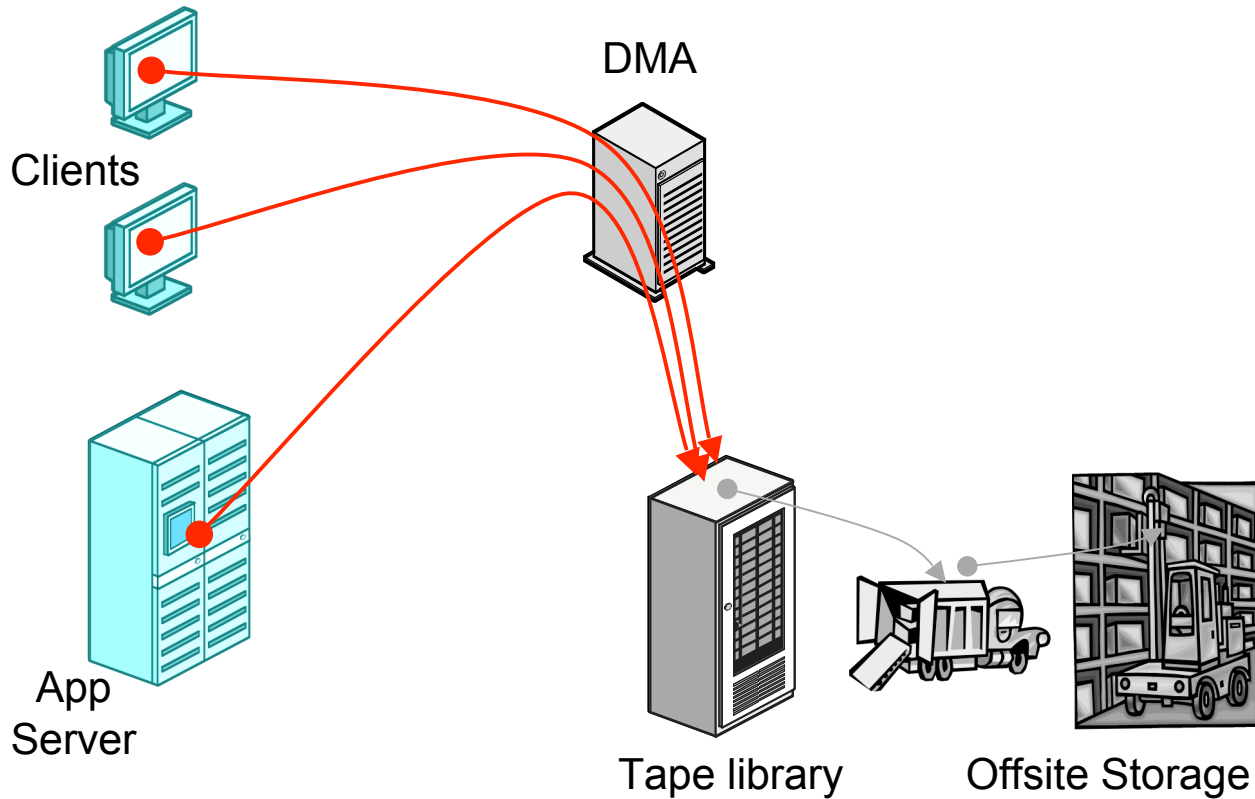# Using the NDMP File Service for DMA-Driven Replication for Disaster Recovery

