Implementing Oracle's StorageTek Cross TapePlex Replication (Or Not)

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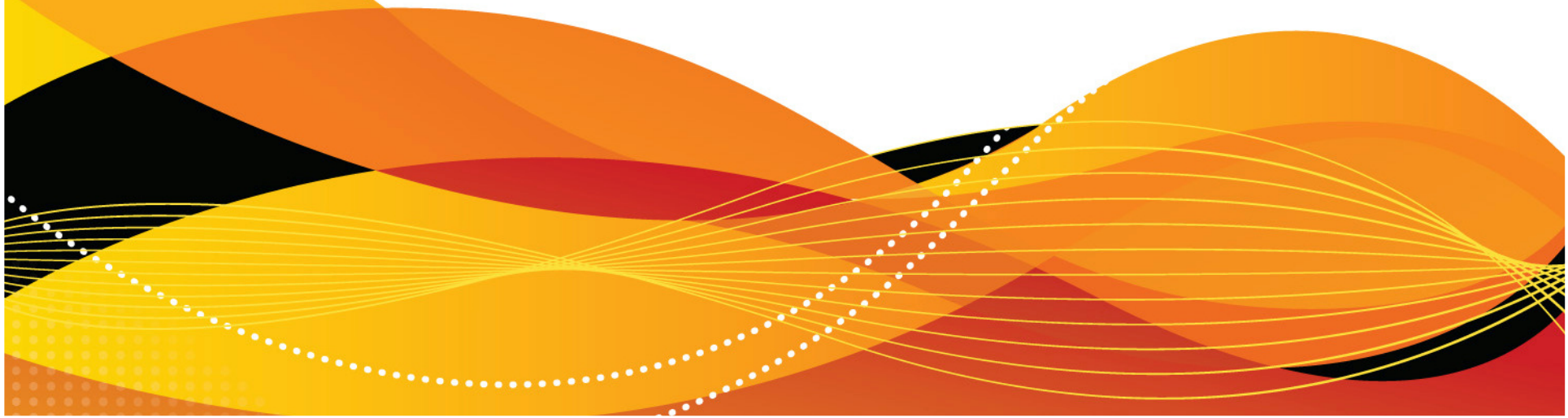
Oracle Corporation

Wednesday, August 10, 2011: 3:00 PM-4:00 PM
Session 09898



Agenda

- Some Terms I'll Be Using…
- VOLPARM/POOLPARM
- Why and Why Not
- CTR Unidirectional Configuration
  - Normal Operations
  - Complete Loss of TapePlex A
- Software Implementation Requirements
  - Uni-directional CTR Statements
  - Bi-directional CTR Statements
- Cross TapePlex Auto Recall
- DR Testing
- Requirements for CTR
- **Bonus Material**
  - VOLPARM/POOLPARM Conversion & Examples
  - How CTR pools work
  - EEXPORT Example

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Some Terms I'll Be Using…

- CDRT: Concurrent DR Test Software
- Clustered VTSS: Two or more VTSSs clustered together
- CTR: Cross-TapePlex Replication
- PTAM: Pickup Truck Access Method
- STK: StorageTek
- VSM: Virtual Storage Manager
- CDS: Control Data Set
- HSC: Host Software Component
- SMC: Storage Management Component; the interface between z/OS & Oracle STK real & virtual tape
- VTCS: The VSM software
- VTSS: The VSM hardware
- SL8500: Enterprise auto library

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Use VOLPARM/POOLPARM

- VOLPARM and POOLPARM define MVCs and VTVs
  - POOLPARM Types:
    - SCRATCH
    - CLEAN
    - EXTERNAL
    - MVC
- The older system of defining MVCVOL, VTVVOL and pools can still be used
- Using VOLPARM/POOLPARM makes everything so much easier
- This presentation focuses on VOLPARM/POOLPARM

