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Enterprise**



HPE Shadowbase New Innovations and Recent Customer Projects

Kenneth Scudder, VP, Global Sales and Business Development, Gravic, Inc.

Anke Mailaender, Head of NonStop Services, CSX Software Concepts and Solutions GmbH

Rick Stather, Senior Consultant, TCM Solutions, Ltd.

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HPE Shadowbase Discussion Topics

- **Digital Resilience for HPE NonStop**

- 4 pillars of HPE Shadowbase Data Resilience
- TCM: Data Replication Project
- CSX Software: Data Migration Project

- **New innovation**

- Zero Data Loss (ZDL) synchronous replication
- Data Recovery for Cybersecurity
- Cloud Integration
- Roadmap

- **Wrap-up**

- Recent customer successes
- Why customers choose HPE Shadowbase



About Gravic

- **Leaders in HPE NonStop data availability**

- Strong commitment to HPE NonStop and other servers
- 80+ technology patents
- Hundreds of customers use Shadowbase worldwide

- **Mission critical data availability solutions**

- Data replication, streaming, and validation
- High and continuous availability for Digital Resilience

- **HPE's strategic, go-forward partner**

- HPE Shadowbase globally sold and supported by HPE since 2014
- Close collaboration between Product and Engineering groups



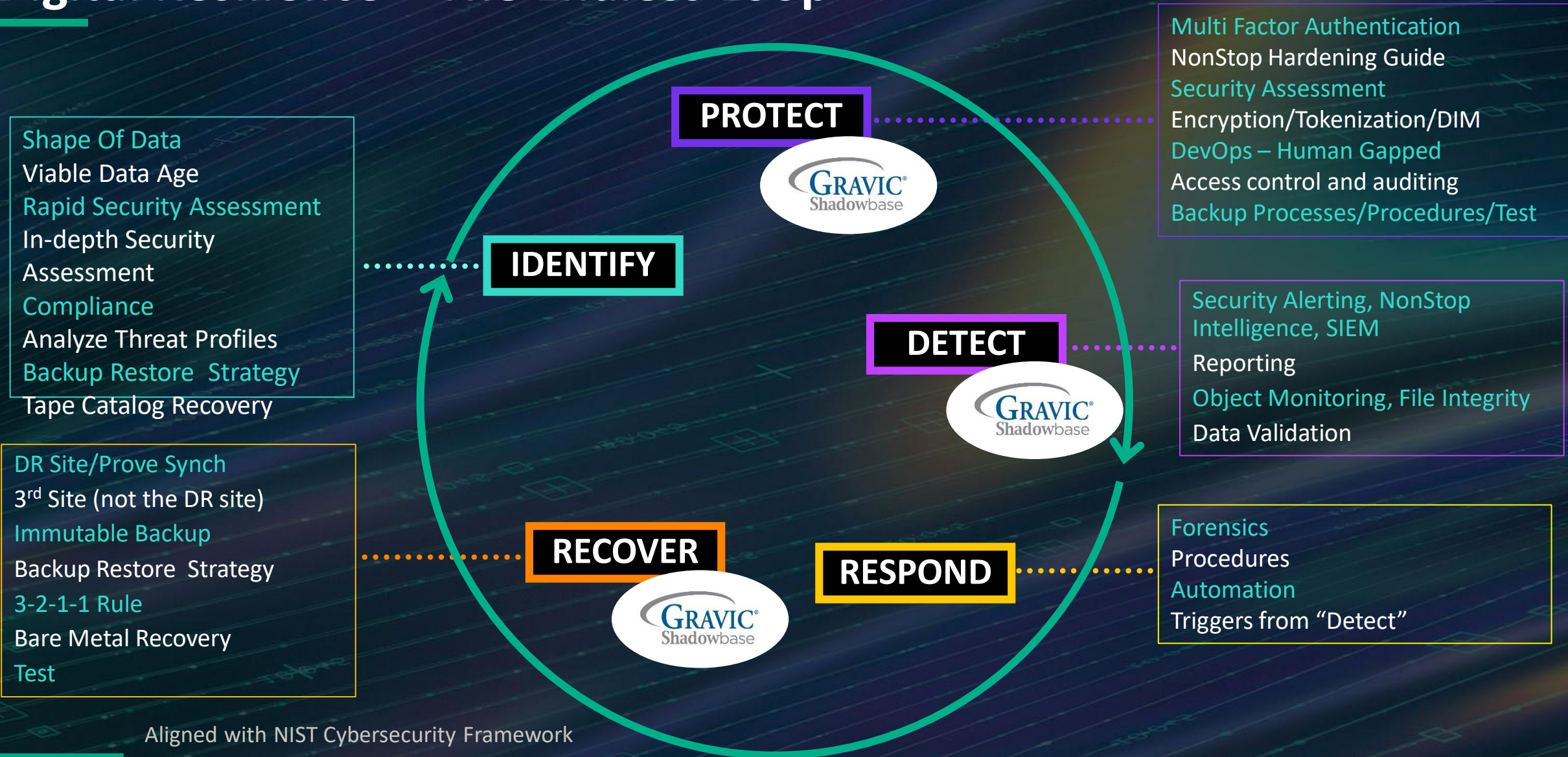
Gravic HQ in Pennsylvania, USA



Momentum Technology
Partner of the Year 2019

Digital Resilience for HPE NonStop

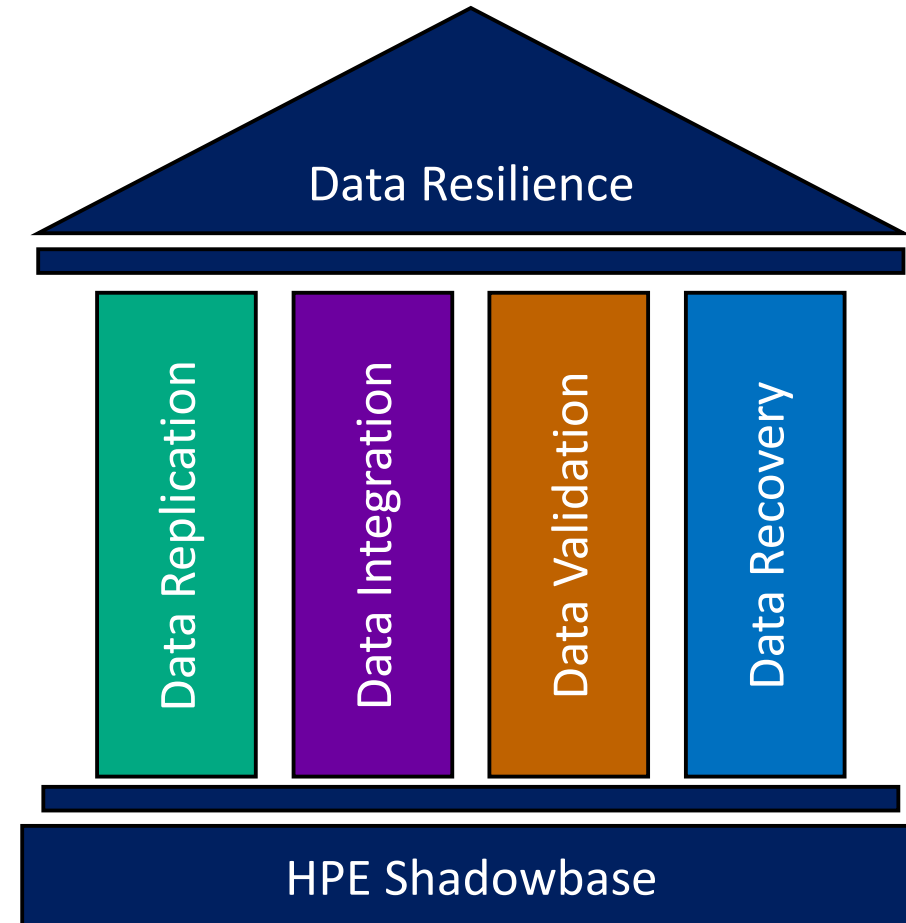
Digital Resilience – The Endless Loop



Aligned with NIST Cybersecurity Framework

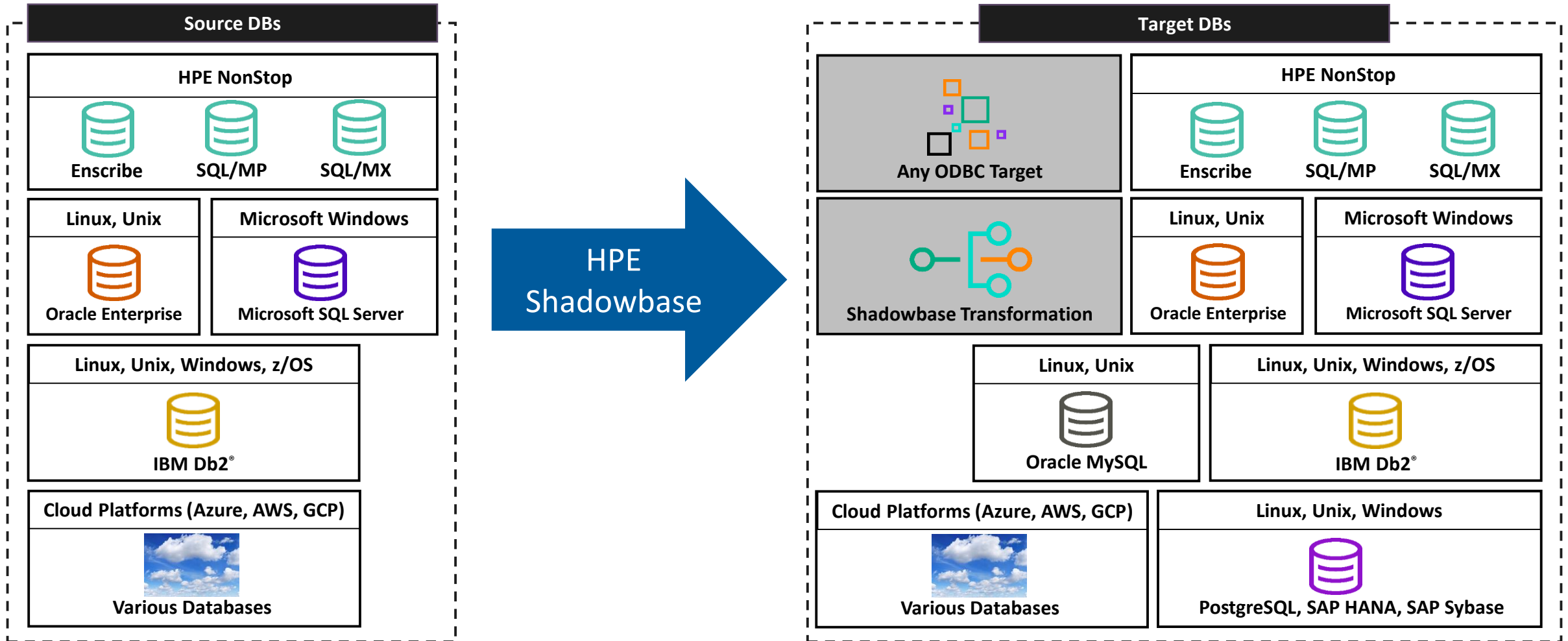
HPE Shadowbase

- Digital Resilience for mission critical HPE NonStop environments
- Key pillars of HPE Shadowbase
 - Data Replication for Business Continuity
 - Data and Application Integration
 - Data Validation
 - Data Recovery for Cybersecurity



