



STORAGE DEVELOPER CONFERENCE

SNIA ■ SANTA CLARA, 2014

# LTFS Bulk Transfer Standard

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# LTFS Bulk Transfer Standard

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# LTFS Bulk Transfer Standard

## Standard Mandate and History

- ❑ The Linear Tape File System (LTFS) became part of the SNIA family of standards in 2012.
- ❑ The SNIA LTFS Technical Working Group:
  - ❑ Improves and refines the LTFS standard
  - ❑ Formally standardizes LTFS at the national and international level (ISO/IEC)
  - ❑ Provides a vendor-independent forum
  - ❑ Broadens industry collaboration and adoption

# LTFS Bulk Transfer Standard

## Standard Mandate and History

- ❑ LTFS has significant adoption in the following industries:
  - ❑ Media and Entertainment<sup>1</sup>
  - ❑ Oil and Gas
  - ❑ Science (HEP/Pharma/Astronomy)
- ❑ Many use cases in these industries involve bulk transportation of data
- ❑ Networks are still expensive and limited

1. See [http://www.lto.org/pdf/2012\\_MTMP-LTFS%20Hits%20the%20Mark.pdf](http://www.lto.org/pdf/2012_MTMP-LTFS%20Hits%20the%20Mark.pdf)

# LTFS Bulk Transfer Standard

## Standard Mandate and History

- ❑ In addition, cloud storage has emerging needs:
  - ❑ Lower cost bulk storage tiers (e.g. Glacier)
  - ❑ Bulk cloud transfer (e.g. AWS Import/Export)
  - ❑ Cloud repatriation/evacuation (e.g. Nirvanix)
  - ❑ Cloud to cloud transfer
  
- ❑ LTFS provides significant cost savings for large data volume transfers

# LTFS Bulk Transfer Standard

## Standard Mandate and History

- ❑ Standardization work on bulk transfer was initiated in 2013 as part of SNIA LTFS Technical Working Group investigations into how LTFS can provide value for cloud storage deployments
- ❑ This work included:
  - ❑ Object storage on LTFS (CDMI, Swift, S3)
  - ❑ LTFS as a cloud backing store
  - ❑ **LTFS bulk transfer to/from/between clouds**

# LTFS Bulk Transfer Standard

## Overview

- ❑ The LTFS Bulk Transfer Standard defines a standardized way to:
  - ❑ Package files and objects onto LTFS volumes for transport to/from/between clouds
  - ❑ Specifies how files and objects are merged into a destination namespace
  - ❑ Specifies transfer verification and atomicity
  - ❑ Specifies error handling and fault recovery

# LTFS Bulk Transfer Standard

## Overview

- ❑ The LTFS Bulk Transfer Standard specifies:
  - ❑ How content is stored on LTFS volumes
  - ❑ Workflows for common use cases
  - ❑ Guidance on error handling and recovery
  - ❑ The format of the XML transfer request manifest
  - ❑ The format of the XML transfer response manifest

