



**Hewlett Packard
Enterprise**

The changing world of databases

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Forward-looking statements

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The back story...

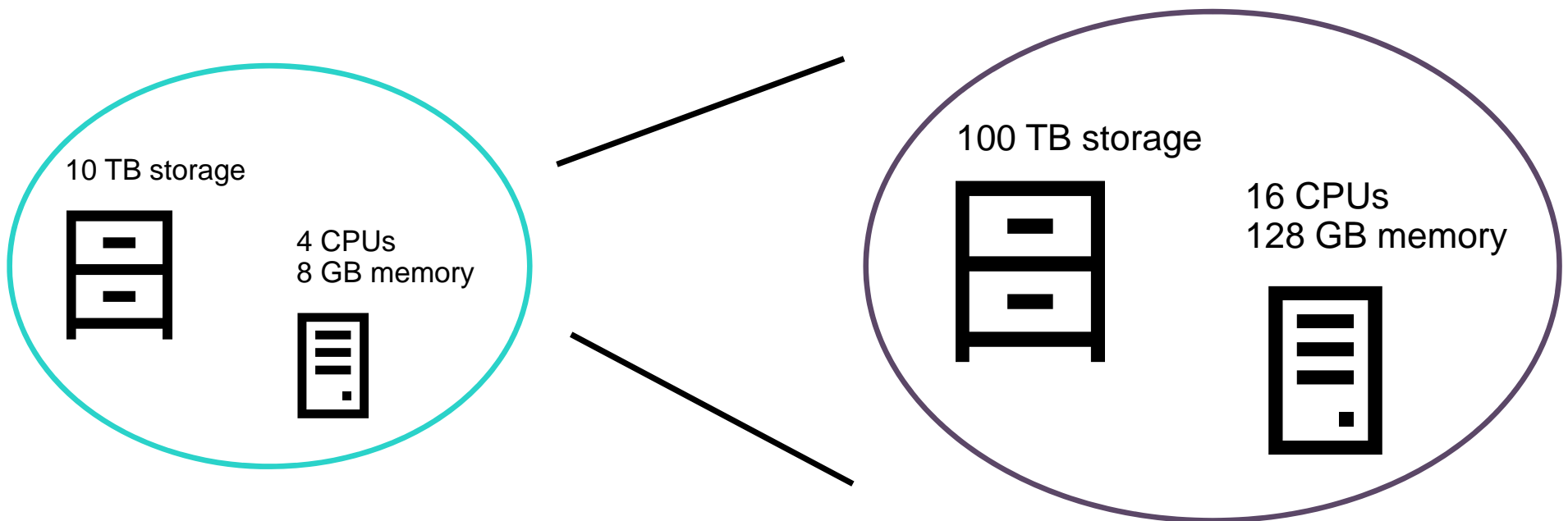




Today's world of databases

DBA challenges with relational database management systems

RDBMS vertical scaling



On an SMP platform, scaling or expansion is done through a system migration to a larger system

On an MPP platform (e.g. NonStop), scaling or expansion is possible by adding CPUs / nodes

ACID vs. BASE / RDBMS vs. NoSQL

What does your application need

ACID - Atomicity, Consistency, Isolation, Durability

- Strong consistency
- Isolation
- Focus on “commit”
- Transactional integrity and nested transactions
- “Correct” consistent answer
- Conservative (pessimistic)
- Limited scalability

BASE - Basic Availability, Soft-state, Eventual consistency

- Weak consistency
- Availability first ★
- Best effort
- No transactions
- Approximated answers
- Aggressive (optimistic)
- Massive scalability ★

★ HPE NonStop SQL provides ACID properties with
BASE *Massive scalability* and *Availability first* properties



Changing the IT database environment

Database as a Service (DBaaS) at Hewlett Packard Enterprise IT

Business challenges



- Businesses need to move faster & IT historically has not been agile enough
- Services should meet both IT & business requirements

Solutions



- An automated, self-service DBaaS
- Leveraging HPE Software solutions (Operations Orchestration)

Results



- Services delivered in minutes not weeks or months
- Scales without increasing staff
- Improved HW density and reuse
- Use virtual machines where appropriate

