

Continuity Planning & Disaster Recovery with Nonstop Technologies

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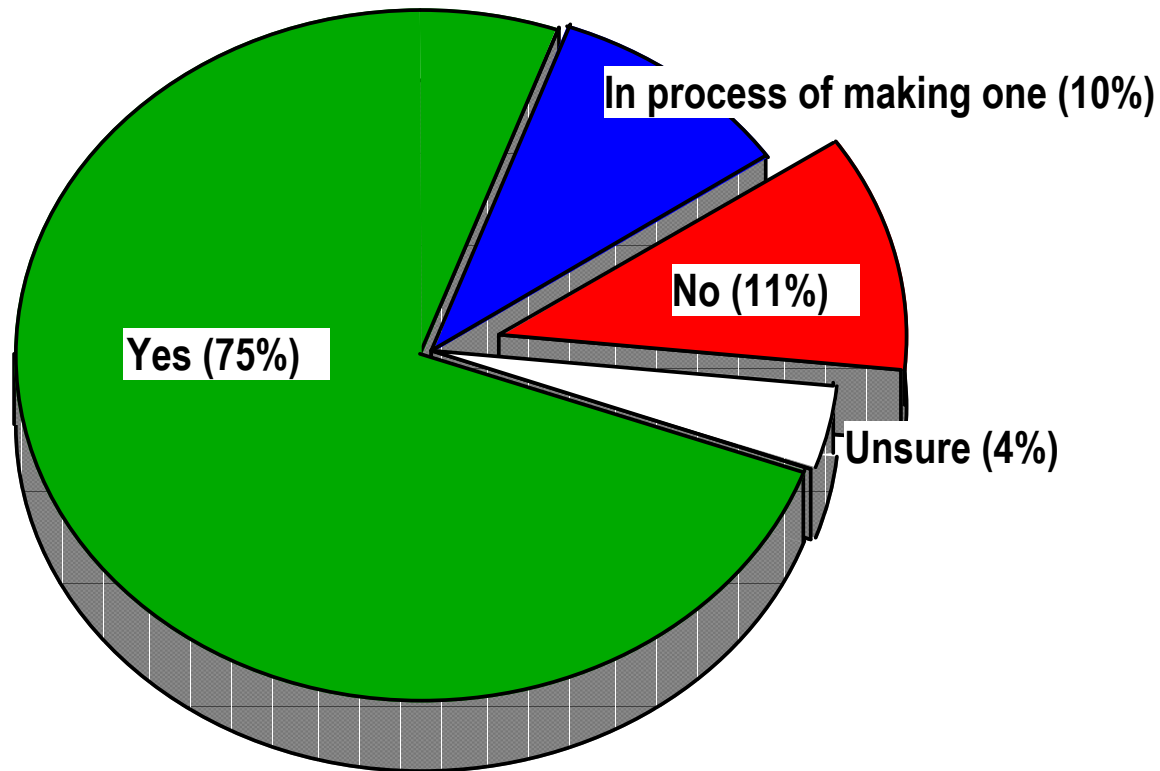
Agenda

- Customer Survey
- Best Practices
- Customers and HP
- Features of the NonStop System
- Q&A



Formal business continuity plans

N=83

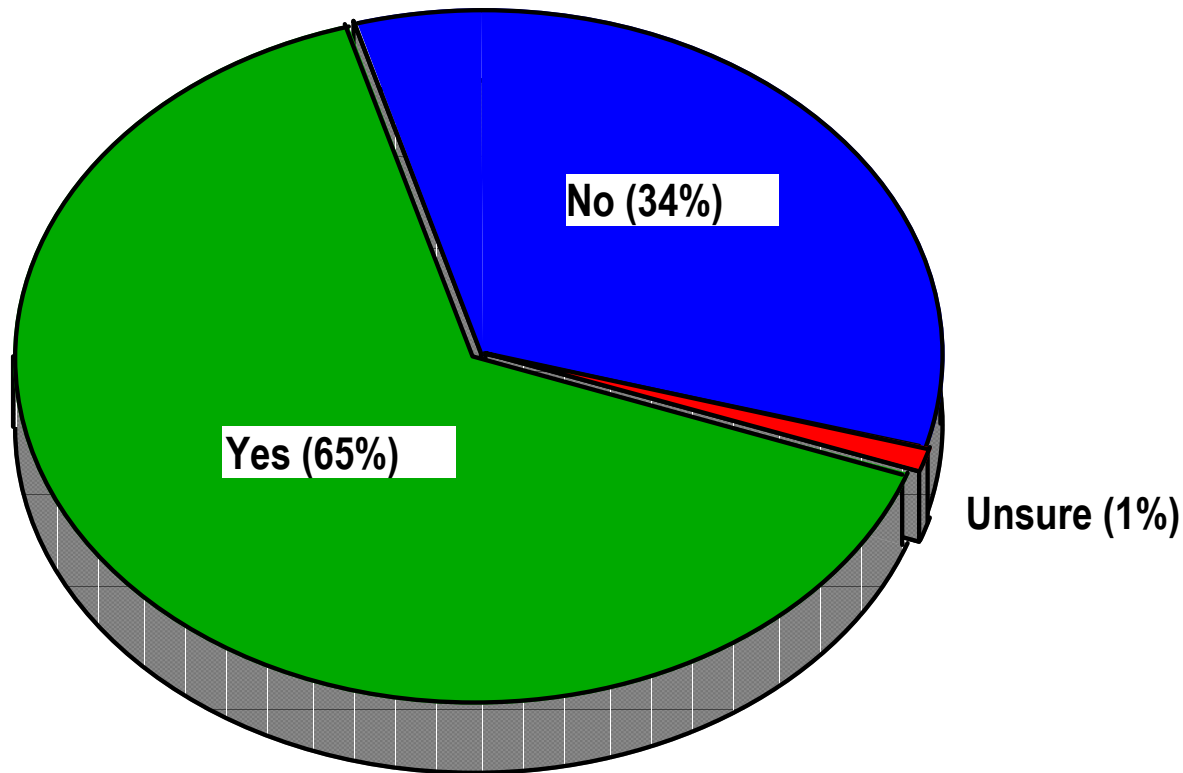


YES: NA, 77% ; EMEA, 69%

Source: HP NED 2003

Use NonStop servers for business continuity

N=83

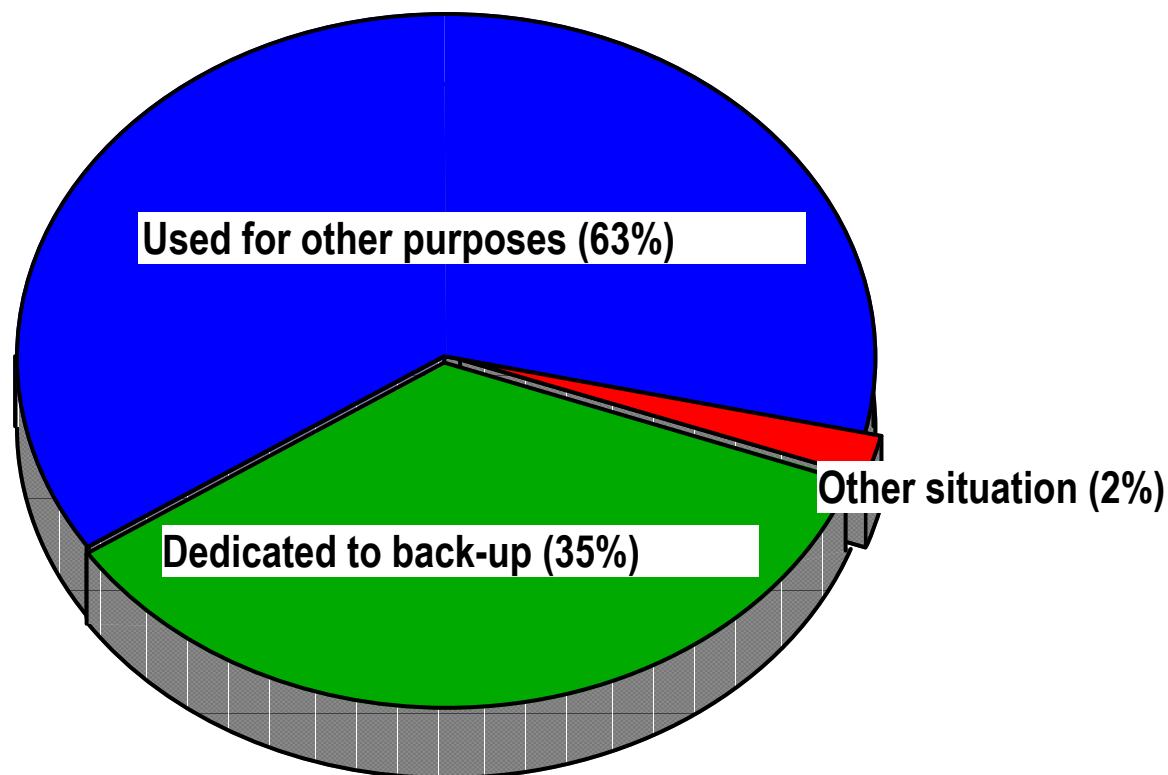


YES: NA, 63% ; EMEA, 69%

Source: HP NED 2003

Exclusive dedicated back-up systems

N=54

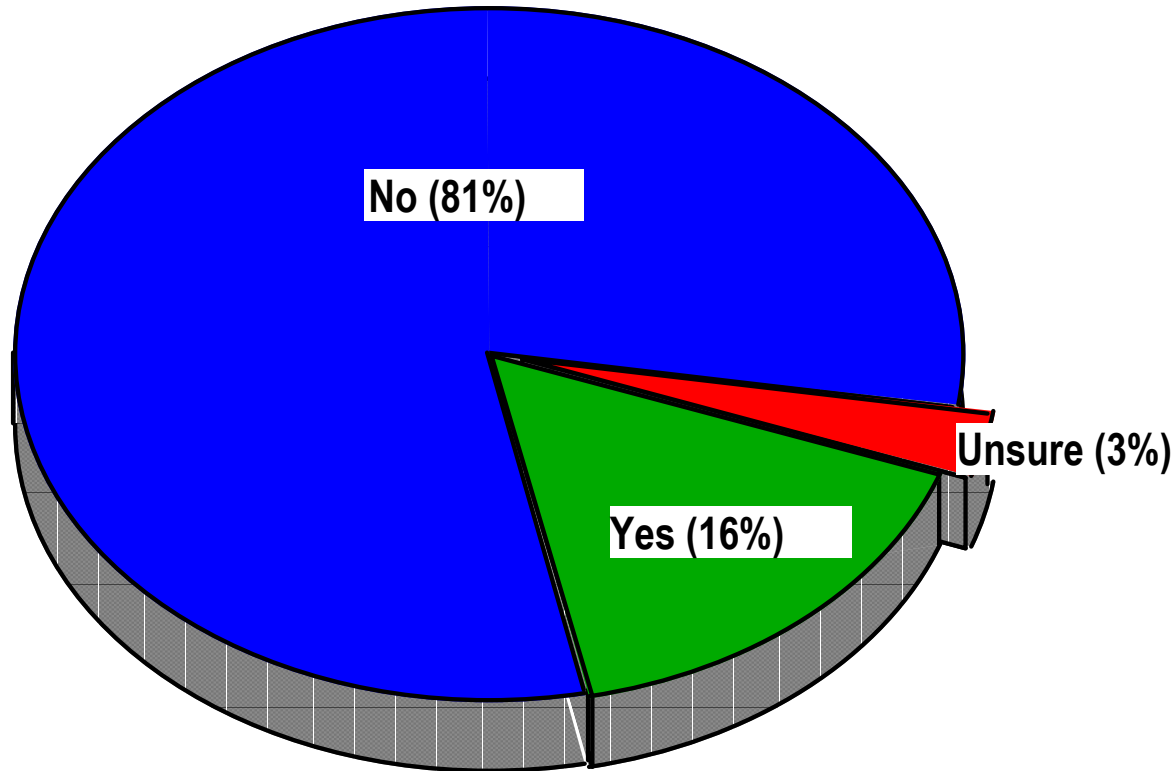


Dedicated: NA, 33 % ; EMEA, 39 %

Source: HP NED 2003

Business continuity outsourced

N=83



YES: NA, 21 % ; EMEA, 4 %

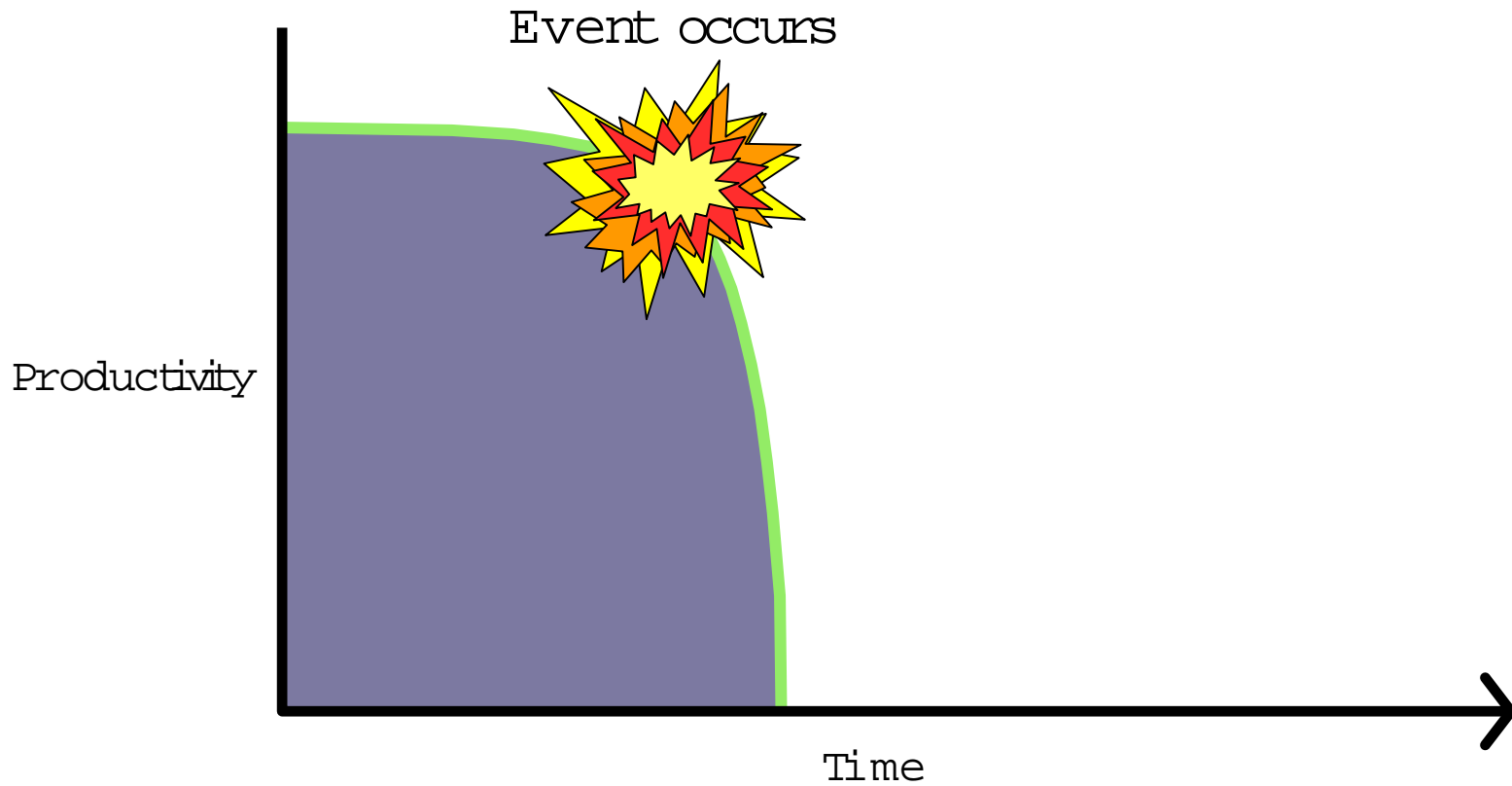
Source: HP NED 2003

Best Practices

- The difference between DR and BC
- What is your cost of downtime
- It's a continuum
- Separating RPO and RTO

