the Availability Digest

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Bank Chooses "Sizzling-Hot-Takeover" Data Replication for its BASE24™ Business Continuity Solution

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Introduction

For the past eight years, a tier 1 regional bank serving a major resort island was using an ACI BASE24 Classic financial transaction switch to manage its network ATMs and POS terminals.[1] For business continuity, its BASE24 system was running in an active/passive mode on a pair of HPE NonStop S-Series servers. Early in 2015, the bank found that it needed to upgrade these servers, which along with the operating system and application software, were nearing their end-of-support life. The bank made the decision to migrate its BASE24 system to a pair of NonStop NS-Series servers, again running as an active/passive pair.

The bank also decided to replace its current data replication product with HPE Shadowbase solutions, due to cost issues and to optimize its business continuity failover time for system outages, whether scheduled or unscheduled. Furthermore, this replacement positioned the bank to take advantage of the Shadowbase *sizzling-hot-takeover* (SZT) facility, which can typically reduce failover time to a few seconds.

The Bank's Original BASE24 System

The original configuration employed by the bank running its BASE24 system is shown in Figure 1. It comprised a production system (\S78PRD) and a backup system (\S78BKP), each running on a NonStop S-Series server. The production system ran the BASE24 application, which managed the bank's ATMs and POS terminals, and it communicated with other hosts in the financial transaction network to forward ATM and POS transactions for authorization.

The BASE24 files were initially all unaudited Enscribe files. The source system could not run audited files (via HPE NonStop's TMF facility using AutoTMF), because the customer used $DSMSCM and $SYSTEM for application data volumes. (TMF auditing is not recommended/should not be used on these special disk packs.)

The source Enscribe files were replicated to the backup system by a replication product that intercepted changes to the production databases via an intercept attached to the source application and created extract files of the database changes. The extract files were then sent to the backup system via an

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Expand communication link to update the backup databases with the source application database changes.

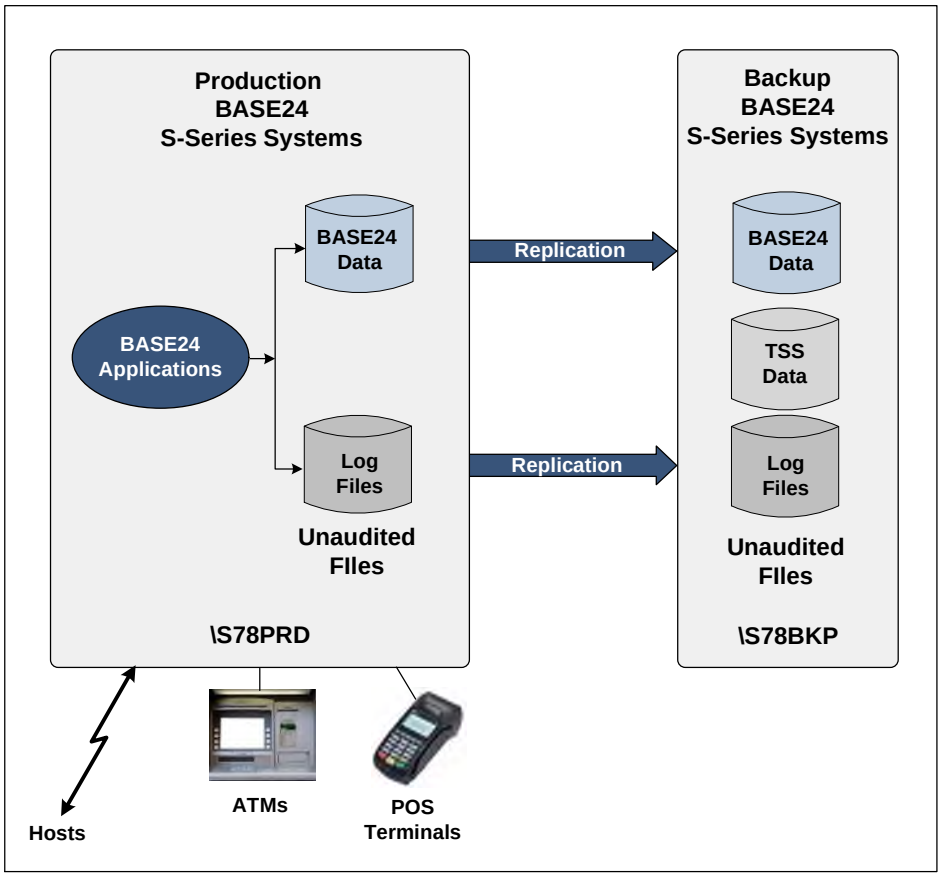

Figure 1: The Original BASE24 System

The log files held all of the transactions processed by the BASE24 application during the day. The data in these files was processed daily through a batch settlement process, and an extract file was built of the business transactions. The extracts were then sent to the card issuing organizations for reconciliation, and the accounts of the corresponding acquiring banks and merchants were credited and debited with the appropriate transaction values.