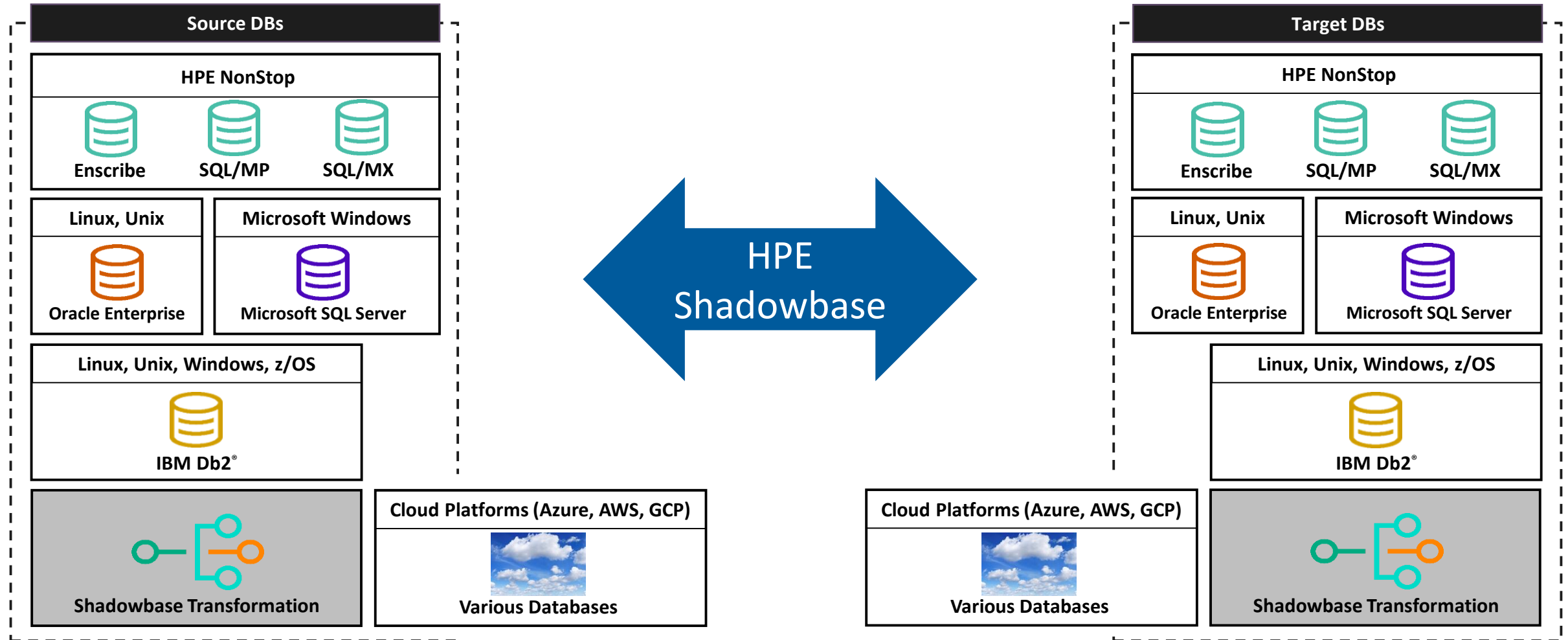
Homogeneous & heterogeneous uni-directional data replication and streaming

All combinations supported



Homogeneous & heterogeneous bi-directional data replication and streaming

All combinations supported



HPE Shadowbase Data Replication for Business Continuity

Eliminate planned and unplanned downtime



- HPE Shadowbase supports all Business Continuity architectures
 - Active / Passive Disaster Recovery (DR)
 - Active / Almost-active “Sizzling-Hot-Takeover” (SZT)
 - Active / Active Continuous Availability (Hot-Hot)
- HPE Shadowbase Zero Downtime Migrations for upgrades, migrations, and platform refreshes
- Many BASE24 and BASE24-eps customers use HPE Shadowbase

Use Case

ZDM

Zero Downtime Migration for
California Credit Union

ShadowbaseSoftware.com/Publications/Use-Cases/ZDM-for-Credit-Union/



Data Replication Customer Project

Rick Stather
Senior Consultant
TCM Solutions



RDF To HPE Shadowbase Migration

Rick Stather

Senior Systems Specialist, Data Replication SME

TCM Solutions



Introduction & Background

TCM are a global NonStop Services provider (UK Based) and HPE NonStop Platform experts.

Our core is Managed Services such as Systems Management, but also Professional Services.

Our breadth of expertise covers all areas of the NonStop platform, such as:

- Data Replication (HPE Shadowbase, RDF, GoldenGate, DRNet, Autosync, AutoTmf)
- Platform Migrations (Itanium to Itanium, Itanium to NSX)
- BASE24 Migrations and Support (Classic and EPS)
- Security (Including PCI-DSS)
- Health Checks

TCM have performed many HPE Shadowbase installations and upgrades.



The Request

HPE had sold HPE Shadowbase to Postbank as a replacement for RDF – since RDF is now a ‘mature’ product (meaning no active development) – plus additional advantages!

Postbank engaged TCM via HPE with a request for assistance with their data replication migration project as phase 1 of a Platform refresh.

Postbank needed assistance with migrating their BASE24-eps application from RDF to HPE Shadowbase, including training to be able to manage and change their own HPE Shadowbase environment as required in the future.