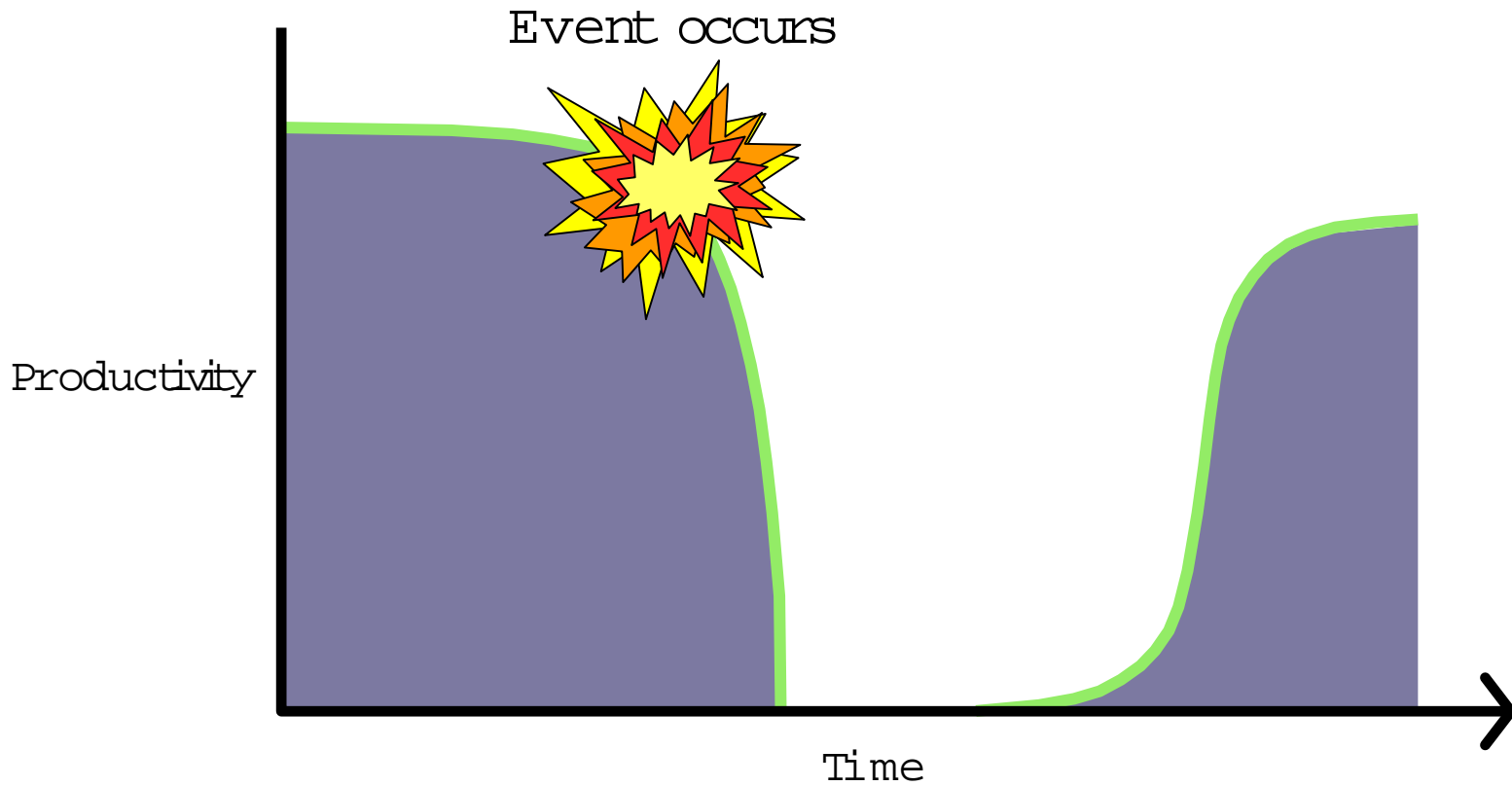


Something happens



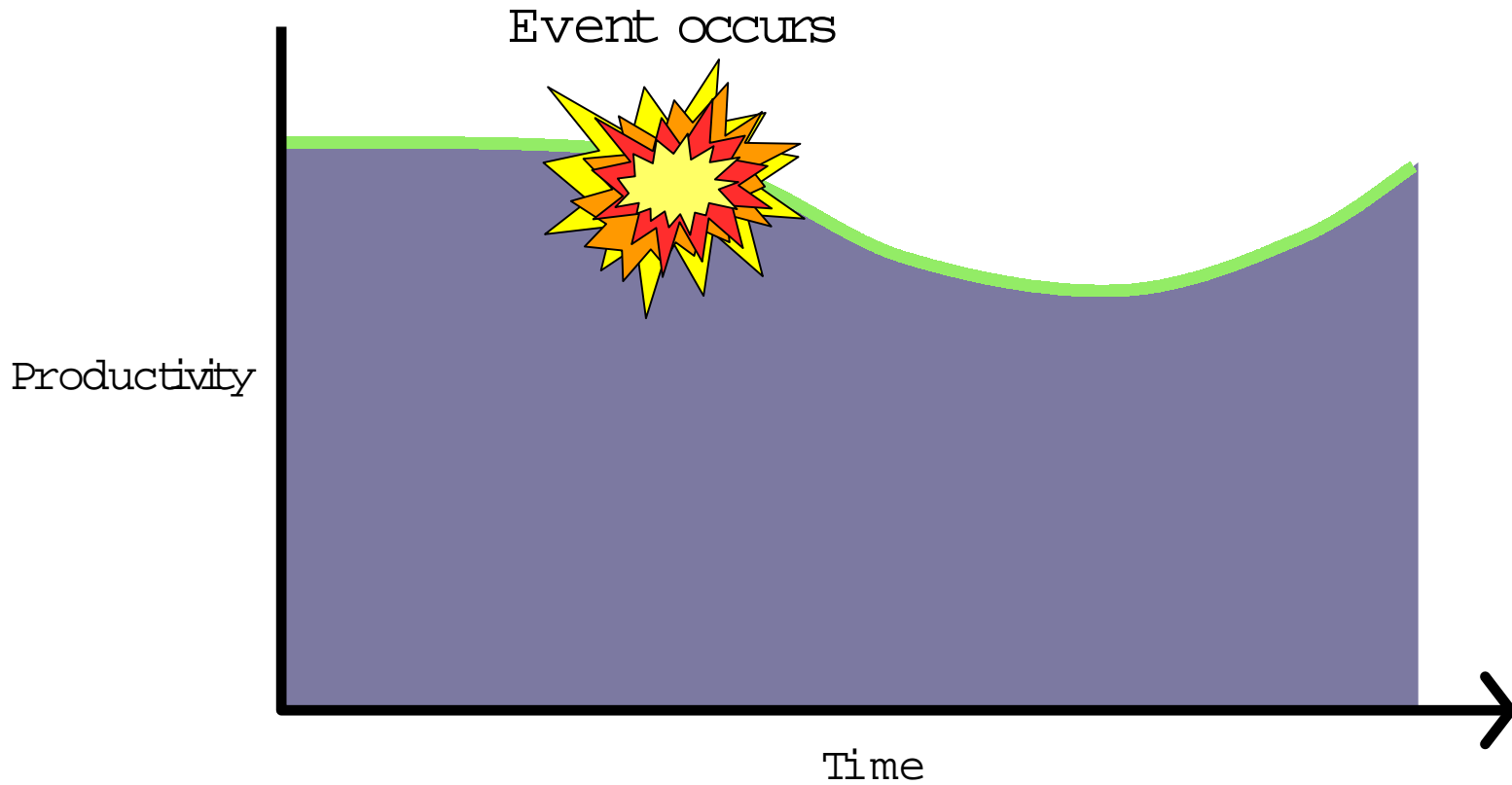
Source: DRII

Disaster recovery



Source: DRII

Business continuity



Source: DRII

Continuity planning perspective

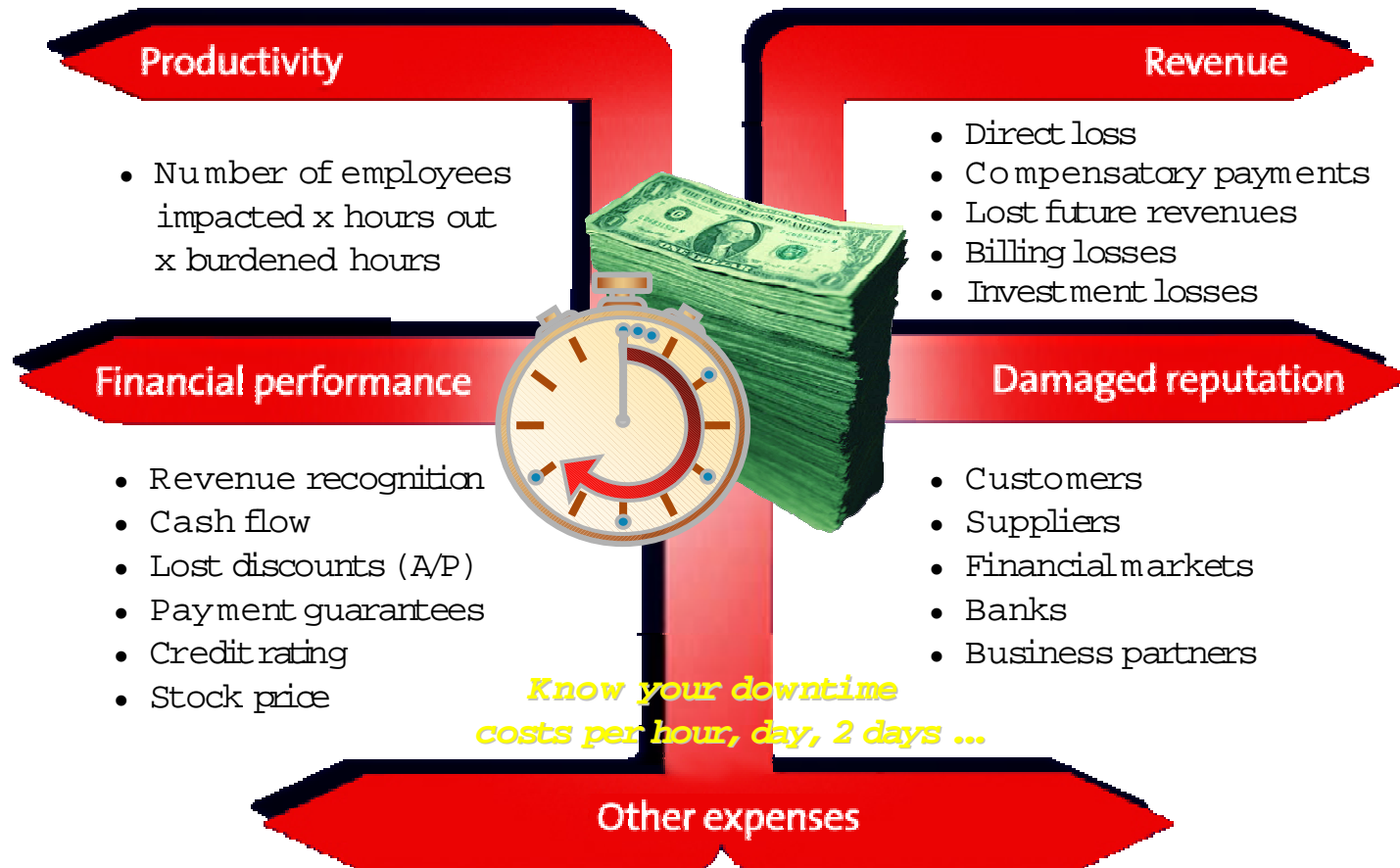
- Ensures that an event doesn't become a *disaster*
- Covers a broad spectrum of business and technology issues
- The key goal: required business process availability

What is your cost of downtime?