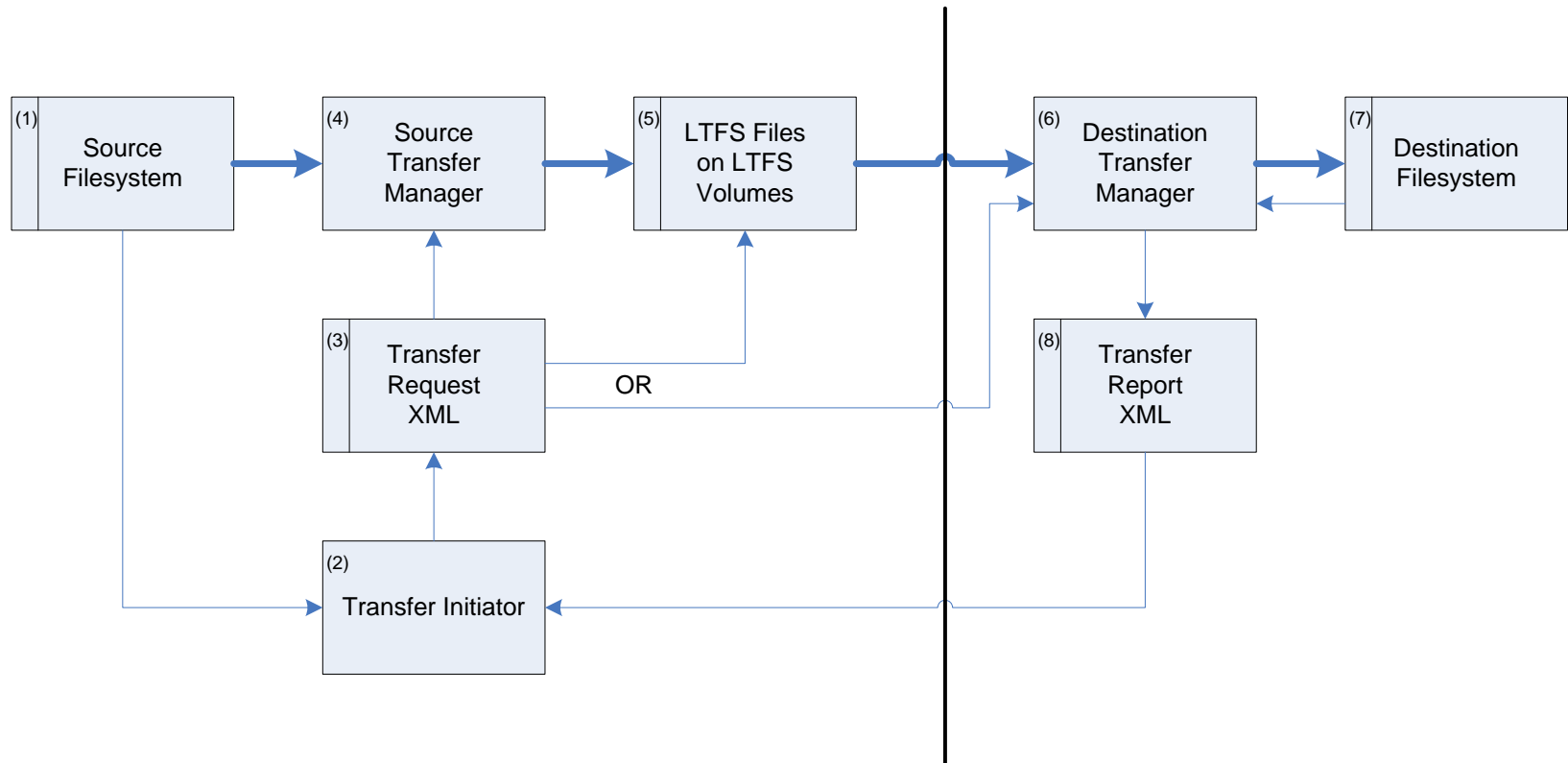


# LTFS Bulk Transfer Standard

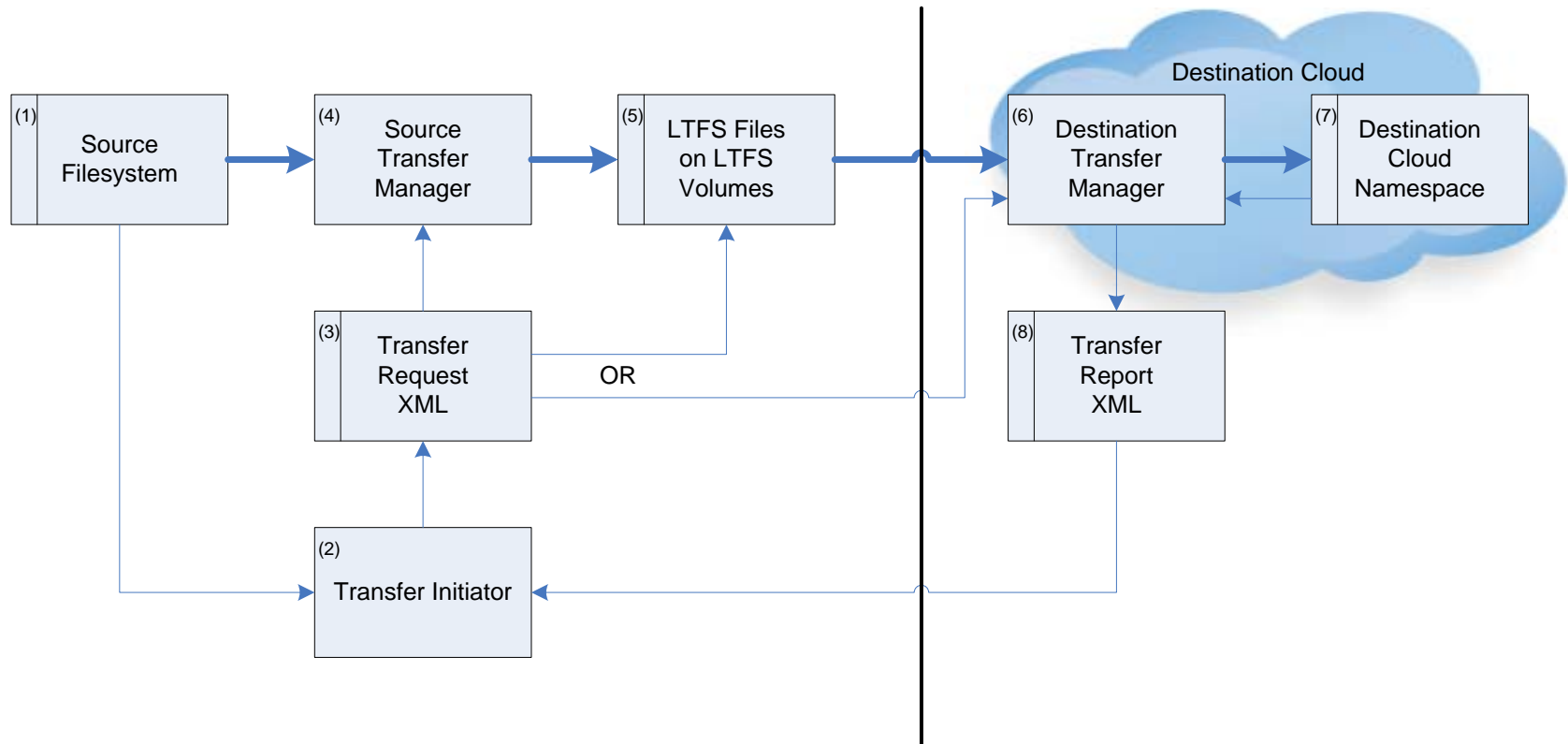
## Overview

- The primary use cases for LTFS transfer are:
  - Cloud seeding, where a cloud account is populated via a bulk transfer of data
  - Cloud updates, where new and updated data is transferred to the cloud
  - Cloud retrievals, where all or a subset of cloud-stored data is retrieved
  - Cloud transfers, where data is moved from cloud to cloud