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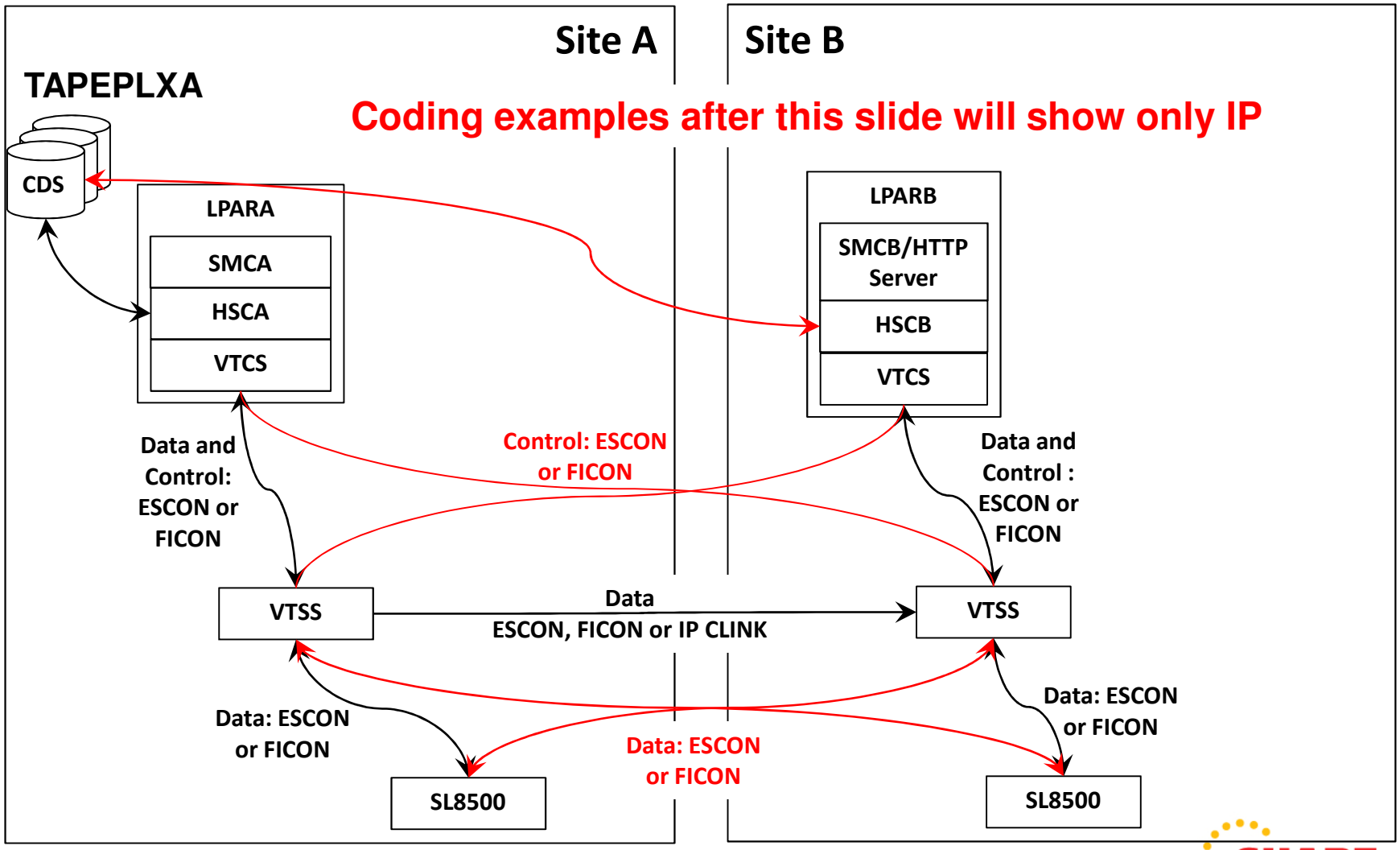
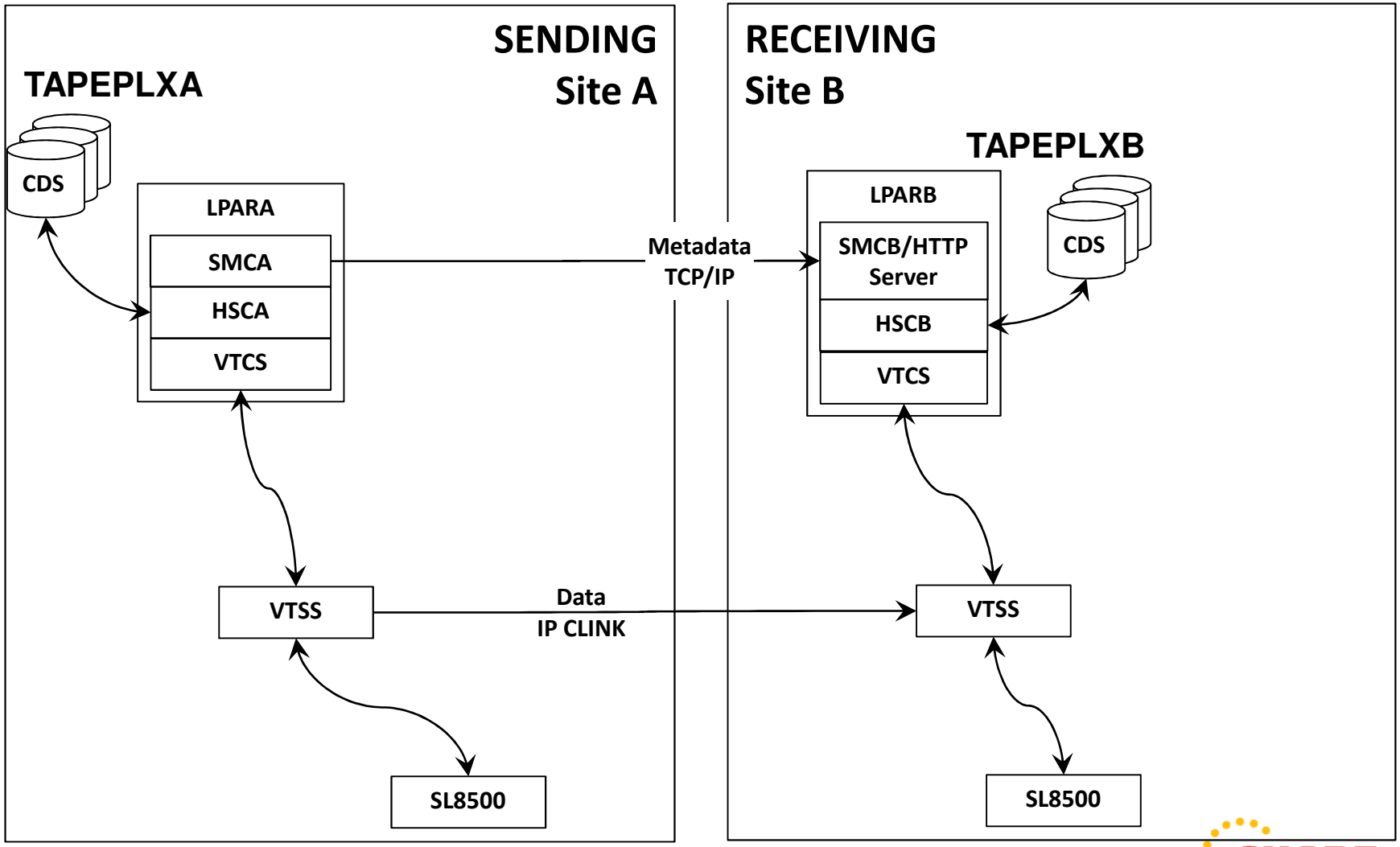
Cross-TapePlex Replication (CTR): Why?

- As an electronic replacement for Export/Import
  - Also eliminates PTAM
- Dedicated VTSS(s) not required for DR testing
- No clustered VTSS cross coupling requirement
- Allows IP only data transfer between locations
  - Oracle StorageTek products allows users to implement:
    - ESCON
    - FICON
    - IP
- Allows CDS to be “split” across two sites

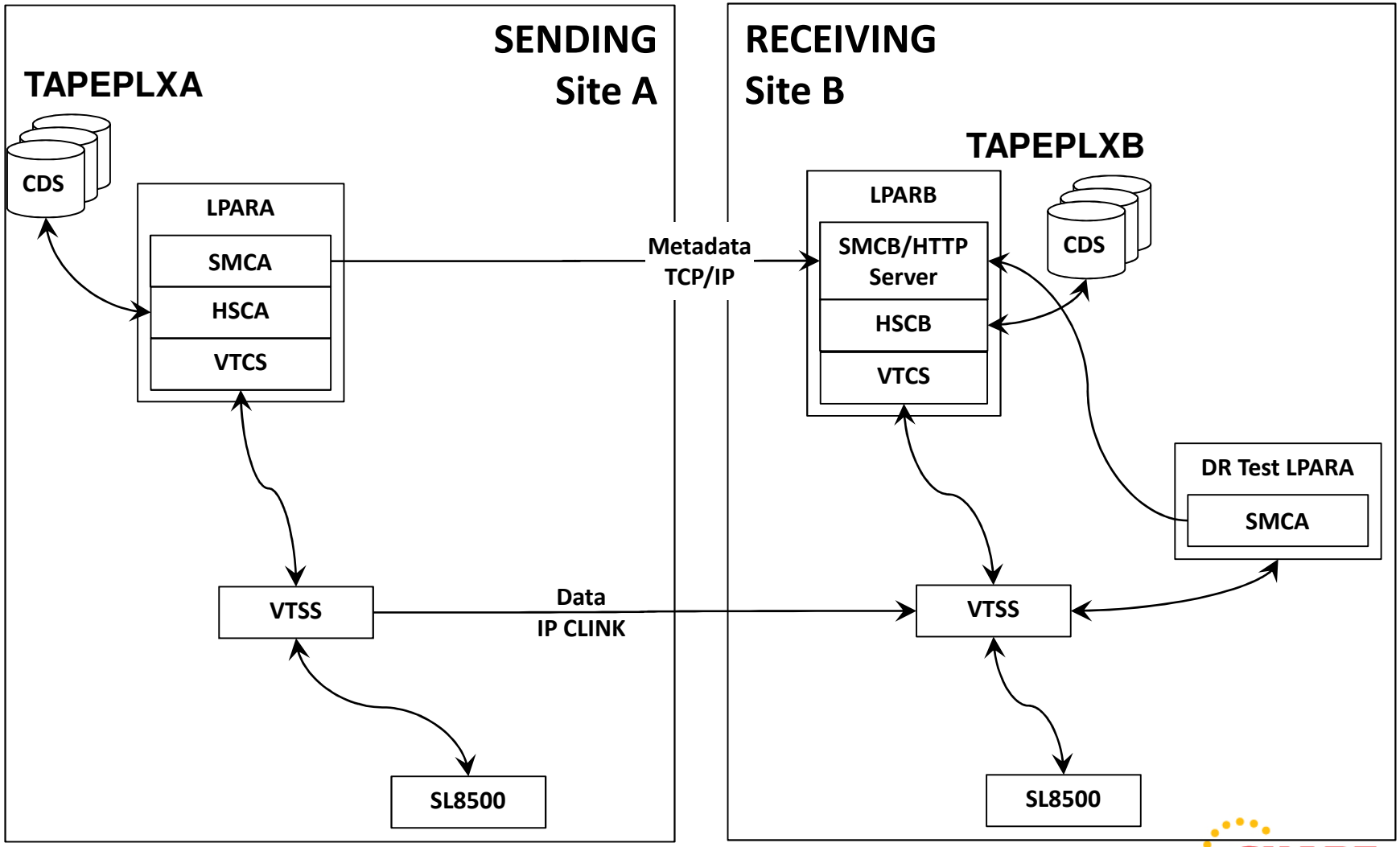
Basic Clustered VTSS Configuration



Basic Cross-TapePlex Replication Configuration



Basic Cross-TapePlex Replication Configuration With DR Test Running



Cross-TapePlex Replication: Why Not?

