LTFS Bulk Transfer Standard

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Today's Presenters

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LTFS Bulk Transfer Standard
Agenda

- Standard Mandate and History
- Overview
- Use Cases
- Error Handling and Recovery
- Security Considerations

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[1]
  - 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

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
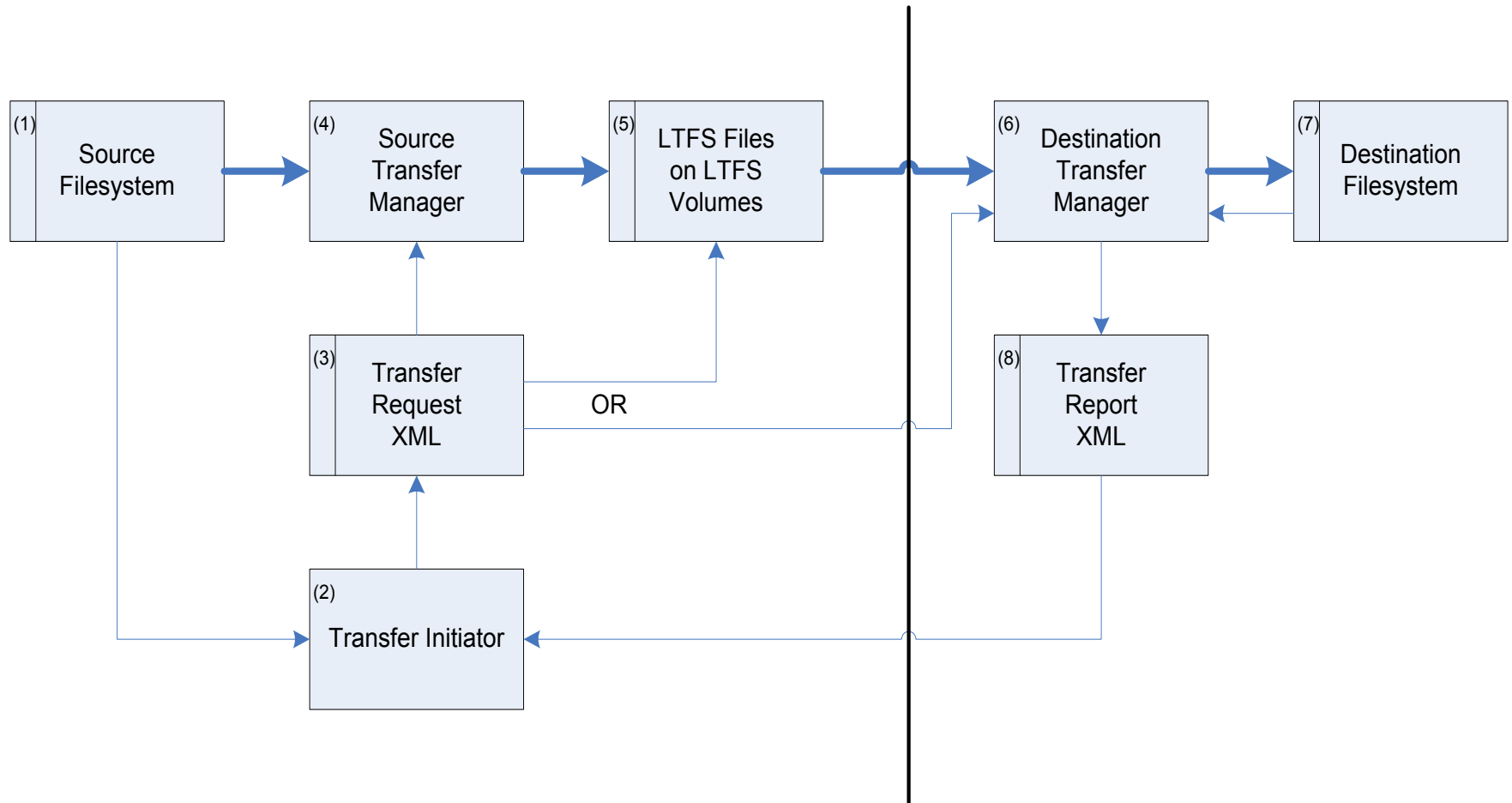- ◆ Specifies error handling and fault recovery