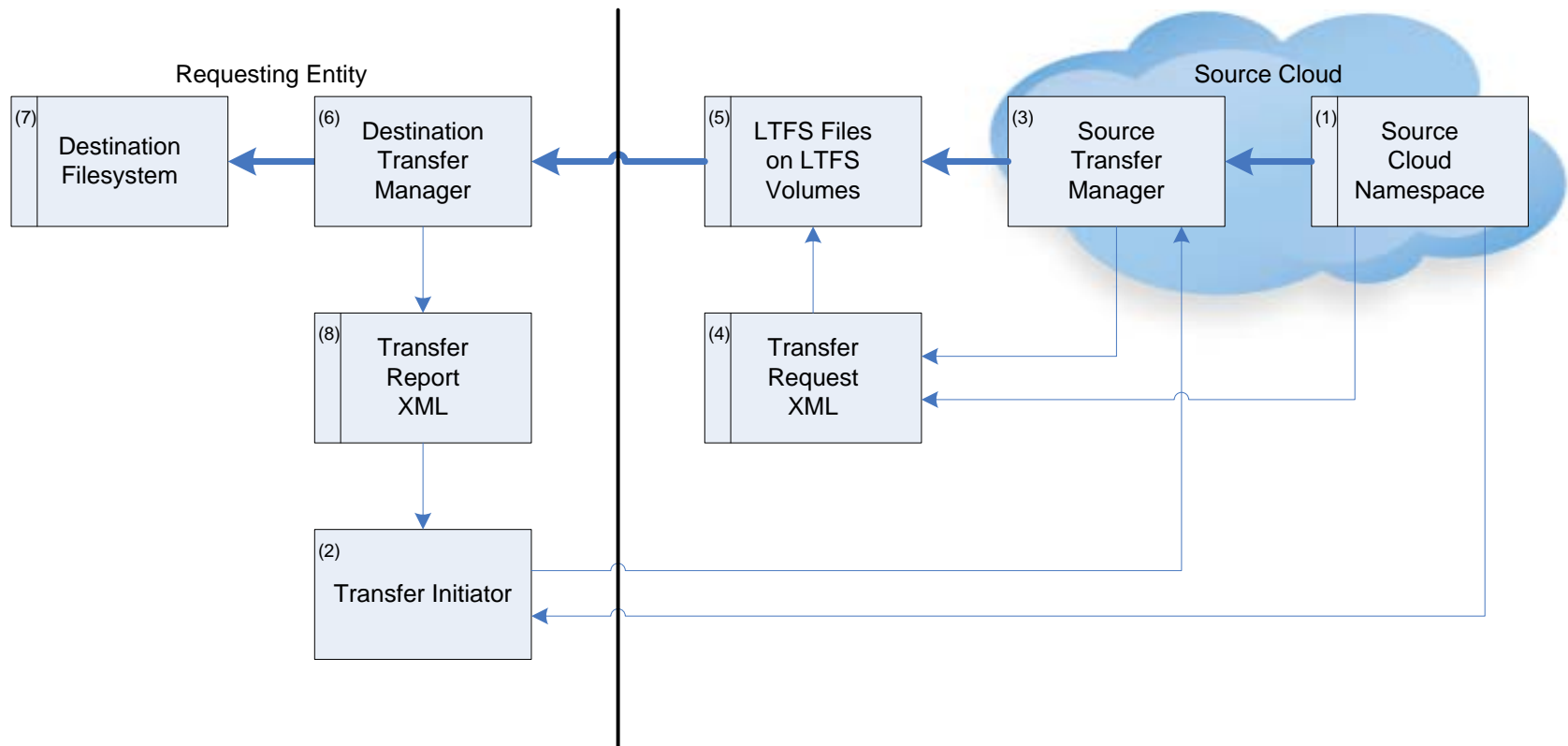
# Enterprise to Enterprise Bulk Transfer Use Cases



