Hewlett Packard Enterprise

HPE Shadowbase Zero Downtime Migrations & Upgrades Overview

Paul J. Holenstein
Executive Vice President
Shadowbase Products Group
Gravic, Inc.

September, 2016

VNUG
VIKING NONSTOP USER GROUP

GRAVIC® Shadowbase

Disclaimer

This presentation contains forward-looking statements regarding future operations, product development, product capabilities and availability dates. This information is subject to substantial uncertainties and is subject to change at any time without prior notification. Statements contained in this presentation concerning these matters only reflect Gravic, Inc.'s predictions and/or expectations as of the date of this presentation and actual results and future plans of Gravic, Inc. may differ significantly as a result of, among other things, changes in product strategy resulting from technological, internal corporate, market and other changes. This is not a commitment to deliver any material, code or functionality and should not be relied upon in making purchasing decisions.

Specifications are subject to change without notice and delivery dates/timeframes are not guaranteed…purchasing decisions should not be made based on this material without verifying the desired features are available on the platforms and environments desired.

All trademarks mentioned in this presentation are the property of their respective owners.

Agenda

Business Continuity Eliminates *Unplanned* Application Downtime

- Our focus today: ZDM Eliminates *Planned* Application Downtime

A (Brief) Review of the Need to Upgrade

- Change is the only constant, even when you don't want to, or need to, or are told to…
- What can go wrong will go wrong, so plan for it

Migrations & Upgrades – The *Old* Way

- Application service outages are common
- Rather risky *big-bang* approaches are common
- Failback typically is very difficult & time consuming, usually with data loss

Migrations & Upgrades – The *New* Way

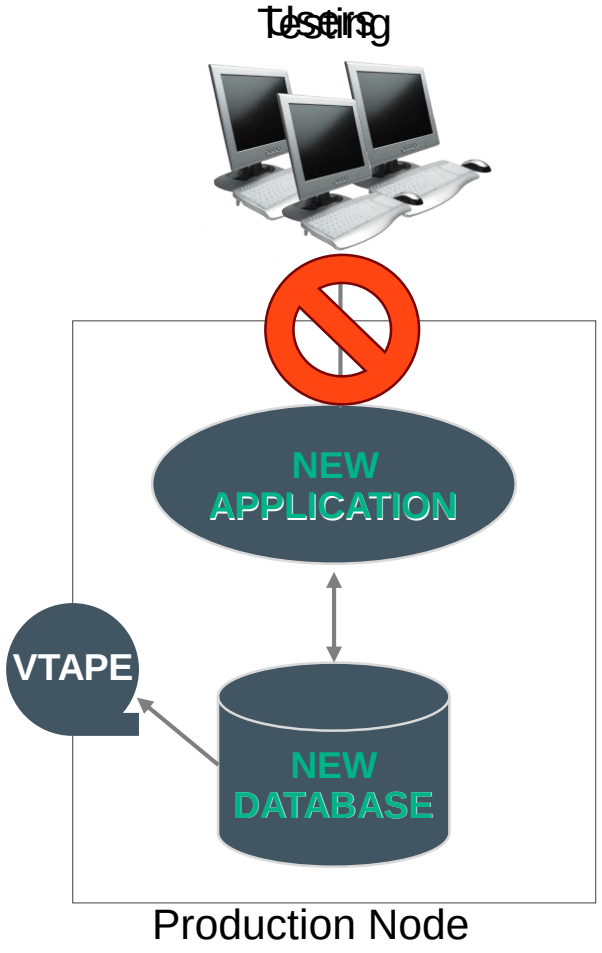
- Application service outages are uncommon (or at least so short that either customers don't notice or they are not materially inconvenienced)
- Risk is mitigated – migration is to a *known-working & fully tested* environment
- Failback is managed, controlled, & fast, with no data loss

Migrations & Upgrades – The *Old* Way

- Single System Environment
- Multi-system Environment

System Migrations the Old Way – The "Big Bang" Approach

Single System Upgrade in a Single System Environment (1)



1. Schedule a (usually long) outage window during a night/weekend
   - Application services are usually down for the entire duration
2. Take existing system out of service
   - Shutdown application and quiesce the database, take a full and consistent backup
3. Perform necessary activities for the upgrade/migration
   - Install new software/systems, build/load new database, install and start new application version, etc.
4. Test system to extent possible within outage window
   - Include load/scaling testing as well as external interfaces testing if possible
5. Put upgraded/migrated system into production, and hope it all works
   - *But what about failback if it doesn't go well?*
   - *How long will it take to restore and recover the application and database?*
   - *Will you lose all of the new data during a failback operation?*

Migrations & Upgrades – The *Right* Way

- Presenting HPE Shadowbase for Zero Downtime Migrations (ZDMs)

System Migrations the Right Way

The HPE Shadowbase Method for Zero Downtime Migrations (ZDM)

HPE Shadowbase ZDM software:

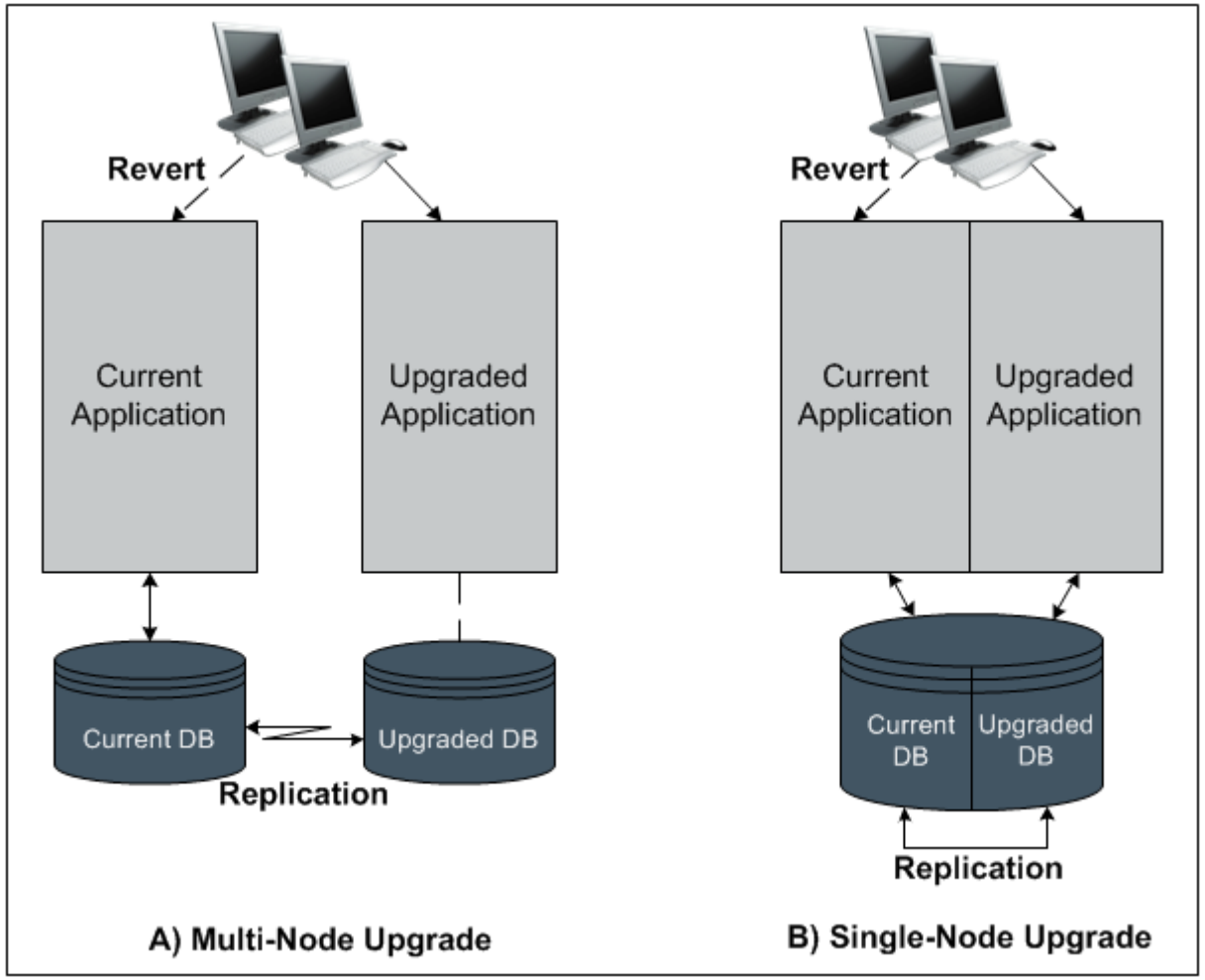
- Provides continuous application services availability while the migration occurs, thereby eliminating planned downtime;
- Removes business risk that the migration will fail; and,
- Avoids data loss if a failback does have to occur (Mitigating Murphy's Law)

It is used to:

- Convert from an older to a newer application version or database layout
- Upgrade/convert operating system or database software
- Migrate to new hardware (homogeneous or heterogeneous)
- Relocate systems, sites, or data centers
- Move "other" application or database environments onto NonStop

It provides these capabilities by leveraging the key features of the HPE Shadowbase data replication engine to provide zero application service downtime for the disruptive activity…

HPE Shadowbase Zero Downtime Migration (ZDM)



HPE Shadowbase for Zero Downtime Migrations

- NonStop to NonStop (Platform/Database Upgrade)