Hewlett Packard Enterprise IT worldwide DBaaS

Architecture of the “automated self-service solution”

User interface

Cloud portal
(ASP.Net & SQL server)

DBaaS
Add/remove/manage

- Reporting
- Account management
- Backups
- Security
- Pricing
- Flexing
- Maintenance

DB Copy

APIs

Execution layer

HPE Software
(Orchestration/execution)

**HPE Operations
Orchestration (OO)**

uCMDB

Helion

HPE DMA
10.x

Infrastructure

Supply: multi-tenant
physical & virtual servers
(assets)



DBaaS automated self-service portal

NonStop SQL database of choice

Select the EPR ID from the drop down: ?

Select the Application CI from the drop down: ?

204498 - GDS Cloud Database Service (HPE)

hpit:w-cloud-db-nonit-ent-dev


Required :	Type	Environment ?	Location	Cloud Database Name <small>(2 characters minimum)</small>	Size (GB) <small>(500 GB Max)</small>	From	To
<i>Co-Locate ?</i> <input type="checkbox"/>	NonStop	DEV	HPE H9	test902	1 10 GB (Max)	4/14/2016	5/14/2016

Service Account ? Subscription owner (Optional)

-- No Selection --

[Next](#)

Request Flow - Submit >> Pending >> Assigned >> Provisioned

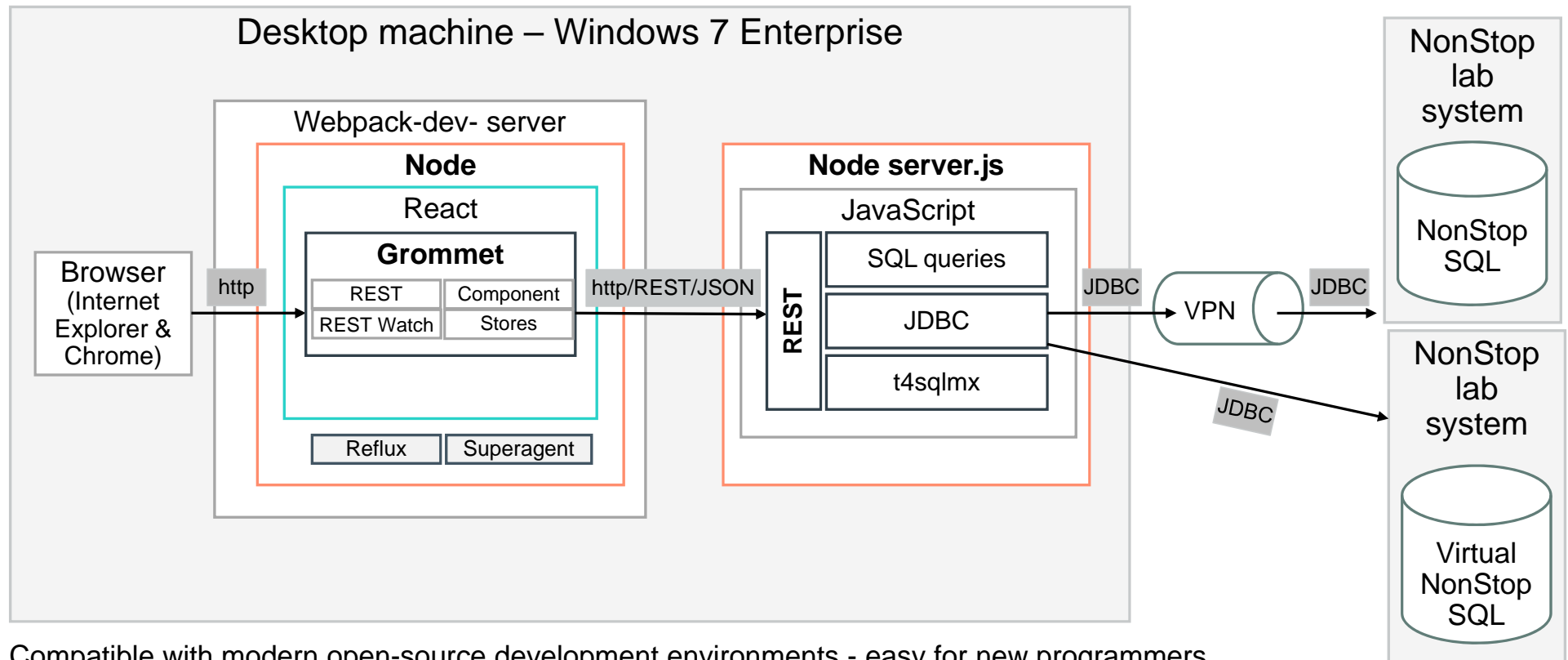
ID	Cloud DB	Type	Env.	Location	Size (GB)	Used %	EPRID	App CI	Start Date	End Date	Requested	Status	Action
22404	test904	NonStop	DEV	HPE H9	1	NA	204498	hpit:w-cloud-db-nonit-ent-dev	4/14/2016	5/14/2016	4/14/2016	Provisioned	 Refresh



