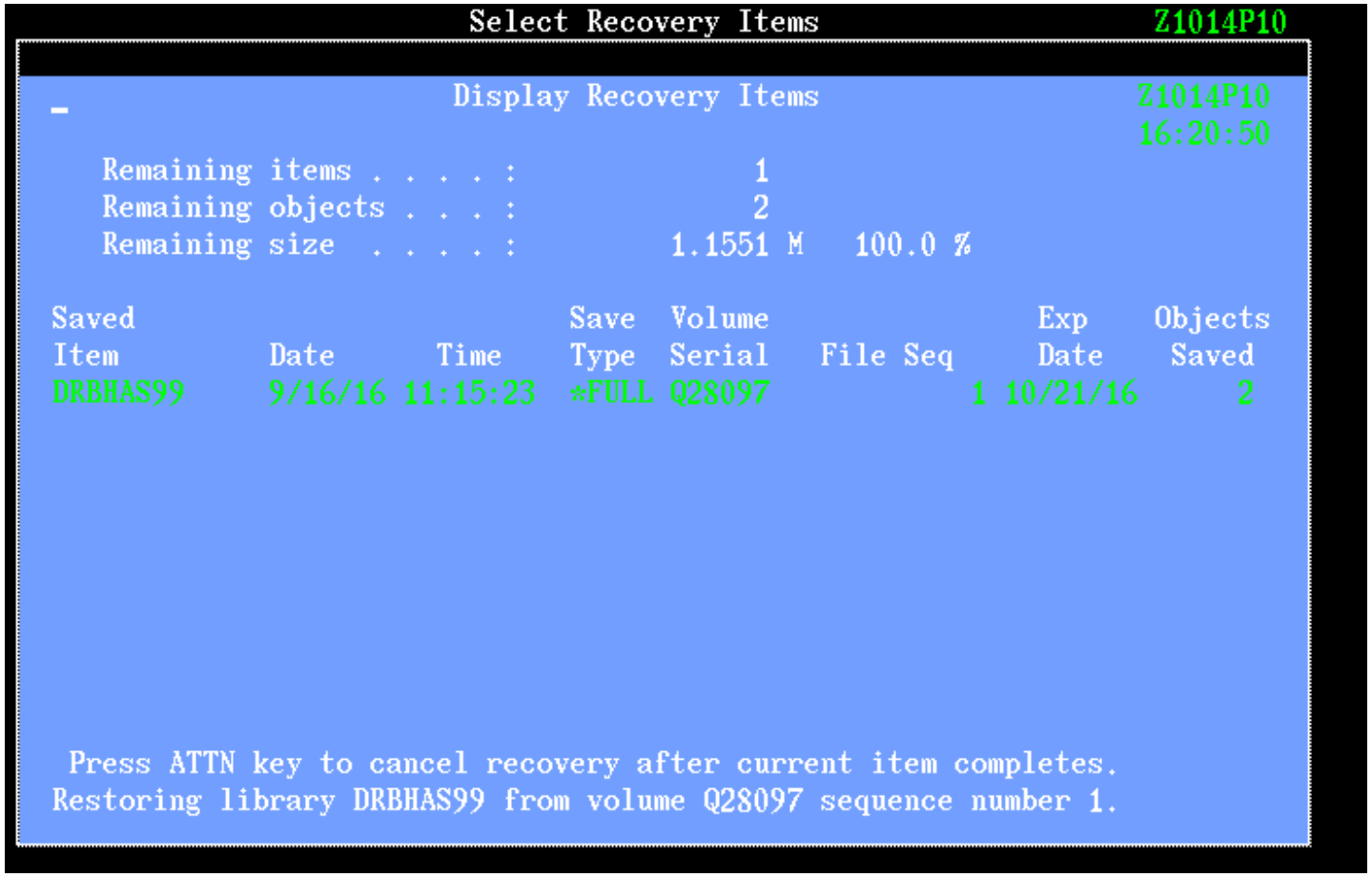
Restoring from the Cloud

- BRMS will automatically “move” the virtual media from the cloud and do the restore!
- BRMS will create the image catalog and image stub to move into from the cloud.



Restoring from the Cloud

- BRMS will then do the restore!



Advanced Topics

- BRMS Backup and Restores to the cloud can be done in restricted state.

Media size for automatic transfers to the cloud

BRMS will use the available storage from the system ASP to determine the size of media images that will be created for automatic transfer to the cloud. The media size can be overridden by running the following command:

```
CALL PGM(QBRM/Q1AOLD) PARM('VRTVOLSIZE'   '*SET    '   'nnnnnnn')
```

where - nnnnnnn is the media size in megabytes (MB). This value must be between 0000001 (1 megabyte (MB)) and 1000000 (1 terabyte (TB)). Note: The size maybe adjusted slightly to reflect minimum or maximum size of the virtual media

The media size can be displayed by running the following command:

```
CALL PGM(QBRM/Q1AOLD) PARM('VRTVOLSIZE'   '*DISPLAY')
```

The media size can be reset to the default value by running the following command:

```
CALL PGM(QBRM/Q1AOLD) PARM('VRTVOLSIZE'   '*REMOVE')
```

Advanced Topics

- How to keep a volume on the system for a few days (yet be in the cloud also).

BRMS will allow media that is associated with a move policy to be retained on the system for a period of time after it has been transferred to the cloud by running the following command:

```
CALL PGM(QBRM/Q1AOLD) PARM('CLOUD     '   'RETAINDATA'    'S'    'mmmmmmmmmm'   'dddd')
```

where

mmmmmmmmmm is the move policy name being updated.

dddd is the number of days (prefixed with 0's) to retain media on the system after it has been transferred to the cloud location.

Note: The number of days to retain media on the system starts on the first full day after the transfer occurs.

Example:

To change set the cloud data retention of move policy CLDMOVPCY to 7 days, run the following command:

```
CALL PGM(QBRM/Q1AOLD) PARM('CLOUD     '   'RETAINDATA'   'S'   'CLDMOVPCY '   '0007')
```

Recommendations

Recommendations for enterprises

- Enterprises need to ensure that they have adequate Internet capacity and speed to handle cloud-based backup and recovery.
- Auditing and regulatory checks need to be executed by a third party to ensure that a service provider adheres to compliance requirements. Enterprises should ensure that they can recover backup data stored at a remote location at any time.
- Be sure you maintain control of the data and can add, edit, or delete information directly while browsing your personal cloud repository through a web-based interface. This capability is not always offered by locked-down managed backup storage services.
- Cloud backup is a rapidly maturing market heading for commoditization, and vendors have already begun differentiating themselves by focusing on specific problems or niche markets.

Recommendations for vendors

- Prior to deploying a cloud backup service, ensure that business requirements are met, such as a primary data cache for cloud backup and recovery.
- Have a pilot project at a remote location and test the services you or your managed service provider offer.
- Offer a flexible reporting tool for backup and recovery drills describing usage, recovery time objective (RTO), and recovery point objective (RPO).

Additional information

Knowledge Center

- http://www.ibm.com/support/knowledgecenter/ssw_ibm_i_73/icc/topics/iccuoverview.htm

Developer Works

- https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/IBM%20i%20Technology%20Updates/page/IBM%20Cloud%20Storage%20Solutions%20for%20i

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