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
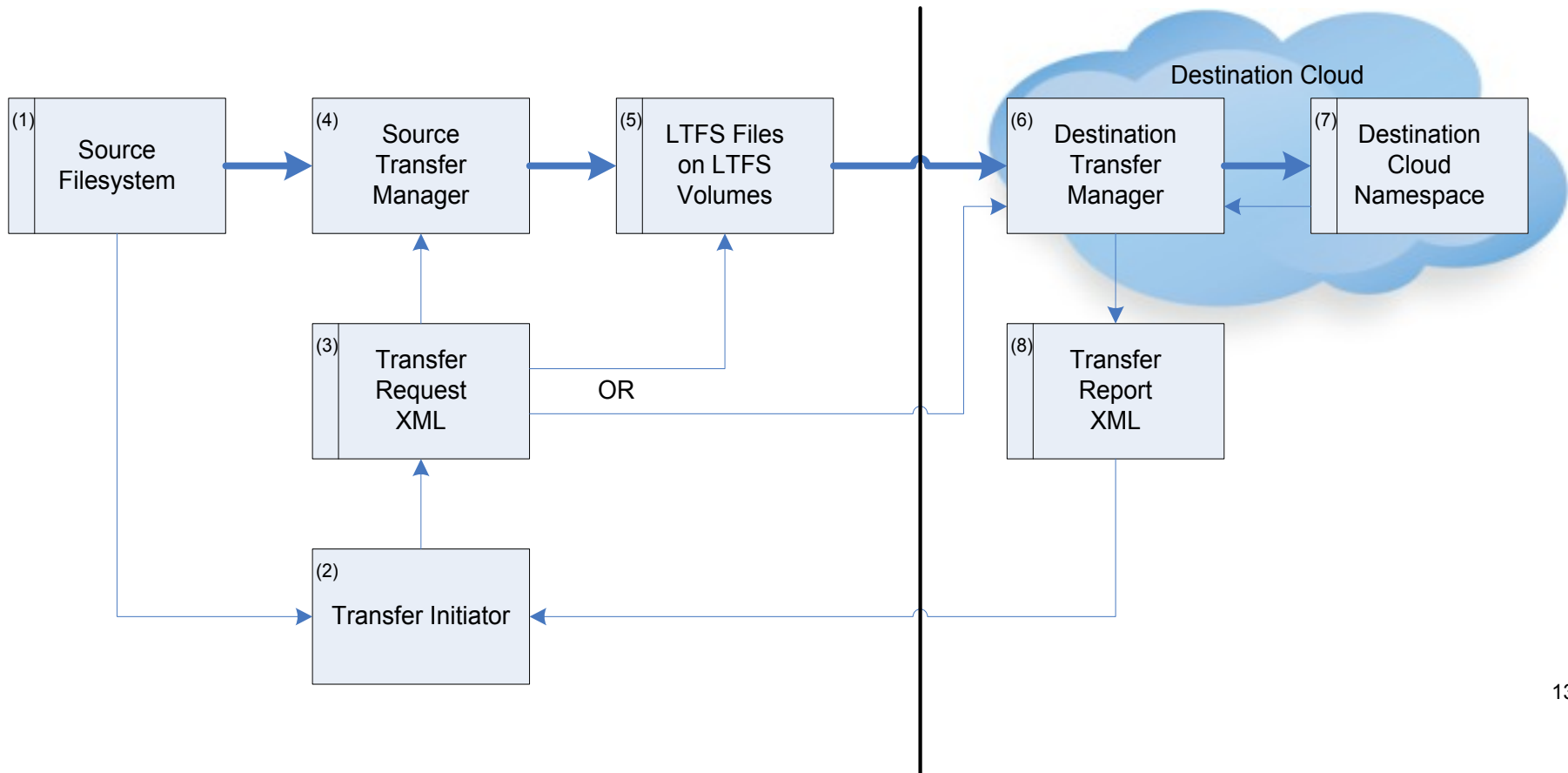- The format of the XML transfer response manifest