- Manage multiple sites, each with a CDS set

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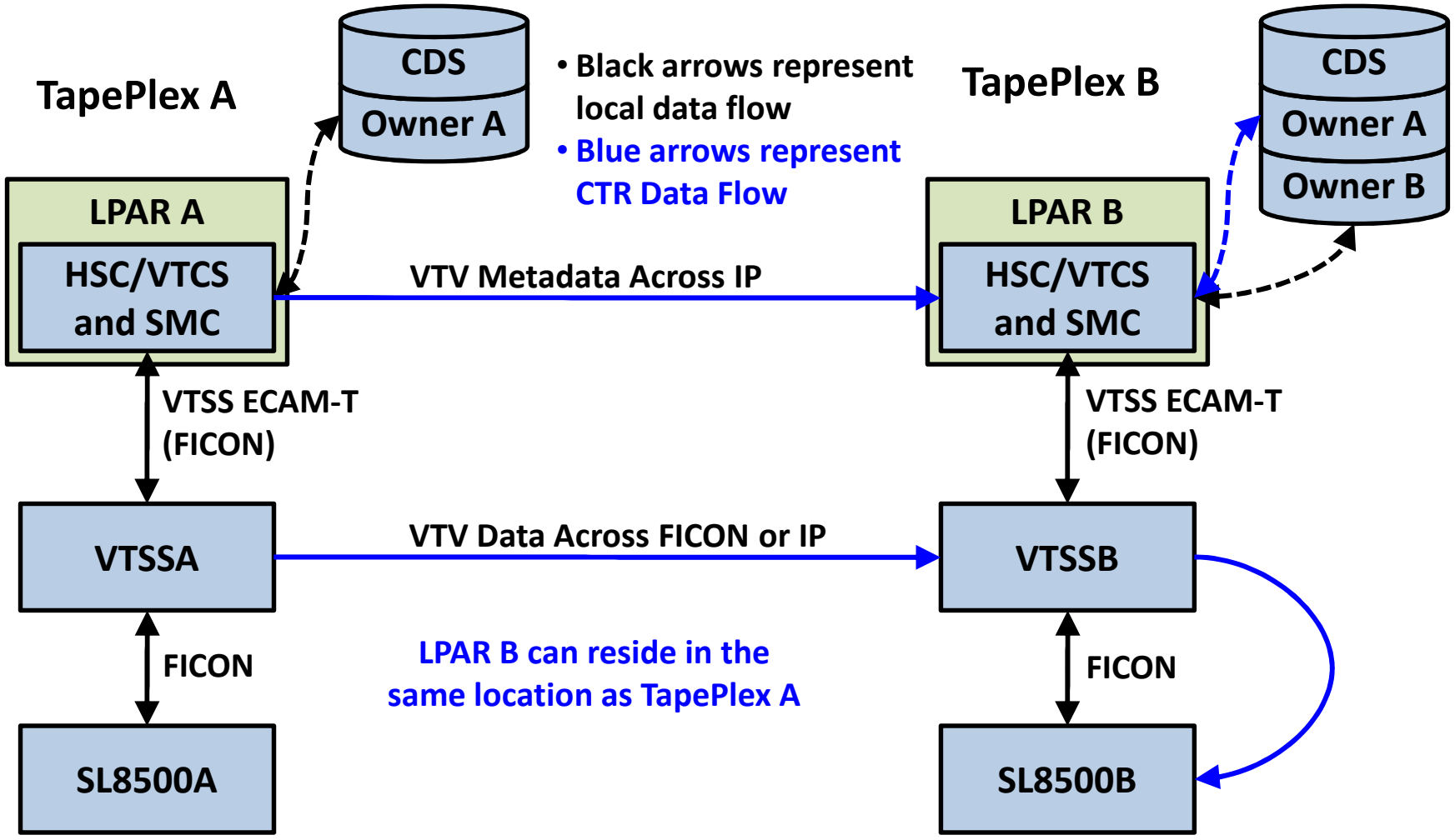
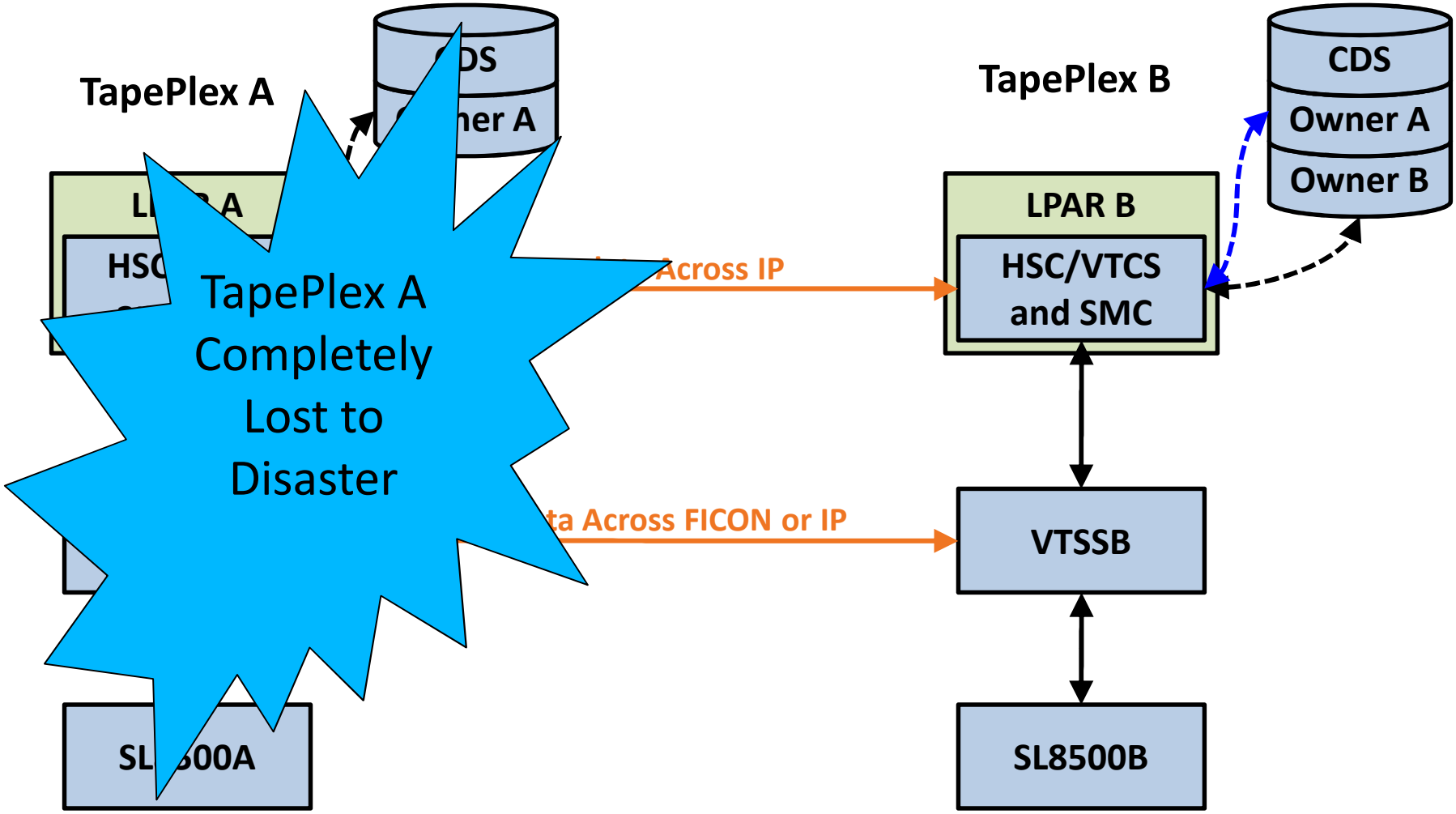
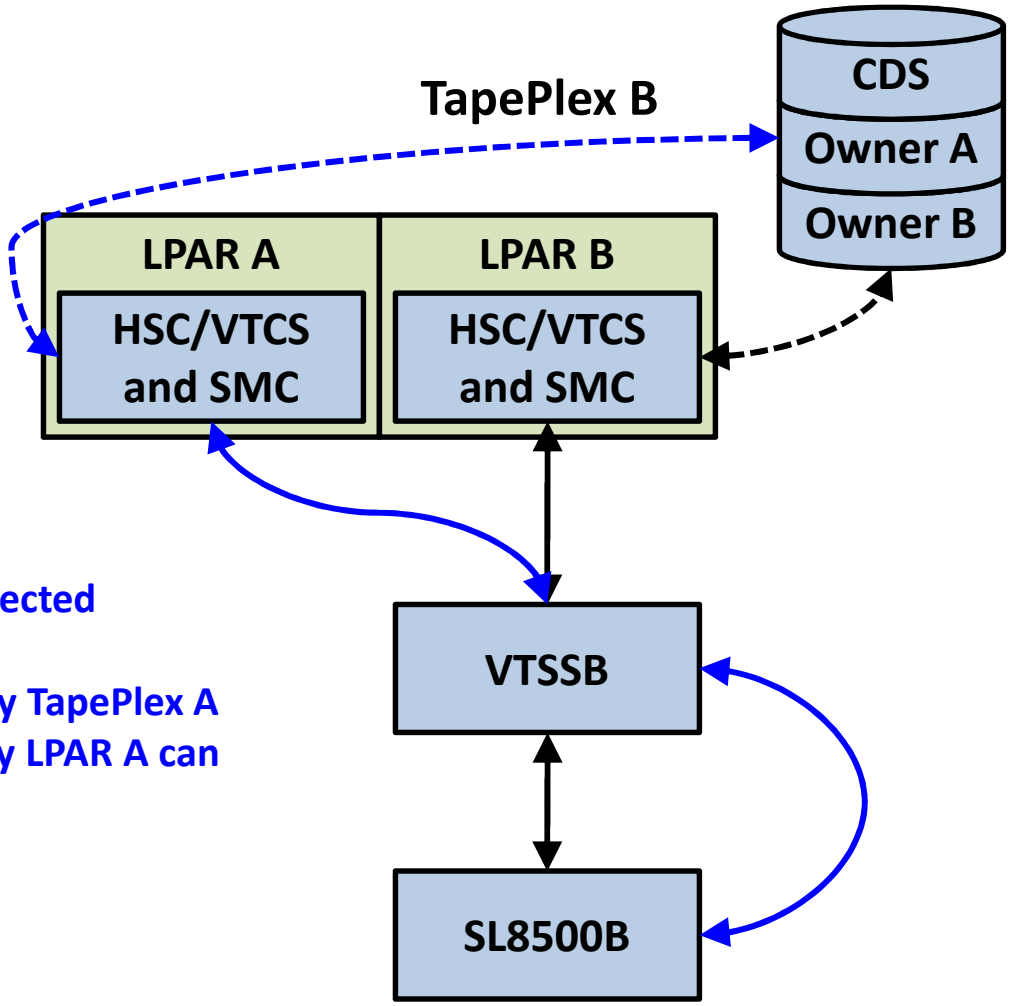
CTR Unidirectional Configuration Normal Operations