Industry sector	Rev/hour	Rev/emp . hour
Energy	US\$2,817,846	US\$569.20
Telecommunications	2,066,245	186.98
Manufacturing	1,610,654	134.24
Financial institutions	1,495,134	1,079.89
Information technology	1,344,461	184.03
Insurance	1,202,444	370.92
Retail	1,107,274	244.37
Pharmaceuticals	1,082,252	167.53
Banking	996,802	130.52
Chemicals	704,101	194.53
Transportation	668,586	107.78
Utilities	643,250	380.94
Healthcare	636,030	142.58
Professional services	532,510	99.59
Media	340,432	119.74
Hospitality and travel	330,654	38.62
Average:	US\$1,010,536	US\$205.55

source: META Group

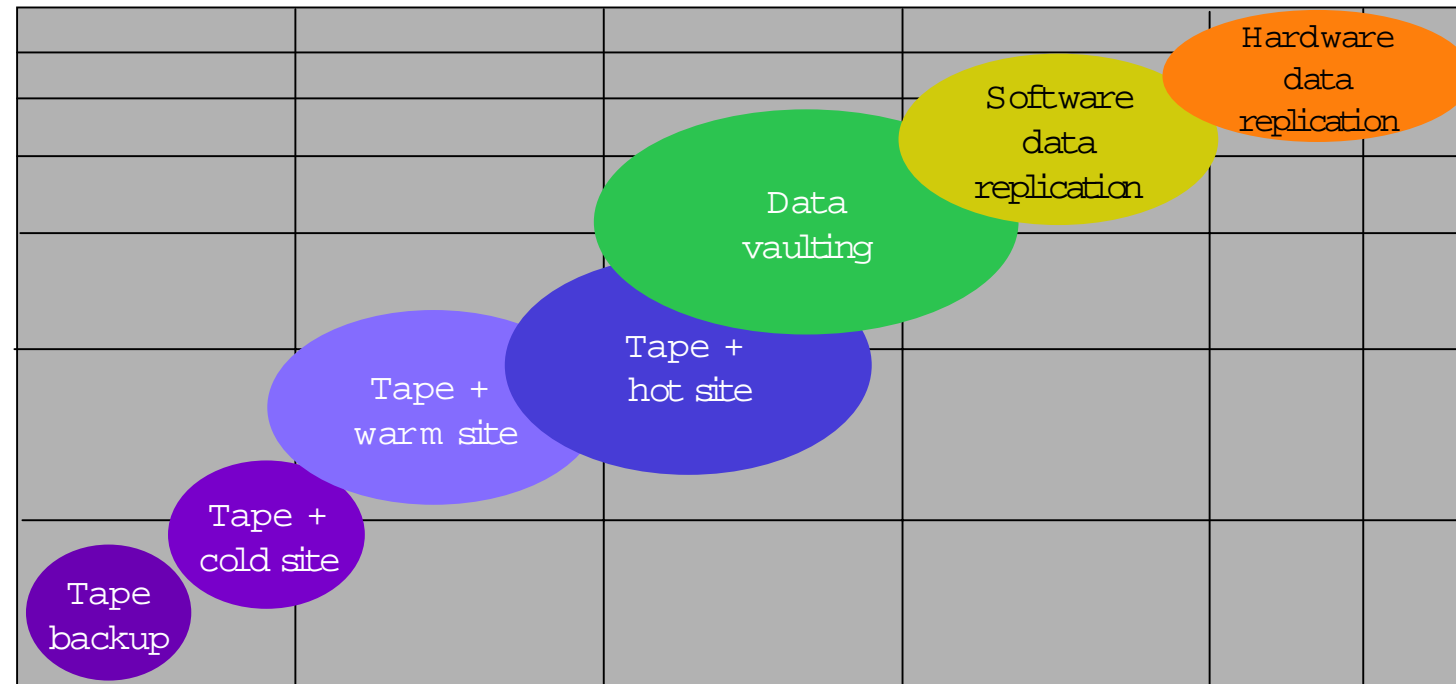
What is your cost of downtime?



Temporary employees, equipment rental, overtime costs, extra shipping costs, travel expenses, etc.

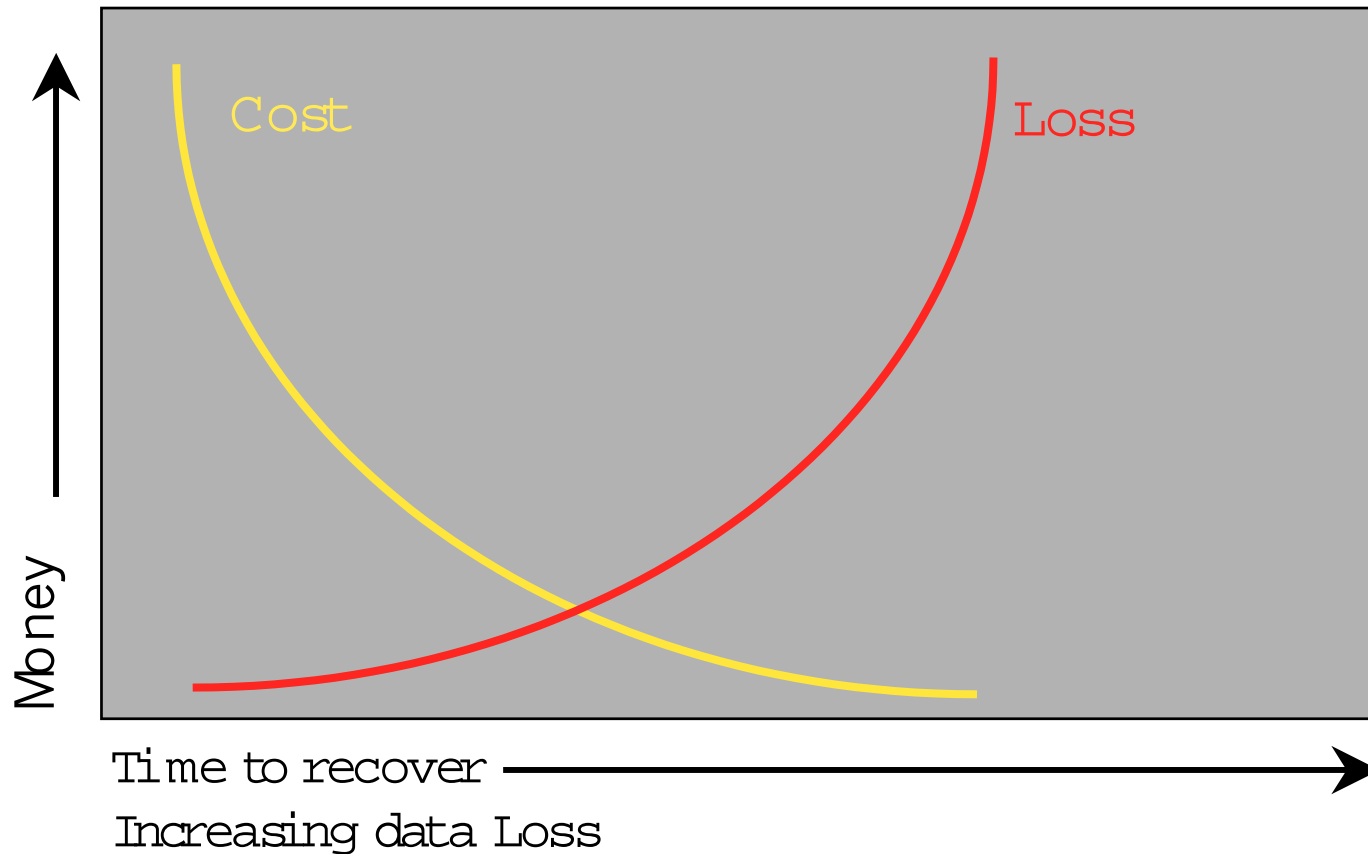
It's a continuum IT infrastructure downtime

Continuity



\$ ————— Total cost of ownership —————> \$\$\$

It's a continuum

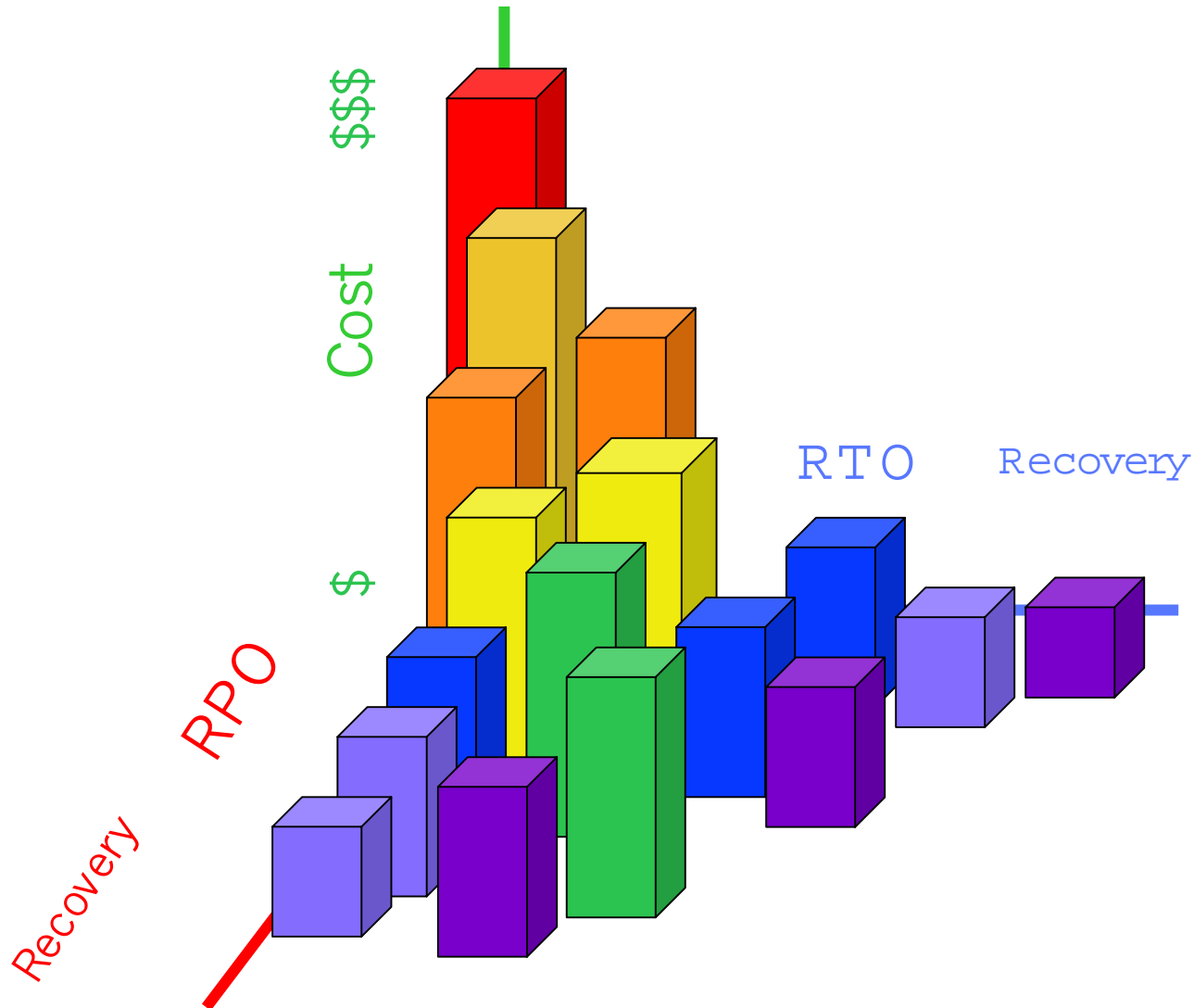


Separating downtime and data loss

- RTO (recovery time objective)
 - How soon after an event does the business process need to be available?
 - Not all business processes need to be available at the same time.
- RPO (recovery point objective)
 - How much work in progress can be lost?
 - Not all work needs to be recovered to the same time.



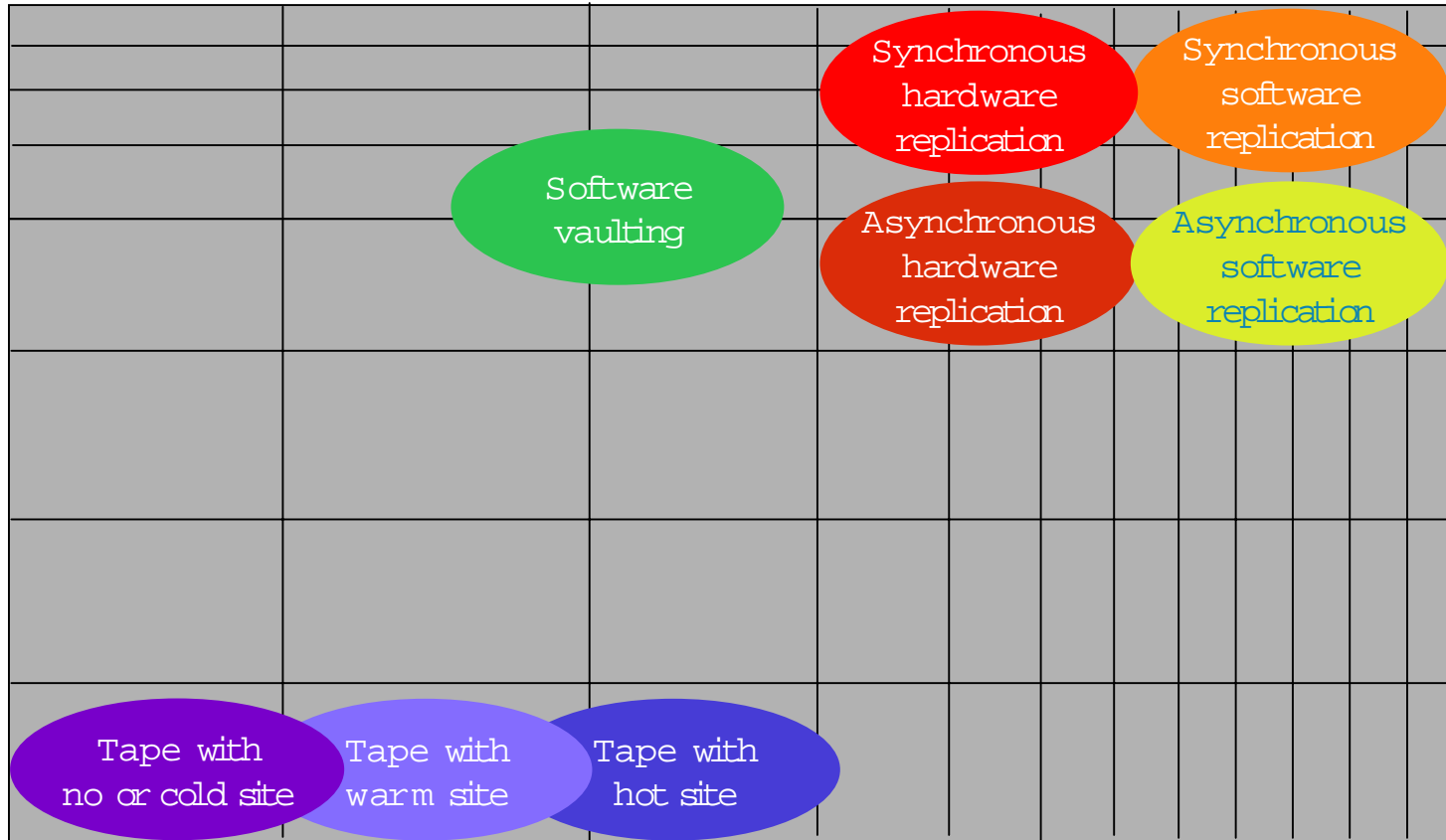
Separating downtime and data loss



Separating downtime and data loss

Continuity

↑
Data loss (RPO)



Recovery

————— Downtime (RTO) —————→

Continuity



TCO —————→

How many things can you find wrong with this picture?