Hugo Patterson
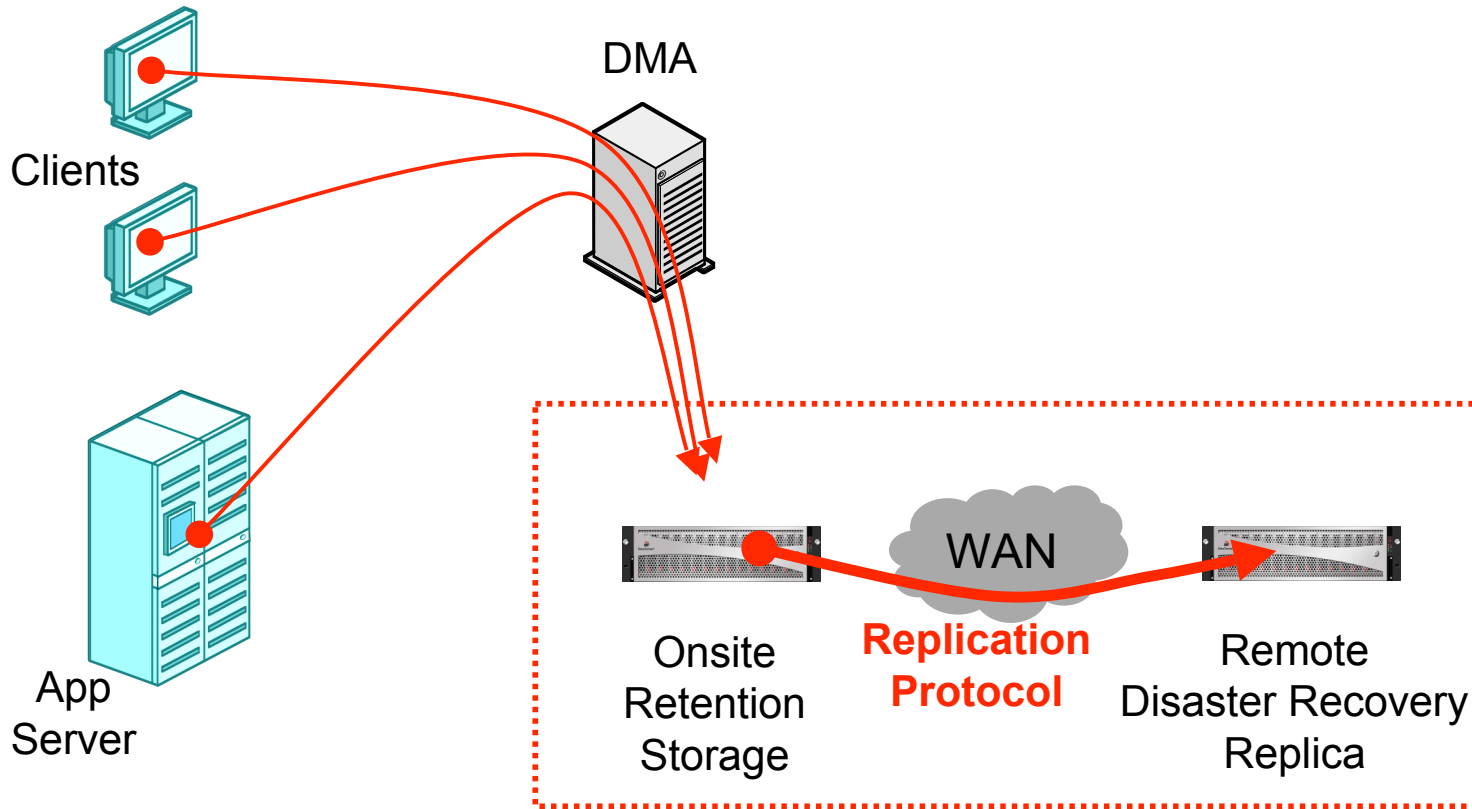
Data Protection Today

Clients

DMA

App Server

Tape library

Offsite Storage

- **Backup to tape**
- **Put tapes on a truck to get data offsite**
- **Problems: too much tape; not automated**

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Next Gen: D2D and replication for DR

DMA

Clients

App
Server

Onsite
Retention
Storage

WAN

**Replication
Protocol**

Remote
Disaster Recovery
Replica

- **Backup to disk (file or VTL)**
- **Capacity Optimized Replication to get data offsite**
- **Benefits: recover from disk; fully automated**