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
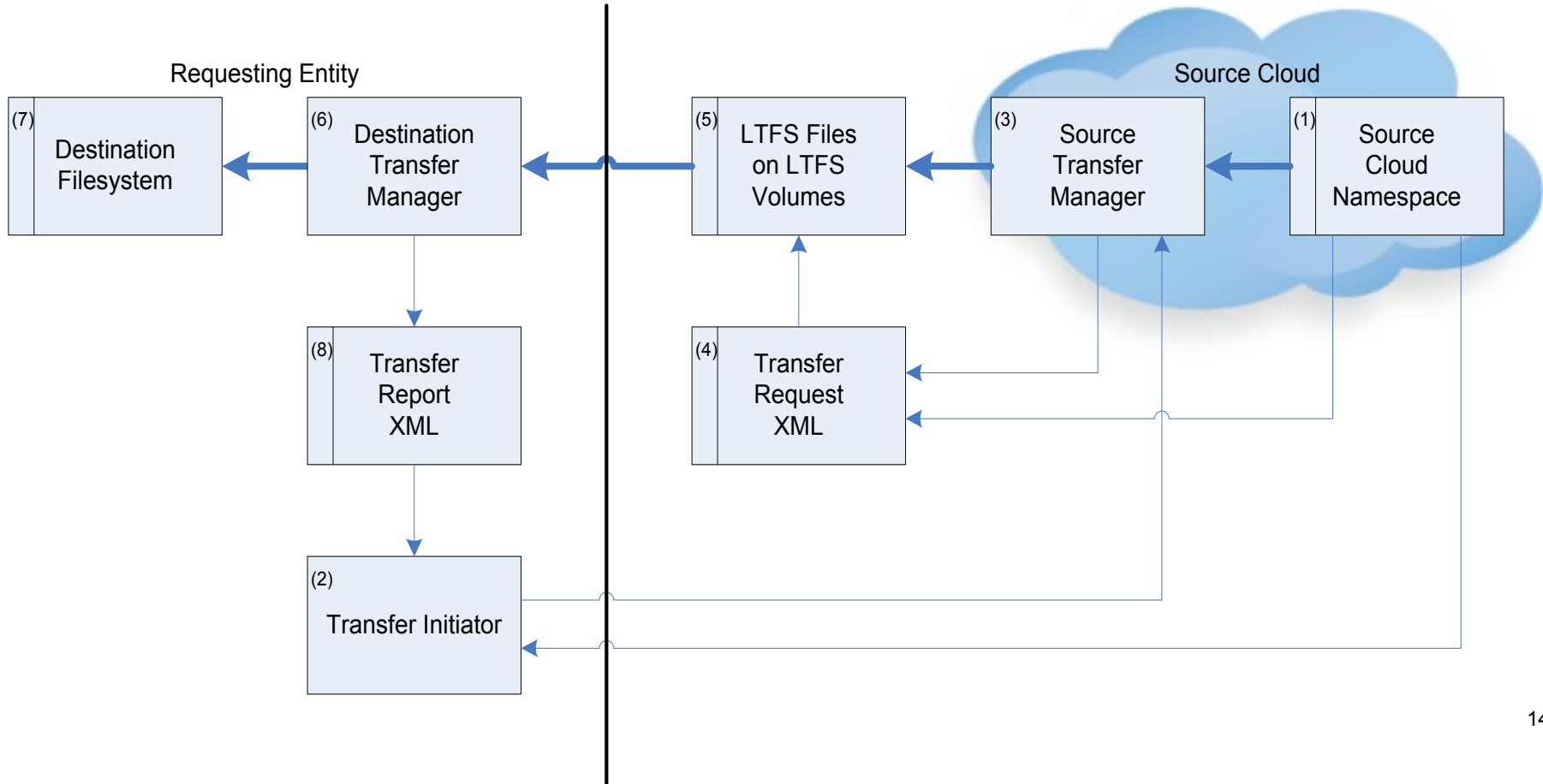
- Cloud transfers, where data is moved from cloud to cloud