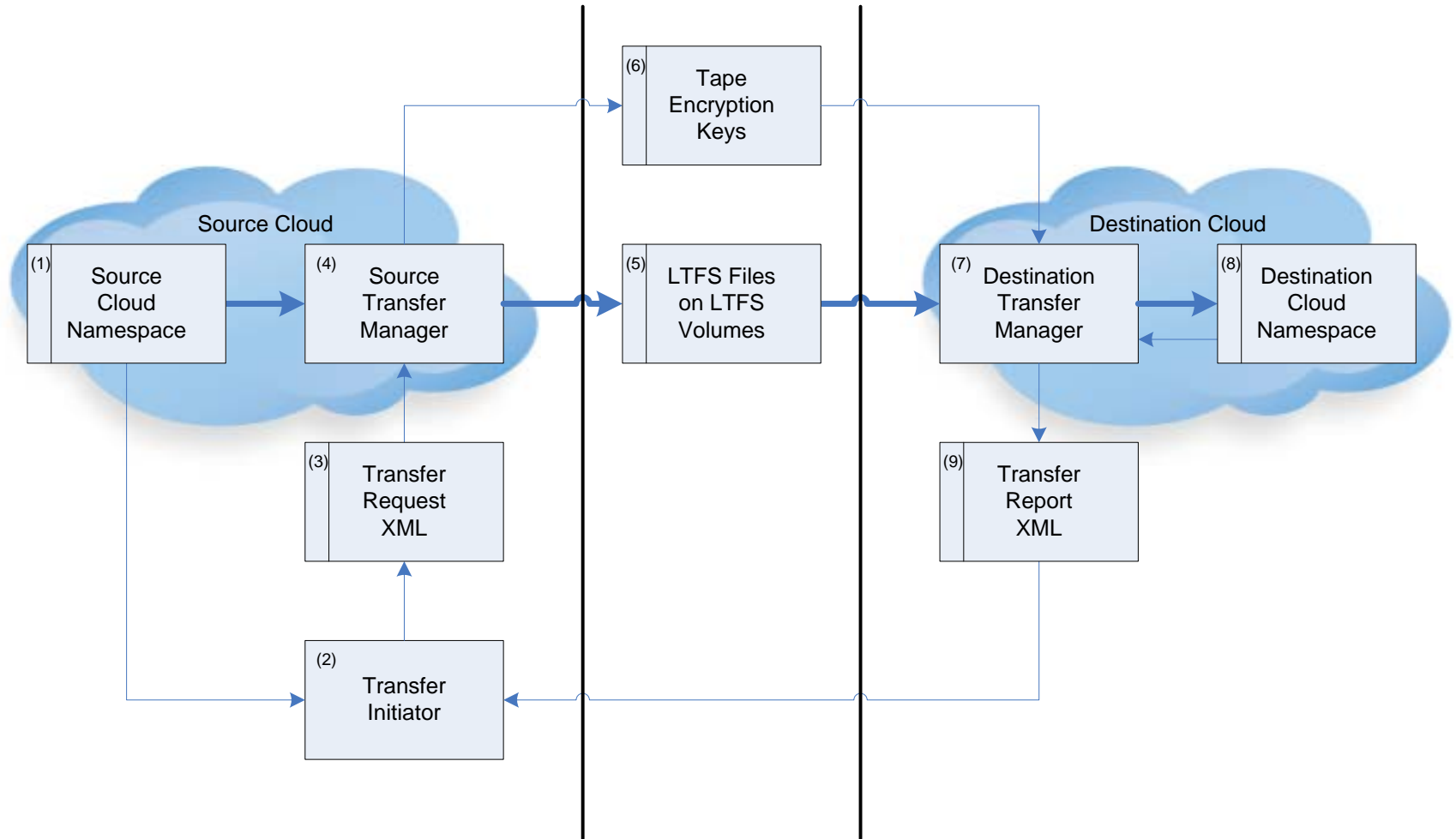
# Enterprise to Cloud Bulk Transfer Use Cases