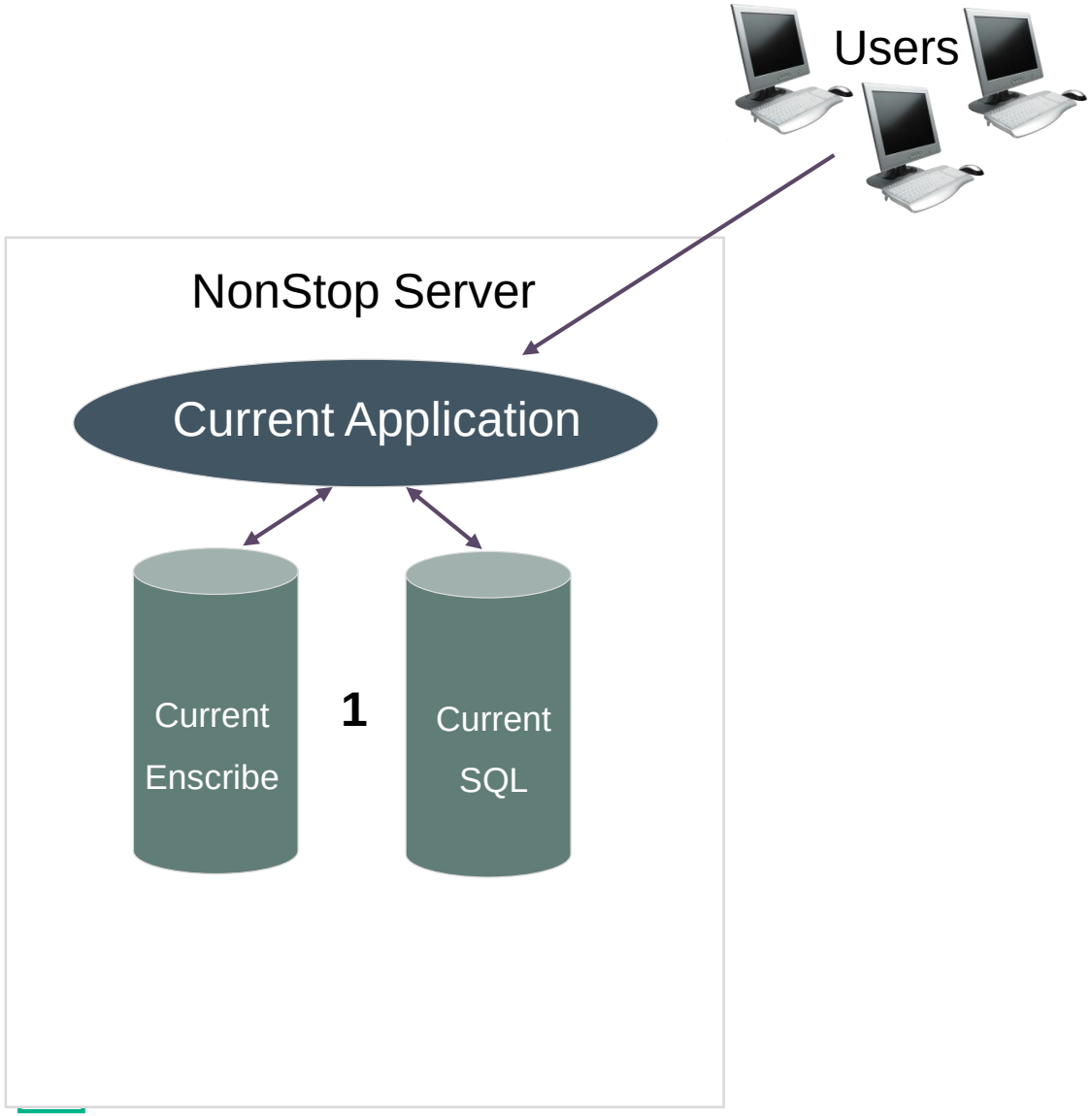
HPE Shadowbase Success Stories – ZDM

Zero Downtime Upgrades & Migrations (ZDM) – Casino Administration Case

Upgrade from One NonStop Server to Another – Casino Operations Example

- New platform type (S to Itanium Blades)
- New application version
- New database format (differing schemas on the source vs target)
- Minimal application service downtime allowed

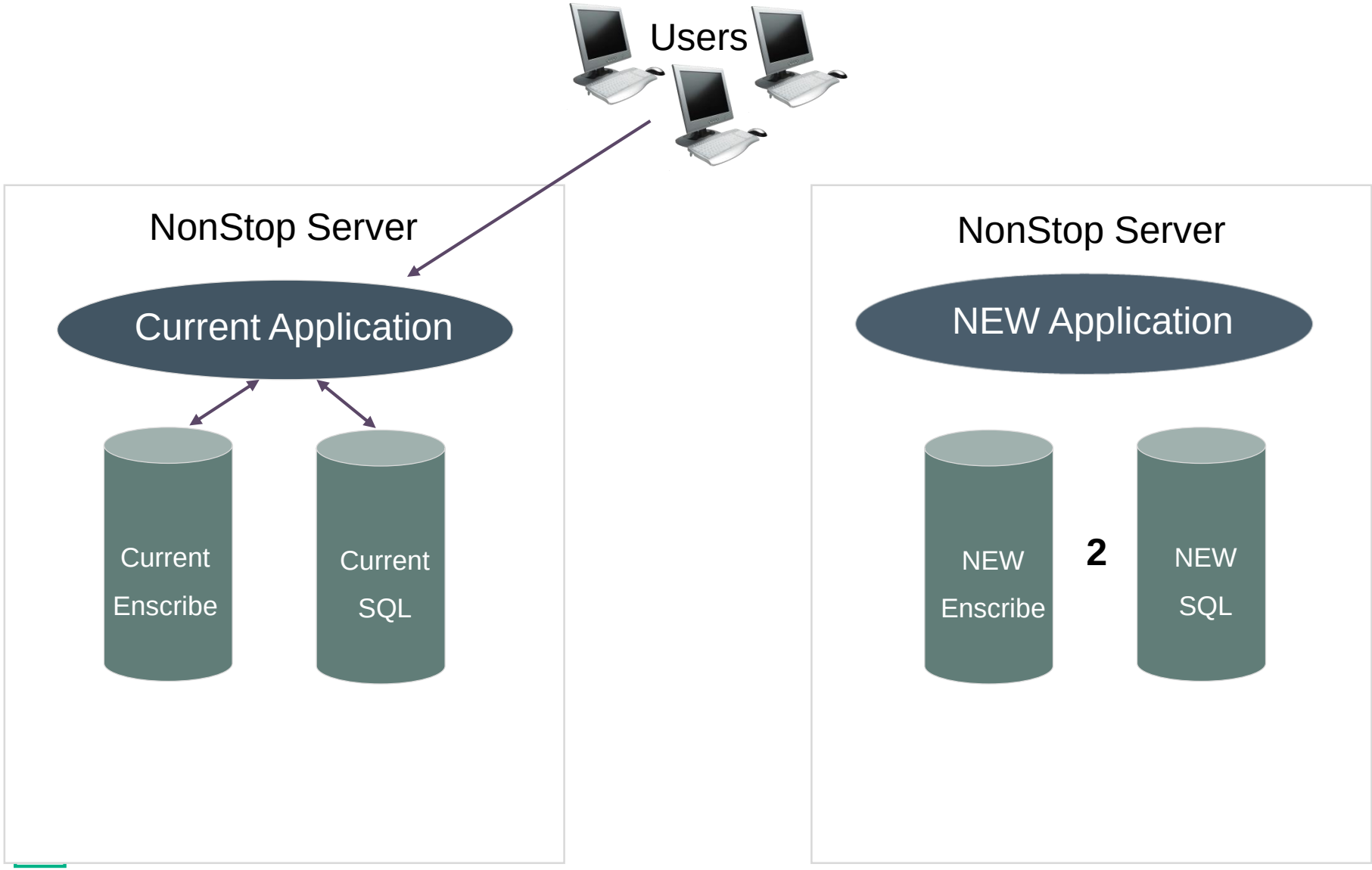
Shadowbase Success Stories – Step 1



Sequence:

1-Current Production

Shadowbase Success Stories – Step 2

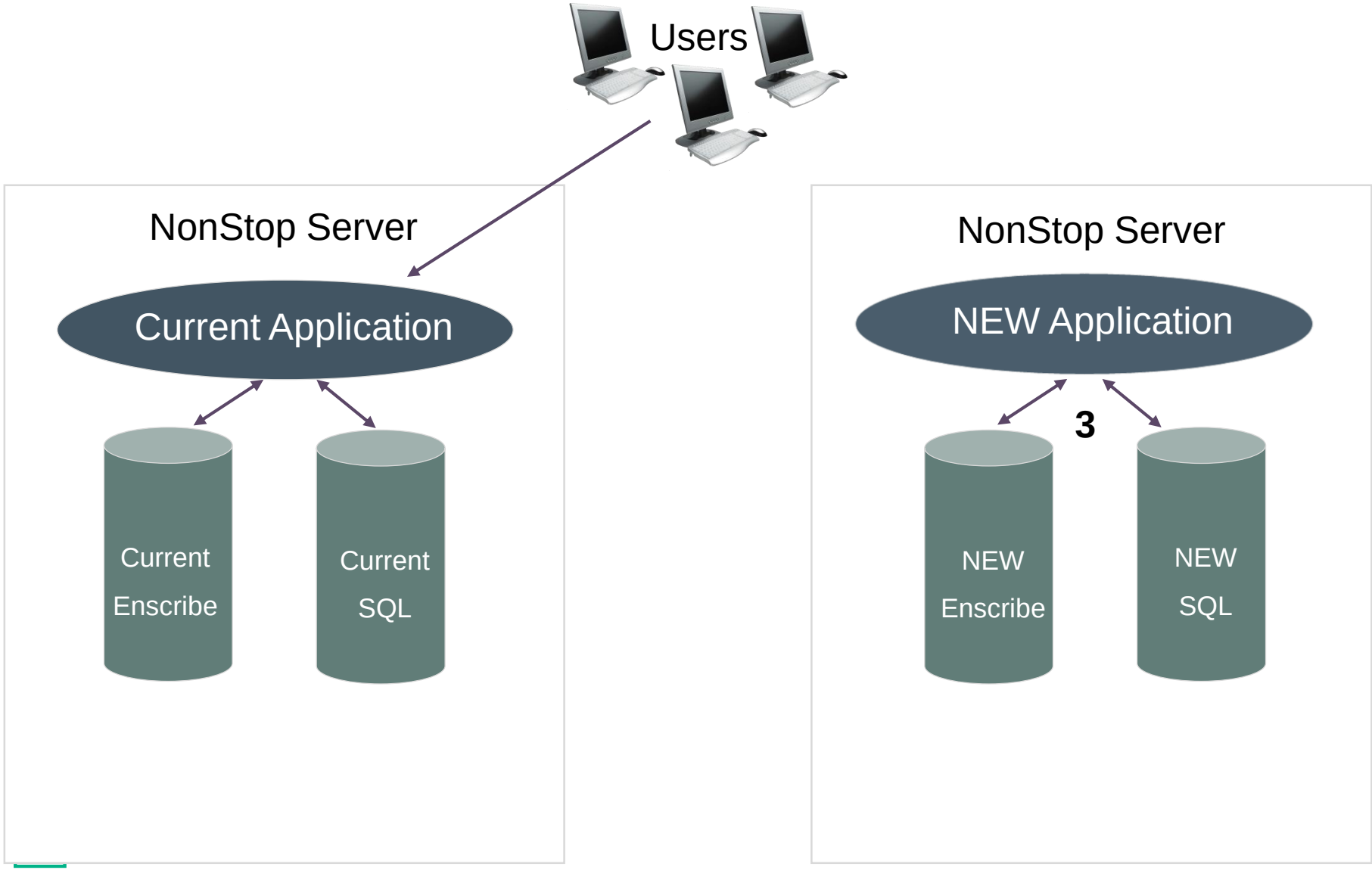


Sequence:

1-Current Production

2-Create "NEW" DB and/or Application

Shadowbase Success Stories – Step 3



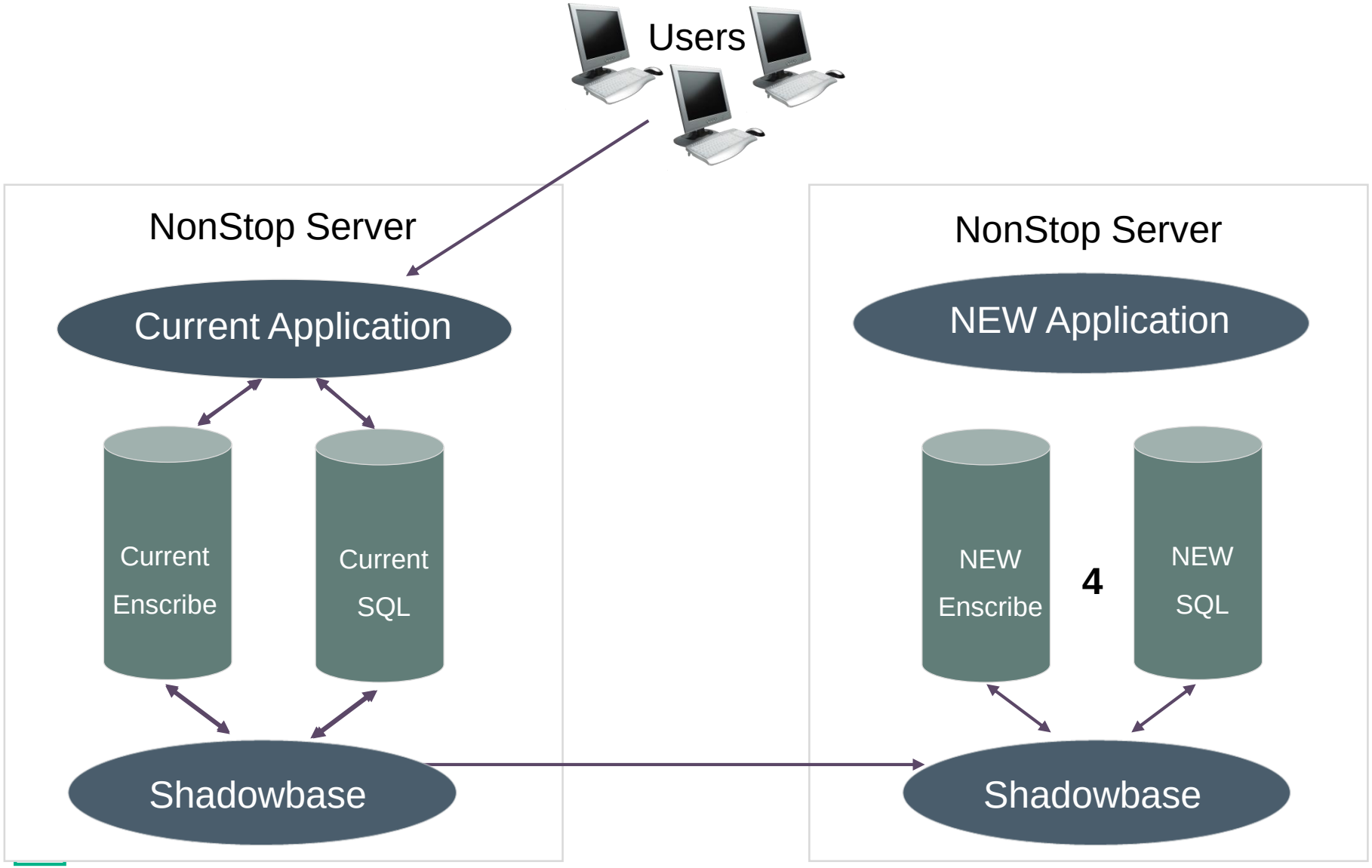
Sequence:

1-Current Production

2-Create "NEW" DB and/or Application

3-Test New Environment

Shadowbase Success Stories – Step 4



Sequence:

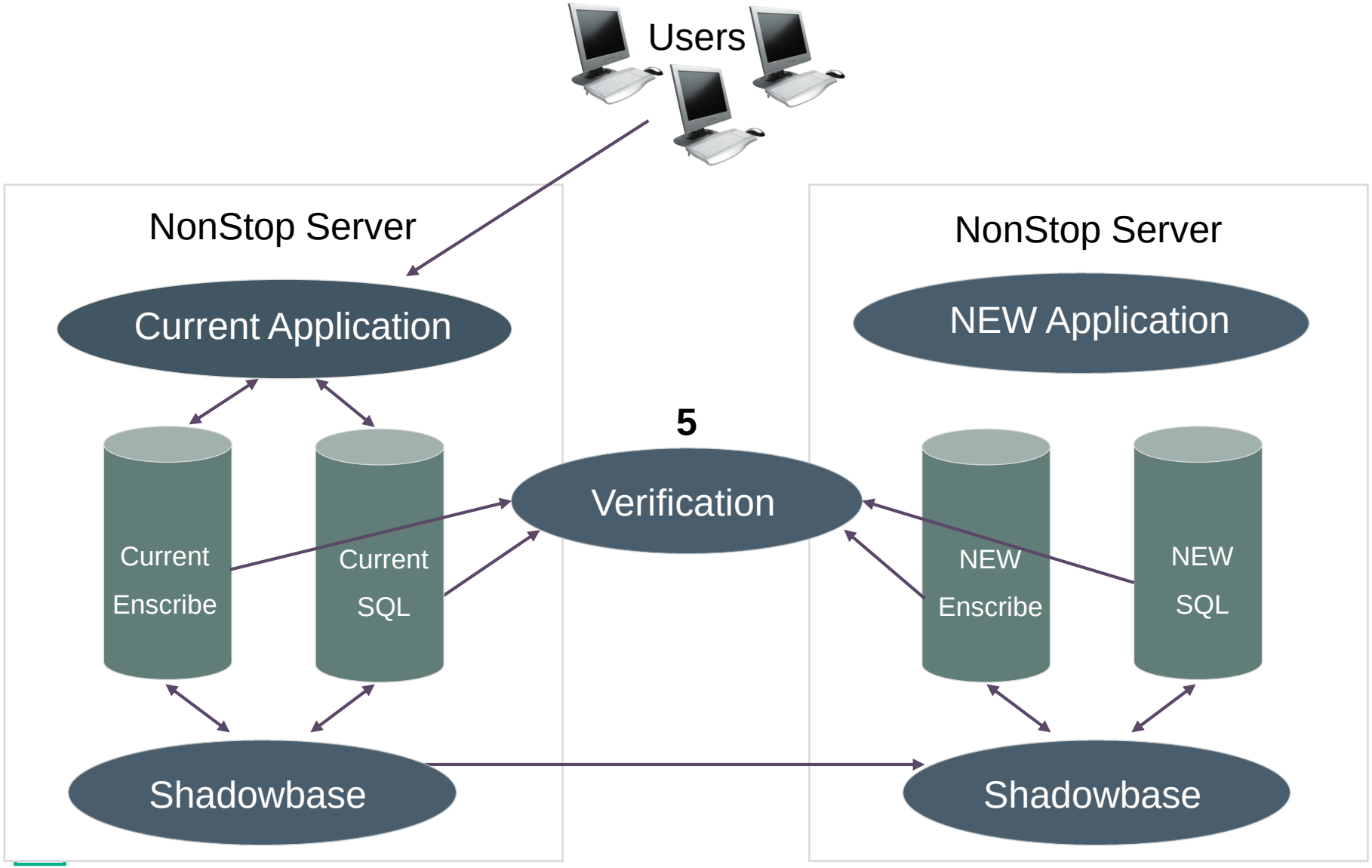
1-Current Production

2-Create "NEW" DB and/or Application

3-Test New Environment

4-Load and Synchronize New Database With Current

Shadowbase Success Stories – Step 5



Sequence:

1-Current Production

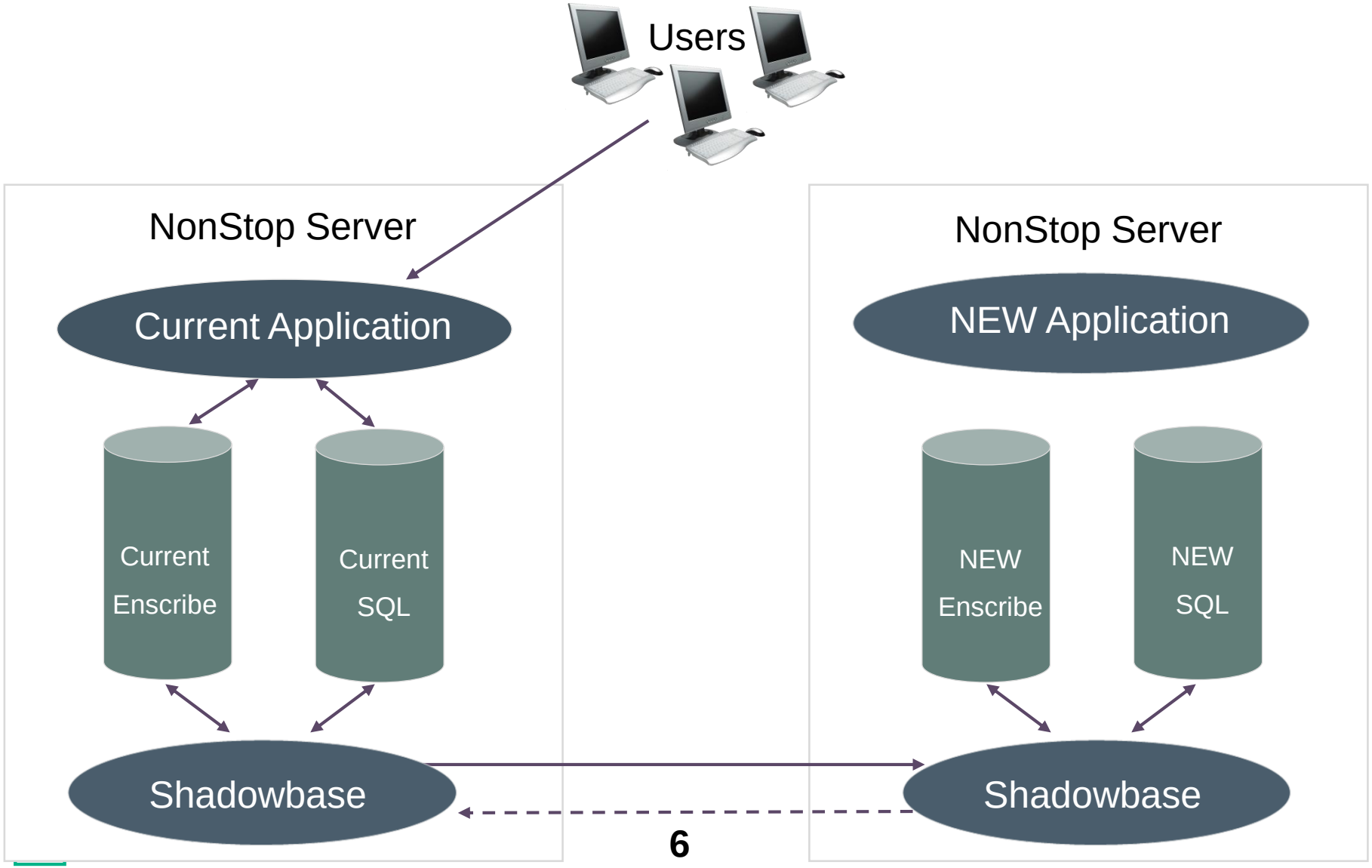
2-Create "NEW" DB and/or Application

3-Test New Environment

4-Load and Synchronize New Database With Current

5-Verify New Matches Current (Optional, but Recommended)

Shadowbase Success Stories – Step 6



Sequence:

1-Current Production

2-Create "NEW" DB and/or Application

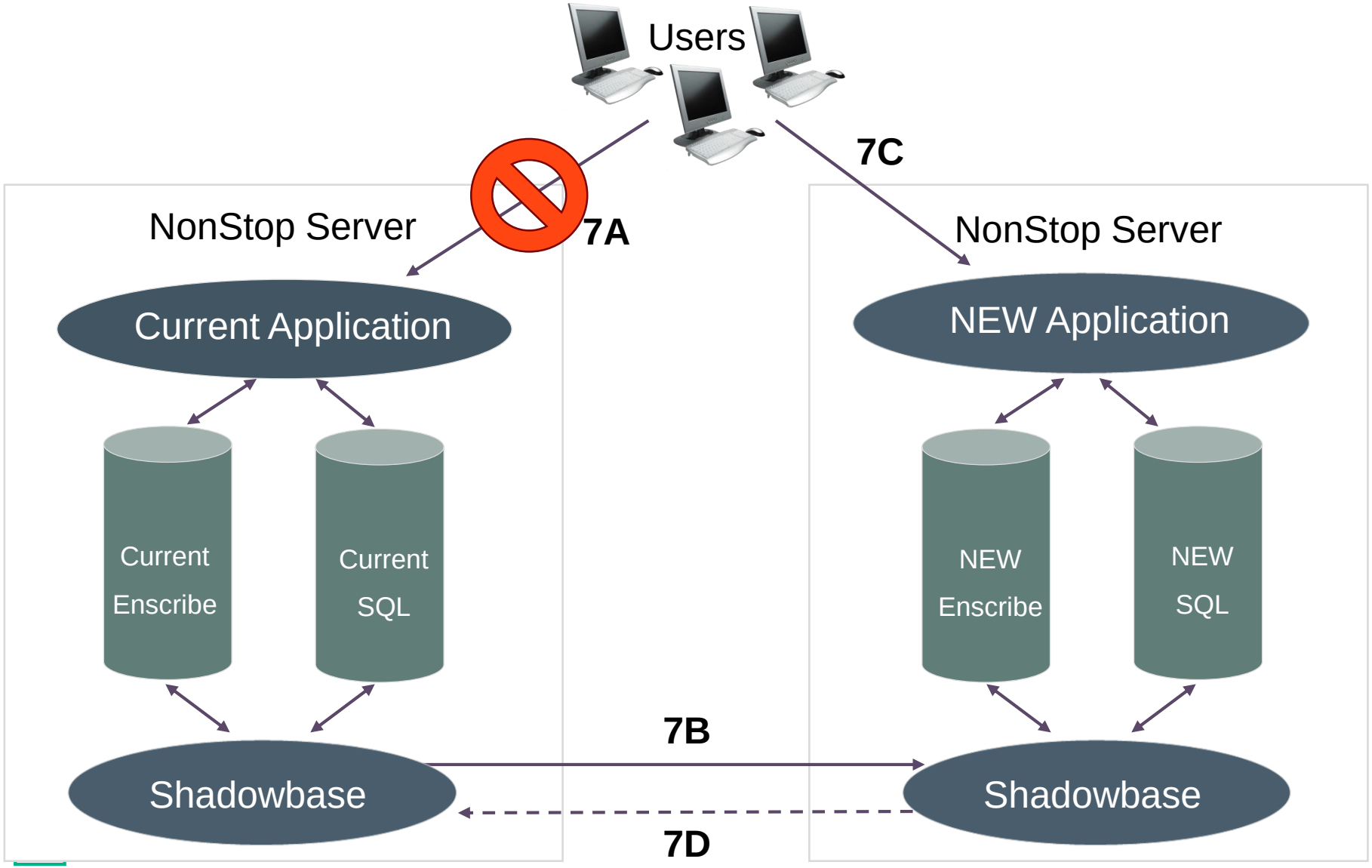
3-Test New Environment

4-Load and Synchronize New Database With Current

5-Verify New Matches Current (Optional, but Recommended)

6-(Optional) Add Failback

Shadowbase Success Stories – Step 7



Sequence:

1-Current Production

2-Create "NEW" DB and/or Application

3-Test New Environment

4-Load and Synchronize New Database With Current

5-Verify New Matches Current (Optional, but Recommended)

6-(Optional) Add Failback

7-Cut-over Users:

A. Disconnect from Current

B. Let Events Drain

C. Connect to New Prod

D. (Optional) Reverse Replicate to Keep Old DB Synchronized with New DB (Thereby Avoiding Data Loss if a Failback Must Occur)

HPE Shadowbase for Zero Downtime Migrations (Recent Project Completed)

- Active/Active NonStop Blades System HW Upgrade
  - While Maintaining Full BC Protection During a Pair of Data Center Moves
  - Replacing Current Replication Vendor (OLDR) with HPE Shadowbase

HPE Shadowbase Zero Downtime Migration

Zero Downtime Upgrades & Migrations (ZDM) – Large Payments Processor Case

Upgrade from NonStop NB54000 Servers to NonStop NB56000 Servers During a pair of Data Center Moves, Replacing Existing Replication Product with Shadowbase

- Platform type: NonStop NB54000 (10 cpu, quad) to NonStop NB56000 (12 cpu, quad)
- Same application version & database format
- No application service downtime allowed (application always available *somewhere*)

Statistics:

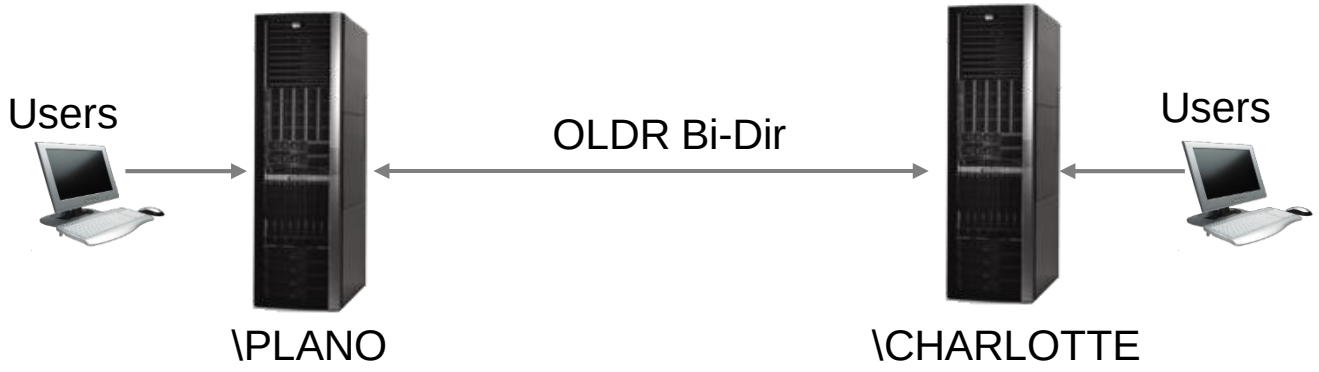
- TPS: 500 (avg), 1000 (peak)
- MAT + 3 AUX: 100GB audit generation/day, roll about 50 audit trails/day
- Database Size (for loading): 3TB
- Files/Tables Replicated:
  - Enscribe = 10's
  - SQL/MP = 500 +/-
  - SQL/MX = 1's
- ADT Retention: originally 2.0 Days, **expanded to 10 days to allow for system move time**

Shadowbase for Business Continuity

Zero Downtime Upgrades & Migrations (ZDM) – WU Use Case 1

Initial Configuration

- Active ↔ Active (Partitioned)
- No data collisions
- Project Goals:
  - Add a new node in \VIRGINIA to replace \PLANO
  - Move \CHARLOTTE node to \CHICAGO
  - Replace OLDR replication engine with HPE Shadowbase
  - Preserve full BC active/active protection during the entire sequence
  - Validate that the databases all match before and after the process completes (remediate if needed)
  - Every step of the way, have proper fail-back if things don't go well…



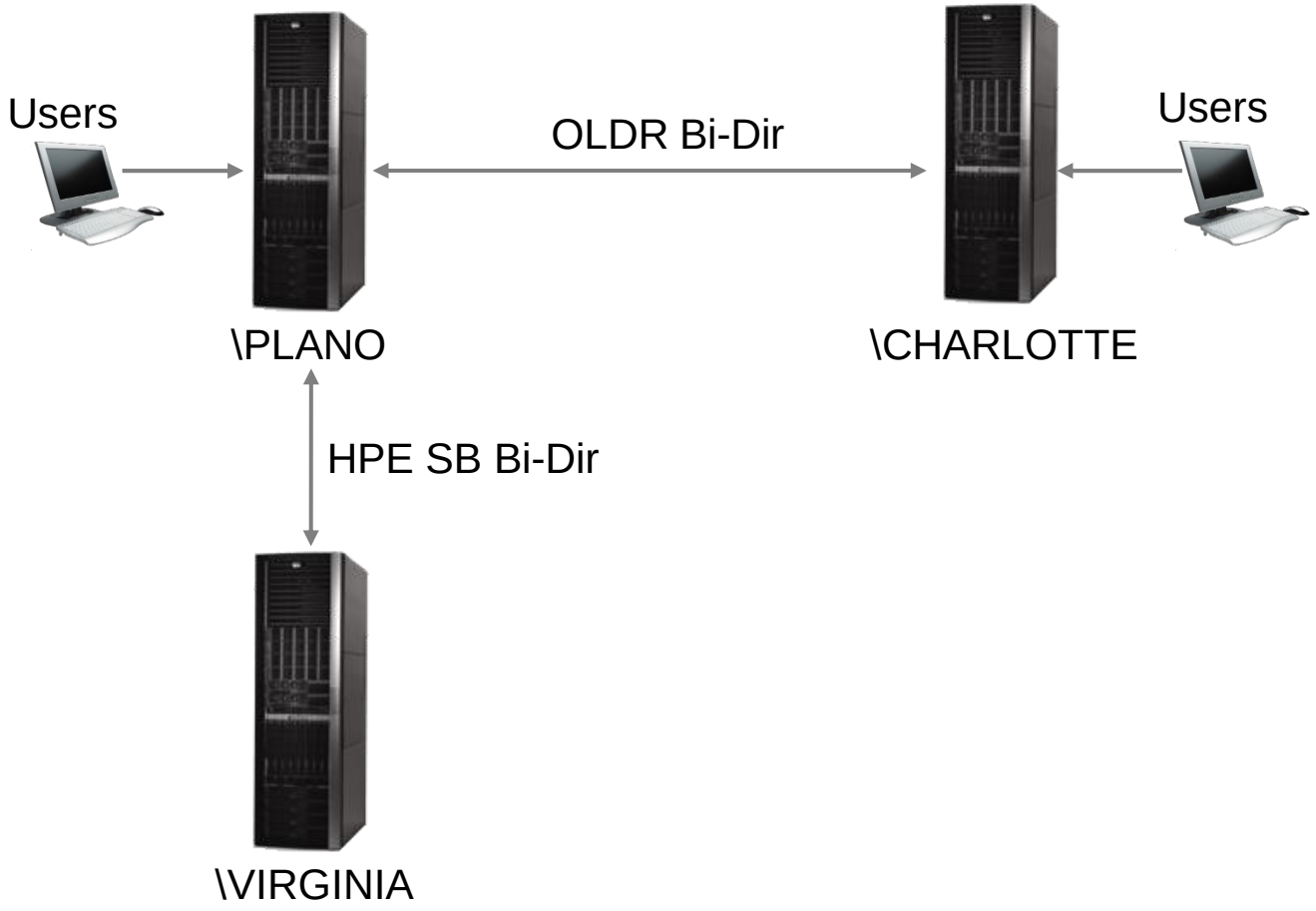
Hewlett Packard Enterprise

Shadowbase for Business Continuity

Zero Downtime Upgrades & Migrations (ZDM) – WU Use Case 2

Configuration Changes

- Add in \VIRGINIA using HPE SB active/active replication
- Load \VIRGINIA database (in this case, using FUP/SQL LOAD) across Expand
- Synchronize \VIRGINIA database (Shadowbase resync after load)
- Start up \VIRGINIA applications

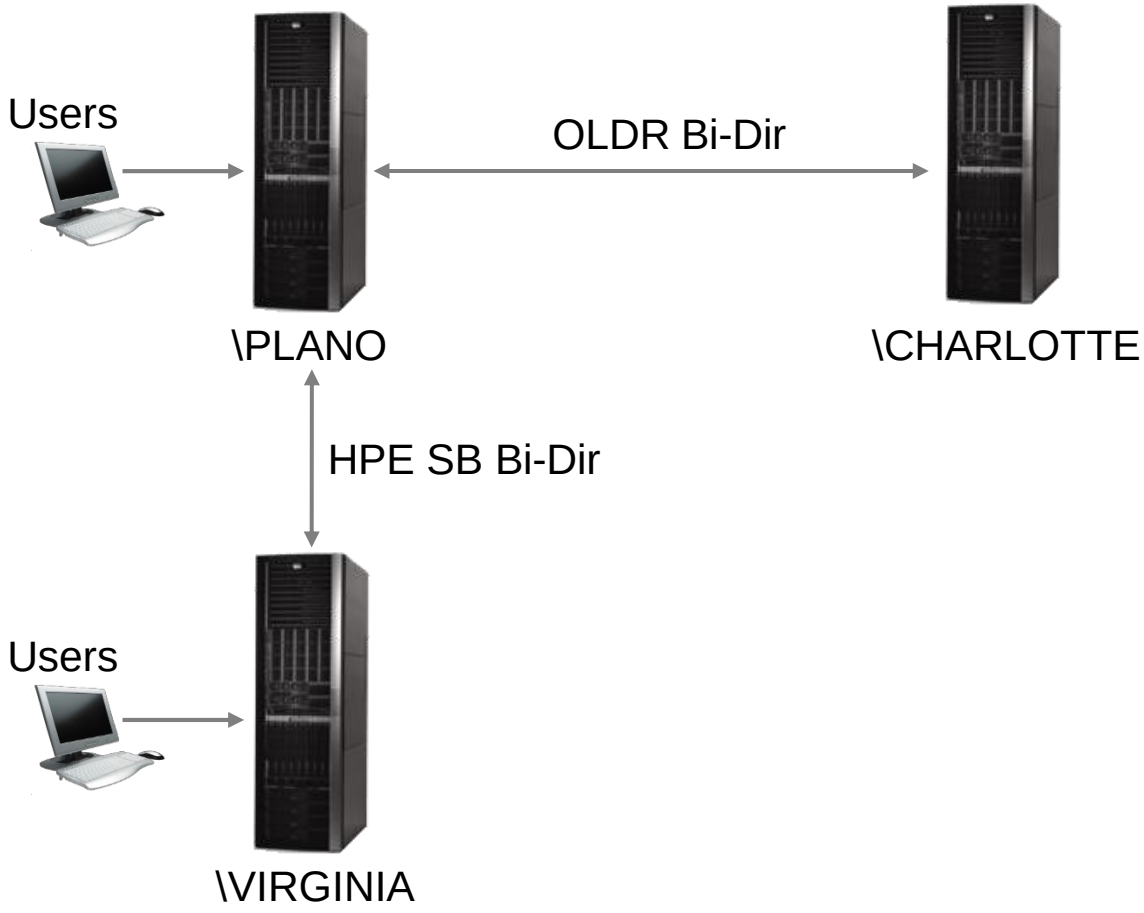


Shadowbase for Business Continuity

Zero Downtime Upgrades & Migrations (ZDM) – WU Use Case 3

Configuration Changes

- Migrate users from \CHARLOTTE to \VIRGINIA
- Recall: Active/Active partitioned, so no data collisions occur…
- Any issues, move them back to \CHARLOTTE and fix \VIRGINIA, and repeat as necessary…