Summary

- Separate RTO and RPO.
- Define where each business process falls on the continuum.
- Identify goals before technology.
- Understand the limitations of the chosen technology.
- Follow best practices.
- Become comfortable with using the technology—practice, practice, practice.

And above all



Ensure you have a tested, functioning, up-to-date business continuity or disaster recovery plan.

And now for something completely different..

What can go wrong?



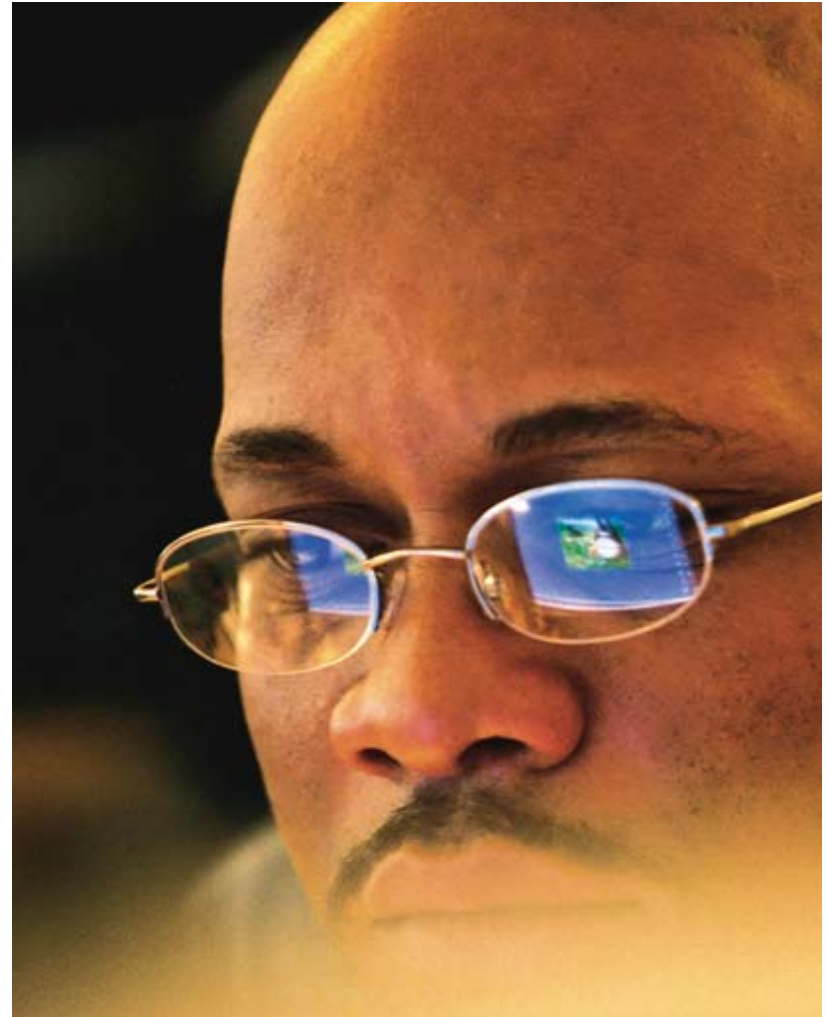
What can go wrong?

- The backup site is in Atlantic city; declaration is during the Miss America pageant. (Hurricane Andrew)
- The computer room is in the basement, and there's a fire in the building. (Bell Canada)
- Will the generators be safe? Do you have a way to refuel them? (Tropical Storm Allison)

What can go wrong?

- You power up the generators and nothing happens.
- You power up the generators and the power surge blows out your systems.
- You power up the generators and realize that your air conditioning isn't on backup power.

Hint: exercise your plan



What can go wrong?

March 18, 2003 – Power Failure at Kaiser Hospitals

- Kaiser officials said a power failure affected its computers. A six-hour glitch caused errors in up to 13,700 prescriptions. Kaiser assembled an army of pharmacists, nurses and other employees to work over the weekend, tracking every patient by phone, courier and even home visits.

Source: Los Angeles Times, KGO TV

What can go wrong?

June 9, 2001 – Tropical Storm Allison

- The basements and ground floors of several Texas Medical Center institutions housed critical diagnostic equipment, medical research laboratories, electrical infrastructure (including back-up power generators and switchgear), and heating, ventilation, and air conditioning (HVAC) equipment. The flooding quickly severed electricity running underground through the TMC. Many TMC facilities lost both primary and back-up power, including Memorial Hermann Hospital, a Level 1 trauma center.

What can go wrong?

- In the early morning hours of June 9, more than 1,000 patients were evacuated from TMC hospital rooms and intensive care units. Vehicular traffic in every direction within the entire TMC was cut off for more than 9.5 hours, and the two Level 1 trauma centers in the TMC, Memorial Hermann and Ben Taub General, lacked any street access.
- Nine of the 13 hospitals in the TMC were closed as a result of flood damage. Damage estimates for the TMC complex exceed \$2.0 billion

Source: Risk Management Solutions

Customers and HP

- J.P. Morgan
- CrestCo
- A large real time bank-owned EFTPOS system in the UK

J.P. Morgan Invest, LLC and HP

■ Challenges

- maintain continuity for one of the largest deep-discount online brokerage firms in the U.S.
- continue to meet sophisticated customer expectations for real-time trade confirmation
- ensure disaster tolerance in the face of these stringent customer requirements

■ Solutions Delivered

- dual HP NonStop™ S74012 servers with all disaster tolerant products
- hp implementation & business continuity plan rehearsal services

■ Result

- disaster recovery proof-of-concept completed successfully start-to-finish in just 42 days with demonstrated recovery in less than 7 minutes
- full production implementation complete in less than 6 weeks after the proof-of-concept
- demonstrated success in critical element in overall corporate business continuity plan

"Working with HP has been a true partnership, both for the Proof of Concept and for the production implementation. The HP NonStop products are critical to our recovery objectives and HP services exceeded our expectations in meeting the production implementation objectives."

Robert Cline
VP of Technology
JP MI

CRESTCo and HP

Securities settlement UK/Ireland

■ Challenges

- business growth required application to move to multi-system environment
- guarantee of no data loss in event of disaster

■ Solution

- customer re-designed application
- hp NonStop RDF added capabilities

■ Result

- support and protect growing applications
- typical recovery time is 10 minutes verses a requirement of 30 minutes

EFTPOS and HP

The largest on-line, real time bank-owned EFTPOS system in the UK

■ Challenges

- 5 separate applications: 1 x authorization/capture, 4 x auth only
- Needed to implement remote backup site
- ISV application not TMF-enabled

■ Solution

- customer implemented NonStop AutoTMF and NonStop RDF

EFTPOS and HP (cont)

■ Result

- Controlled switch over in under 7 minutes
- 'Crash' switch in 1-5 minutes (!)
- Ability to run some applications on each system
- Batch scheduler has several job suites. Each job does a specific task. Run many jobs in parallel to minimize the time to switch. The only manual involvement in the switch procedure is deciding which type of switch to invoke.
- In addition to meeting their recovery needs, NonStop AutoTMF significantly reduced the number of physical database I/Os to files, increasing overall system performance

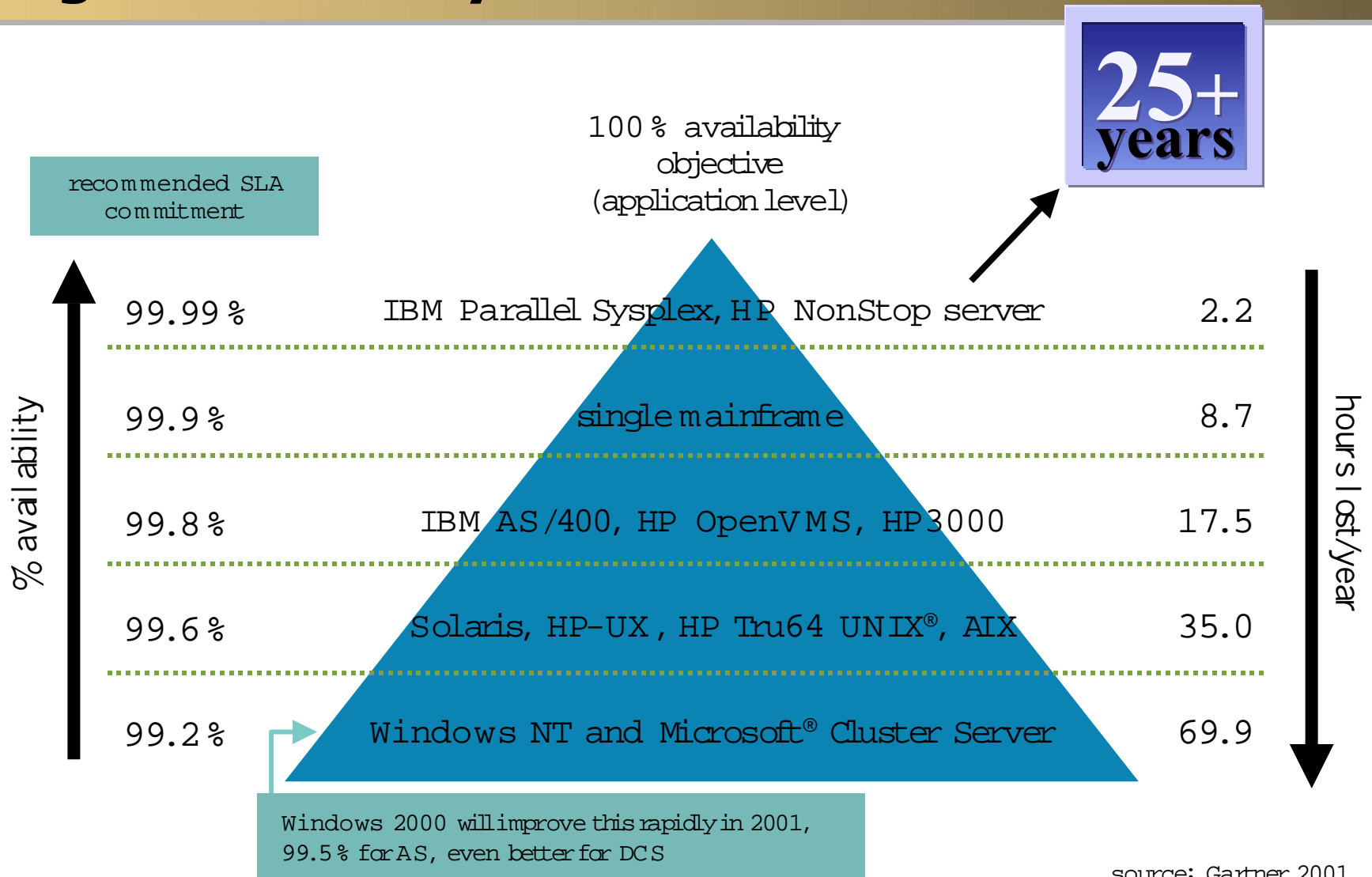
Features of the NonStop system



NonStop servers: fault tolerance designed in, not bolted on

- The key – a fully integrated stack
- Hardware
 - loosely coupled, shared nothing
 - industry leading on-line expansion/replacement
- Software
 - operating system: optimized for OLTP and mixed work loads
 - middleware: open standards hardened for fault tolerance
 - database: industry leading on-line manageability
- The result: an open system with common standards, and uncommon advantages:
 - unparalleled availability
 - unmatched scalability
 - absolute data integrity

High-availability continuum



Integrated disaster tolerance and recovery products for the HP NonStop server

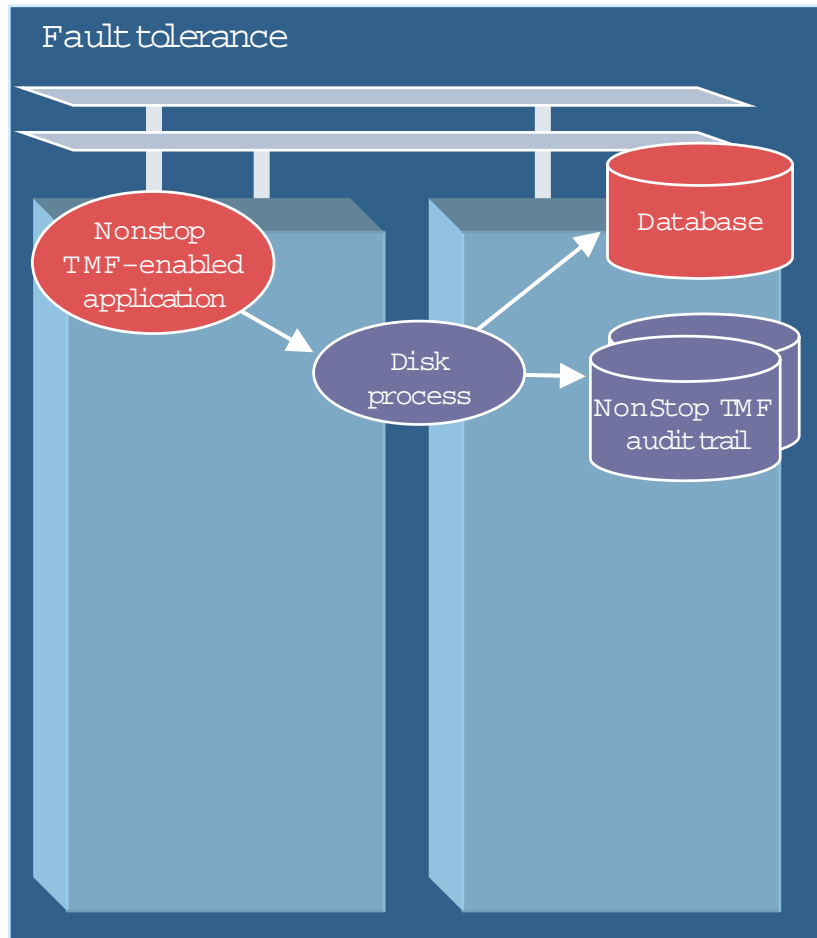


- NonStop TMF
 - The foundation for transaction integrity and data protection
- NonStop AutoTMF
 - Automatically invokes NonStop TMF protection for nonaudited databases
- NonStop RDF
 - High-performance database replication
- NonStop AutoSYNC
 - Synchronizes nondatabase files

What is NonStop TMF software?

