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# HPE Shadowbase Zero Downtime Migrations & Upgrades Overview

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# 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



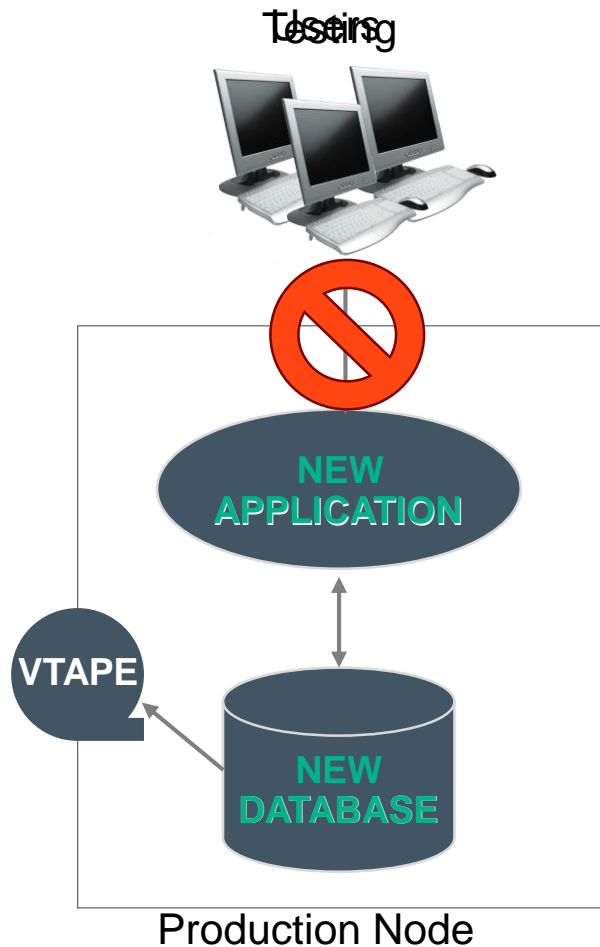


## Migrations & Upgrades – The *Old* Way

- 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?*

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# System Migrations the Old Way – The “Big Bang” Approach

## Single System Upgrade in a Single System Environment (2)

### *Why this approach is wrong:*

- Application services are unavailable to users during the outage window (who can afford this today?)
- The scheduled outage period may give insufficient time to properly test the new system
- Constrained test environment (e.g., full production load typically not possible)
- Uncertainty as to whether upgraded/migrated system will perform properly in production
- All or nothing – all users migrated at once, no chance to proceed incrementally
- No easy failback if upgrade/migration goes wrong (“sawing off the branch you’re sitting on”)

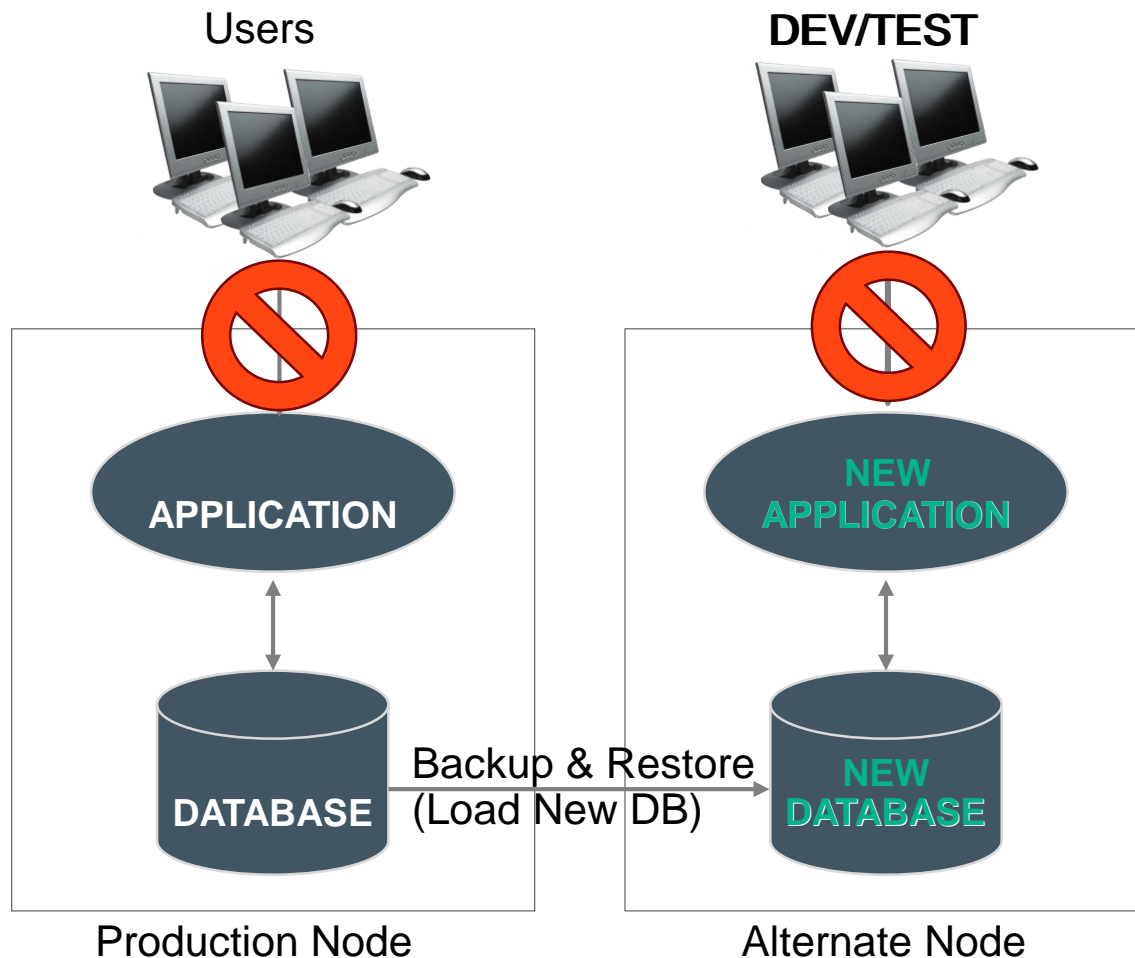
**Net: there is a strong possibility the migration/upgrade will not succeed, and if it doesn't, getting back to your original configuration will be difficult (prolonged service outage)**