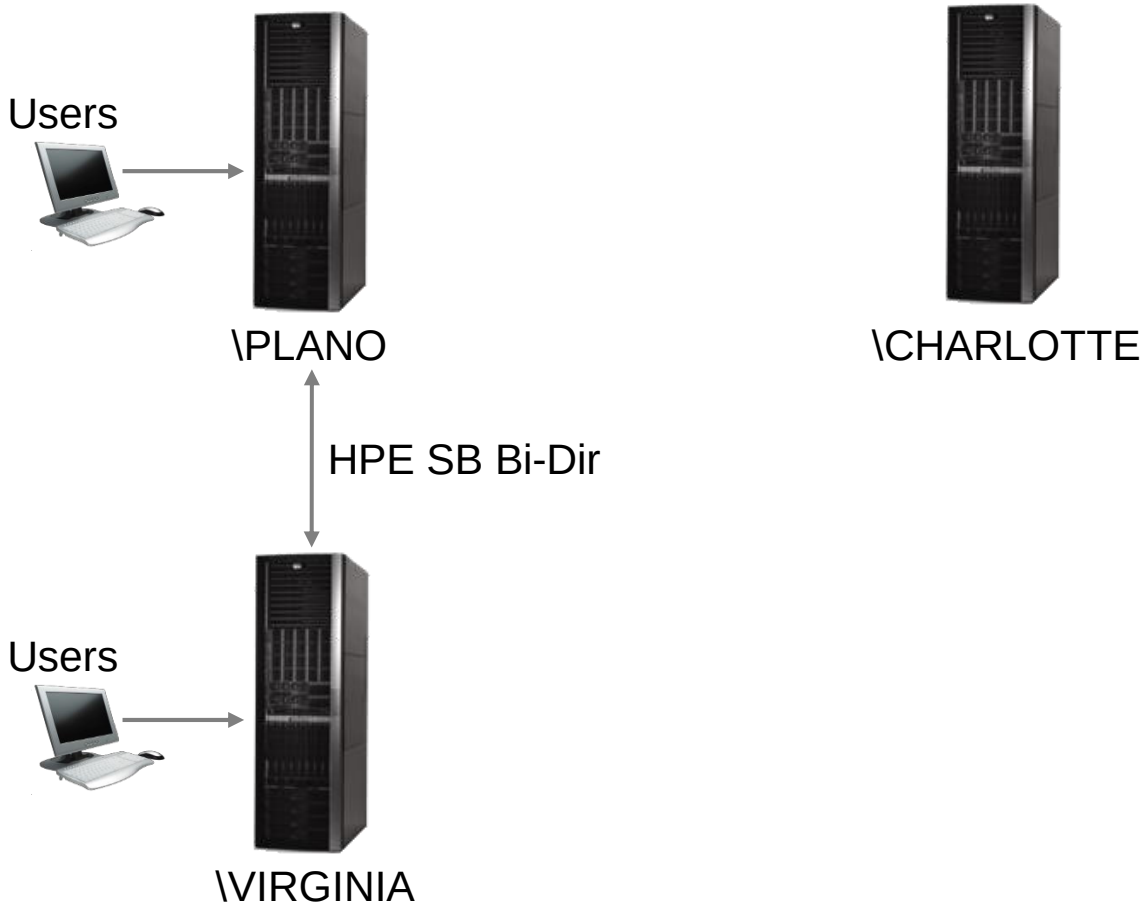


Shadowbase for Business Continuity

Zero Downtime Upgrades & Migrations (ZDM) – WU Use Case 4

Configuration Changes

- Shutdown OLDR replication to \CHARLOTTE
- Key Point: Have to make sure all events drained from \PLANO to \CHARLOTTE, else we have to replay them later on…

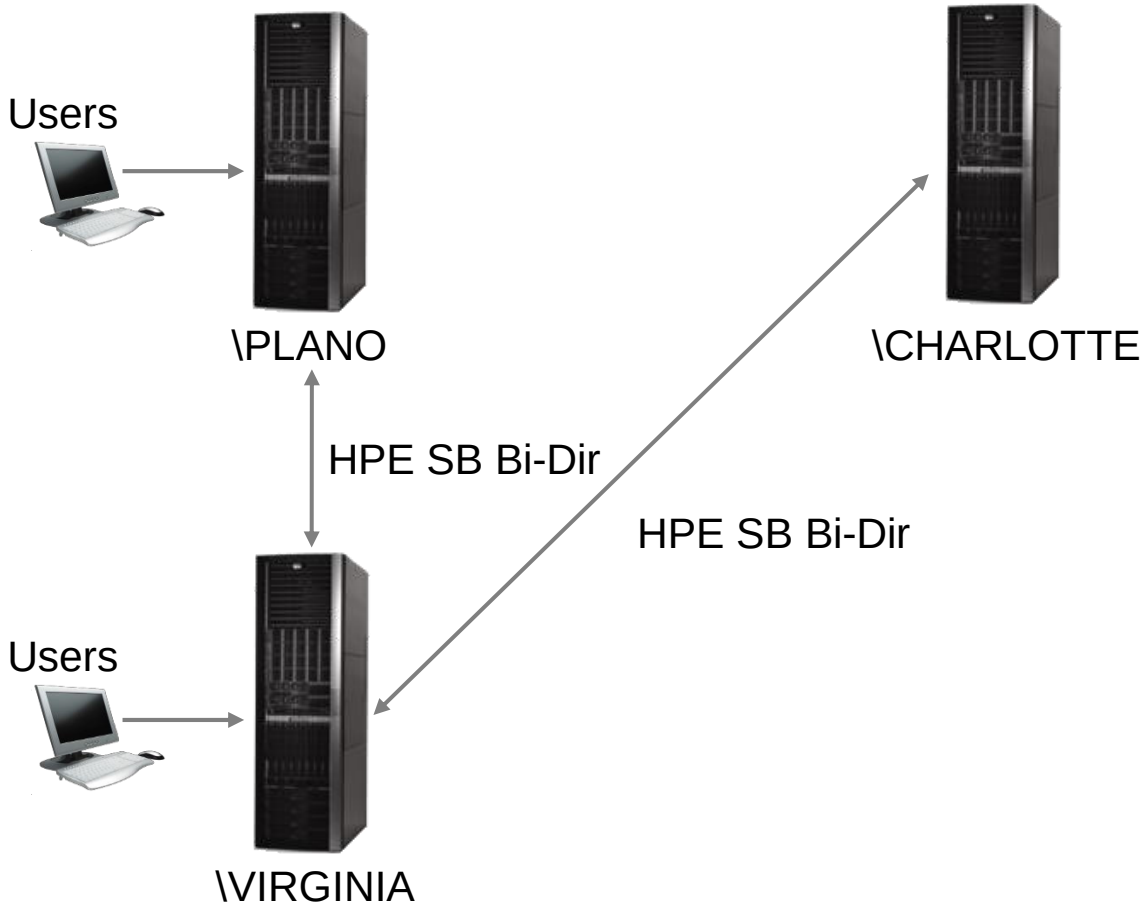


Shadowbase for Business Continuity

Zero Downtime Upgrades & Migrations (ZDM) – WU Use Case 5

Configuration Changes

- Here's where it gets a little weird: now configure and start up HPE Shadowbase replication to \CHARLOTTE. Why?
  - To set a restart point for after the move…
- Previously, if any data didn't make it from \PLANO to \CHARLOTTE, replay it from \VIRGINIA to \CHARLOTTE (an HPE SB configuration param assists with this issue)

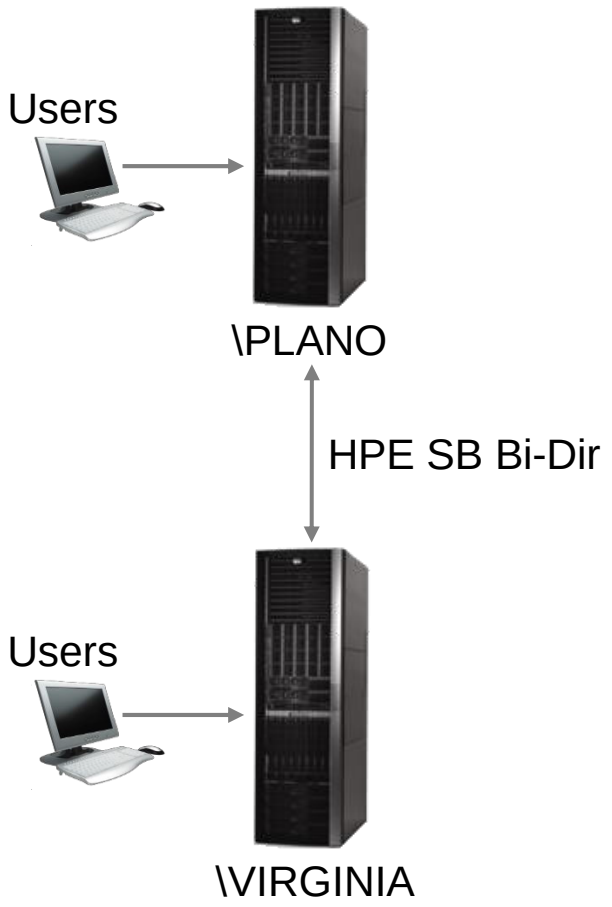


Shadowbase for Business Continuity

Zero Downtime Upgrades & Migrations (ZDM) – WU Use Case 6

Configuration Changes

- Next, shutdown HPE SB replication to \CHARLOTTE and bring the node down in preparation for the move to Chicago…