- NonStop TMF is a fault-tolerant disk and transaction manager that provides transaction atomicity and database integrity.
 - All database modifications are captured in the NonStop TMF audit trail.
 - Before and after images efficiently captured
 - Guaranteed log of database changes
 - Audit trail can be used to replicate and rebuild the database
 - If any part of the transaction fails, the entire transaction fails.

NonStop TMF software



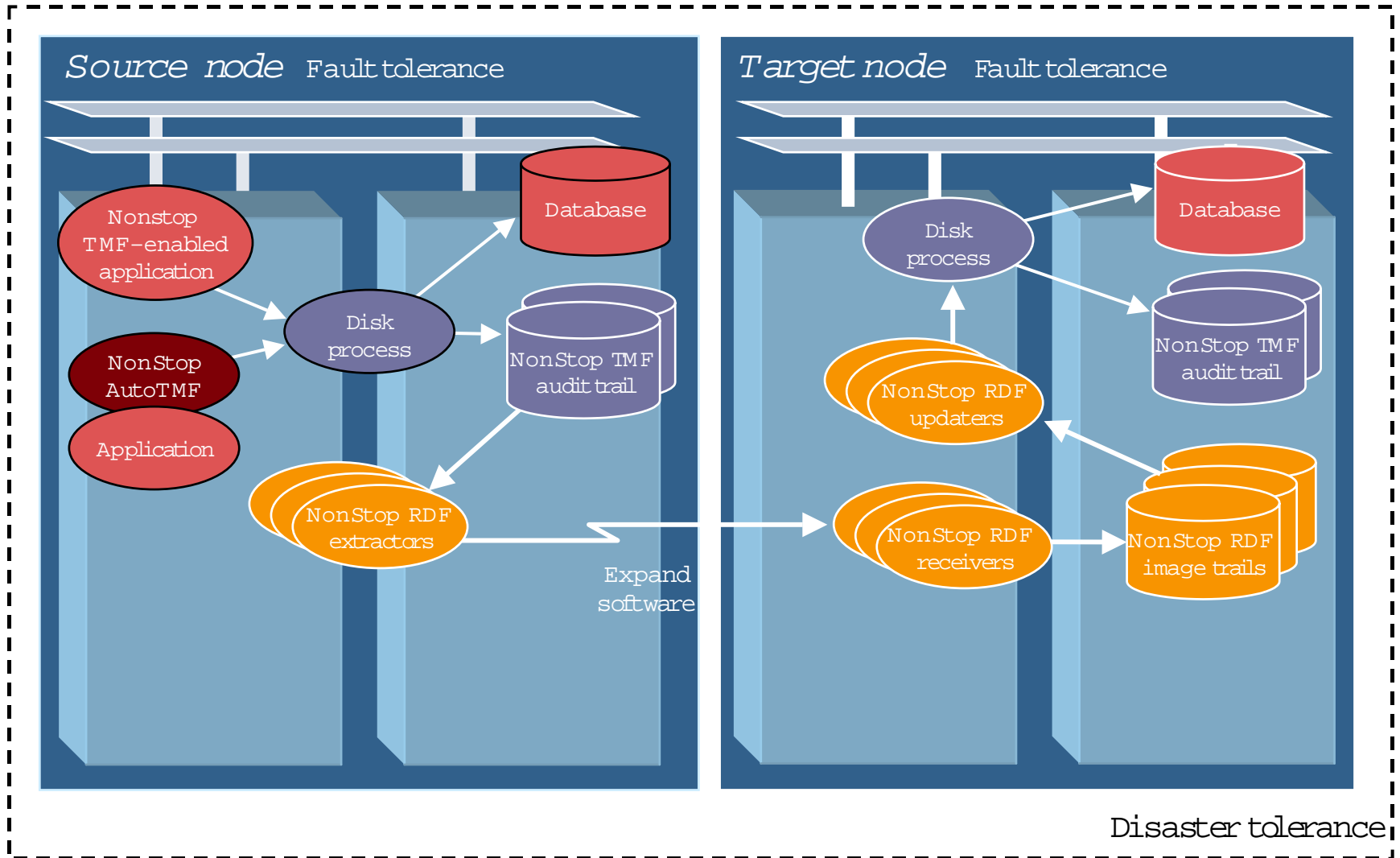
What can NonStop TMF do for an application?

- NonStop TMF software is the foundation for any 24 x 7 IT operation
 - Database reorganization, partition split/merge/move, and backup to disk or tape with zero application downtime
 - Near-real-time replication to a backup system
- Online database backup
 - One block split can ruin your whole day
 - Do you run tape retrieval and restore tests?
- Recovery from accidental or intentional database modification
 - Part or all of the database can be recovered to a point in time, including to just before that “drop table” command
 - Using third-party tools, accidentally deleted records can be reinserted

What is NonStop RDF software?

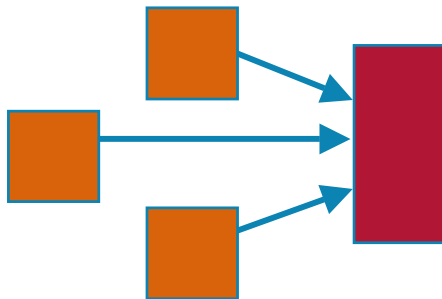
- High-speed, low-latency database replication software
- Peer-to-peer for NonStop servers only
- Focused on disaster tolerance
- Uses low-level system interfaces

NonStop TMF and NonStop RDF software: Unbeatable for NonStop system-to-system replication

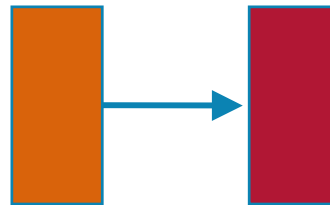


Some NonStop RDF topologies

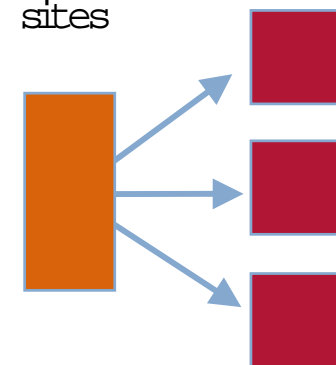
Centralized



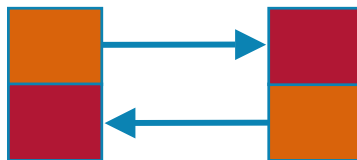
Simplex



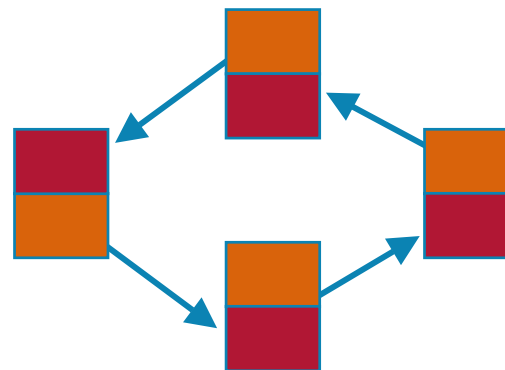
Multiple duplicate



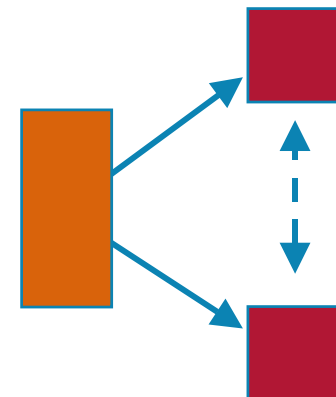
Reciprocal/
split workload



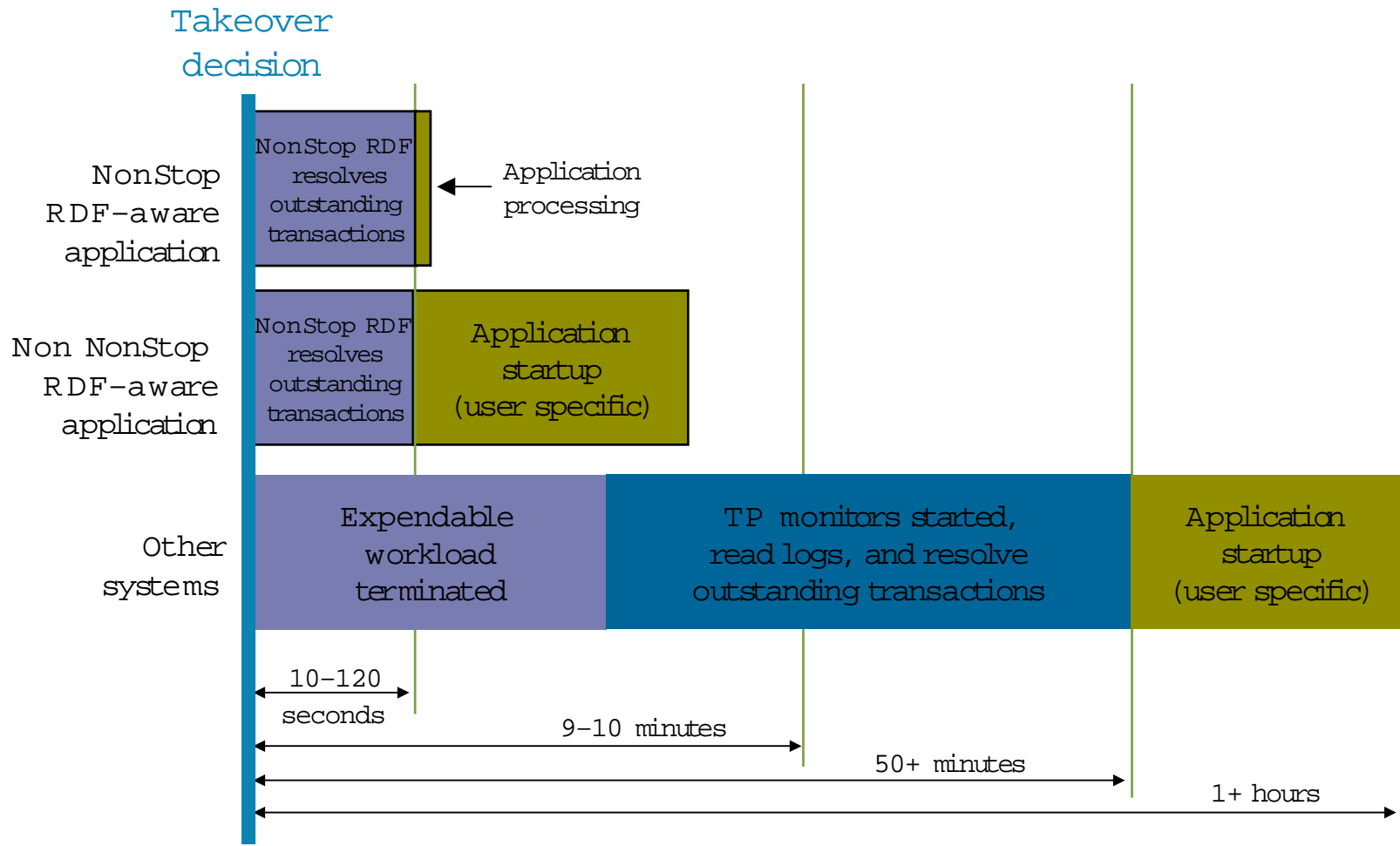
Ring



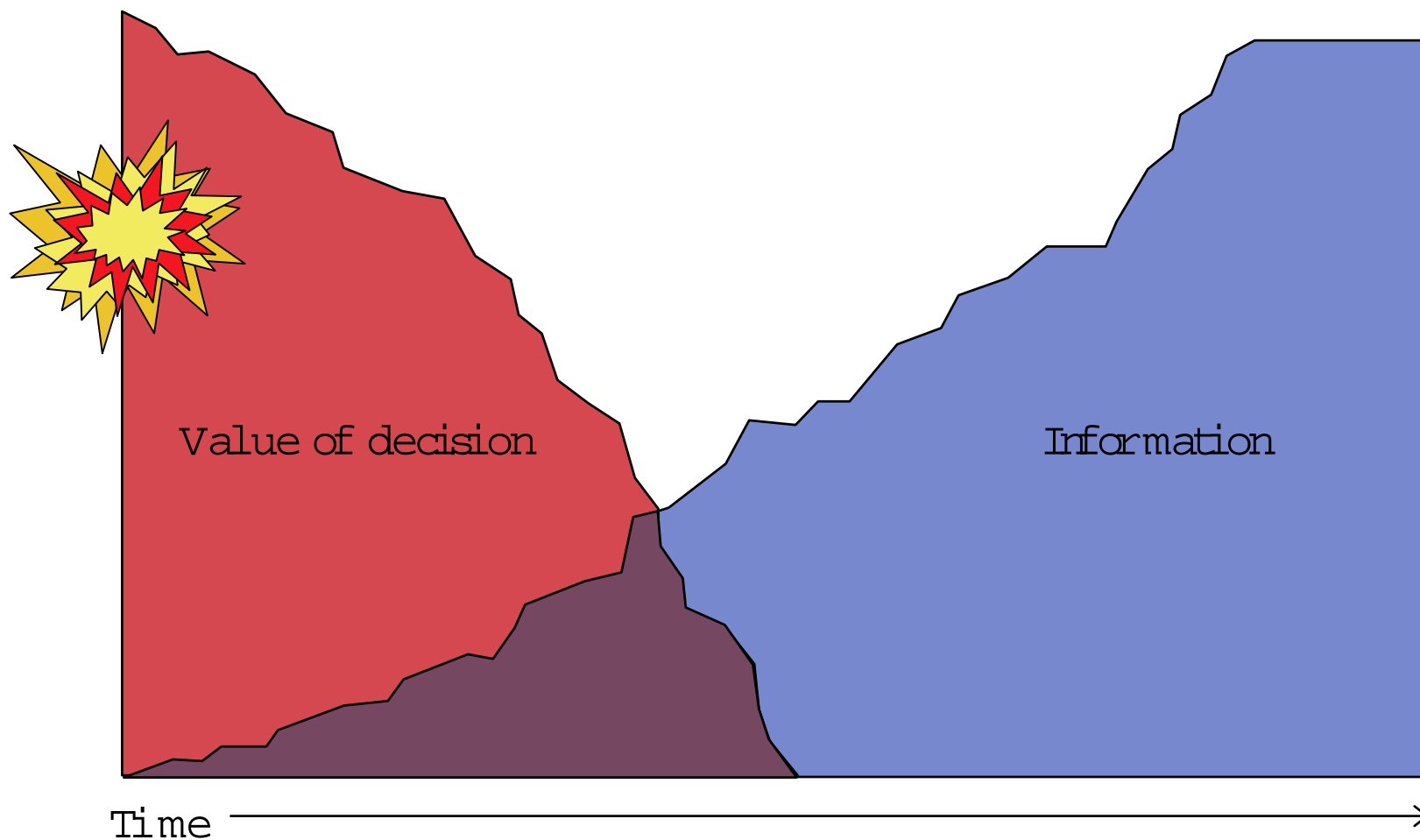
Triple contingency



Backup system takeover timeline



Think time impacts RTO



What is NonStop AutoSYNC software?