***And even if it does succeed, you've taken a fairly long application service outage***



# System Migrations the Old Way – The “Big Bang” Approach

## Single System Upgrade in a Multi-System Environment (1)



*Simply having multiple systems isn't the answer...*

1. Start with the *Alternate* system (e.g., DEV or TEST) and take it out of service
2. Perform necessary activities for the upgrade/migration
  - Install new software/systems, install and start new application version, etc.
3. Test system to the extent possible
4. Take an outage of the application by shutting current production down, take backup, restore/load into new database, and bring up new application
5. Put upgraded/migrated system into production, *and hope it all works;*
  - *Failback is easier though – to original production system with original application & database intact.*
  - *However, any 'new' data is usually lost...*

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# System Migrations the Old Way – The “Big Bang” Approach

## Single System Upgrade in a Multi-System Environment (2)

**This approach improves on the single system approach by allowing certain steps to be completed before the outage period starts...but it still has the same drawbacks as the previous approach:**

- Application services are unavailable to users during the outage window
- All or nothing – all users migrated at once, no chance to proceed incrementally
- No easy failback if upgrade/migration goes wrong (“sawing off the branch you’re sitting on”)

**Net: there is a possibility the migration/upgrade will not succeed, and if it doesn’t, getting back to your original configuration will be difficult (prolonged service outage)**

***And even if it does succeed, you’ve still taken a (fairly long) application service outage***





# Migrations & Upgrades – The *Right* Way

- HPE Shadowbase for Zero Downtime Migrations (ZDMs)

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# 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...*

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# System Migrations the Right Way

## The HPE Shadowbase Method for Zero Downtime Migrations (ZDM)

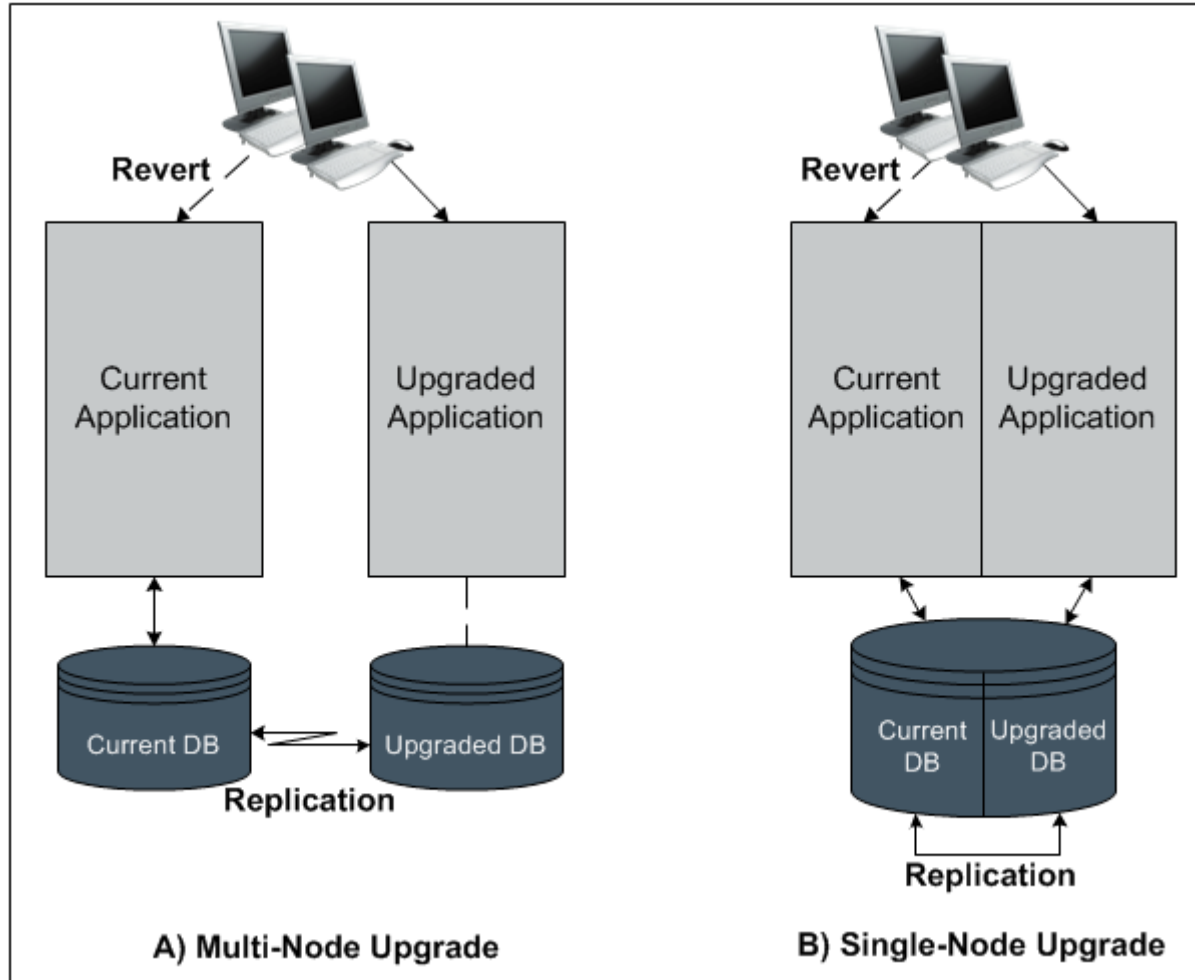
### Why this approach is right:

- No need for application service interruption (outage window)
- No “failover faults” (you have either verified that it will work or you don’t do it)
- Take as much time as you need to validate the approach and verify that it is correct
- Build and test new environments without impacting existing production users
- Fully verify the new environment before deploying, no testing constraints
- Cut-over users either gradually or at all at once to a *known-working* environment
- “Safe-failback” if things go wrong, with no loss of newly generated application data
- Bonus: Can be done with full application business continuity provided across the migration if > 2 nodes are involved

**Net: there is a very high confidence that the migration/upgrade will succeed, and if it doesn’t, “failing back” to your original configuration will be straightforward**

***And whether it succeeds or not, there is no application service outage and no data will be lost***

# HPE Shadowbase Zero Downtime Migration (ZDM)





# HPE Shadowbase for Zero Downtime Migrations

- **NonStop to NonStop  
(Platform/Database Upgrade)**

# HPE Shadowbase Success Stories – ZDM

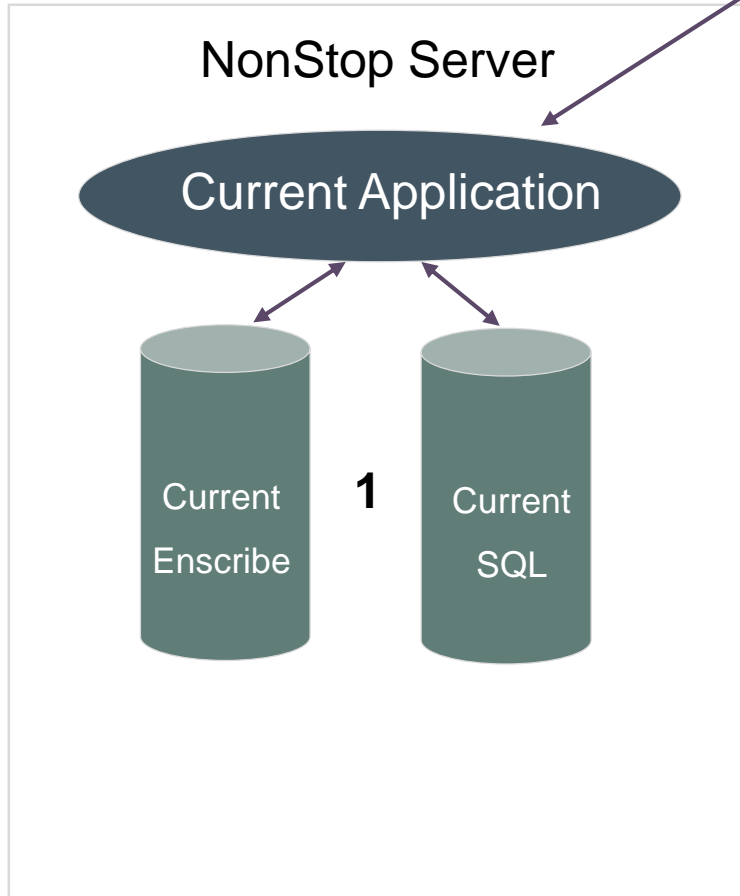
## Zero Downtime Upgrades & Migrations (ZDM) – Casino Administration Case