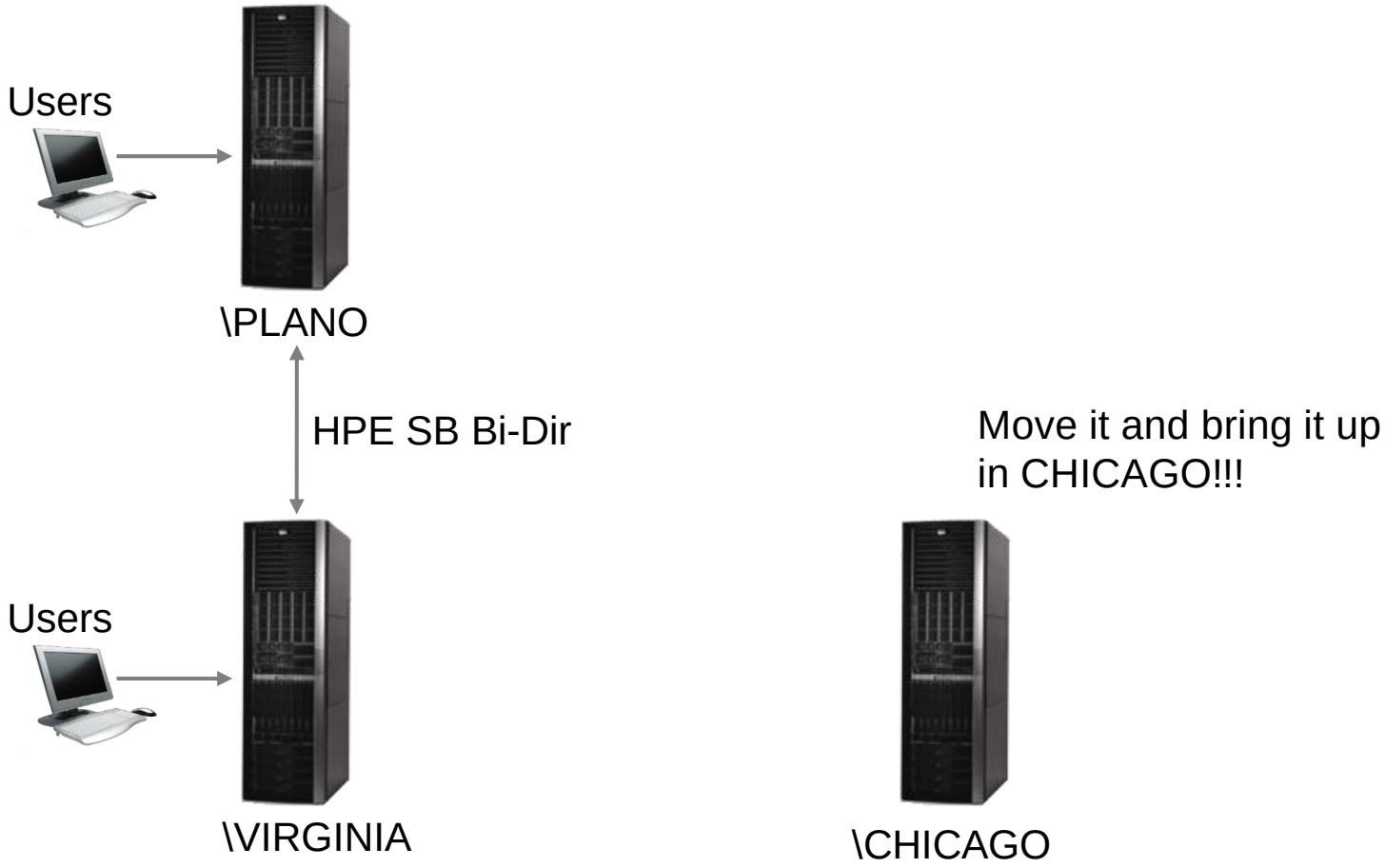


Shadowbase for Business Continuity

Zero Downtime Upgrades & Migrations (ZDM) – WU Use Case 7

Configuration Changes

- Move \CHARLOTTE system to \CHICAGO
- Have to make sure the TMF audit trail retention (or HPE SB retention) from \VIRGINIA to \CHICAGO is configured large enough to cover the move time…

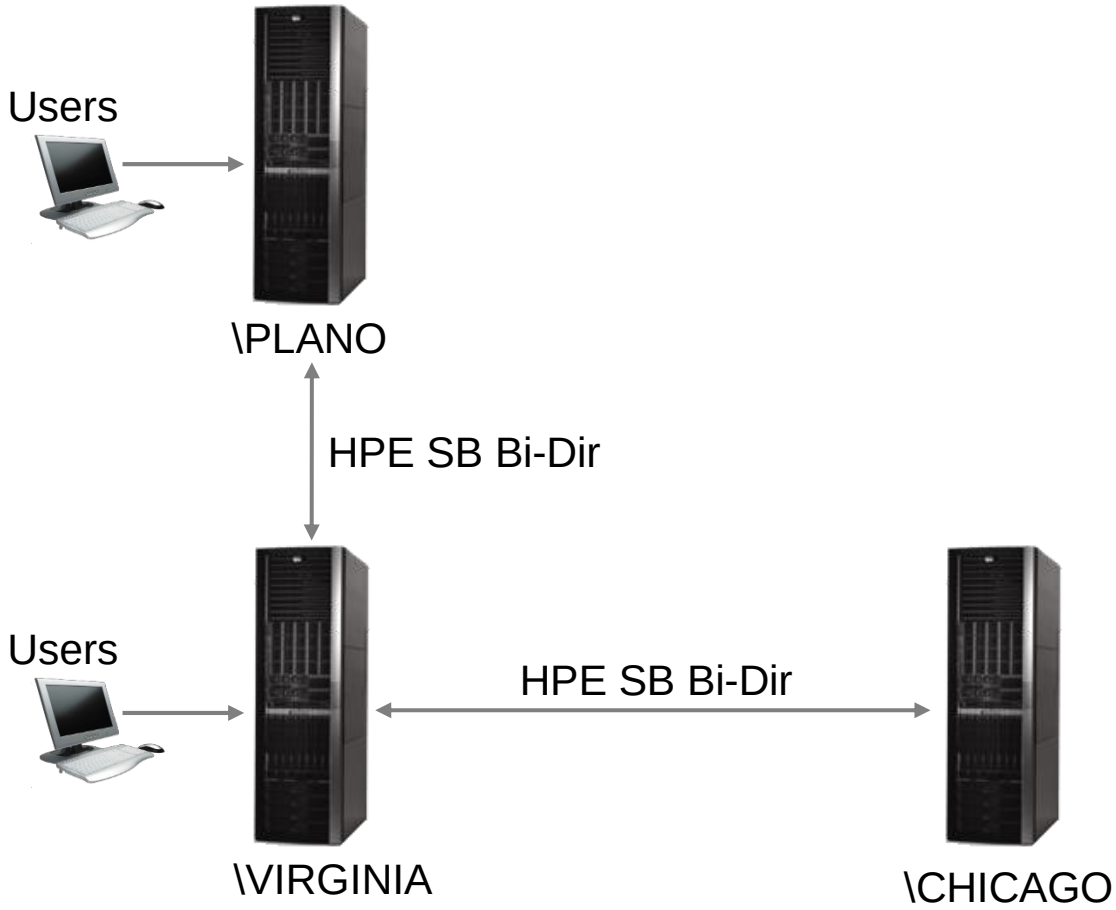


Shadowbase for Business Continuity

Zero Downtime Upgrades & Migrations (ZDM) – WU Use Case 8

Configuration Changes

- Restart HPE Shadowbase replication between \VIRGINIA and \CHICAGO
- HPE Shadowbase will automatically re-sync the \CHICAGO database to match the \VIRGINIA database
- Validate, of course, using HPE Shadowbase COMPARE
- Remediate, if required (e.g. if move takes “too long” and audit is lost, re-load \CHICAGO from \VIRGINIA)
- Bring up applications on \CHICAGO