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Replication for remote office data consolidation
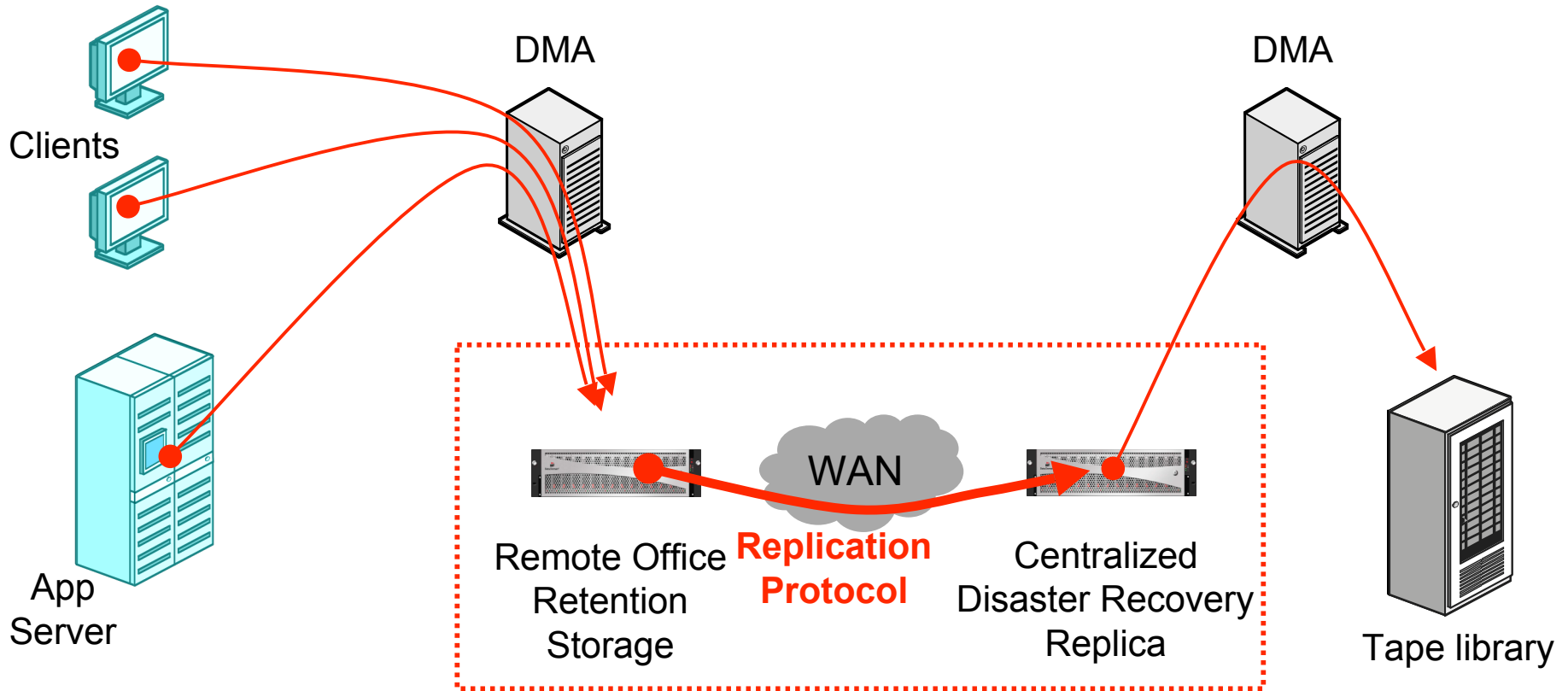
- **Backup to disk at remote site**
- **Replication to consolidated data center**
- **Make archive tapes at data center**