The Bank's New BASE24 System

As shown in Figure 2, the bank's new production system (\NSPROD) and backup system (\NSBKUP) are both NonStop NS-Series servers. The backup system is kept synchronized with the production system by using the HPE Shadowbase data replication engine.

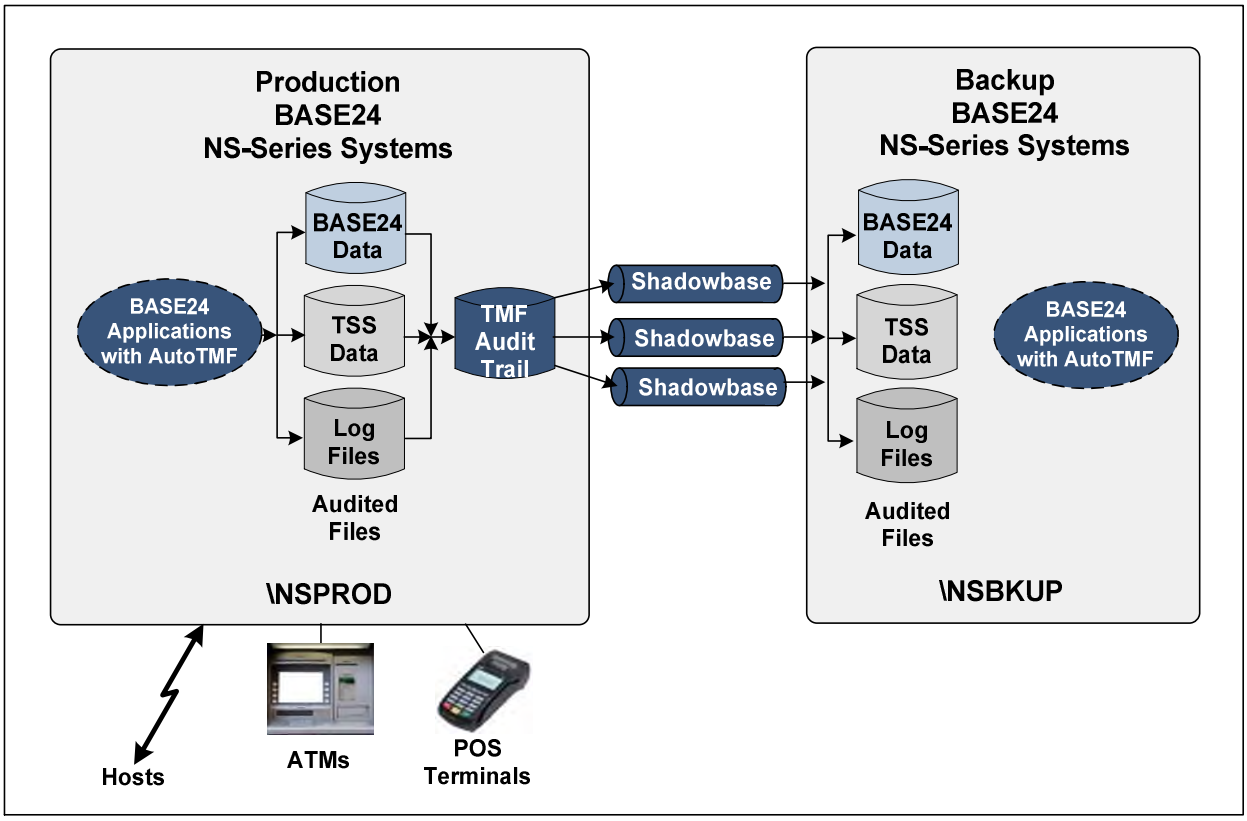

Figure 2: The New BASE24 System

The latest BASE24 Classic application is installed on both systems. Since the backup system has the BASE24 application already installed and tested, it serves as a hot backup and can take over processing from the production system in just a few minutes in the SZT configuration.

The Shadowbase replication engine is configured to be bi-directional, meaning it can simultaneously replicate in either direction. This configuration supports failover to the backup system, which must then act as the production system and replicate changes back to the old production system once that system is restored to service, to bring the systems back into synchronization.

The Phased Migration

The bank faced several challenges as it planned its upgrade. The primary problem was the existing BASE24 version possessed some data inconsistencies with the new BASE24 version running on the NS-Series servers. Therefore, data transformation was required in migrating the production data to the new BASE24 release. These transformations were handled by customized User Exits implemented in the Shadowbase software.