CTR Unidirectional Configuration
Complete Loss of TapePlex A



CTR Unidirectional Configuration Complete Loss of TapePlex A



1. Initially, VTVs owned by LPAR A are protected against being scratched
   - This is because they are still owned by TapePlex A
2. After a settling in period, VTVs owned by LPAR A can be changed to be owned by TapePlex B

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Software Implementation Requirements

- SMC communications
  - SMC TapePlex statement(s)
  - SERVER statement(s)
  - HTTP statement(s)
- VTCS CONFIG
  - VTCS TAPEPLEX statement(s)
  - CLINK statements
- Other Statements
  - MGMTclas statement(s)
  - STORclas statement(s)
  - VOLPARM and POOLPARM statement(s) (in bonus)

SMC Communications Sample

- This is a Uni-Directional CTR example
- These statements are coded in the SMCPARMS dataset
- These definitions allow communications between the source and target VTCSs for exported VTV metadata

TapePlex A Definitions:

```
TAPEPlex  NAme(TAPEPLXA)  ENable  LOCSUBsys(HSCA)  LOCENAble
TAPEPlex  NAme(TAPEPLXB)  Enable
SERVer  NAme(RMTSERVR)   ENable TAPEPlex(TAPEPLXB)  HOst(HSCB) POrt(32500)
```

TapePlex B Definitions:

```
TAPEPlex  NAme(TAPEPLXB)  ENable  LOCSUBsys(HSCB)  LOCENAble
HTTP  START POrt(32500)
```

SMC Communications Sample

- This is a Bi-Directional CTR example
- These statements are coded in the SMCPARMS dataset
- These definitions allow communications between the source and target VTCSs for exported VTV metadata

TapePlex A Definitions:

```
TAPEPlex  NAme(TAPEPLXA)  ENable  LOCSUBsys(HSCA)  LOCENAble
TAPEPlex  NAme(TAPEPLXB)  Enable
SERVer  NAme(RMTSERVR)   ENable TAPEPlex(TAPEPLXB)  HOst(HSCB) POrt(32500)
HTTP  START POrt(32500)
```

TapePlex B Definitions:

```
TAPEPlex  NAme(TAPEPLXB)  ENable  LOCSUBsys(HSCB)  LOCENAble
TAPEPlex  NAme(TAPEPLXA)  Enable
SERVer  NAme(PRDSERVR)   ENable TAPEPlex(TAPEPLXA)  HOst(HSCA) POrt(32500)
HTTP  START POrt(32500)
```

VTCS CONFIG Example

Code RECVPLEX on the sending TapePlex to ensure you can get VTVs back from the remote site

- This is a Uni-Directional CTR example
- These statements are coded in the VTCS CONFIG used to format the CDS
- These statements define how CTR is configured in this environment
- Blue statements (and the red one) are new for CTR

TapePlex A VTCS CONFIG Definitions:

```
TAPEPLEX  THISPLEX=TAPEPLXA  RECVPLEX=TAPEPLXB
VTSS  NAME=VTSSA  LOW=75  HIGH=80  MAXMIG=8  MINMIG=1  RETAIN=10
CLINK VTSS=VTSSA   IPIF=0A:3  REMPLEX=TAPEPLXB  PARTNER=VTSSB
```