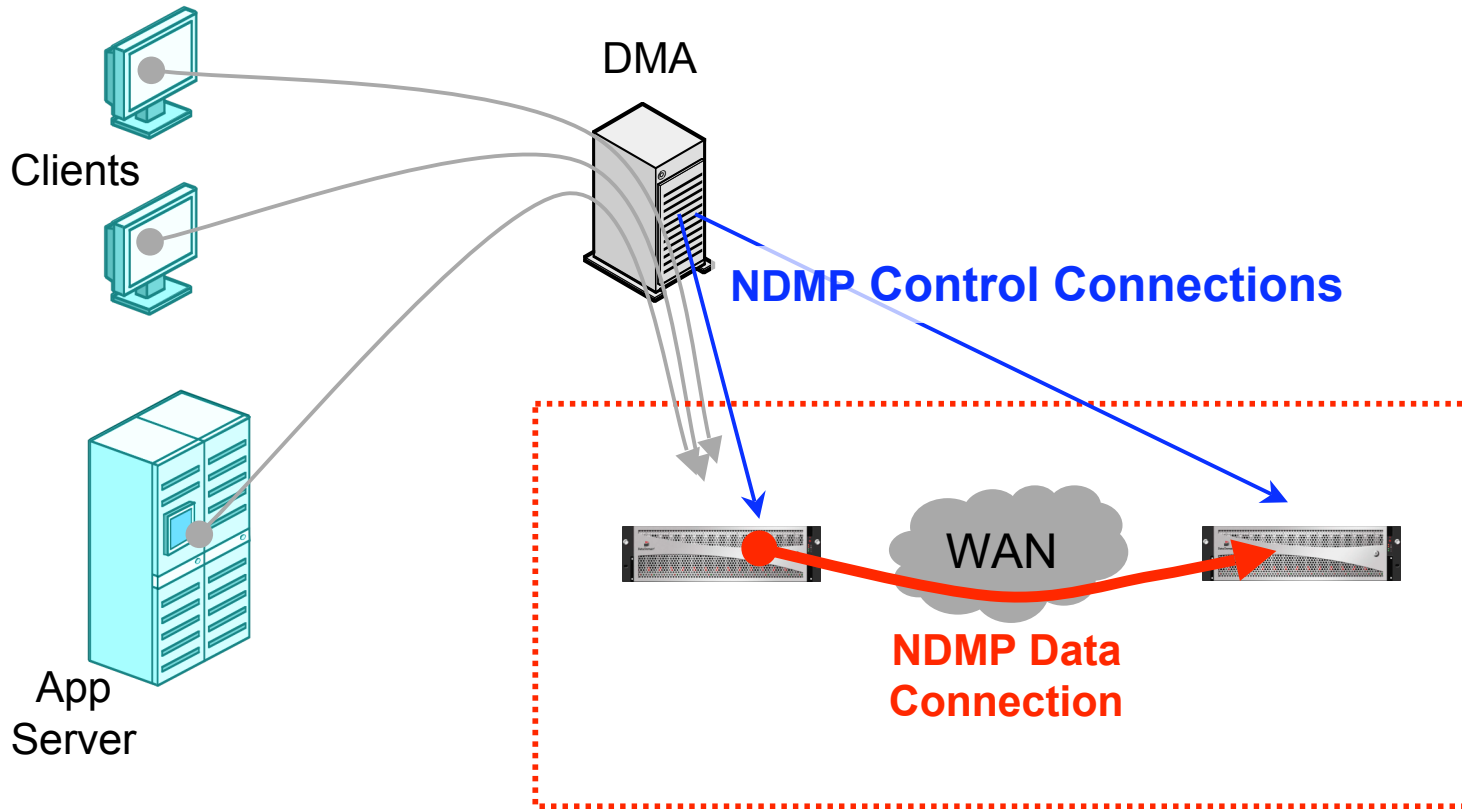Data Domain™

Problems with replication

- **DMA is unaware of replication**
  - Doesn't know there are two copies of backup
  - Unaware replication is done and copy-to-tape can start
- **No support for selective replication**
  - Storage system doesn't know what's in a backup
  - Can't replicate Exchange but not home directories
- **No support for different retention periods**
  - DMA delete on originator results in delete on replica
- **User must manage via both DMA and storage system**
  - No single pane of glass to manage the whole process

Solution: DMA-driven data copies

- **Let DMA drive whole remote replication process**
  - DMA initiates replication of individual backup images
  - DAM manages the two copies separately
- **DMA can:**
  - catalog replica copy since it creates it
  - drive copy to tape since it knows when replication completes
  - replicate only those backups the user wants to replicate
  - expire originator and replica copies at different times
- **User can manage backup and DR replication via DMA**
  - Set replication and retention periods as part of configuring a backup policy

What API could DMA use?

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NDMP for DMA-driven data copies

Clients

DMA

NDMP Control Connections

WAN

NDMP Data Connection

App Server

- Backup to disk as usual (file or VTL)
- DMA uses NDMP to send backup image offsite
- Need extension to send data using capacity optimization

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How to specify optimized data connection?