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

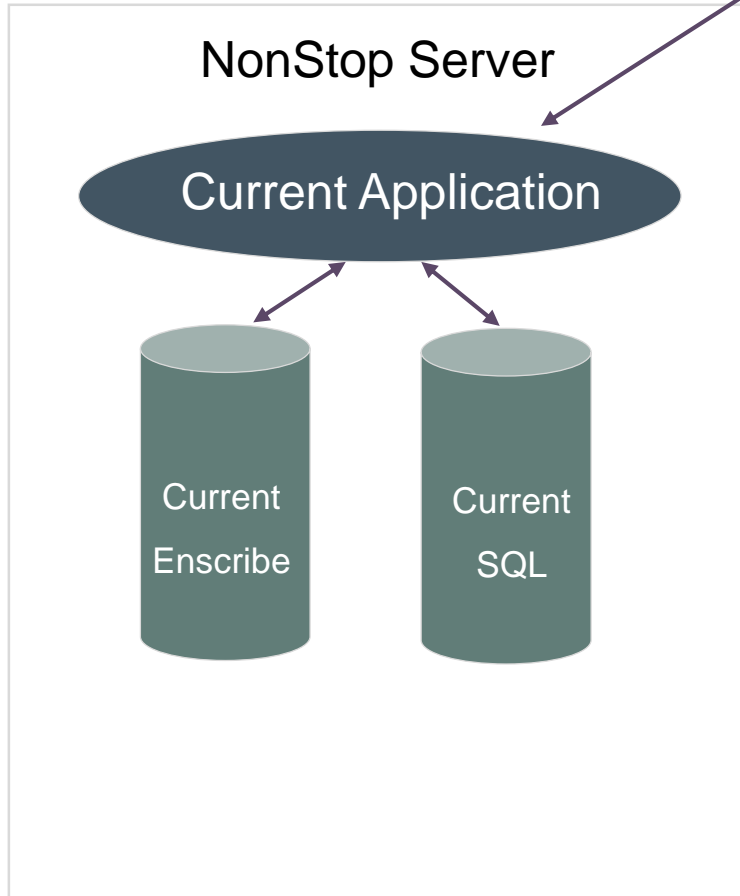


## Sequence:

1-Current Production



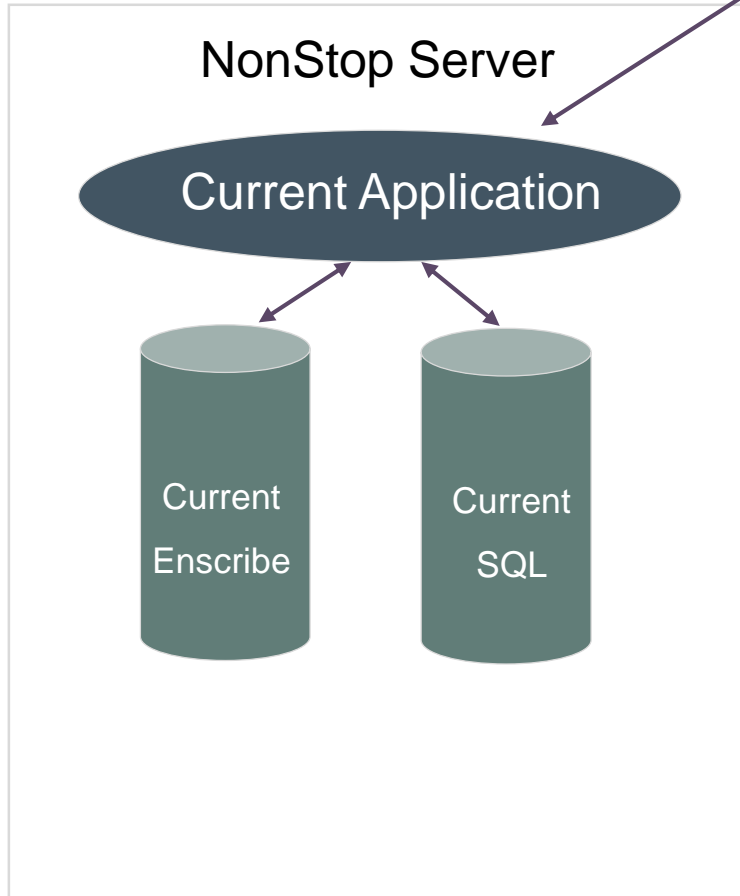
# Shadowbase Success Stories – Step 2



## Sequence:

- 1-Current Production
- 2-Create "NEW" DB and/or Application

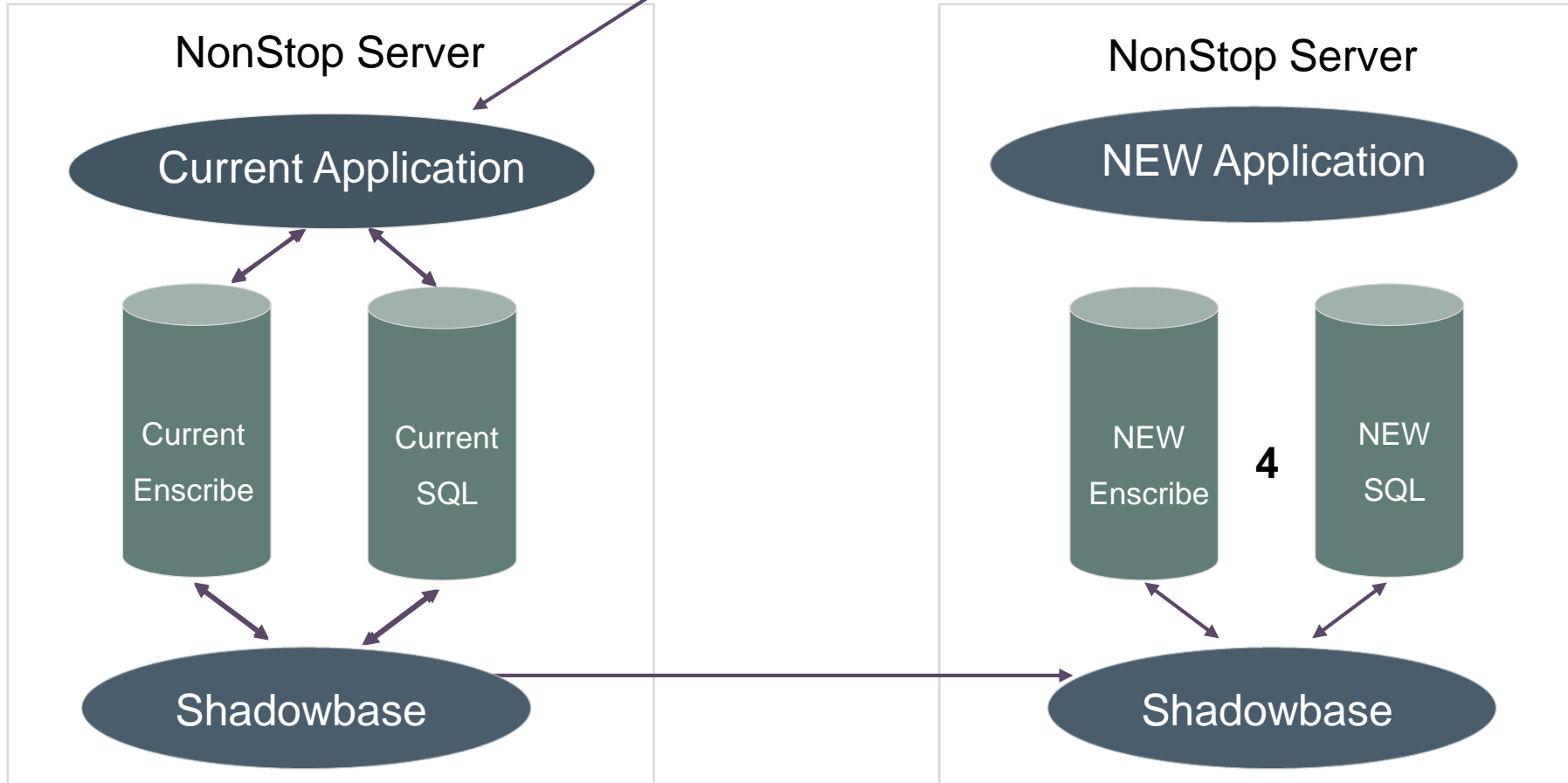