IT Proof of Concept (PoC) with Nonstop SQL and IT's vision for the future

IT NonStop SQL PoC landscape

Implemented with common skills and knowledge



Compatible with modern open-source development environments - easy for new programmers

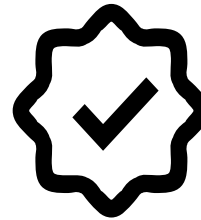
IT NonStop SQL PoC

Results and Conclusions



Results

- Clearly readable data was successfully passed from the database to the browser
- Some JSON formatting issues were observed

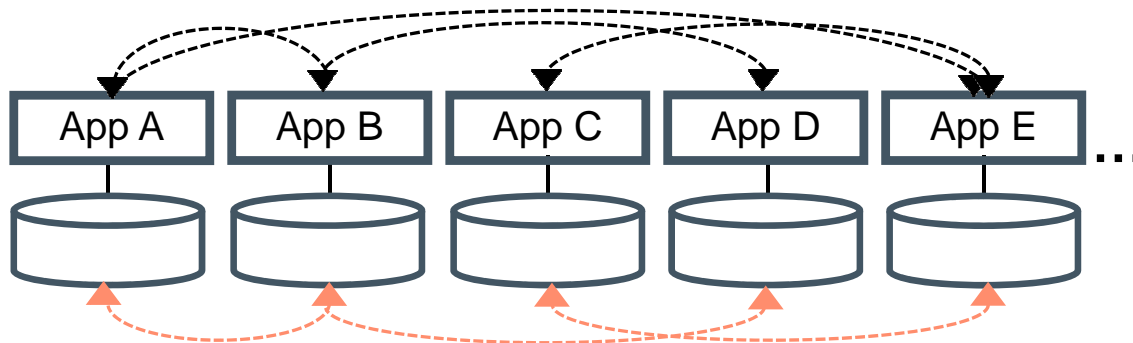


Conclusions

- NonStop SQL is compatible with Open-Source components
- The stack demonstrated a rapid development capability for use in highly-scalable systems
- Results highlighted an area in the driver that requires attention (JSON formatting)