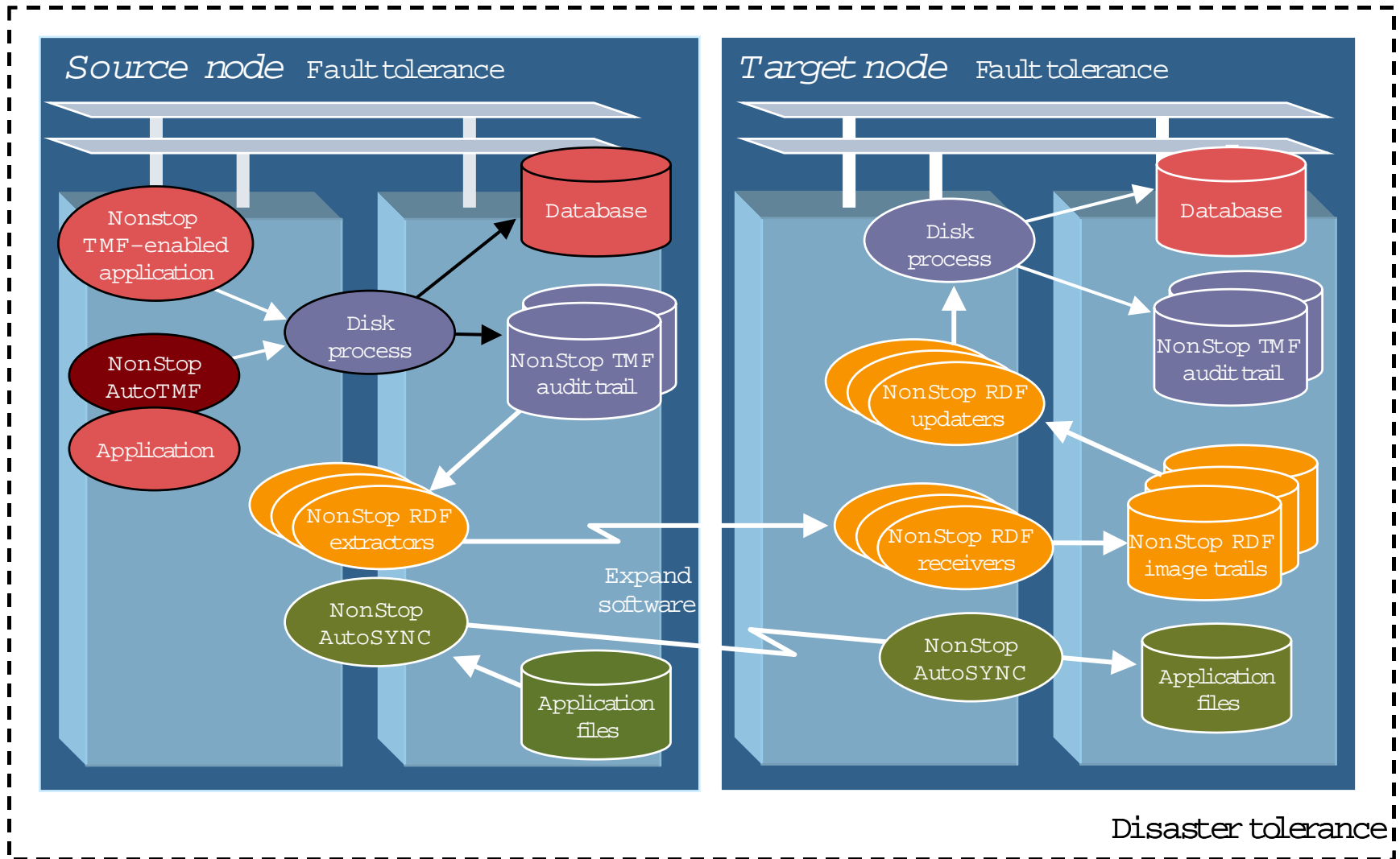
- Whole file replication of
 - NonStop SQL tables, audited and nonaudited structured files, and unstructured files such as edit files, Pathway control and configuration files, batch files, obey files, object files, BLOBs, TACL macros, OSS files and directories, and partitioned files (including volume remapping)
- Synchronizes file sets between NonStop servers via Expand or native TCP/IP
 - TCP/IP allows the source and target systems to have same node name/number
- Easy to install and manage
 - Completely automatic: “set it and forget it”
 - Fault tolerant and highly reliable
 - Triggers on the target system allow for automatic SQL compilation and more

What is NonStop AutoSYNC software?

Used for

- Software distribution
- System migration
- Business continuity and disaster recovery
- Complements NonStop RDF software and other replication products

How it all fits together



For more information...

- Useful URL
 - <http://www.hp.com/go/nonstopcontinuity>
- Product manager for continuity products
 - Ron LaPedis, +1 (408) 285 5987
 - ron.lapedis@hp.com

Remember that building?

To this day, the tornado-scarred Bank One tower in Fort Worth, Texas, is still closed.



30 March 2000



10 February 2001



HP WORLD 2003

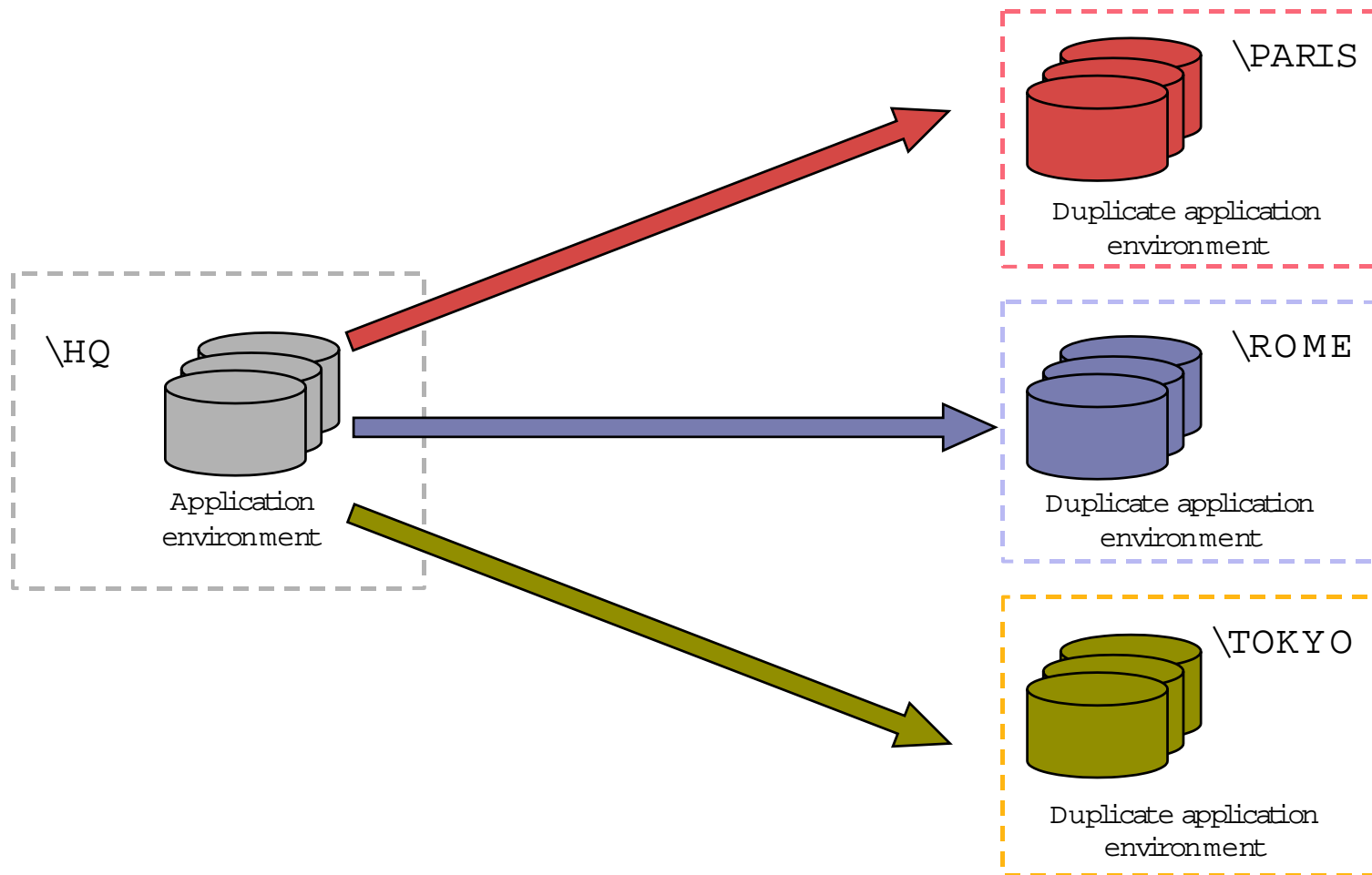
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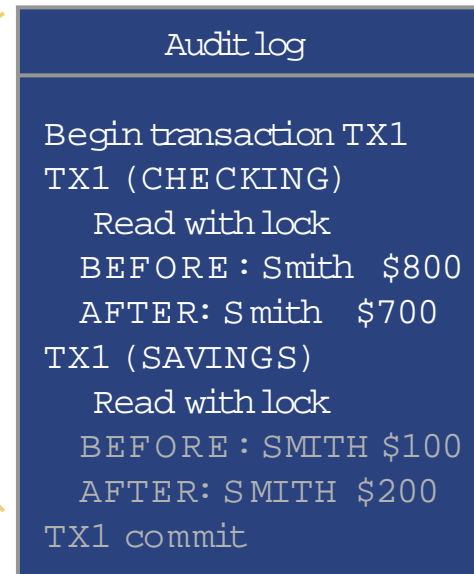
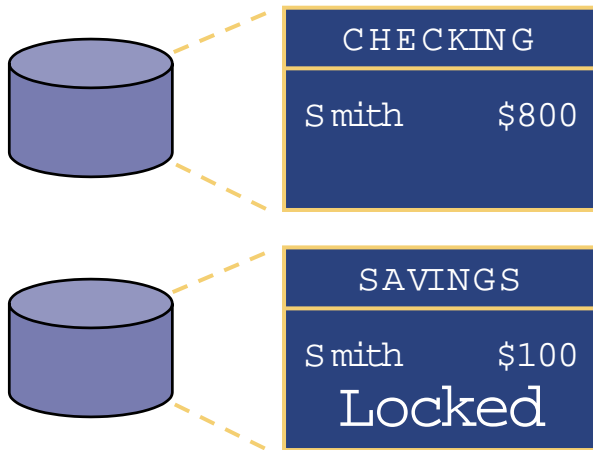
Backup slides