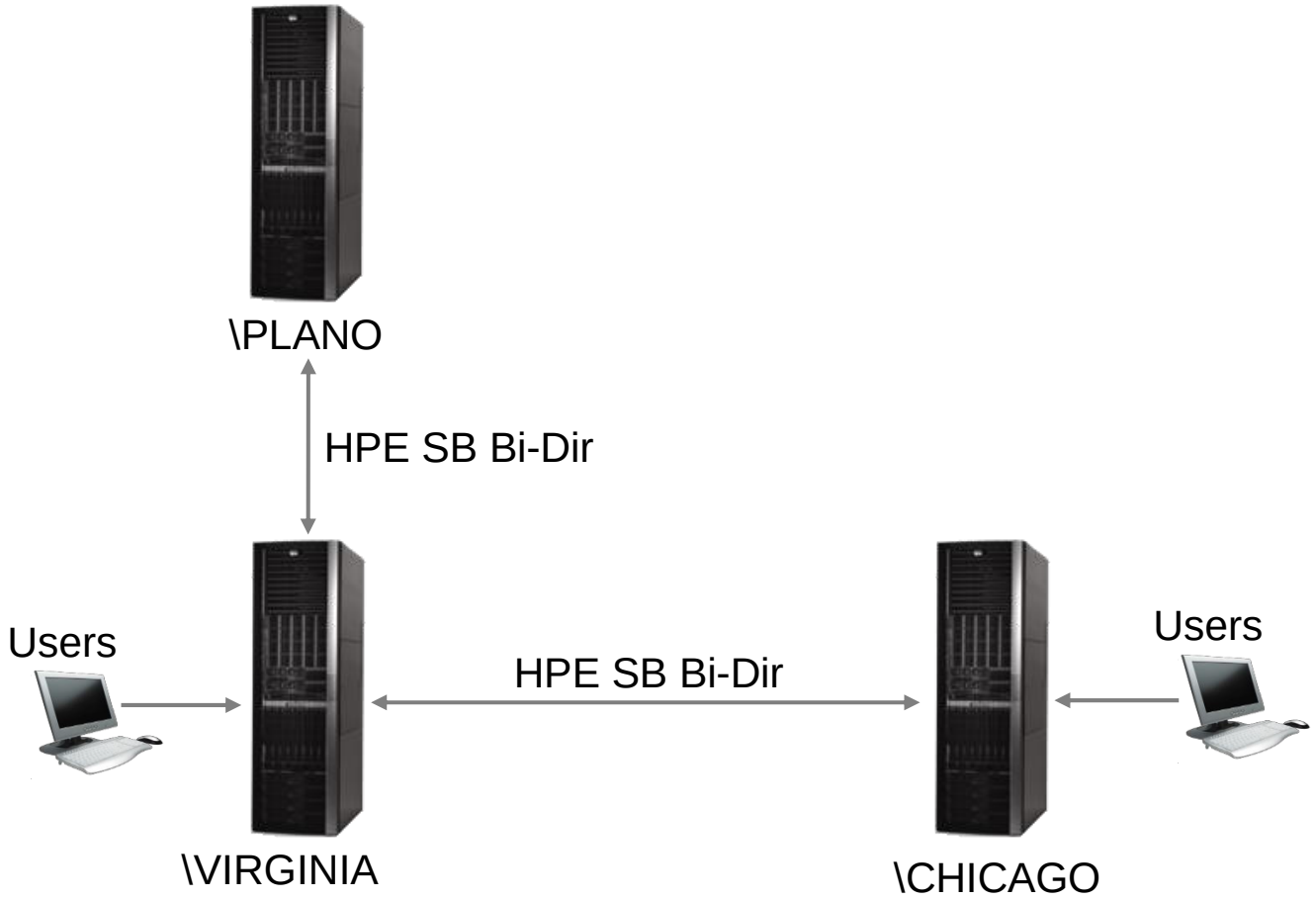


Shadowbase for Business Continuity

Zero Downtime Upgrades & Migrations (ZDM) – WU Use Case 9

Configuration Changes

- Next, migrate users from \PLANO to \CHICAGO



Shadowbase for Business Continuity

Zero Downtime Upgrades & Migrations (ZDM) – WU Use Case 10

Configuration Changes

- Retire \PLANO
- All done…

HPE Shadowbase Product Suite Overview

Shadowbase Product Suite Overview

The Shadowbase Extensible Architecture

Business Continuity & Application Availability Environments

- Active/Passive Disaster Recovery
- Sizzling-Hot-Takeover (SZT)
- Active/Active Continuous Availability
- Eliminate Planned Downtime for Migrations & Upgrades (ZDM)

Data Integration & Data Synchronization

- Homogeneous & Heterogeneous Environments
- Data Transformation, Scrubbing, Filtering & Cleansing
- Extend Replication Capabilities with Embedded Application Logic

Application Integration

- Build *Event-Driven* Architectures
  - Process events as they occur; no more polling for needed data
- Build *Real-Time* Architectures
  - Process events when they occur; no more working with “stale” data
- Integrate Disparate Applications with no Application Code Changes
  - Integrate at the data-layer, avoiding costly adapters, middleware, and code changes

HPE Shadowbase Portfolio

Best in class products for a nonstop world

Business Continuity

- Shadowbase Basic* Data Replication
- Shadowbase Advanced* Data Replication

Data & Application Integration

- Shadowbase Basic* Data and Application Integration
- Shadowbase Advanced* Data and Application Integration

Data Utilities

- Shadowbase Data Management Utilities
  - Audit Log
  - Audit Reader
  - Compare
  - Undo

Proven in the Market

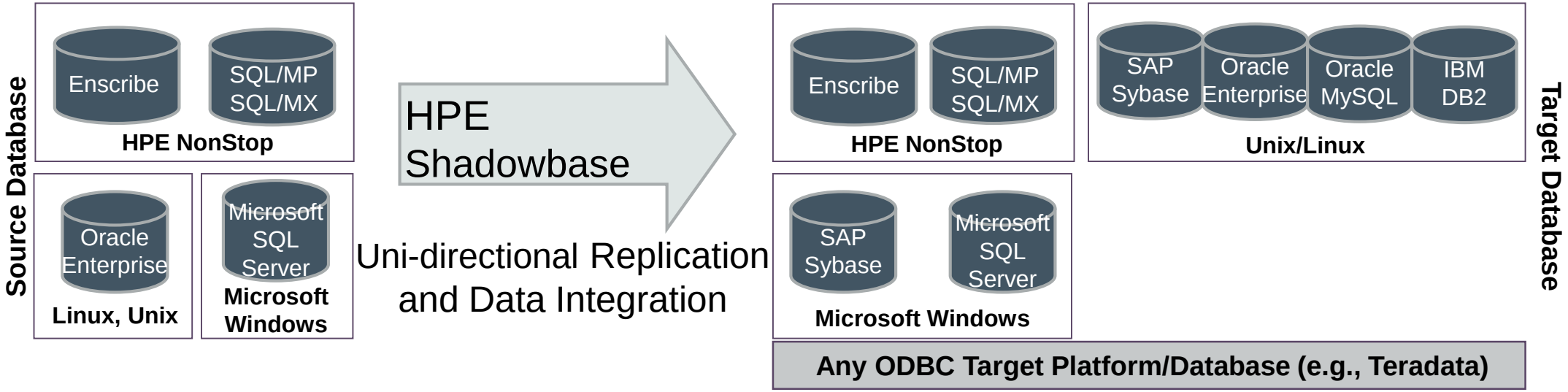
- Large, worldwide, marquee customer base
- Shadowbase has been in the market for over 30 years

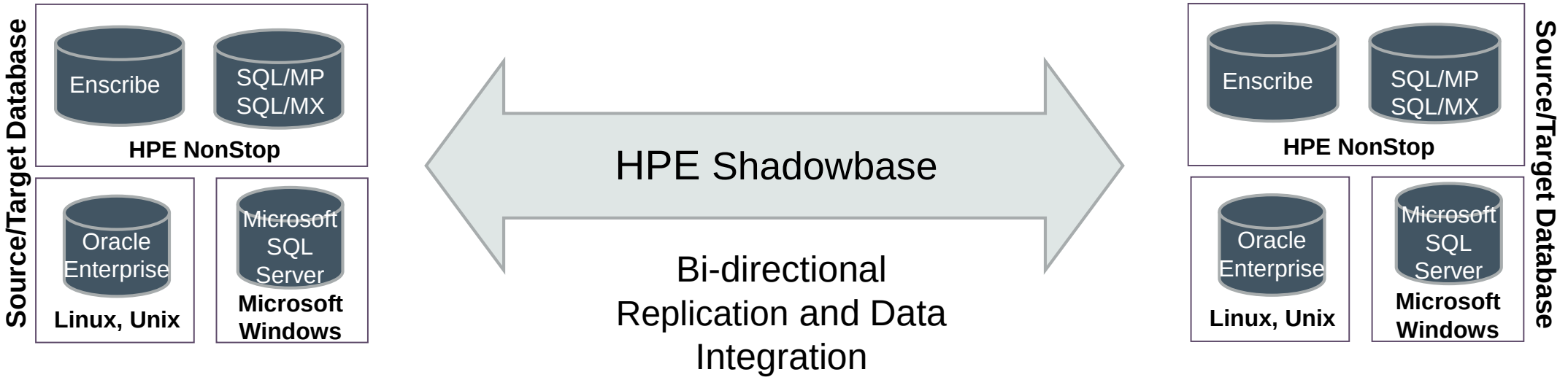
*** Basic = Uni-directional / Advanced = Bi-directional**

Hewlett Packard Enterprise

HPE Shadowbase Supported Platforms & Databases

Homogeneous & Heterogeneous Uni/Bi-directional Data Replication





Hewlett Packard Enterprise

HPE Shadowbase Summary and For More Information

Why Choose Shadowbase?

Proven technology

- Shadowbase is deployed at hundreds of sites, including many of the most-demanding NonStop sites

Flexible solutions for your business challenges

- Business continuity, data integration and synchronization, data warehouse feeds, application integration, real-time business intelligence

Global sales organization

- Global reseller presence from HPE Sales

Global 24x7 support organization and Global Professional Services Organization

- Global support presence from the HPE GNSC and Global PS from HPE TS and HPE SDI

Affordable, and committed to the NonStop platform

- Improves TCO via overall cost advantage and features
  - "One product, many solutions"
- We are partnering and investing with HPE in many innovative enhancements
  - "Only on NonStop"

For More Information

If you are interested in:	Please read these papers:
General Overview About Shadowbase	• Shadowbase Total Replication Solutions for HPE NonStop • Shadowbase Total Replication Solutions for Open Servers • Shadowbase Total Replication Solutions Product Datasheet
Shadowbase Articles, Case Studies, Data Sheets, News, Upcoming Tradeshows, and White Papers	• Shadowbase Articles • Shadowbase Case Studies • Shadowbase Datasheets • Shadowbase News • Shadowbase Tradeshows • Shadowbase White Papers
Performing a Zero Downtime Migration	• Using Shadowbase to Eliminate Planned Downtime via Zero Downtime Migration • Shadowbase ZDM Achieves Zero Downtime Migration for Large Bank Datacenter • Using Shadowbase Solutions for Application Modernization with Zero Downtime • Shadowbase Helps a Major ISP Migrate from Sybase to HP NonStop with No Downtime • Bank Chooses Shadowbase Solutions for BASE24 Business Continuity

Thank you

Gravic, Inc.

17 General Warren Blvd.
Malvern, PA 19355 USA

Shadowbase@gravic.com
SBSales@gravic.com
www.ShadowbaseSoftware.com

Phone: +1.610.647.6250
Fax: +1.610.647.7958

Find us on…

Hewlett Packard Enterprise