TapePlex B VTCS CONFIG Definitions:

```
TAPEPLEX  THISPLEX=TAPEPLXB  RECVPLEX=TAPEPLXA
VTSS  NAME=VTSSB  LOW=75  HIGH=80  MAXMIG=8  MINMIG=1  RETAIN=10
CLINK VTSS=VTSSB IPIF=0A:3  REMPLEX=TAPEPLXA  PARTNER=VTSSA
```

ALSO, although the CLINK in red font is only required for bi-directional data flow, if data is going to be CTR auto recalled from the remote site, both the RECVPLAX from the remote site as well as this reverse direction CLINK statement are required

VTCS CONFIG Example

- This is a Bi-Directional CTR example
- These statements are coded in the VTCS CONFIG used to format the CDS
- These statements define how CTR is configured in this environment
- Red statement shows statement added for Bi-Directional CTR

TapePlex A VTCS CONFIG Definitions:

```
TAPEPLEX  THISPLEX=TAPEPLXA  RECVPLEX=TAPEPLXB
VTSS  NAME=VTSSA  LOW=75  HIGH=80  MAXMIG=8  MINMIG=1  RETAIN=10
CLINK VTSS=VTSSA   IPIF=0A:3  REMPLEX=TAPEPLXB  PARTNER=VTSSB
```

TapePlex B VTCS CONFIG Definitions:

```
TAPEPLEX  THISPLEX=TAPEPLXB  RECVPLEX=TAPEPLXA
VTSS  NAME=VTSSB  LOW=75  HIGH=80  MAXMIG=8  MINMIG=1  RETAIN=10
CLINK VTSS=VTSSB   IPIF=0A:3  REMPLEX=TAPEPLXA  PARTNER=VTSSA
```

MGMTclas and STORclas Example

- This is a Uni-Directional CTR example
- Blue statements/parms relate to TapePlex A
- Red statements/parms relate to TapePlex B

Can have one or two export storage classes

TapePlex A MGMTclas and STORclas Definitions:

```
MGMTclas  NAME(CTR1)  EEXpol(SCREMOT1)  MIGpol(SCPROD1,SCPROD2)
STORclas  NAME(SCREMOT1)  TAPEPLEX=TAPEPLXB
STORclas  NAME(SCPROD1)  ACS(00)
STORclas  NAME(SCPROD2) ACS(01)
```

Note that MGMTclas names must be identical

TapePlex B MGMTclas and STORclas Definitions:

```
MGMTclas  NAME(CTR1) MIGpol(SCREMOT3)
STORclas  NAME(SCREMOT3)  ACS(00)
```

ACS(00) and ACS(00) are two different ACSs in two different TapePlexes

Note that local and remote storage classes need not be the same and typically are not the same

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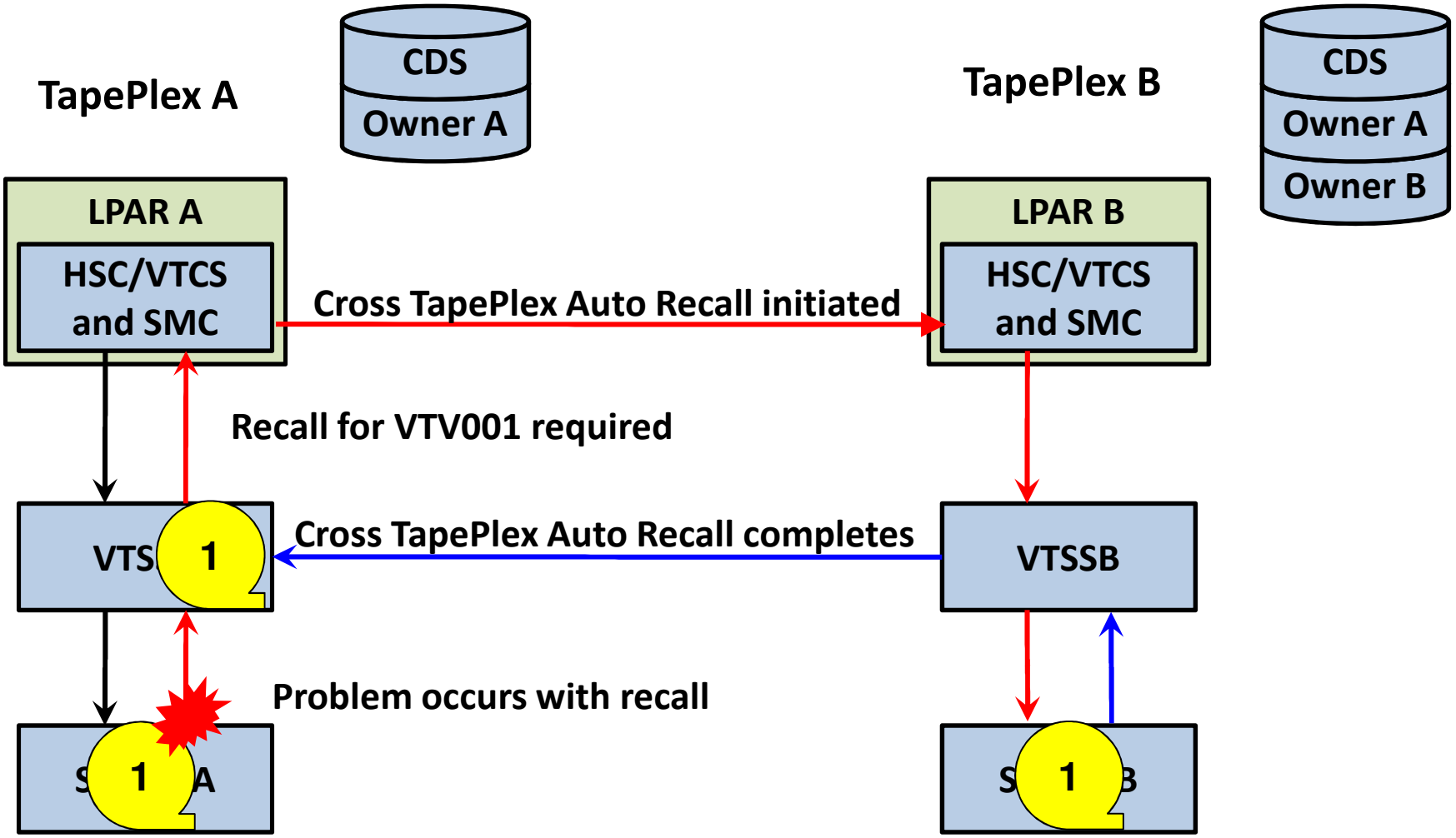
Cross TapePlex Auto Recall