NonStop AutoSYNC for software distribution



Transaction atomicity

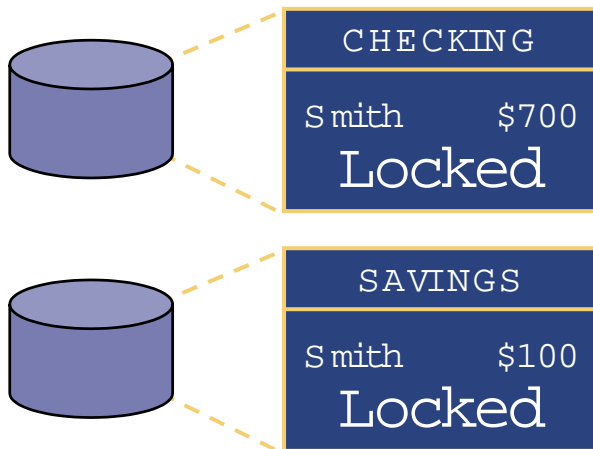
Before transaction starts



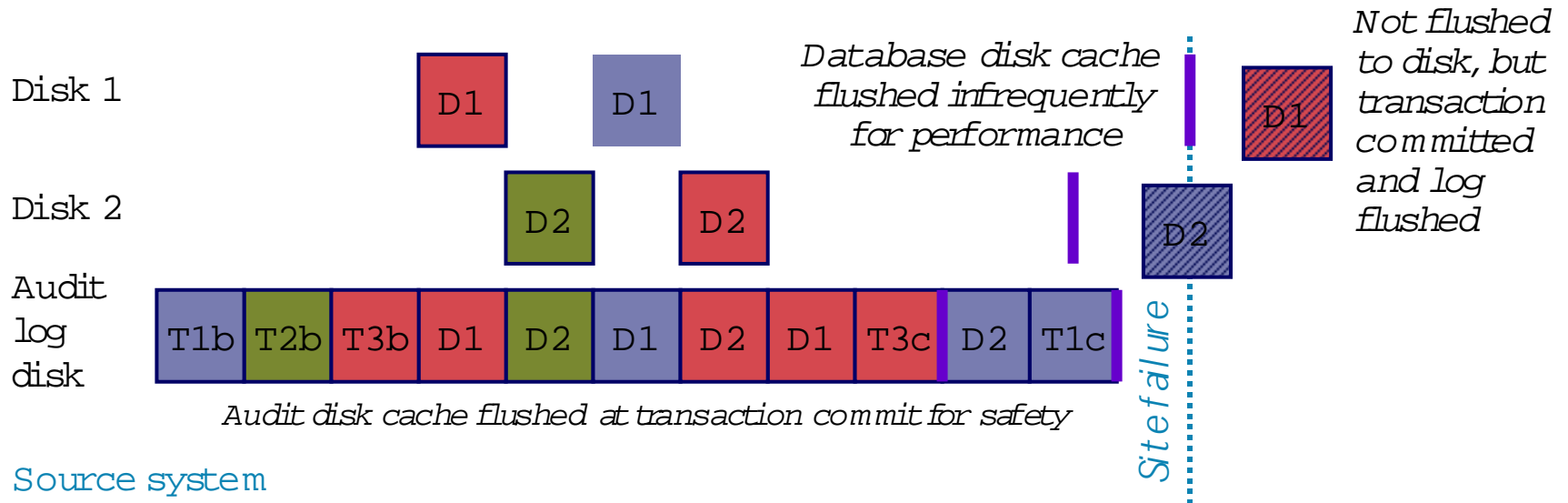
← Already locked

Transaction aborted

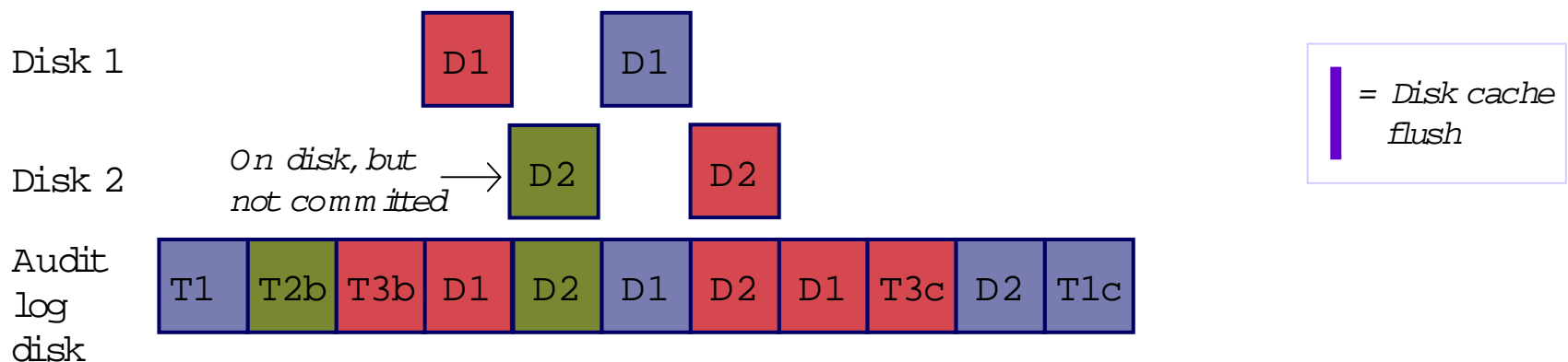
Transaction in progress



Physical disk does not equal logical database

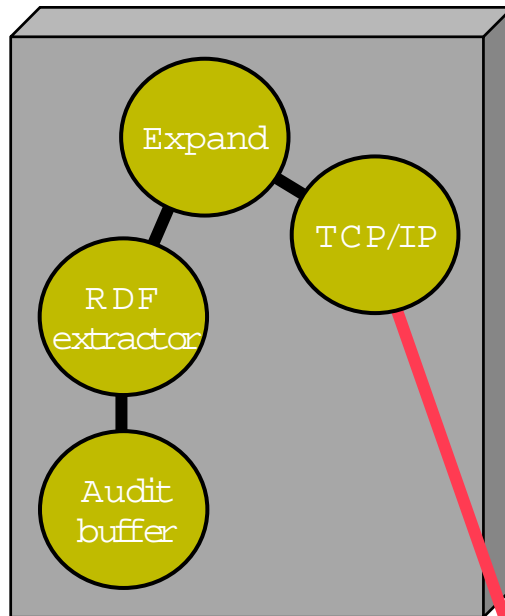


Target system

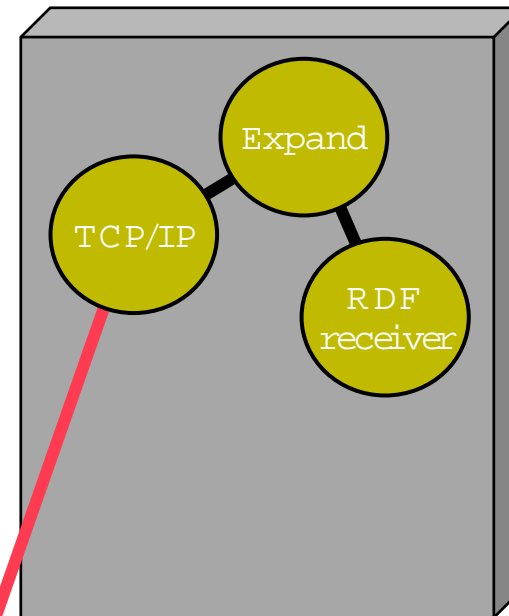


NonStop RDF: Audit data

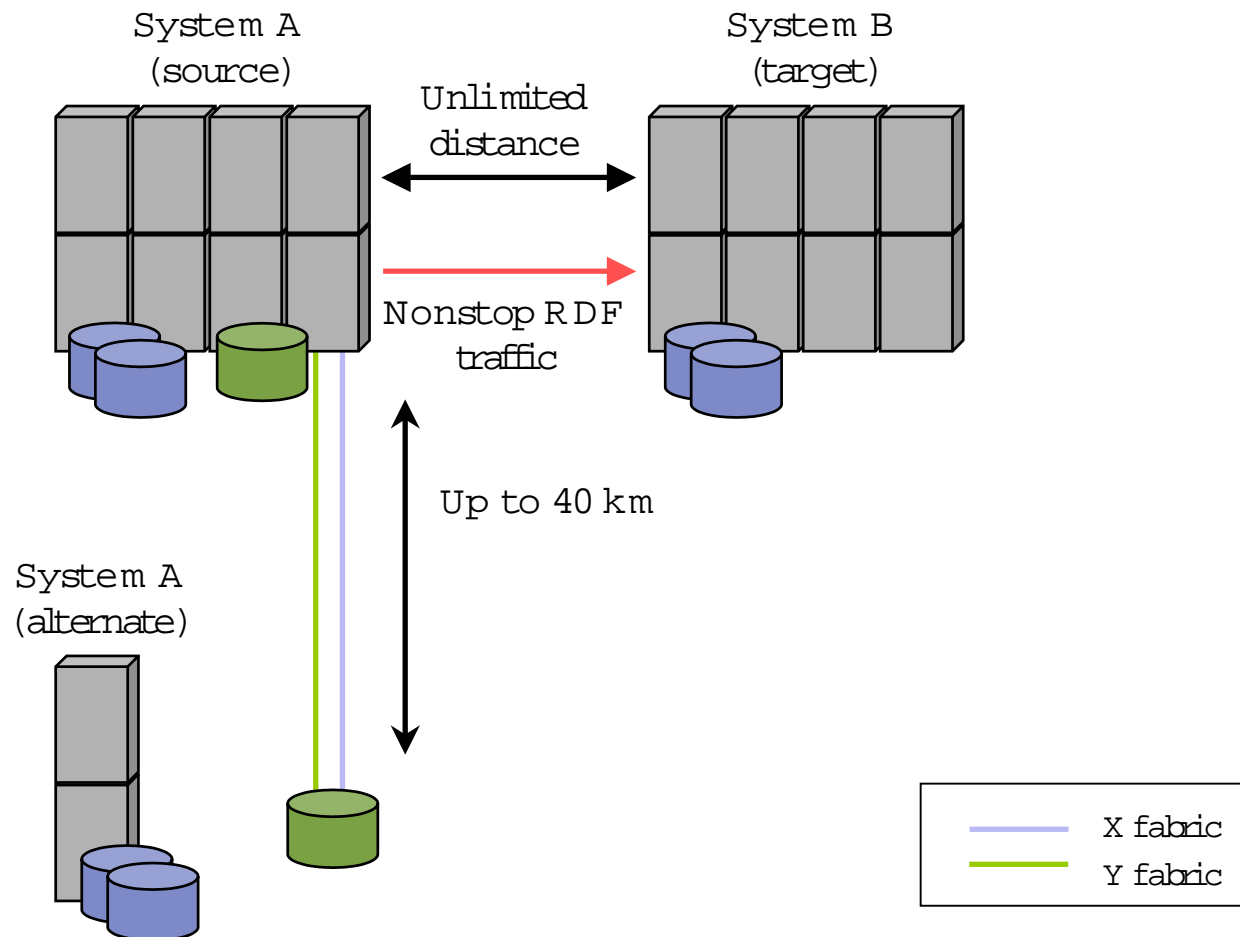
Source system