Old Setup

RDF running on NS2300 systems, in an Active/Passive mode replicating BASE24-eps ATM and POS transactions.

BASE24-eps is already TMF enabled and does not require AutoTMF.



Requirements:

- HPE Shadowbase (SB) running on current systems replicating only BASE24-eps as BASE24 “classic” is retired
- Minimize downtime (to almost zero)
- Faster DR procedures that are less complex
- Take advantage of SB bi-directional, “Sizzling Hot Takeover” (SZT) to provide them a ‘set and forget’ Data Replication solution that provides automated failover detection and recovery



How we migrated RDF to HPE Shadowbase

1. Took copies of the RDF configuration (\PROD and \DEV)
2. Converted it into a bi-directional HPE Shadowbase (SB) configuration
3. Installed SB on existing NS2300 Dev/DR system
4. Postbank tested BASE24 \DEV environment to ensure replication was working with SB as per RDF
 - Once OK'd –we were ready to migrate \PROD
5. Installed SB on existing NS2300 \PROD system
 - No impact to running application



How we migrated RDF to HPE Shadowbase

6. Configured bi-directional SB processing between systems
7. RDF was stopped and the timestamp taken
8. SB replication started with ADTSTARTTIME (using RDF's stop time)
9. Ensure no replication errors



Advantages

- DR Procedures – less complex
- Massive RTO reduction
- Shadowbase is easier to maintain in times of Disaster
- DB resync if ever required can be done online with no data loss or service impact
- DDL operations on Production seamlessly replicated to DR
- HPE Shadowbase provides 'Compare and Repair' utility so they can always be sure of their DB consistency
- (Plus others)



Next Phase

- Hardware refresh
- Zero Downtime Migration using HPE Shadowbase
- In-Flight Data Changes using SBMAP utility (SQL-like scripting)
- Further reduction of RTO

Lots more details we'd be happy to share after the session!

Postbank was extremely happy with the result and happy to share their experience (TCM presenting)



Thank you

www.tcm.uk.com

Rick Stather

Senior Systems Specialist, Data Replication SME

TCM Solutions

T: +44 (0)1592 770081

E: info@tcm.uk.com

Head Office: TCM House, Saltire Centre, Pentland Park, Glenrothes, Fife, KY6 2AG

London office: 25 Sovereign House, 19-23 Fitzroy Street, Fitzrovia, London W1T 4BP

Registered in Scotland No. 167135

HPE Shadowbase Data and Application Integration

Eliminate data and application silos



- Unlimited data transformation, scrubbing, and filtering
 - Like-to-like and dissimilar environments
 - Extend replication capabilities with SQL-like scripting
- Popular use cases
 - Fraud detection
 - Data warehouse feeds
 - Real-time business intelligence and analytics

Use Case

AI BC DI

Real-Time Fraud Detection and Resolution for Financial Switch

ShadowbaseSoftware.com/Publications/Use-Cases/Fraud-Detection-for-Financial-Switch/



HPE Shadowbase Data Validation

Find and resolve data discrepancies



- Source and target data validation
 - Supports Enscribe, SQL/MP, and SQL/MX
 - Runs online and on-platform
 - Works with all data replication engines
 - Repair function
 - Ensures backup is ready for an immediate takeover

Use Case



Massive Datacenter Migration for Money Transfer Firm

ShadowbaseSoftware.com/Publications/Use-Cases/Massive-Datacenter-Migration-for-Money-Transfer-Firm/



Data Migration Customer Project

Anke Mailaender

Head of NonStop Services

CSX Software Concepts and Solutions

Tailored Solution Provider



SOFTWARE
MEMBER OF CSX GROUP



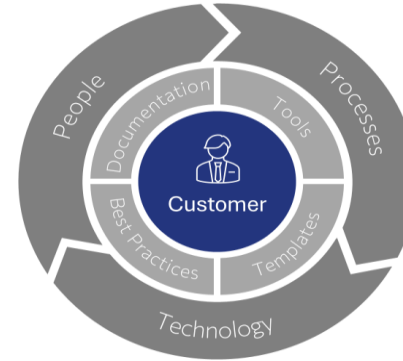
OUR MISSION

- Fault-tolerant systems that ensure almost 100% availability
- 24/7/365 service by our team of technical experts with decades of experience to ensure your systems are in the best hands around the clock
- Fully managed end-to-end non-stop services including SLAs or outsourcing for specifically requested service components