The bank also decided, in part, to move from the original product that replicated data between the production and backup systems, to HPE Shadowbase software, which requires TMF audited files. All of the files in the BASE24 system were unaudited, so the upgraded BASE24 system was further modified to support audited files using the HPE NonStop AutoTMF product.[2]

[2]Using AutoTMF to audit database file updates is a non-invasive process, and does not require any changes to the application itself. There are many implementations of AutoTMF for BASE24 customers.

This was accomplished by installing a replay facility on the old Backup server to convert the unaudited database changes into audited database changes. These new audited database files were then used as the data source for HPE Shadowbase replication, as shown in Figure 3.

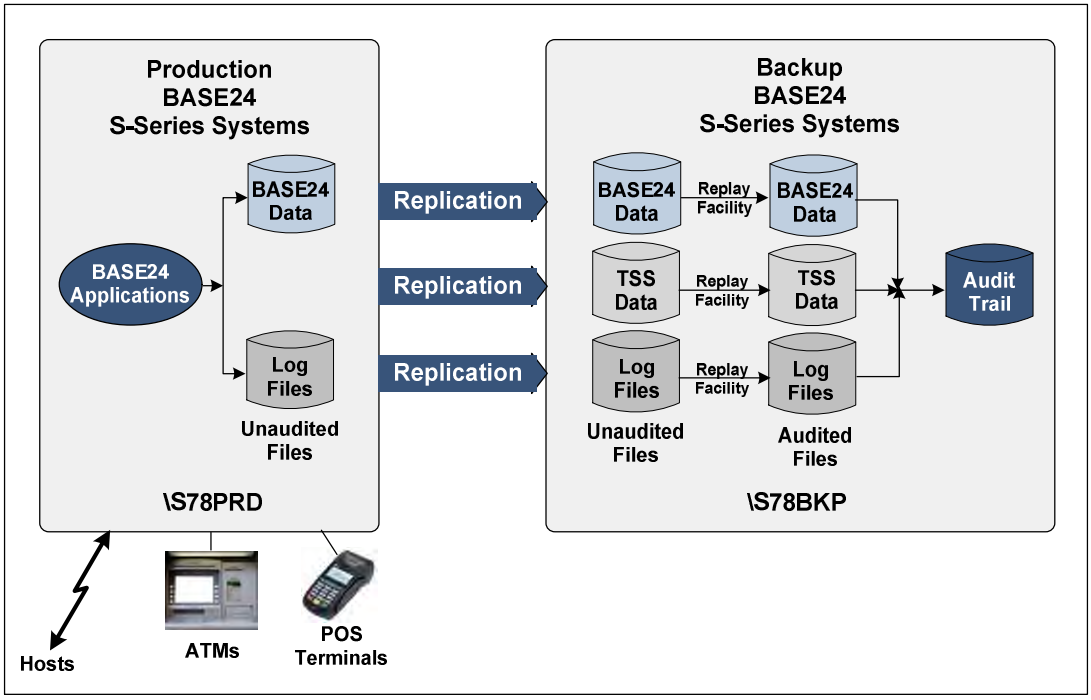

Figure 3 – Configuring the Backup Server as a Shadowbase Source Database

To address these issues and perform the migration, the bank enlisted the aid of a professional services (PS) team assembled by HPE. This team utilized the following resources:

- HPE for hardware, operating system and software installation and support
- PayX, an industry leading provider of consulting services and support in the payments industry for BASE24 Classic and BASE24-eps, among other payments products
- Gravic Shadowbase personnel, for the replication engine work

Since the bank felt it was imperative that switchover to the new system be seamless and with no impact on its customers, the project was organized into steps. Each step accomplished only one task and involved only the necessary project partners, with the results thoroughly tested before the next step began. The multiple steps were carried out from June through October 2015, when the new system was put into production. The basic steps of the project consisted of the following tasks (see Figure 4):

- Install new NonStop NS-Series systems (production and backup)
- Install current BASE24 Classic on new systems
- Implement AutoTMF to automatically create audited BASE24 files
- Install and configure HPE Shadowbase software to replicate BASE24 data from old systems to new systems, without interrupting service and keeping all systems synchronized with current production data
- Test new system independently (including failover/failback testing)
- Cut over from the old system to the new system with minimal service interruption using Shadowbase Zero Downtime Migration (ZDM)
- Shut down old systems