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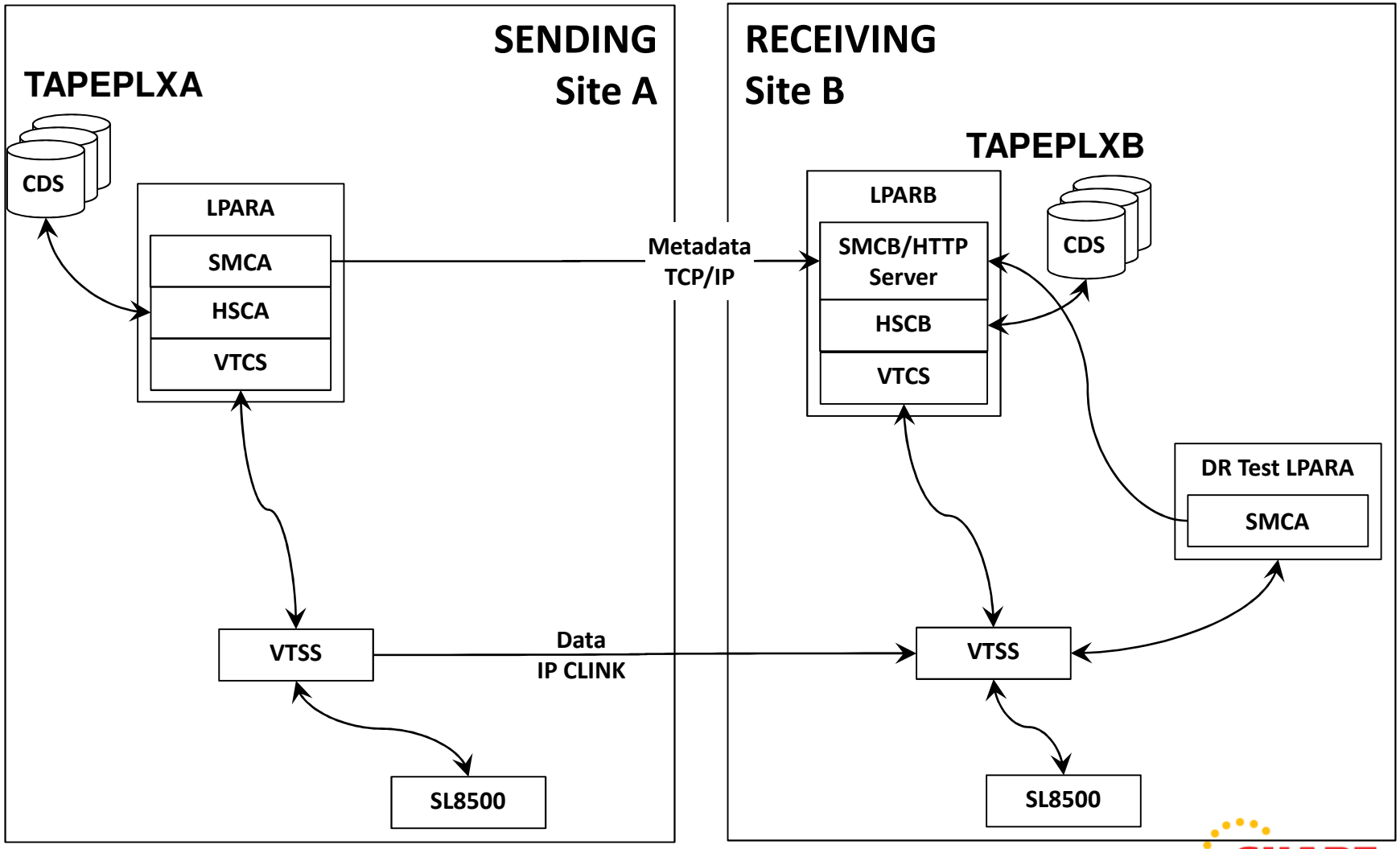
DR Testing

- CTR allows testing at the receiving site because all VTVs sent from another TapePlex are automatically protected from being overwritten
- CDRT is not **required** to use the above features
- CDRT **can be used** if the user wants to overwrite VTVs without losing the protection CTR offers

Cross-TapePlex Replication DR Testing



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Requirements for CTR

- ELS 7.0
- “G” level CDS using VTCS CONFIG CDSLEVEL(V62ABOVE)
- Clustering Feature in each VTSS
- FICON and/or ESCON cluster links directly from VTSS(s) in one TapePlex to VTSS(s) in another TapePlex
  - FICON CLINKs are uni-directional
  - IP CLINKs are bi-directional although the need to be defined as uni-directional from each VTSS
- Two or more TapePlexes
- Two or more VTSSs
- Two or more Libraries with RTDs and MVCs

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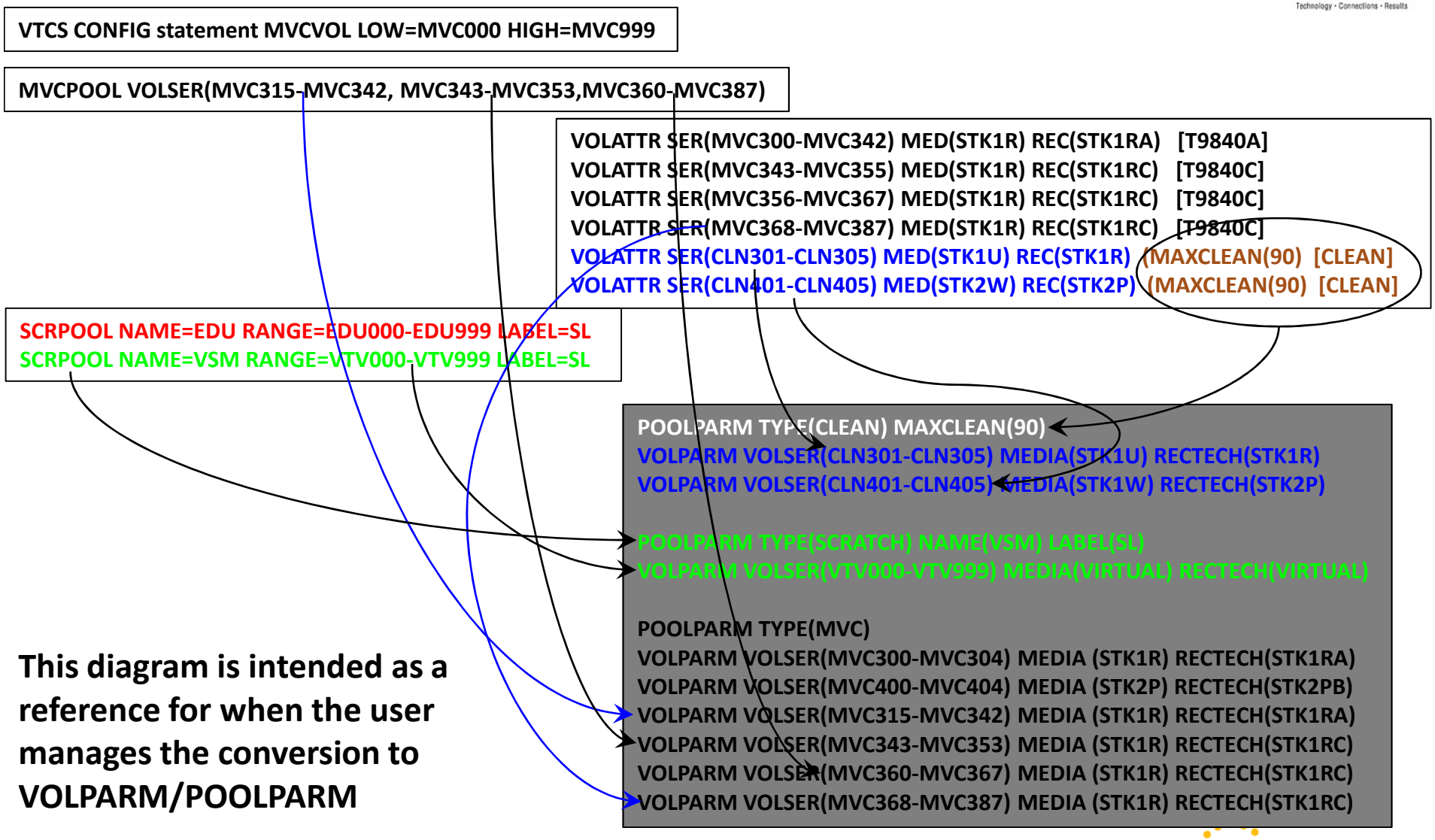
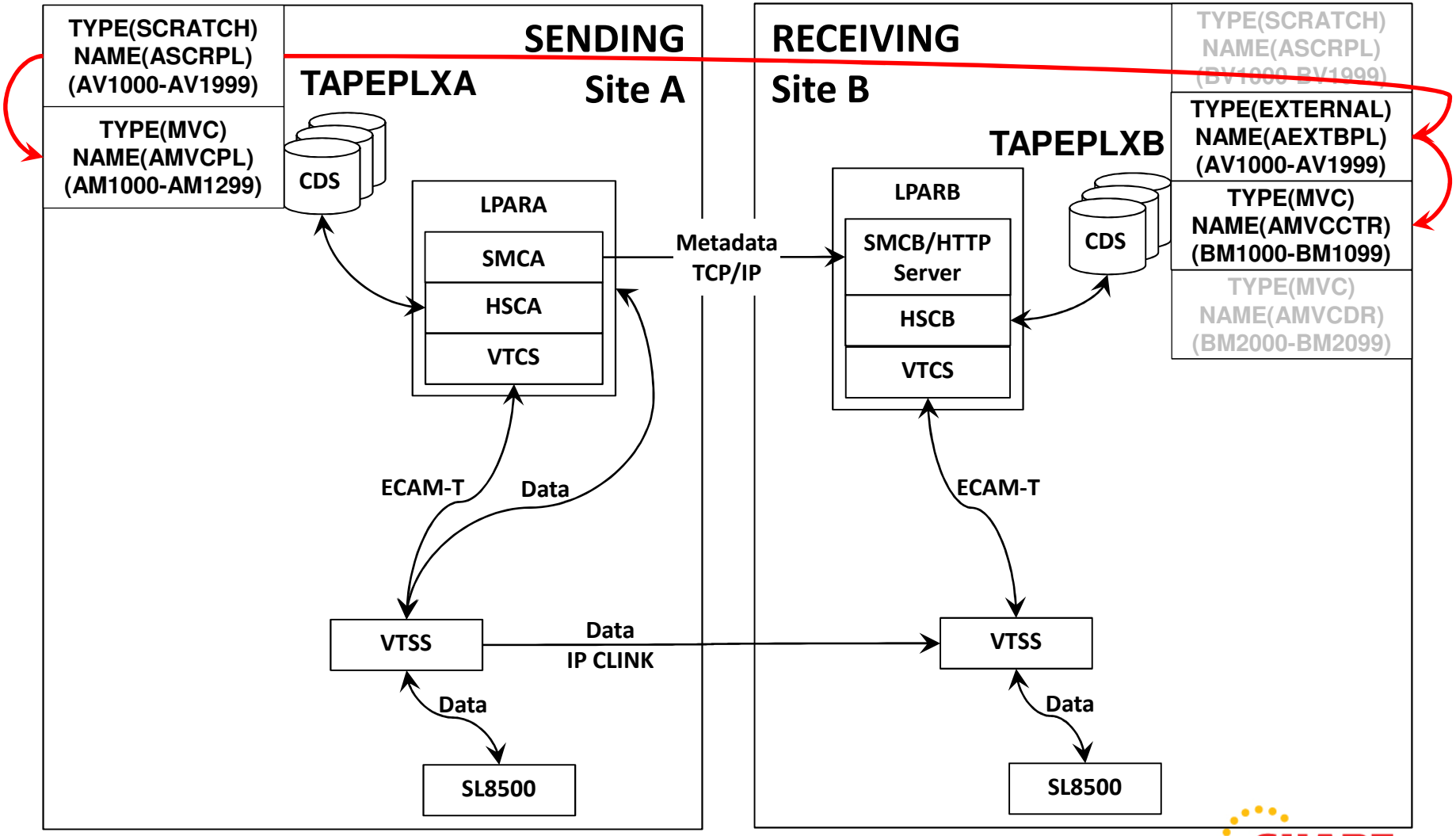
VOLPARM/POOLPARM Conversion & Examples