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CUSTOMER PERSPECTIVE



NonStop Service Expert Team with over 35 years of experience

Service Responsibility	Delivery of non-standardized and customer-specific requirements	Understanding of all industries and specific requirements	Special know-how for the use of applications and databases
Consulting & migration planning (X-systems)	Consulting & conception of DR concepts (RDF, Shadowbase, and GoldenGate)	Hardware Relocation & Impact Control	Advice on the use of IBM MQ & implementation

Highly motivated NonStop Operations Team

Availability: 24x7 / 365 days	Escalation & Single Point of Contact (SPOC)	Knowledge Base
Fault and process management	Batch operations	Knowledge transfer



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ORGANIZATION



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MEMBER OF CSX GROUP

CONTACT

ANKE MALAENDER
Head of NonStop Services
CSX Software
Concepts and Solutions GmbH
Kaiserwerther Str. 115
40680 Ratingen / Germany
+49 (0) 212 2766 3827
malander@csx-software.com
csx-software.com

Falk Dreßler
Managing Director
CSX Software
Concepts and Solutions GmbH
Schwieberdinger Str. 60
70435 Stuttgart / Germany
+49 (0) 714 36644 909
dreßler@csx-software.com
csx-software.com

Rene Wigg
Managing Director
CSX Software
Concepts and Solutions GmbH
Schwieberdinger Str. 60
70435 Stuttgart / Germany
+49 (0) 714 36644 909
wigg@csx-software.com
csx-software.com



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COSTUMER MIGRATION PROJECT



Client's Situation

- DR concept based on XP-storage
- Migration from Itanium to X86
 - XP migration technical not possible
 - Data copy during service break would exceed and excite the service window (280 GB; 16 Partitions SQL/MX Table)
- Limited NonStop resources



Goals

- Implement a proofed online data replication to manage the migration within the service window
- Minimize the workload on the customer's NonStop team





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COSTUMER MIGRATION PROJECT

Success factors

- Detailed Analysis of the environment and databases before the configuration starts
 - All information about all NonStop files must be available in Excel or a database to prepare the configuration
 - Configuration changes are time-consuming and should be avoided by a good preparation
- Educate customer teams on how to handle database changes using Shadowbase
 - This will avoid troubleshooting and double work
- Close cooperation with Gravic during the implementation
- Automate building the Shadowbase configuration files





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COSTUMER MIGRATION PROJECT

Data Load and Validation

- Load via Shadowbase Consumers had little impact on the CPU load. This allowed multiple Shadowbase Consumer threads in one CPU
- Validation of massive SQL/MP environment has some challenges
 - Check the versions of SQL/MP catalogs
 - Different versions like 2.4 and 3.5 needed different installations
 - Start compares below application priority
 - Initial Compare run consumes higher CPU than subsequent iterative runs





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COSTUMER MIGRATION PROJECT

Project Status

- Migrated the test environment successfully
- Completed the first Load and Validation of production data
- Executed customer tests on the new production system
- Currently working on the second data Load and Validation



New Innovation

Zero Data Loss (ZDL)

Groundbreaking, patented HPE NonStop replication technology



HPE Shadowbase Zero Data Loss (ZDL) solution

- **Synchronous data replication**

- Enables zero data loss (RPO = 0)
- Enables zero downtime (RTO ~ 0) in A/A configuration with no data collisions
- Minimizes application latency

- **Technical advantages**

- No interconnect or distance limitations
- Standard comms and storage technology
- Leverages existing/proven HPE Shadowbase technology

- **FCS target: Q2 2024**

Data Recovery for Cybersecurity

HPE Shadowbase innovations for Digital Resilience against cyber attacks



- **New architectures to meet recovery time requirements**
 - Resilient Recovery System
 - Rapid recovery architecture
 - Bare metal recovery architecture
- **New HPE Shadowbase functionality for Data Recovery**
 - Capture and store queued DB change data in “Q Files”
 - Securely transfer Q Files to Resilient Recovery Sites and Immutable Storage to isolate data
 - Validate Q Files to detect tampering (e.g., MitM attacks)
 - Hold Q Files in suspension until rolling threat window has passed
 - Apply (or roll-back) Q Files to a trusted point on a clean system