# Shadowbase Success Stories – Step 3



## Sequence:

- 1-Current Production
- 2-Create "NEW" DB and/or Application
- 3-Test New Environment

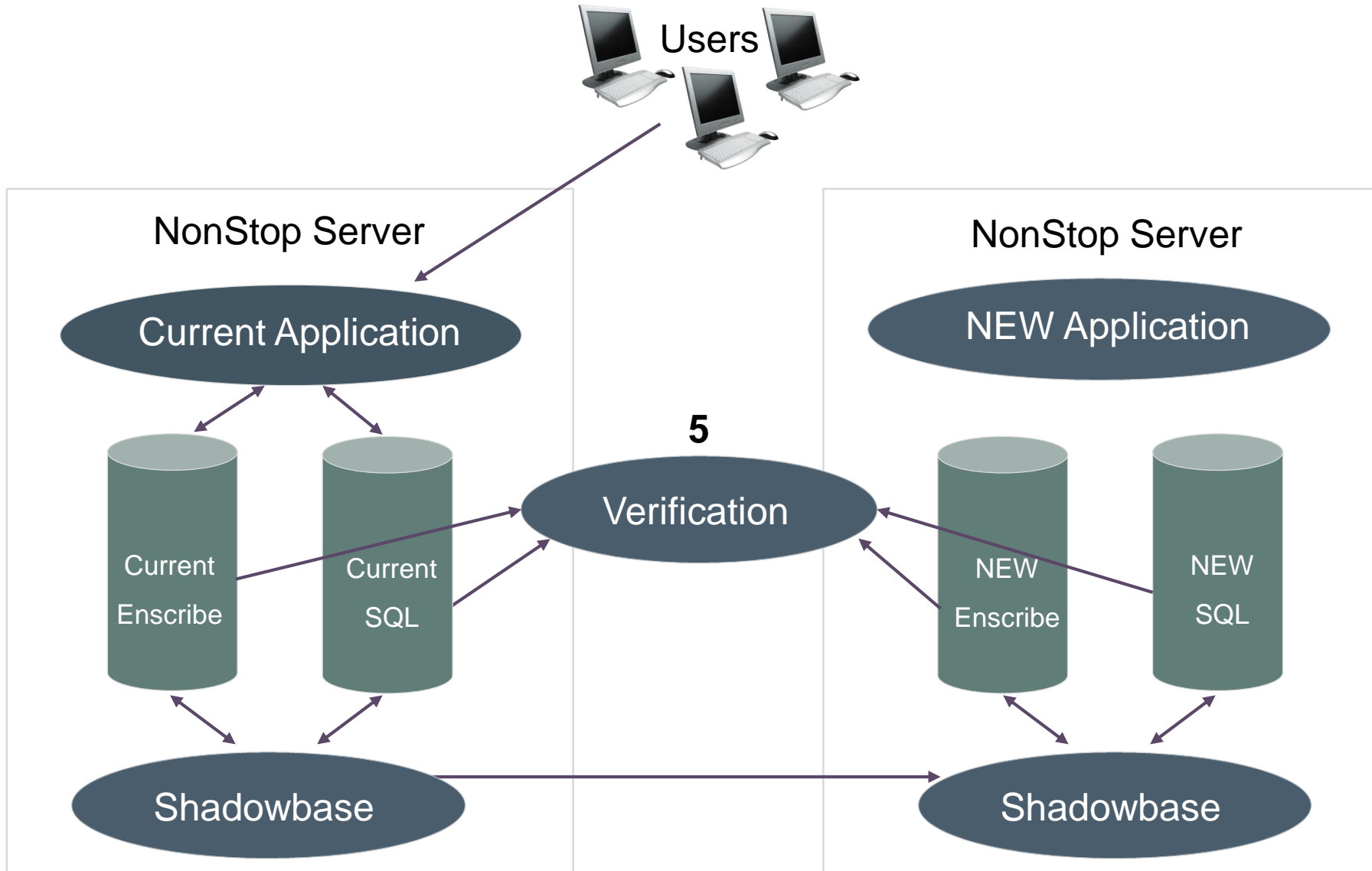
# Shadowbase Success Stories – Step 4



## Sequence:

- 1-Current Production
- 2-Create “NEW” DB and/or Application
- 3-Test New Environment
- 4-Load and Synchronize New Database With Current

