Hewlett Packard
Enterprise


# NonStop SQL and Friends -- the best choice for the cloud

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# Introduction

- Cloud computing – infrastructure
- Cloud application model
- NonStop application model

- Advantages

- NonStop SQL/MX DBS
  - Standardization
  - Separation of duties
  - Isolation
  - Best practices
  - Self service

# Cloud computing

- Technology that allows users to use “without owning” resources:
  - Servers
  - Storage
  - Databases and Software
  - Other resources
- Shared pool of resources
- Various implementation models
  - Public cloud
  - Private cloud
  - Hybrid cloud
- Flexibility through pay as you go pricing model
  - Minimize or avoid up-front infrastructure costs, while having access to high performing compute resources

# “Cloud computing means that you are using somebody else’s computer”

## (with a faulty power supply)

Anonymous

# Cloud Application Model

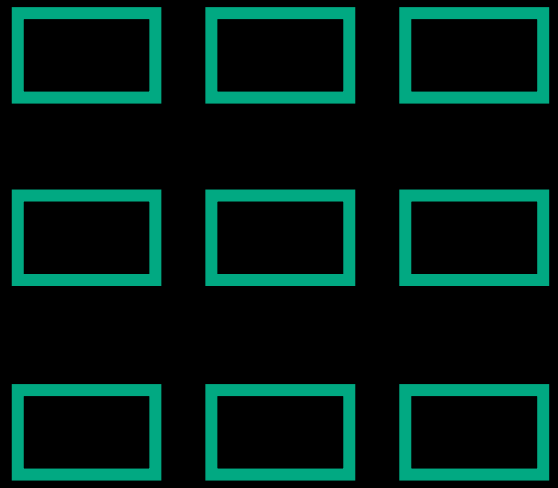
How to make use of cloud infrastructure

# Cloud Application Model

- “Cloud-Native” Application  characteristics
  - (Small, independent) services which are loosely coupled
  - Distributed
  - Easy to improve in a continuous development mode

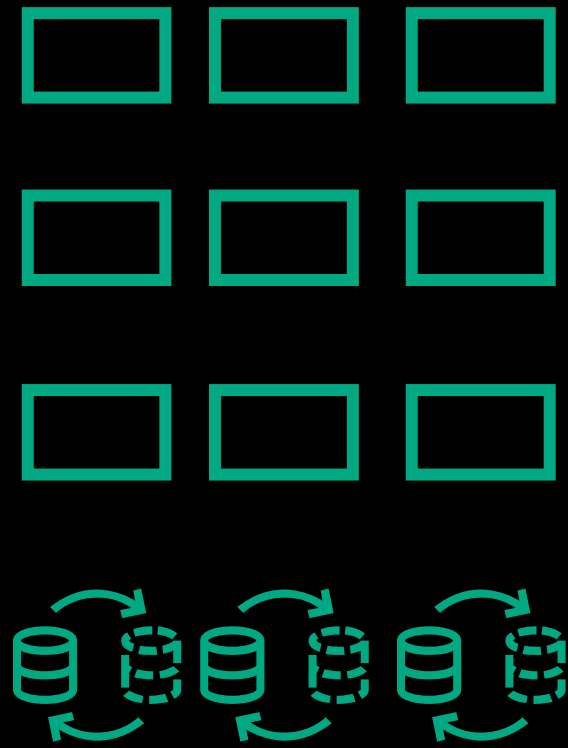
- Example buzzwords
  - Microservices
  - Containers
  - Stateless
  - DevOps CI/CD

- Enables to increase
  - Scalability
  - Availability
  - Release velocity



# NonStop applications fit the cloud model

- Well designed NonStop application characteristics
  - Distributed
  - Services-based
  - Message-based (loosely coupled)
  - Stateless for linear scalability
  - Transactions can span multiple services (*)
  - Data integrity
  - Scalable, distributed, ACID  SQL database
- Does not exclude
  - Microservices
  - DevOps CI/CD



# NonStop server, a cloud in a box

There are similarities in application architecture, however there are differences