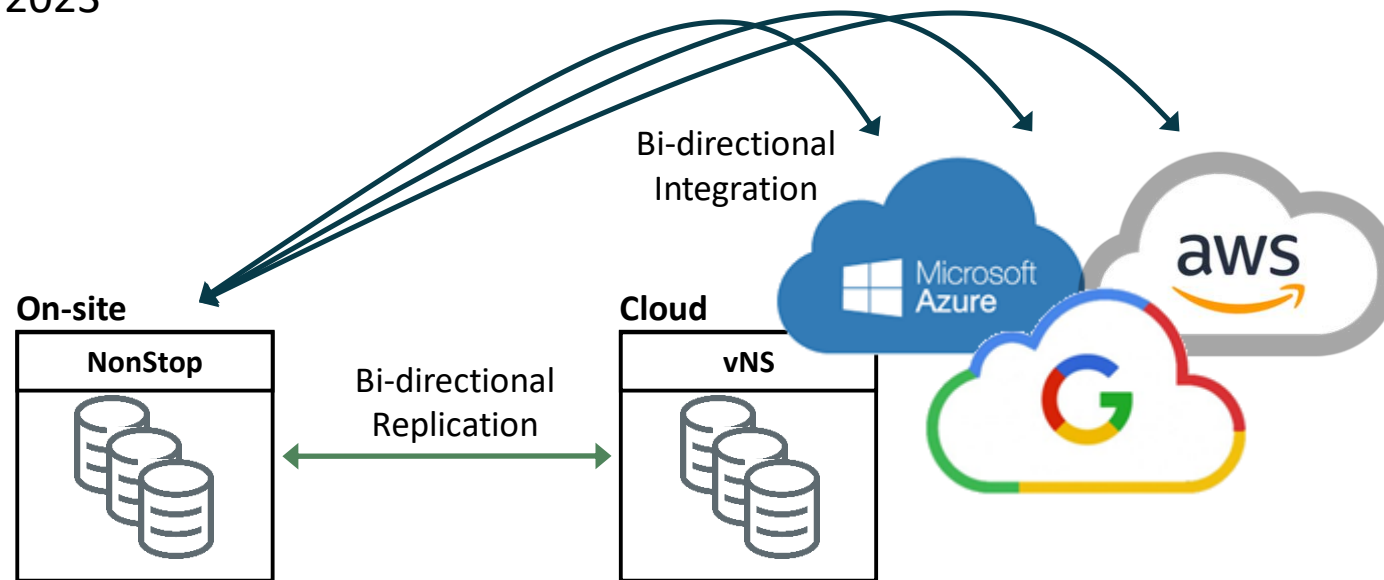
High-Performance Cloud Integration

- **HPE Shadowbase Data Integration and Application Integration with public clouds**

- Customers already using HPE Shadowbase for NonStop to cloud integration
- Latest version of HPE Shadowbase enhances cloud integration speed by 10-100x

- **HPE Shadowbase Business Continuity with vNS in cloud environment**

- Full capabilities for NS to vNS bi-directional replication
- Demo at eBITUG 2023



New Enhancements and Roadmap Items

HPE Shadowbase continues to be enhanced with new functionality



• Available now

- Simplified SYSKEY replication
- Additional ETL tools
- JSON support
- Direct Kafka and IBM MQ integration
- Native REST API (coming soon)

• Roadmap

- Heterogeneous Database Compare
 - E.g., NonStop vs Oracle, SQL Server, DB2, Sybase, MySQL, PostgreSQL, and others
- Enhanced z/OS integration
 - Native Shadowbase port on IBM Mainframe z/OS to support Db2 as a source and target