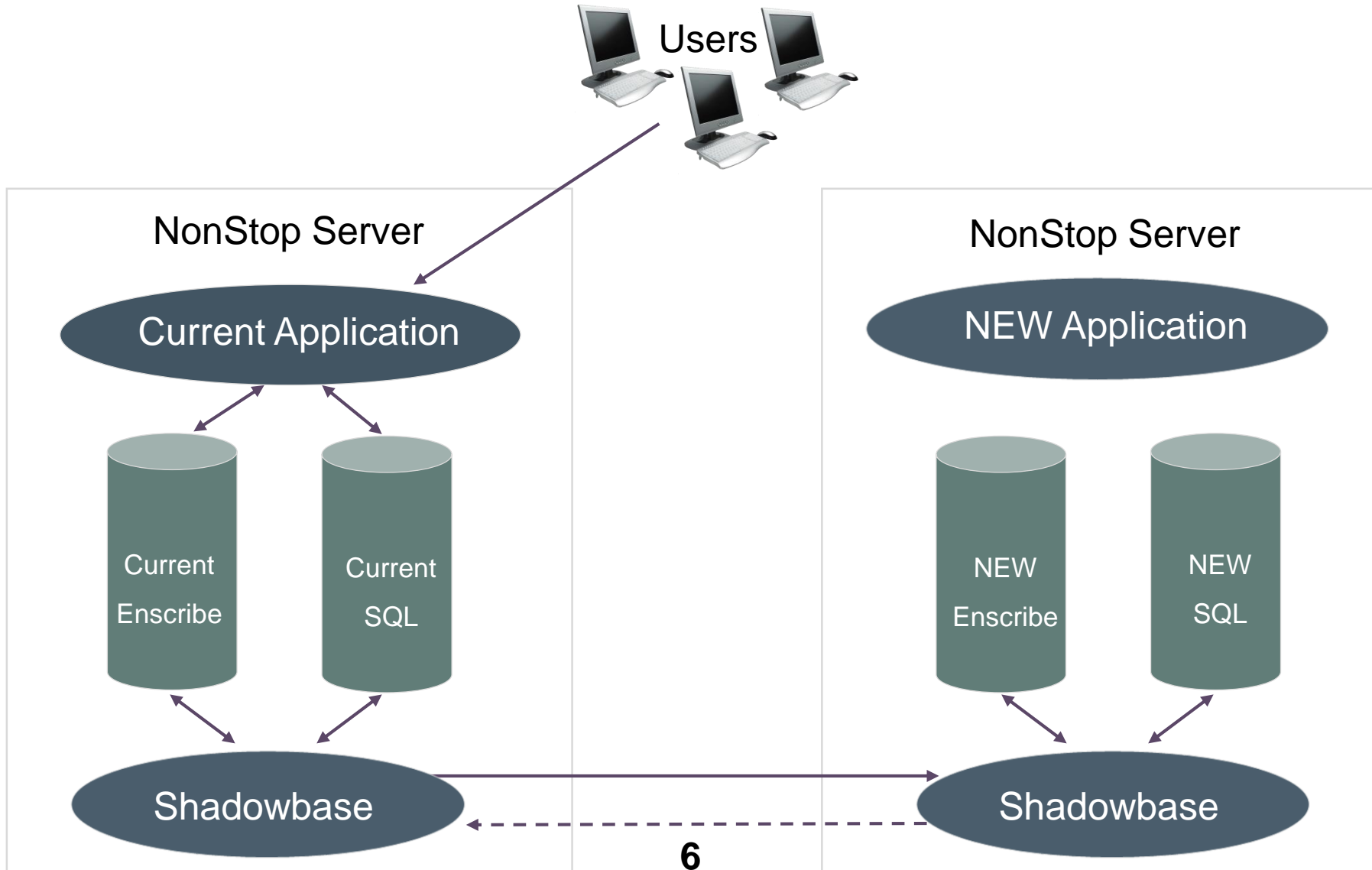
# Shadowbase Success Stories – Step 5



## 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)

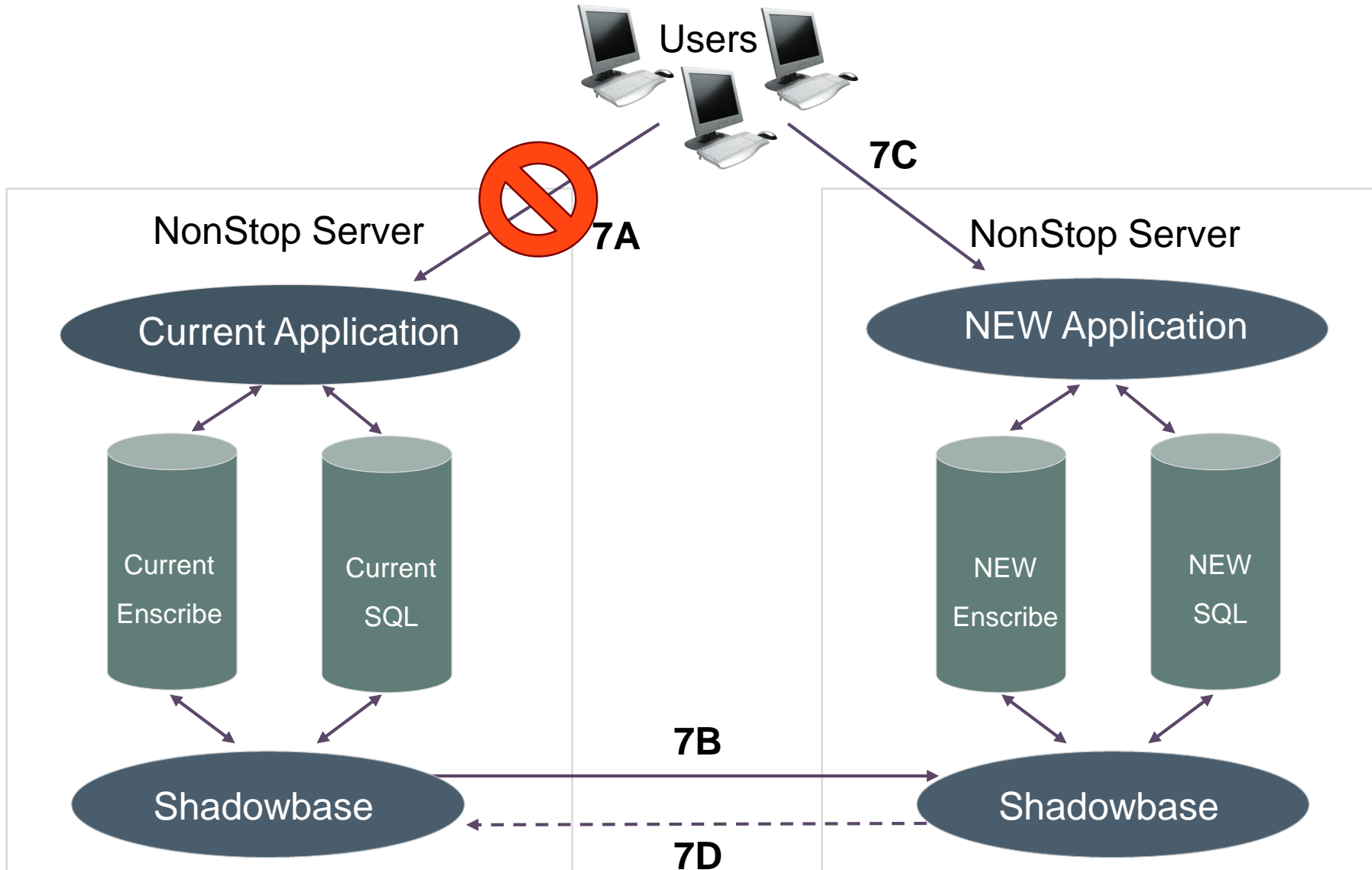
# Shadowbase Success Stories – Step 6



## 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 Case Study

- Using ZDM for a Data Center Migration
  - Preserving Full Business Continuity Protection



# HPE Shadowbase Zero Downtime Migration

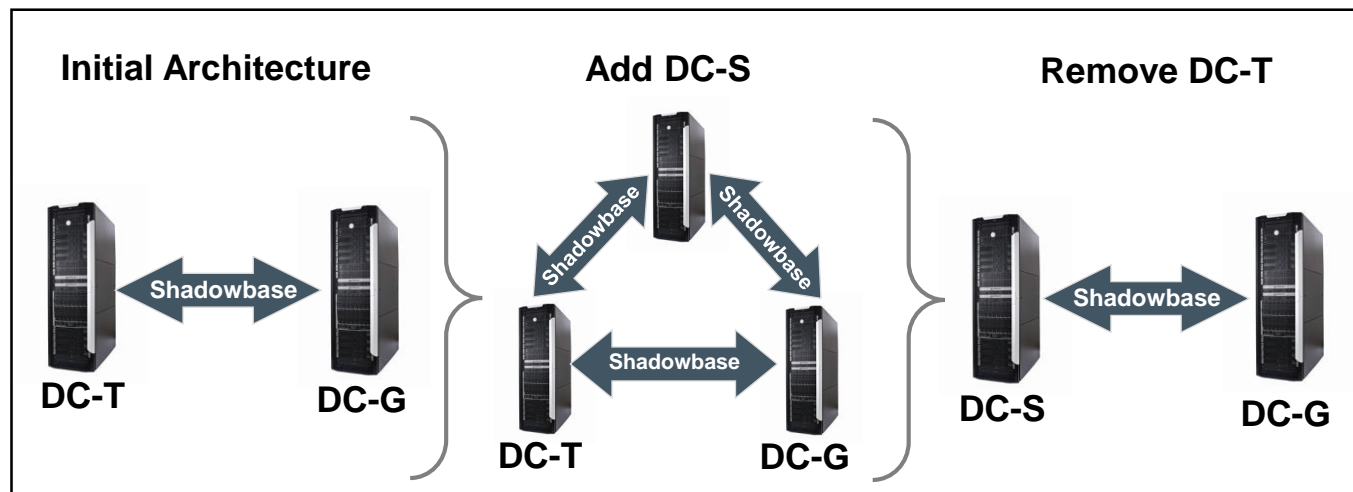
## Data Center Migration with Zero Downtime – Large Payments Processor Case

Migrate an Entire Data Center from Toronto (DC-T) to Strath Haven (DC-S) While Maintaining Application Services

- Add in new/third data center at start of the process to maintain full business continuity (preserves fast failback to old data center with no data loss)
- Network needs to support appropriate routing changes prior to migration starting

### Statistics:

- Large financial message switch, all Enscribe BASE24 Classic data (audited via AutoTMF)
- TPS: Avg 500, Peak 1000
- Database size: 500GB





# HPE Shadowbase Product Suite Overview

# 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**

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# 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