# Cloud advantages

- Standardization of building blocks
  - Standard compute blocks
  - Networked into clusters of servers
  - VMs or Containers
- Automation brings velocity
  - Ability to quickly provision infrastructure, even for short time
- Elasticity -- add and remove resources as needed
  - Virtually unlimited capacity in public cloud providers
- Pay per use

# NonStop advantages

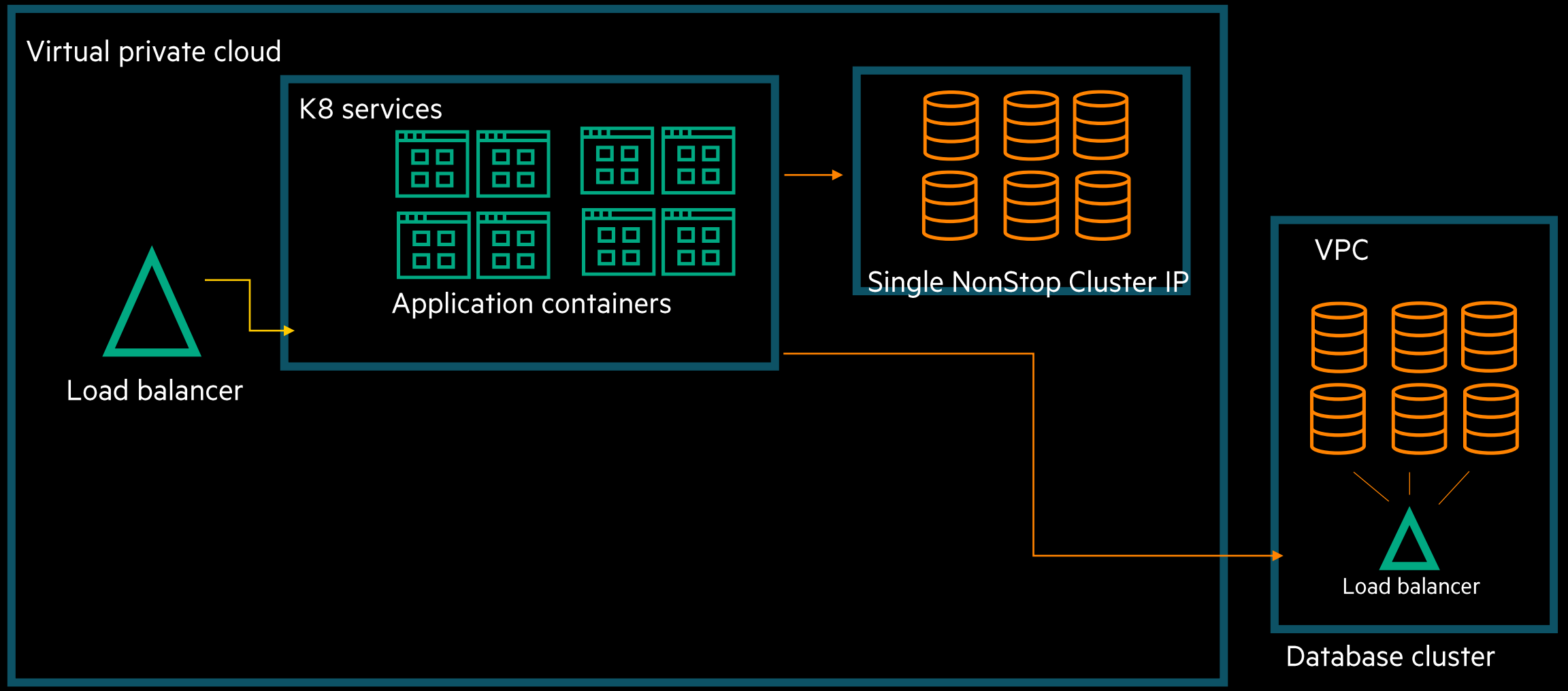
- NonStop OS presents a cluster as a single system
  - Easier to connect to
  - Fault-tolerant
  - Easy to manage (16 servers managed as one)