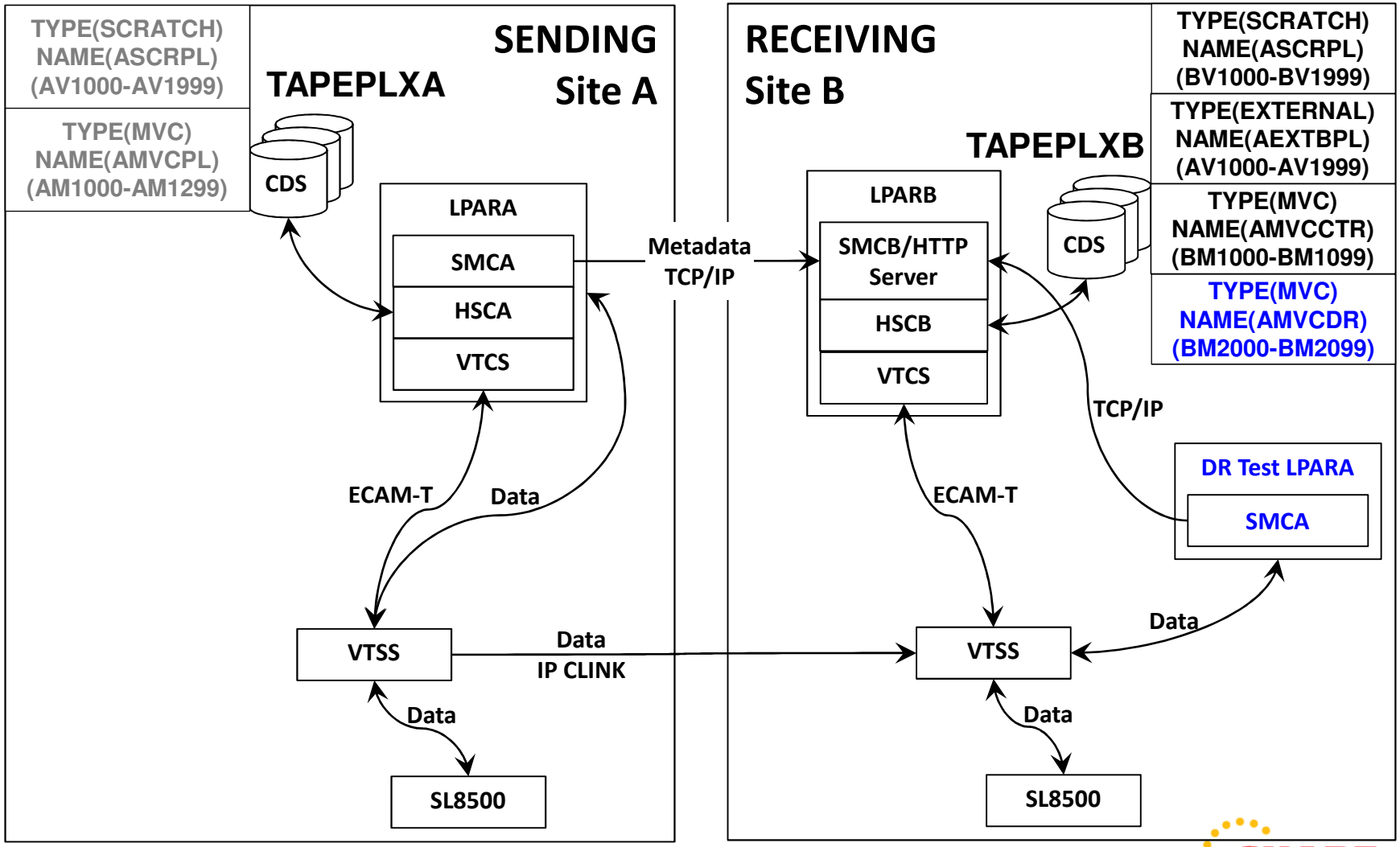


This diagram is intended as a reference for when the user manages the conversion to VOLPARM/POOLPARM