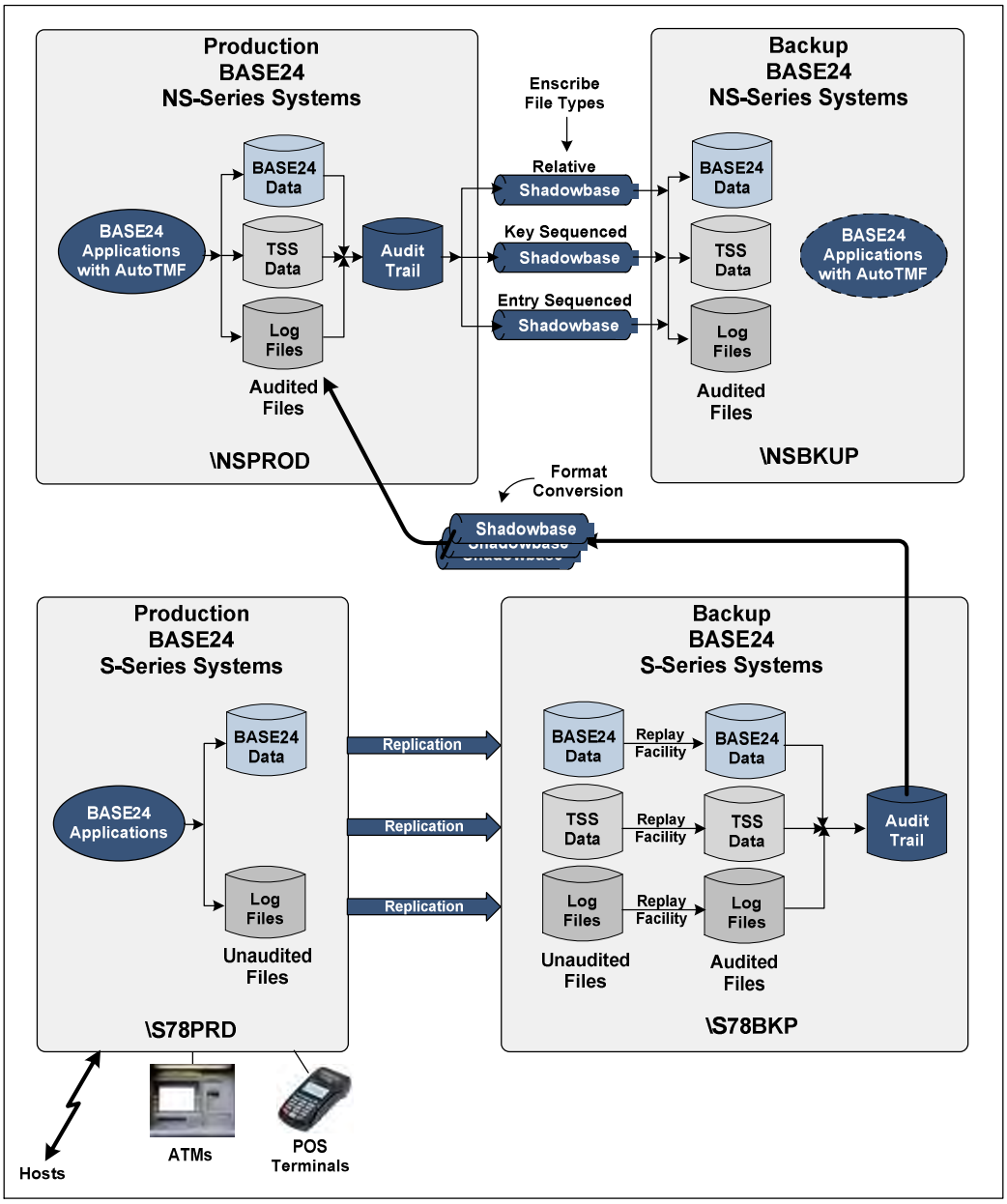

Figure 4 – Shadowbase Configuration for a Zero Downtime Migration

Mission Accomplished

The first transactions were actively processed on the new production system just 15 minutes after the cut over began, and the new BASE24 system was fully operational and in production after 45 minutes. During this entire migration process, the old production system remained in service to act as a fall back in case anything went wrong. As expected, it wasn't needed. The bank now conducts regular failover testing, with complete tests that bring the backup system into full service.

The bank is now positioned to move from its active/backup configuration to a Shadowbase SZT architecture. With the BASE24 application up and running on both production and backup nodes, if an outage of the production system occurs, all that is needed is to re-route users to the backup system (which is known-working and ready to process transactions), resulting in failover times that can be measured in seconds.

Summary

The bank took a very stale, aged BASE24 system and upgraded both the hardware platform and BASE24 software with no outages except for a brief time during the final cutover. At the same time, the bank replaced a costly data replication product with HPE Shadowbase software. The cutover application service outage could, in fact, have been completely avoided if the bank had elected to use the Shadowbase ZDM features that were installed and tested (an abundance of caution). Choosing a team whose members had specific expertise to support the project was another major factor in the success of the upgrade. This team included HPE for the NS-Series system upgrade, PayX for its BASE24 expertise, and Gravic for the configuration of HPE Shadowbase software. In addition, the bank implemented reliable failover procedures that reduced its downtime due to a production failure from two hours to under four minutes. The bank is now positioned to reduce its outage time to just seconds when it moves to a full SZT configuration.