- **Use NDMP_ADDR_FC as connection type**
  - Pros: works with v3 Tape Service; easy to implement
  - Con: it's a hack; not flexible
- **NDMPv4 Data Connection Attributes Extension**
  - 3 messages:
    - NDMP_DCA_GET_SUPPORTED_ATTRS
    - NDMP_DCA_SET_ATTRS
    - NDMP_DCA_GET_ATTRS
  - Connection attr types
    - NDMP_DCA_STREAM
    - NDMP_DCA_GZIP_STREAM
    - NDMP_DCA_PROPRIETARY_x

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# NDMPv4 Data Connection Attributes Extension Overview

- **useful for movers, data servers, or file servers**
  - Not linked to File Service Extension
- **Use NDMP_DCA_GET_SUPPORTED_ATTRS to determine server's supported attributes**
- **use NDMP_DCA_SET_ATTRS just prior to appropriate LISTEN or CONNECT message to the server**
- **use NDMP_DCA_GET_ATTRS to fetch server's currently active attributes**
- **an extensible extension**
  - Standard and proprietary attrs are supported
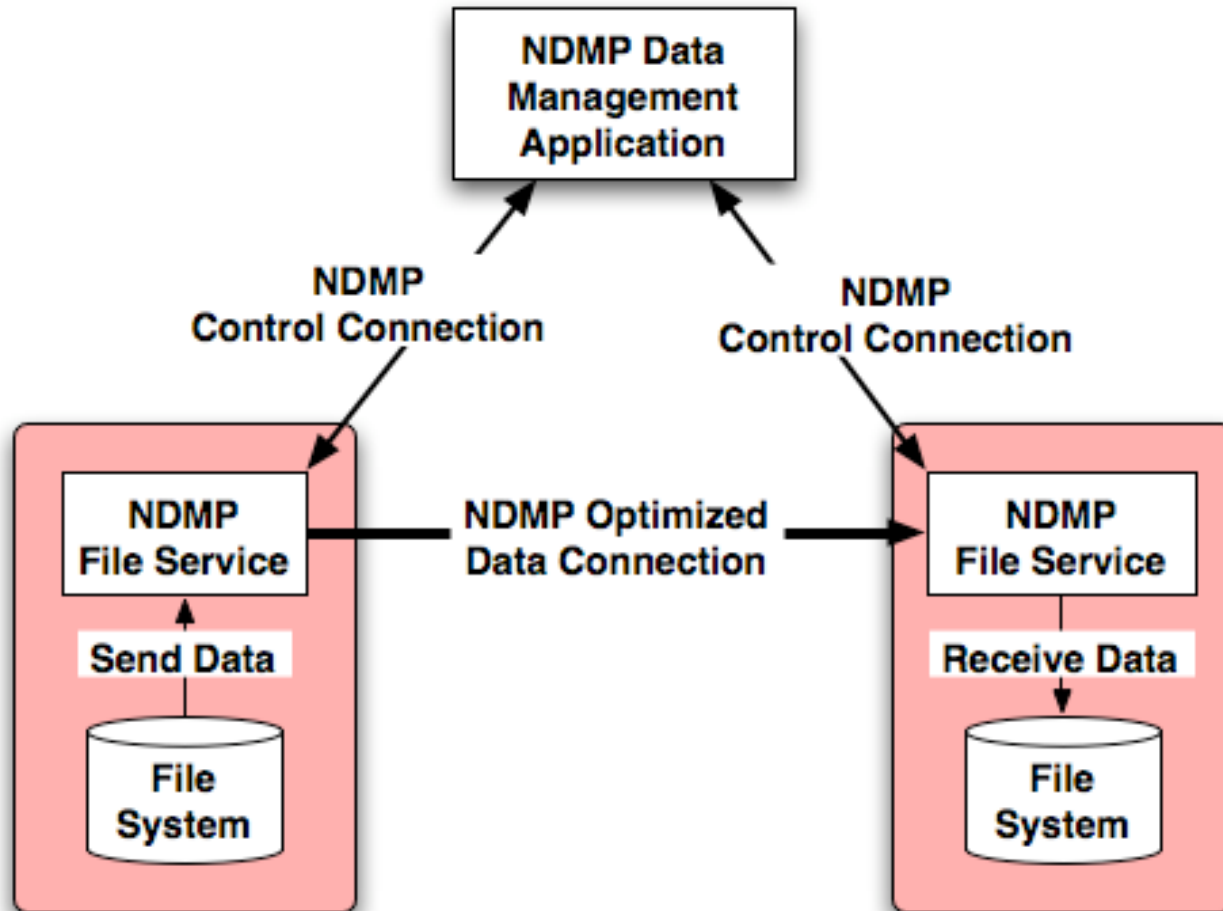
VTL to VTL optimized data copy
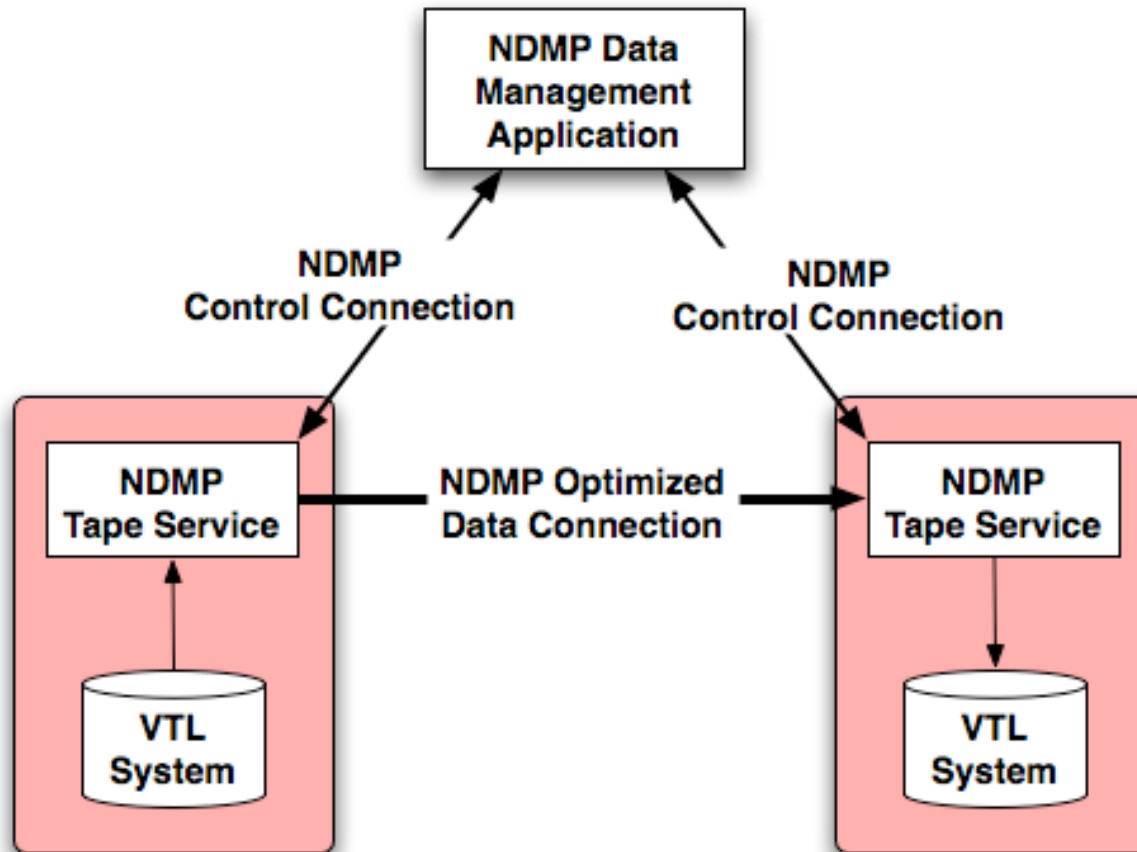
- **Tapes could have been written by DMA or via NDMP**