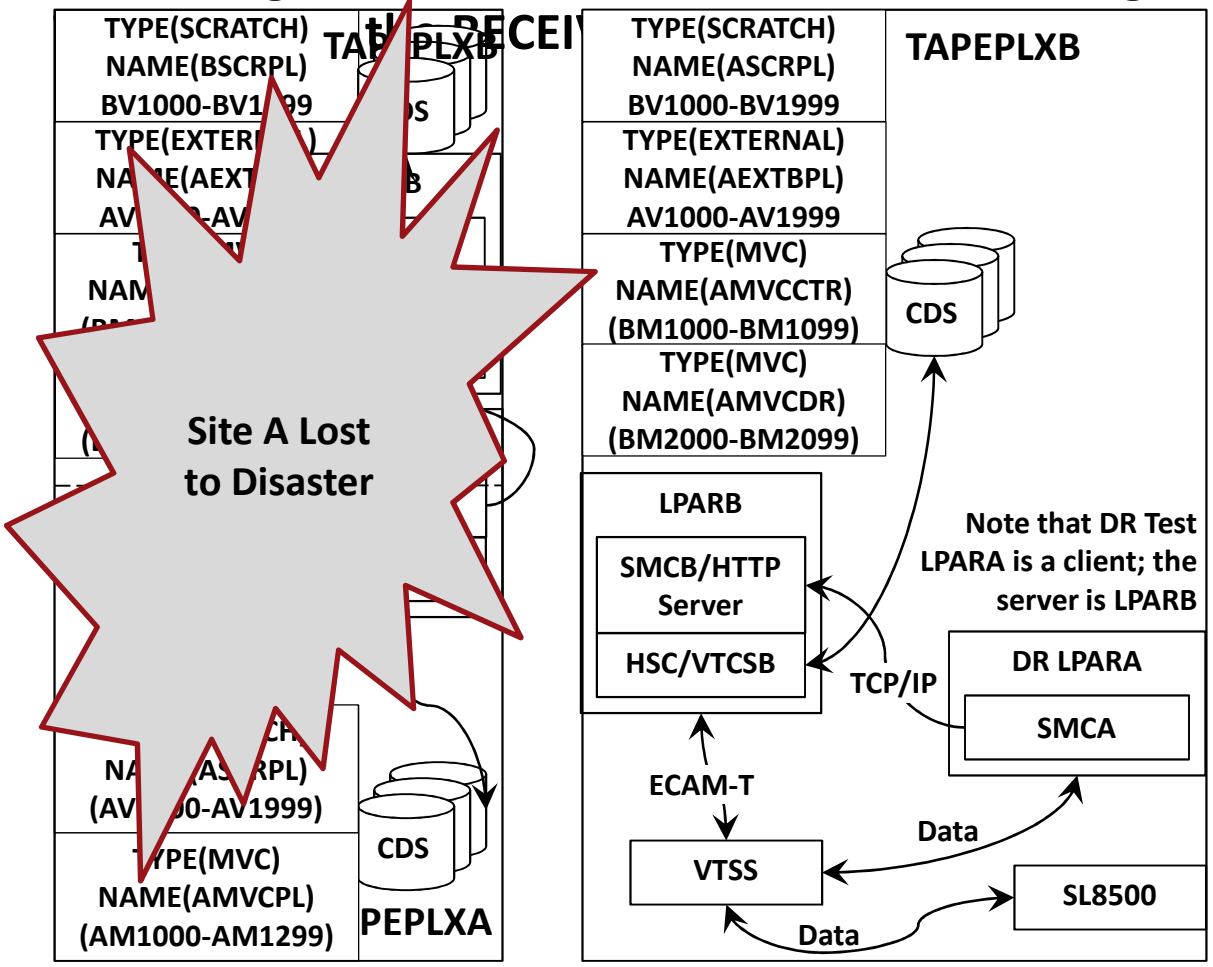
Cross-TapePlex Replication



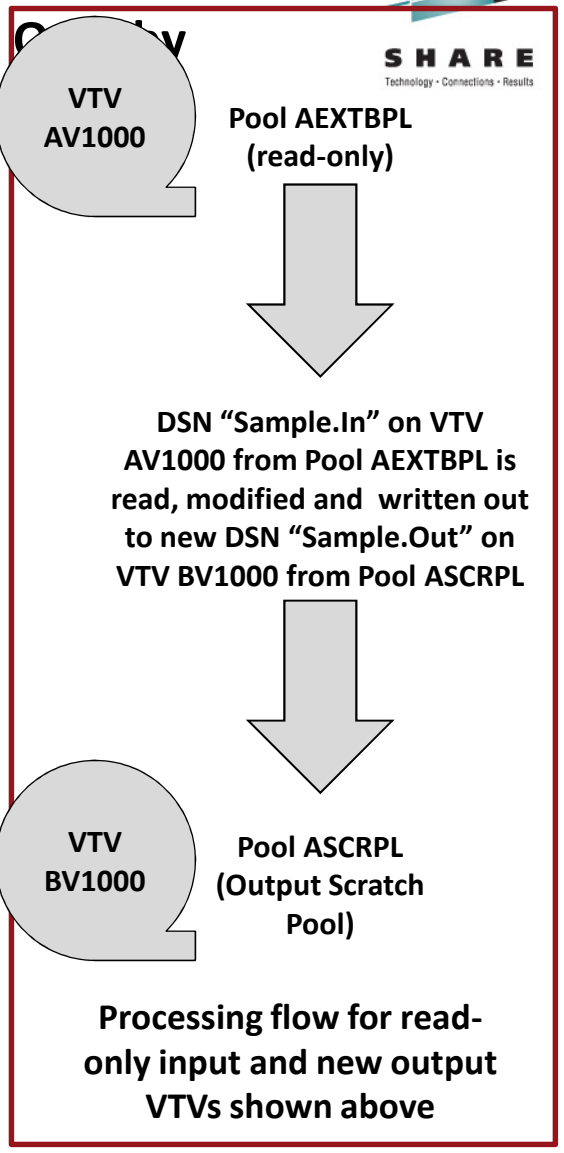
Cross-TapePlex Replication Running with DR Test



Processing After Disaster at Site A; All Processing Taken O[illegible]



Pool AEXTBPL (read-only) is left in read only state until situation has stabilized (some weeks, perhaps). After this period, Pool AEXTBPL can be changed from TYPE(EXTERNAL) and OWNRPLEX(PLEXA) to TYPE(SCRATCH) and then managed for scratch purposes by TapePlex B



EEXPORT Example

- The EEXPORT Utility is used to electronically export VTVs from one TapePlex to another

Example of returning a VTV from TapePlex B to TapePlex A because the TapePlex A copy has been lost. This command is issued on TapePlex B:

EEXPORT VTV(VTV001) TOPlex(TAPEPLXA) ULINKMVC(*volser*)

- The EEXPORT statement above will electronically export VTV001 back to TapePlex A
- Remember that running the EEXPORT in this example requires that RECVPLEX(TAPEPLXB) be specified on the TapePlex statement in TapePlex A per the note in the upper right hand corner on the previous slide
- It also requires at least one CLINK going from TapePlex B back to TapePlex A
- If (MVC) *volser* is specified on the ULINKMVC parm, it refers to the MVC copy to be deleted from the target VTVs in TapePlex A
  - If not specified, then all MVC copies of the VTV in TapePlex A are deleted
  - See also the Notes under this parm on page 304 of *STK ELS 7.0 Command, Control Statement, and Utility Reference Nov 2010 Rev AG*