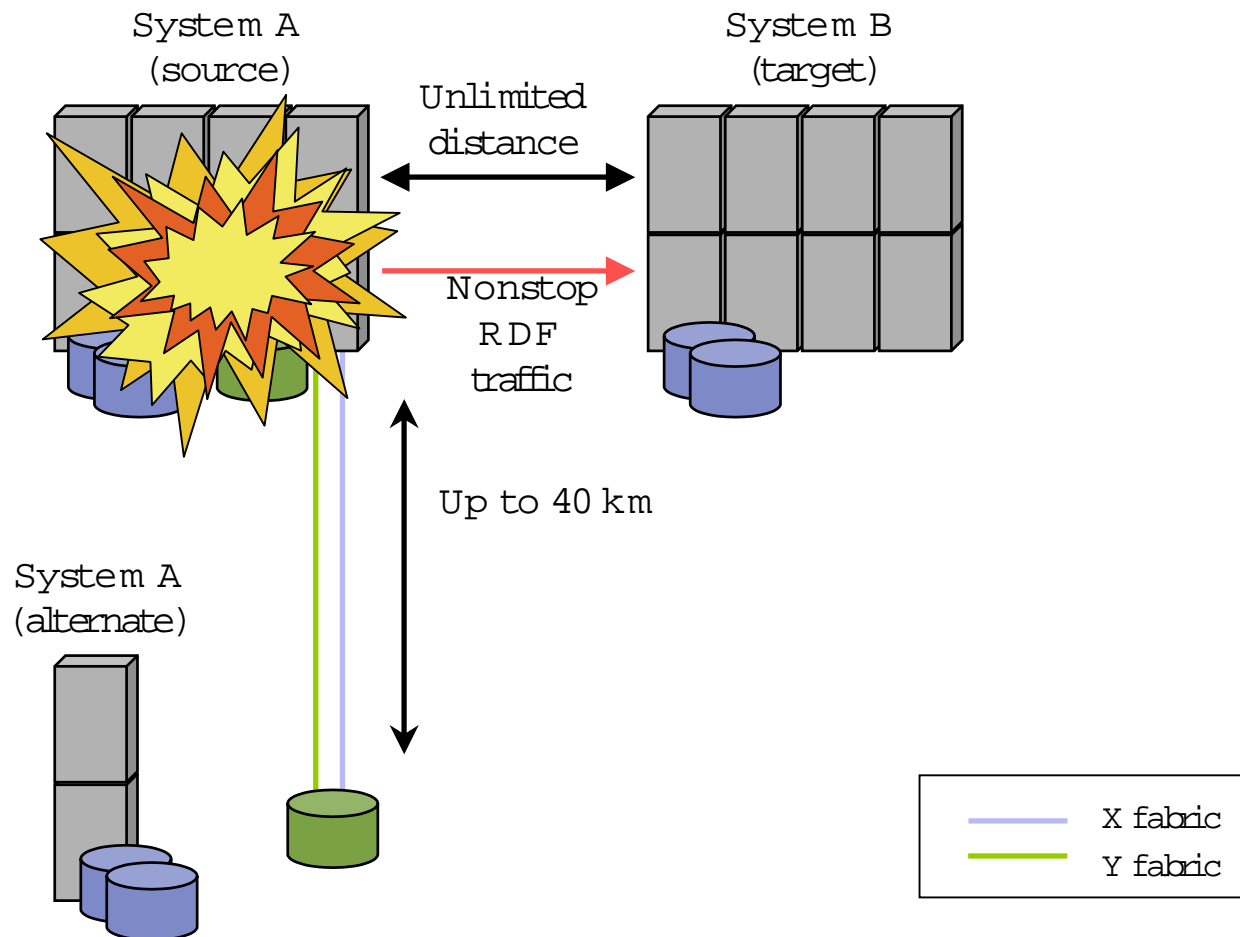
Target system



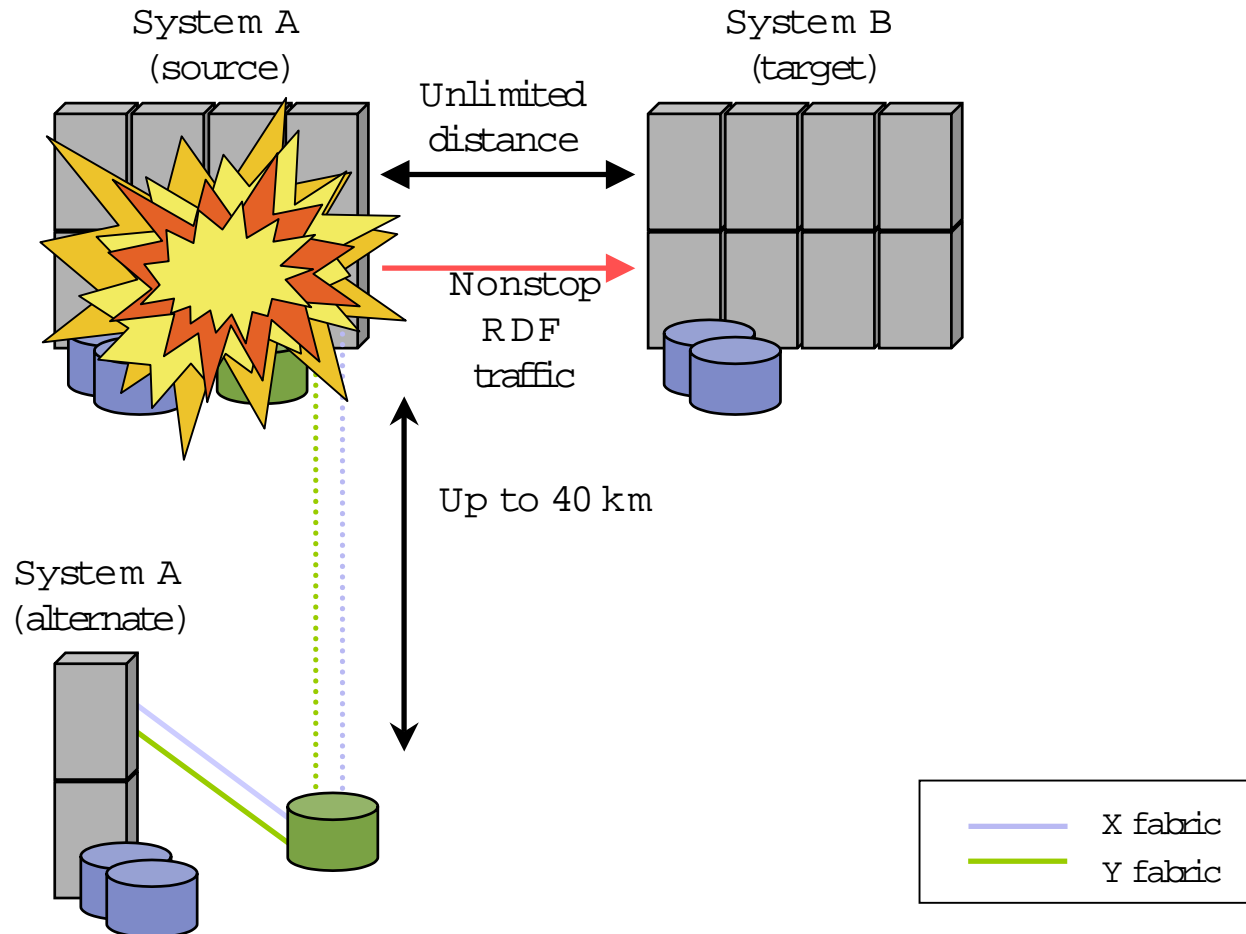
NonStop RDF zero lost transactions: Normal processing



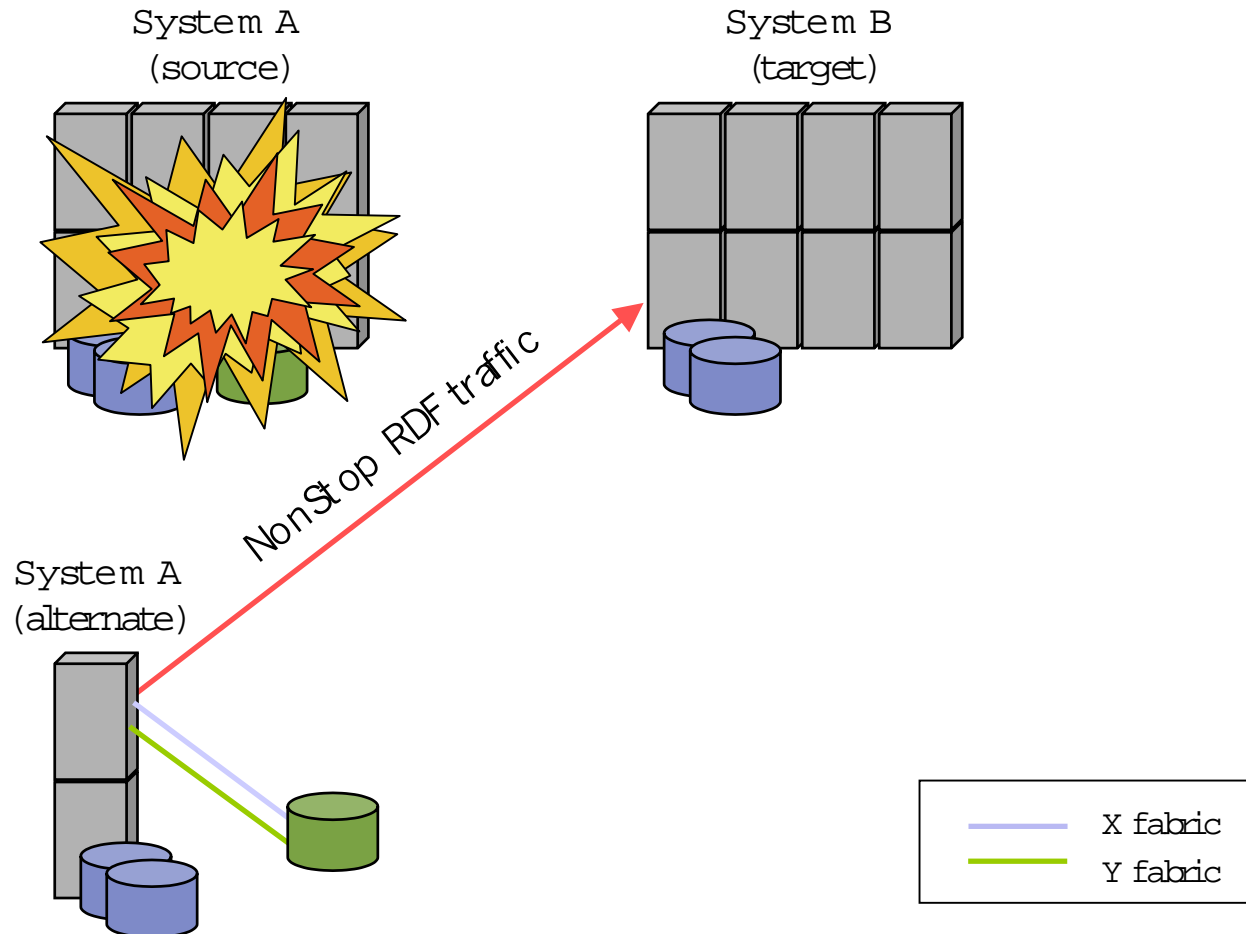
NonStop RDF zero lost transactions: Normal processing



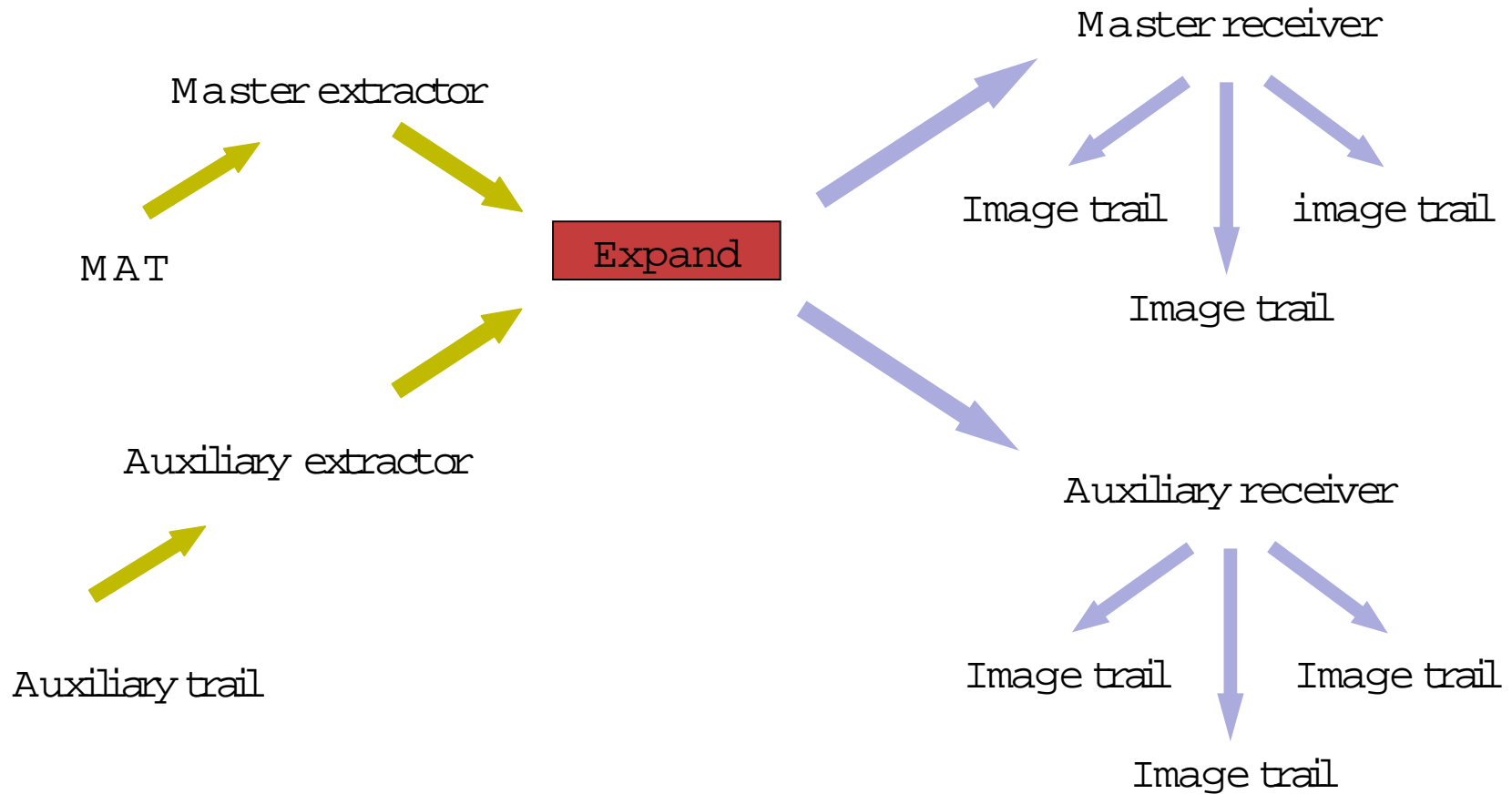
NonStop RDF zero lost transactions: ZLT processing



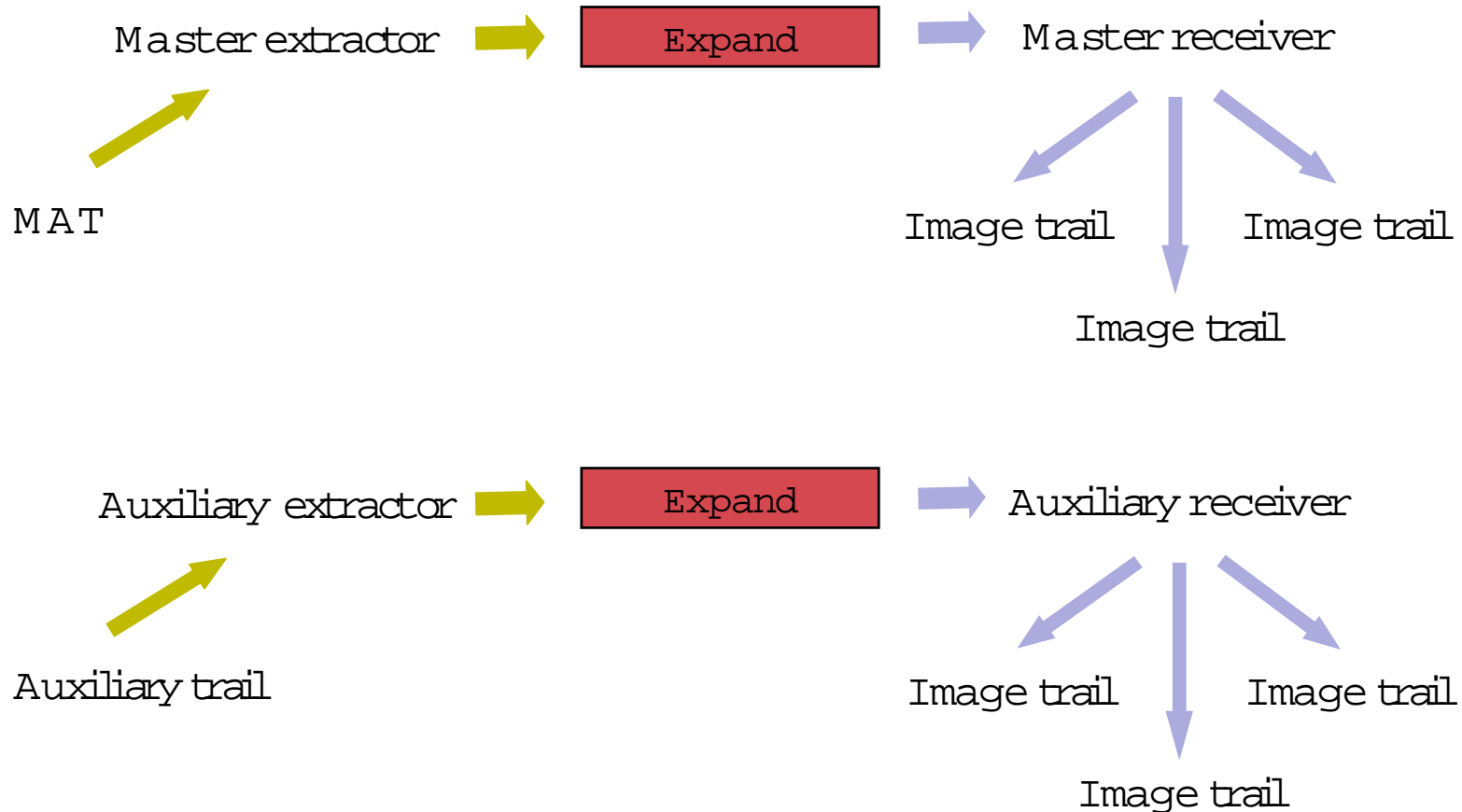
NonStop RDF zero lost transactions: ZLT processing



Auxiliary audit: Single path



Auxiliary audit: Super paths



Network transactions