NDMP File Service Review
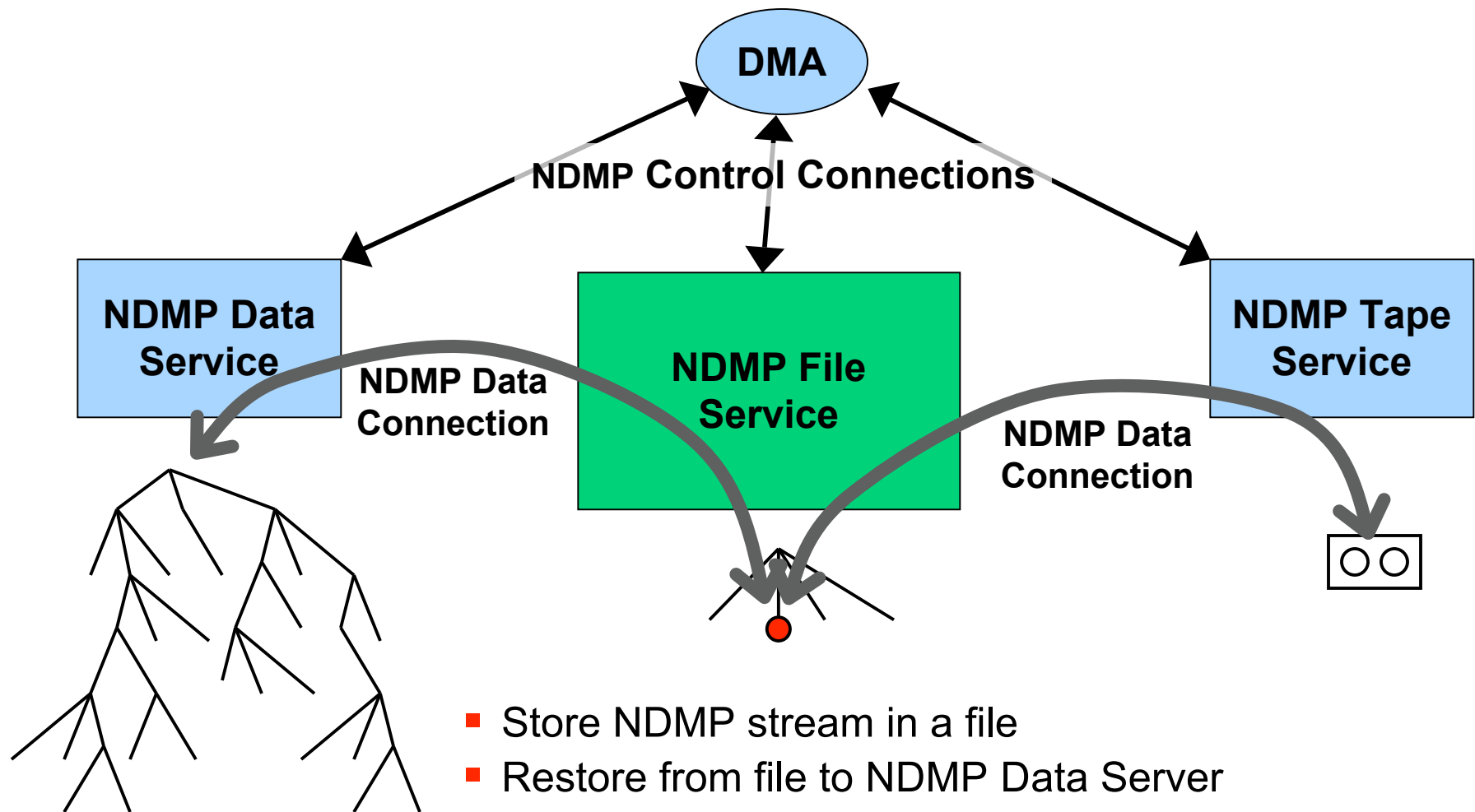
- Store NDMP stream in a file
- Restore from file to NDMP Data Server
- Copy to an NDMP Tape Server later
- See http://sourceforge.net/projects/ndmfs for spec

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File to File optimized data copy

- **Files could have been created with or without NDMP**

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Summary

- **Capacity Optimized Replication gets data offsite efficiently**
- **Storage-level replication is not integrated with DMA**
- **DMA should drive capacity-optimized copy of individual backup images**
  - Single management interface
  - Backup policy can set remote copy and retention periods
- **NDMP is a natural fit as the API for optimized copy**
- **NDMP Data Connection Attributes extension enables DMA control of the capacity-optimized copies**

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