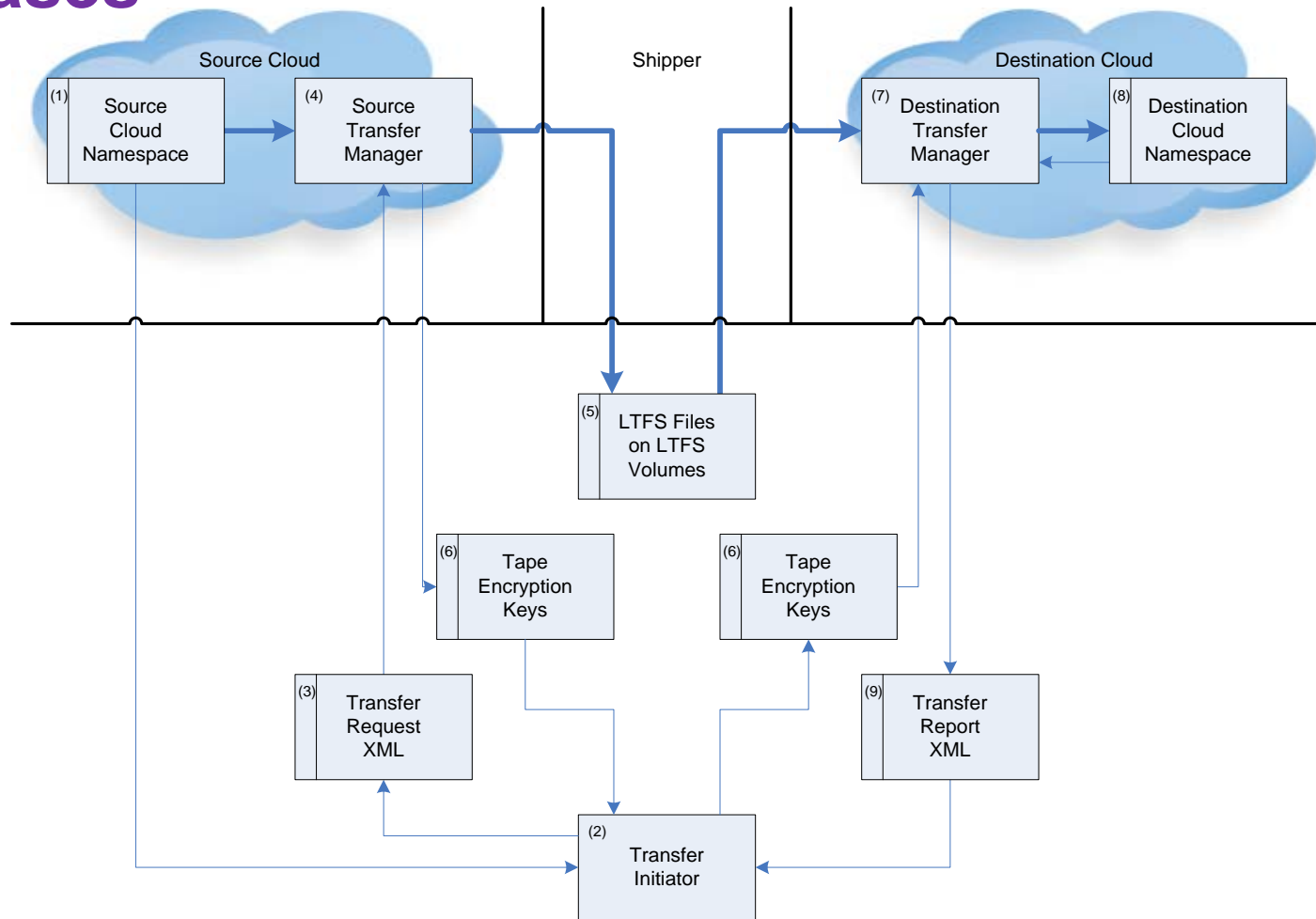
# Cloud to Enterprise Bulk Retrieval Use Cases



# Cloud to Cloud Bulk Transfer Use Cases



# Brokered Cloud to Cloud Bulk Transfer Use Cases



# LTFS Bulk Transfer Standard

## Error handling and Recovery

- ❑ What about when things go wrong?
  - ❑ Enables detection of corruption
  - ❑ Enables detection of missing data
  - ❑ Enables detection of merge conflicts
  - ❑ Enables detection of privilege conflicts
- ❑ Allows recovery
  - ❑ Enables partial transfers to resolve problems without having to re-write/re-send all the data over again.

# LTFS Bulk Transfer Standard

## Security Considerations

- ❑ Weaponized transfers
  - ❑ `rm -rf` transfers
  - ❑ Sparse File Bombs
  - ❑ Compression Bombs
  - ❑ Billion laughs attack
- ❑ Many vulnerabilities triggered by merely copying a file or directory off an LTFS volume
- ❑ Automated (and manually initiated) services **must** guard against hostile inputs



# LTFS Bulk Transfer Standard Demonstration



## LTFS Bulk Transfer Demonstration

# LTFS Bulk Transfer Standard

## Questions and Answers

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