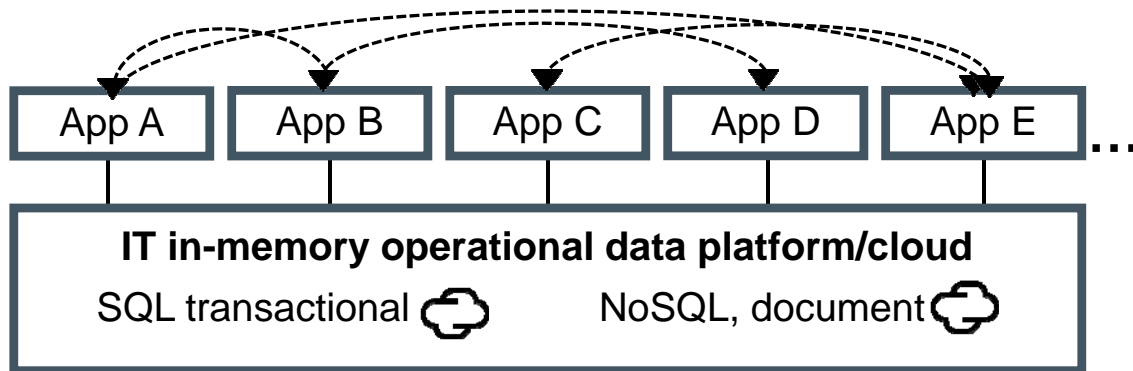
IT MC data backplane transformation

Evolving to manage data as a strategic asset & accelerate deployments



Present state

Future state



- Ability to respond faster to biz model pivots and shifts in data intersections
- From 25k DBMS instances to a "managed set"- PaaS apps "bind and go"
- Apps decoupled from data residency- enterprise data backplane vs fragmentation
- Less data replication and lower operational costs
- Position for future evolution and colocated data and compute scale (machine, etc.)

IT MC rapid app development & deployment transformation

Evolving to manage data as a strategic asset & accelerate deployments

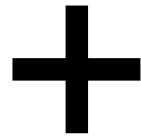


Present state - mix of data sources and custom apps

Future state - agnostic data source & open source apps



HPE Grommet
Open Source UX
Framework



NonStop
FT, MC, x86



node.js



- Establish ultra MC, true highly available DB processing for all stake holders
- Magic mix #1: rapid, modern app dev + “highly available/scalable DBMS” + ACID compliancy
- Magic mix #2: ultra MC + standard infra + private cloud deployment model
- Drive down DBMS costs, difficult vendor lock-ins and reinvest \$
- IT & BU co-innovation and large scale, real-world Hewlett Packard Enterprise IT proof points

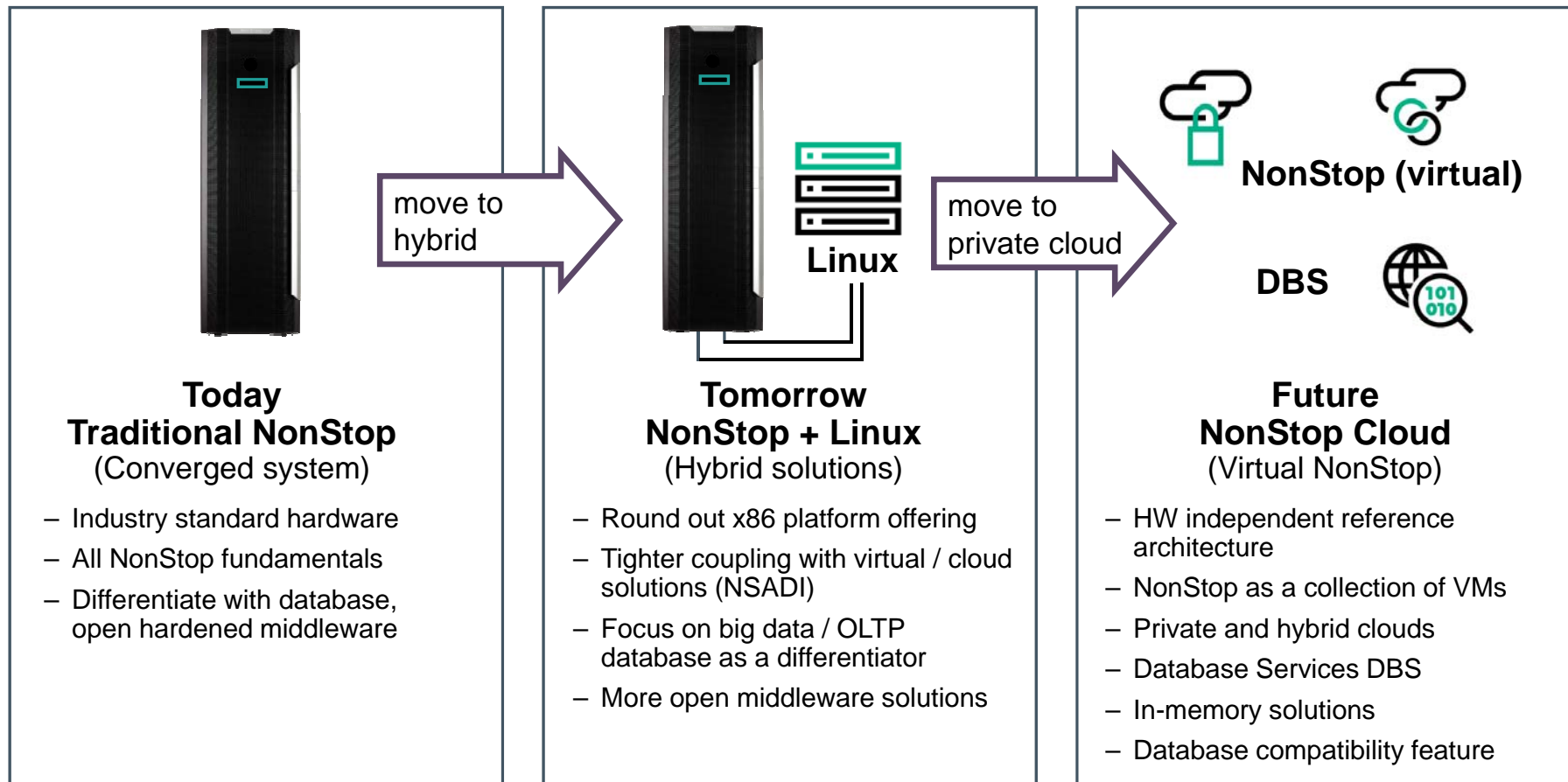
NonStop SQL DBaaS at Hewlett Packard Enterprise IT roadmap