Wrap-up

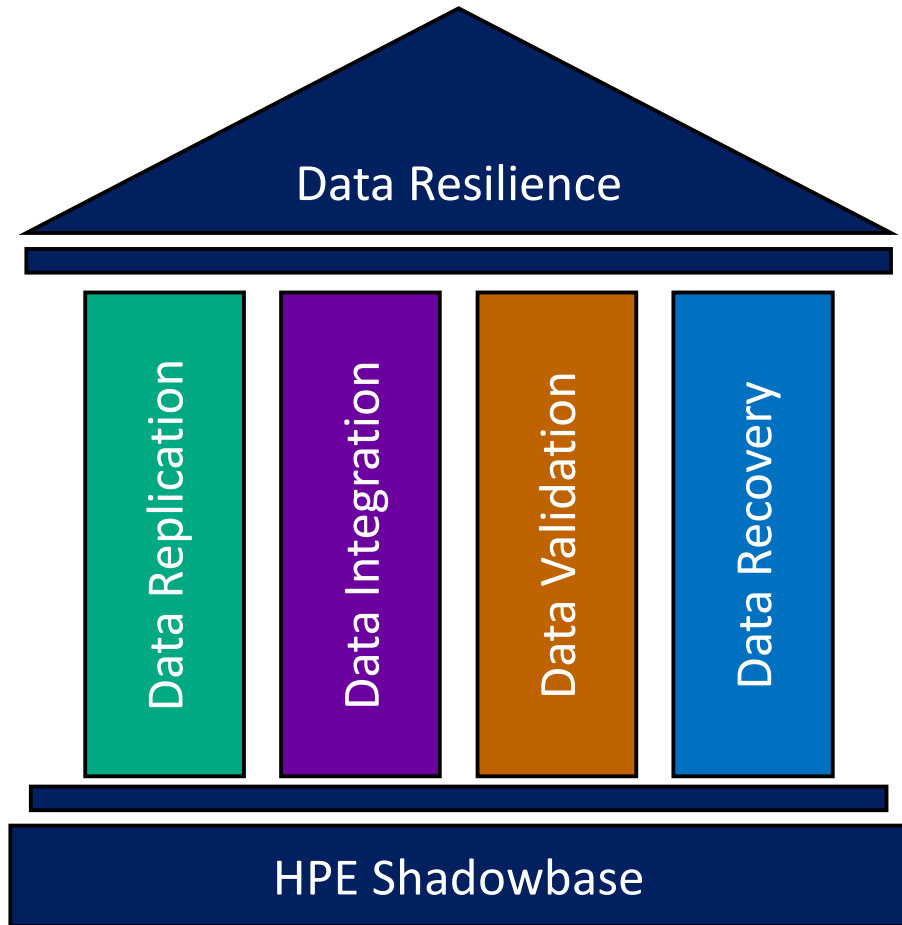
HPE Shadowbase success stories

Recent implementations



- **Major international bank (UK)**
 - RDF upgrade for large BASE24 Dual-site A/A environment
- **Large retailer (USA)**
 - Competitive replacement for customer moving to HPE Shadowbase “Sizzling-hot Takeover” (SZT)
 - Project done in under 30 days
 - Data latency improved from hours/days to only seconds
- **Major bank and financial services (EU)**
 - RDF upgrade for custom banking app moving to SZT
 - ~66% reduction in failover recovery time
- **Regional bank (EU)**
 - RDF upgrade for BASE24/BASE24-eps apps moving to SZT
 - ~75% reduction in failover recovery time

Why customers choose HPE Shadowbase



What we hear from customers

- **HPE Shadowbase provides large cost savings**
 - Licensing and support aligned with NonStop (including GreenLake flexible capacity models)
 - Typically much less expensive
- **HPE Shadowbase has more features**
 - Robust NonStop roadmap and ongoing new innovation, including Data Recovery for Cybersecurity
- **HPE Shadowbase has outstanding support**
 - GNSC provides global, 24x7 coverage (with Gravic backup)
- **HPE Shadowbase is committed to NonStop**
 - Strong product roadmap for NonStop and Other Servers
 - HPE's strategic, go-forward NonStop data replication solution

Learn more about HPE Shadowbase and Digital Resilience



Session slides available from eGTUG

Tuesday, April 9th @ 14.45 h (Salon VIII)

Advanced Data Resilience and Recovery for Mission Critical Systems with HPE Shadowbase Software

Session topics:

- **HPE Digital Resilience Framework**
- **Data Recovery for Cybersecurity**
 - New concepts for resiliency
 - New architecture requirements
 - Rapid recovery
 - Bare-metal recovery
- **Data Recovery Demo**

Thank you

Kenneth Scudder
kscudder@gravic.com