Enterprise to Enterprise Bulk Transfer Use Cases
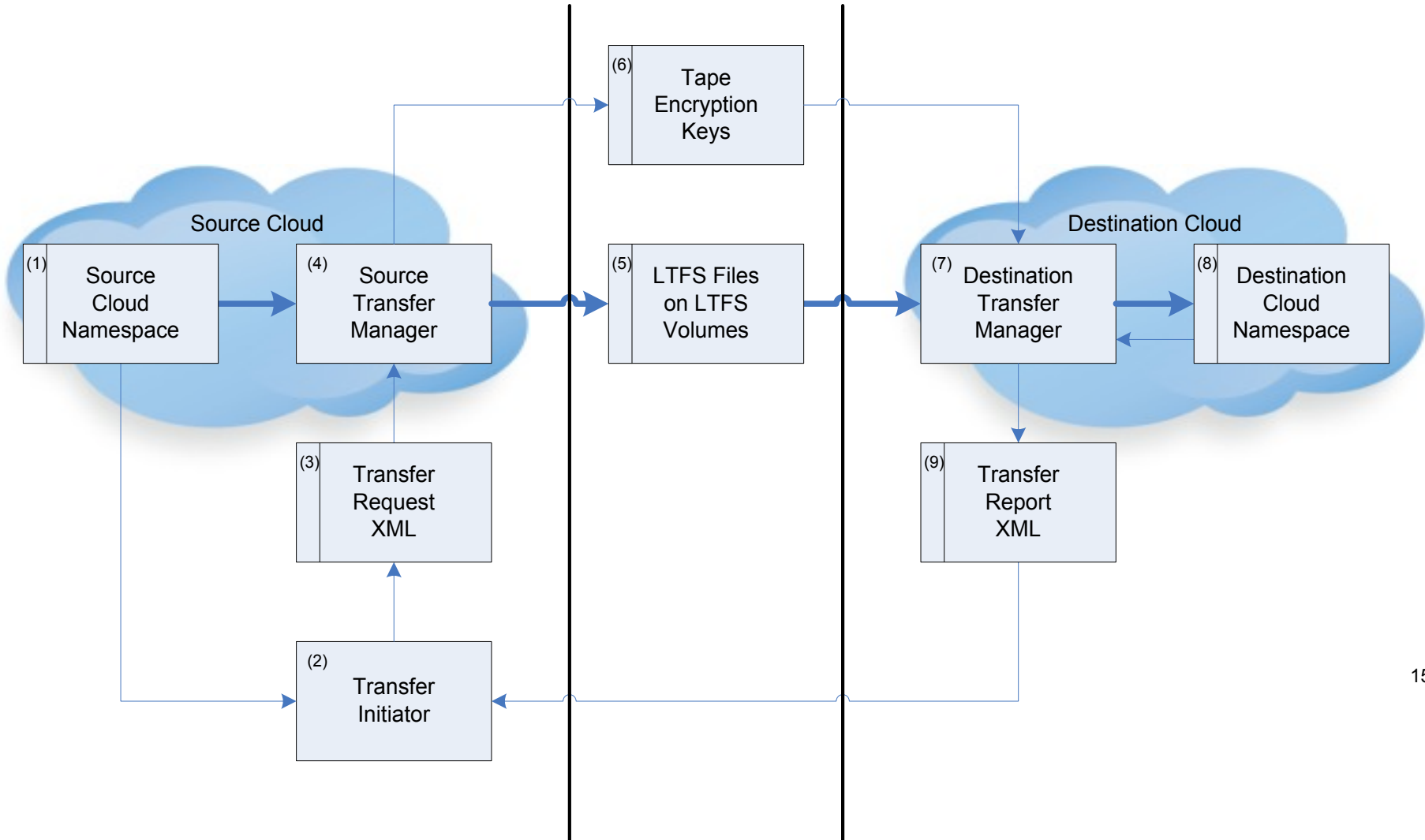