	PoC 50%	DEV 30%	QAS 10%	PRD 10%
Prepare and implement IT NonStop SQL environments		→		
Integrate NonStop SQL into IT support services (backup, monitoring, support, etc.)		→		
Modify IT DBaaS to include NonStop SQL	→			
Integrate into IT Helion environment		→		










The changing world of databases for tomorrow

HPE Integrity NonStop vision for the new style of compute



HPE NonStop SQL advantages

NonStop SQL brings these features to the private cloud

-  **Massive scalability**
Single database image across more than 24,000 cores
-  **Parallel processing**
Leverages NonStop MPP architecture
-  **Absolute data integrity**
Checksums, atomicity, business continuity
-  **Availability**
Online manageability, NonStop fundamentals, AL-4
-  **Mixed workload support**
OLTP, batch and OLAP query workloads
-  **Standards based relational database**
ANSI compliant, JDBC, ODBC
-  **Virtualized data access**



HPE NonStop SQL Database Services (DBS)

Integrating the world's most fault tolerant database for use by cloud enabled apps

Future capabilities for deploying mission critical apps into the cloud

These are features required by Hewlett Packard Enterprise IT

Speed and convenience

- Enables quick provisioning of new business services
- Elasticity for compute resources, disk space and database connections

Efficient resource utilization and administration

- Multi-tenancy to reduce costs and simplify administration
- Infrastructure to allow applications to be implemented with metering and billing

HPE NonStop SQL database compatibility

Present and future

Present

- NonStop SQL has Oracle compatibility features
- External sequence generators, Oracle functions, SQL dialect, etc
- JDBC and ODBC connectivity
- ETL (Extract, Transform & Load) tools for data migration available with HPE Shadowbase and from Merlon (NonStop partner) with SQLXPress
- Customers have successfully migrated Oracle JDBC based apps that use BLOBs to NonStop SQL
- Migration assistance available via the HPE NonStop ATC

Future features

- PL/SQL support (a widely used procedural language in Oracle apps)
- User defined functions
- Materialized views
- Temporary tables
- Synonyms
- Optimizer hints (now available in v3.4)



Overall goals

- With minimal effort, bring applications that use Oracle databases to NonStop SQL
- Scale out applications that use Oracle, without the complexities and limitations of RAC

HPE NonStop SQL / system vision for the future

Database Services



Database lakes for global information gathering - big data



Database provisioning for business functions



SQL database compatibility feature

Virtual NonStop



Fault tolerant cloud infrastructure



NFV host (Telco) for HPE CMS software



Private clouds within IT



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Thank you