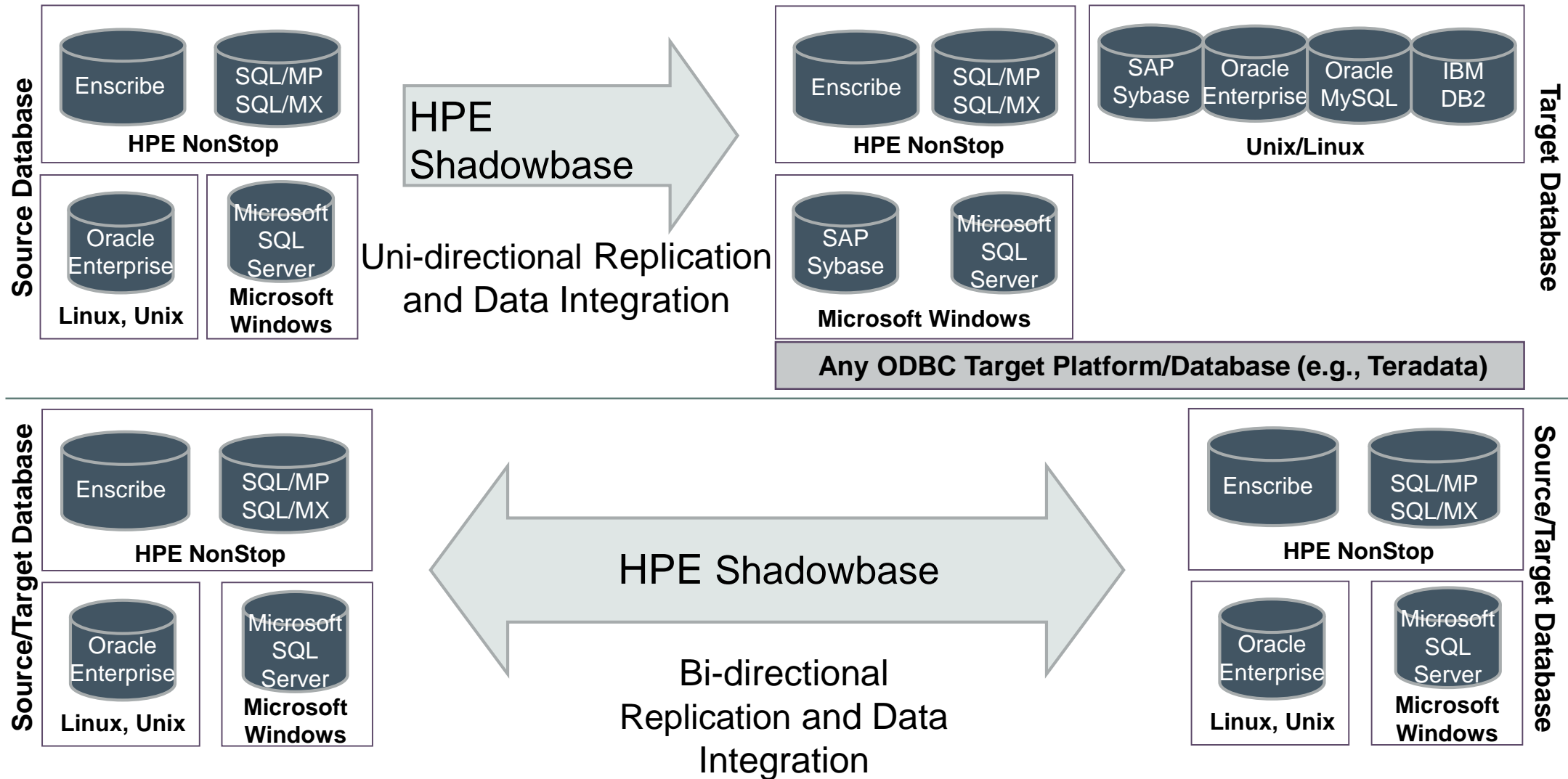
- Homogeneous & Heterogeneous Environments
- Data Transformation, Scrubbing, Filtering & Cleansing
- Extend Replication Capabilities with Embedded Application Logic

### 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 Supported Platforms & Databases

## Homogeneous & Heterogeneous Uni/Bi-directional Data Replication





# 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:
<b>General Overview About Shadowbase</b>	<ul style="list-style-type: none"><li>• <a href="#"><u>Shadowbase Total Replication Solutions for HPE NonStop</u></a></li><li>• <a href="#"><u>Shadowbase Total Replication Solutions for Open Servers</u></a></li><li>• <a href="#"><u>Shadowbase Total Replication Solutions Product Datasheet</u></a></li></ul>
<b>Shadowbase Articles, Case Studies, Data Sheets, News, Upcoming Tradeshows, and White Papers</b>	<ul style="list-style-type: none"><li>• <a href="#"><u>Shadowbase Articles</u></a></li><li>• <a href="#"><u>Shadowbase Case Studies</u></a></li><li>• <a href="#"><u>Shadowbase Datasheets</u></a></li><li>• <a href="#"><u>Shadowbase News</u></a></li><li>• <a href="#"><u>Shadowbase Tradeshows</u></a></li><li>• <a href="#"><u>Shadowbase White Papers</u></a></li></ul>
<b>Performing a Zero Downtime Migration</b>	<ul style="list-style-type: none"><li>• <a href="#"><u>Using Shadowbase to Eliminate Planned Downtime via Zero Downtime Migration</u></a></li><li>• <a href="#"><u>Shadowbase ZDM Achieves Zero Downtime Migration for Large Bank Datacenter</u></a></li><li>• <a href="#"><u>Using Shadowbase Solutions for Application Modernization with Zero Downtime</u></a></li><li>• <a href="#"><u>Shadowbase Helps a Major ISP Migrate from Sybase to HP NonStop with No Downtime</u></a></li><li>• <a href="#"><u>Bank Chooses Shadowbase Solutions for BASE24 Business Continuity</u></a></li></ul>

# Thank you!



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