(1) Source Filesystem

(4) Source Transfer Manager

(5) LTFS Files on LTFS Volumes

(6) Destination Transfer Manager

(7) Destination Filesystem

(3) Transfer Request XML

OR

(8) Transfer Report XML

(2) Transfer Initiator

Enterprise to Cloud Bulk Transfer Use Cases

Cloud to Enterprise Bulk Retrieval Use Cases

Requesting Entity

Source Cloud

(7) Destination Filesystem

(6) Destination Transfer Manager

(5) LTFS Files on LTFS Volumes

(3) Source Transfer Manager

(1) Source Cloud Namespace

(8) Transfer Report XML

(4) Transfer Request XML

(2) Transfer Initiator

Cloud to Cloud Bulk Transfer Use Cases

Brokered Cloud to Cloud Bulk Transfer Use Cases
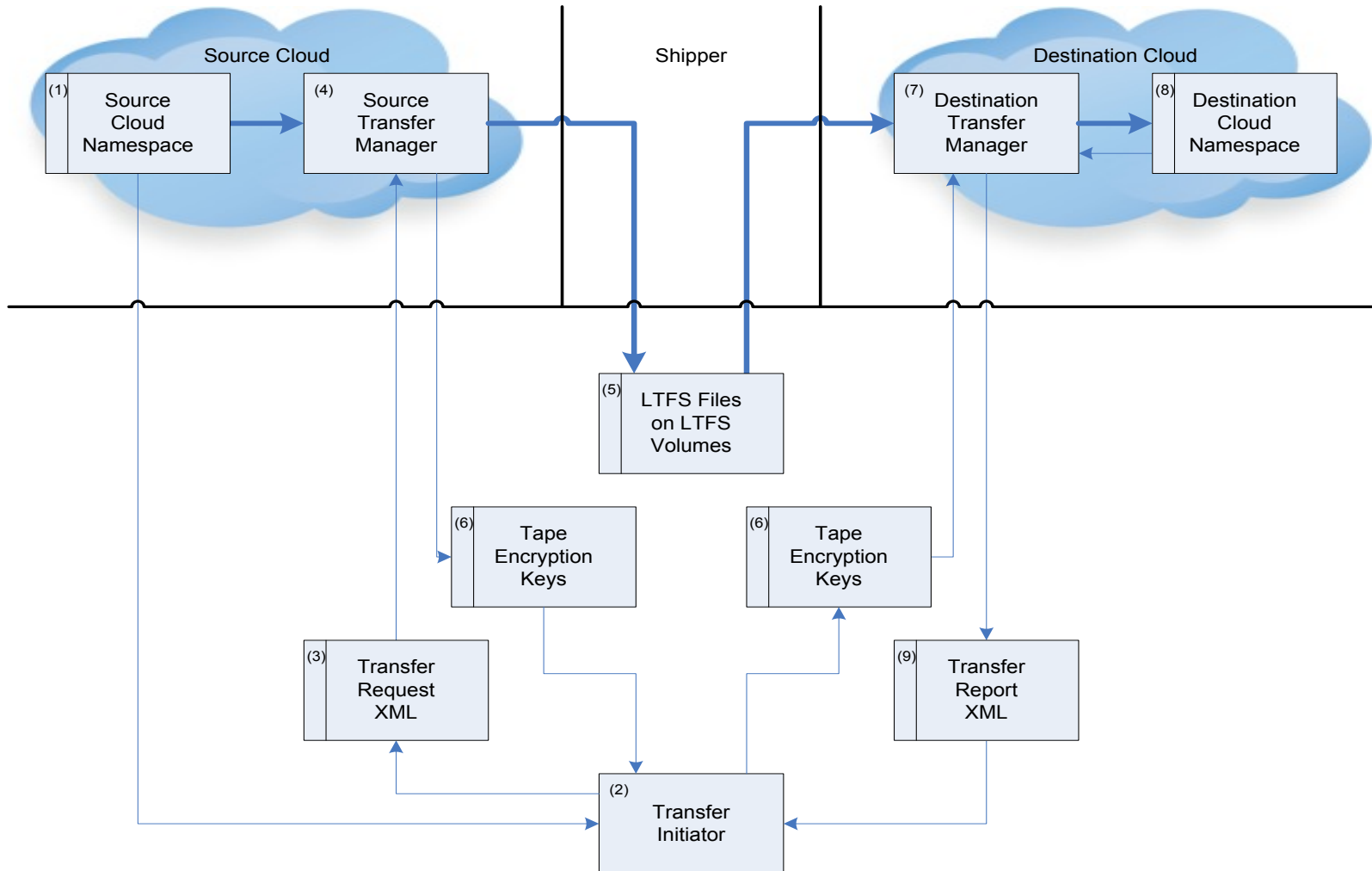
LTFS Bulk Transfer Standard Error handling and Recovery

◆ **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

Other SNIA-CSI Webcasts

- Check out on-demand Webcasts from this Cloud Developers' Tutorial Series:
- Introducing CDMI 1.1
- OpenStack Cloud Storage
- OpenStack Manila
  - http://www.snia.org/forum/csi/knowledge/webcasts
- Upcoming CSI Webcasts:
- Hybrid Clouds: Bridging Private & Public Cloud Infrastructures – March 18 https://www.brighttalk.com/webcast/663/143055

After This Webcast

- The LTFS Specification can be found at:
  http://www.snia.org/tech_activities/standards/curr_standards/ltfs

- This webcast and a copy of the slides will be posted to the SNIA-CSI website and available on-demand
  - http://www.snia.org/forum/csi/knowledge/webcasts

- A full Q&A from this webcast, including answers to questions we couldn't get to today, will be posted to the SNIA-CSI blog
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Conclusion

Questions

Conclusion

Thank You