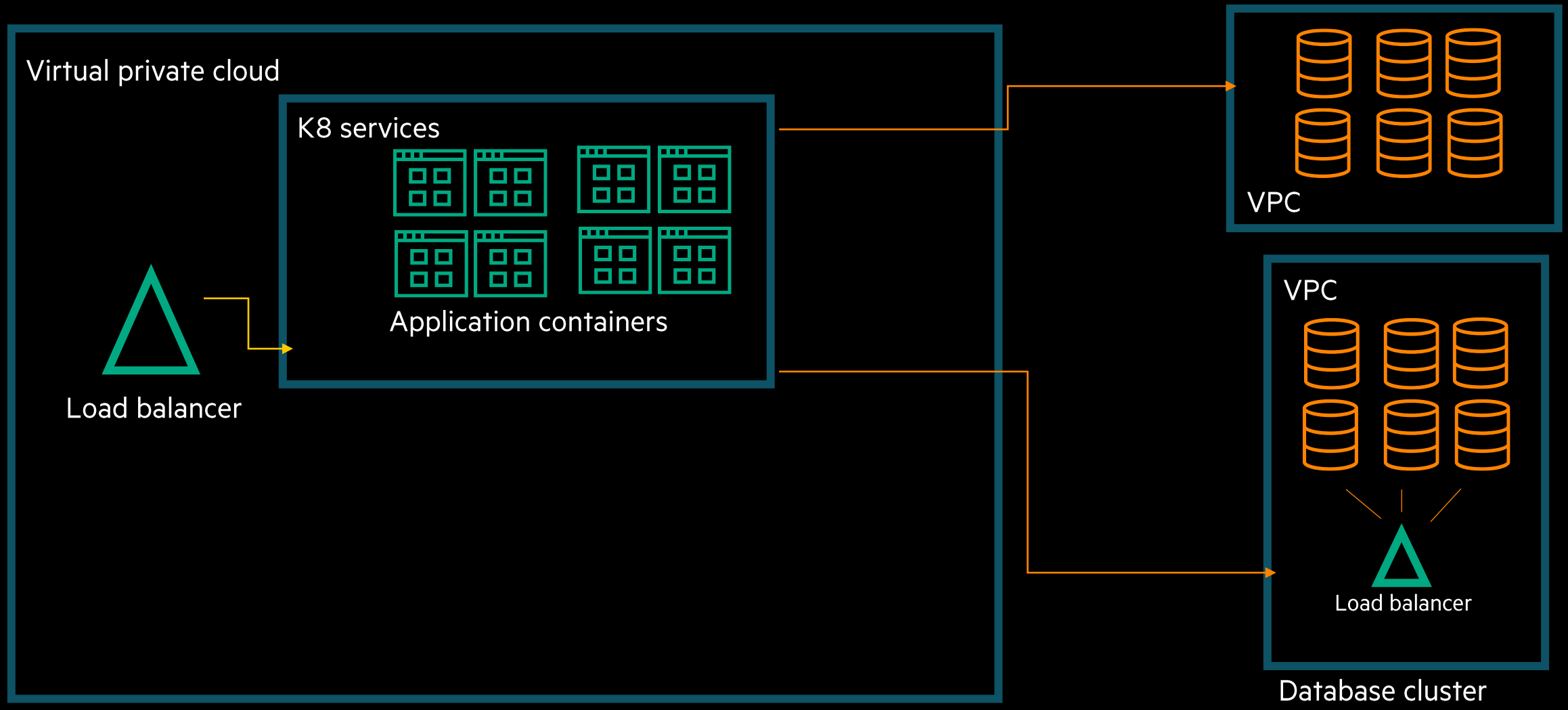
- Scale-out SQL database
  - Typically, databases require sharding or replication  to scale-out
  - NonStop SQL designed to run as a cluster of servers
  - Transaction integrity across the cluster

- SQL/MX DBS multi-tenant database services
  - Sharing resources
  - Consolidation of databases
  - Rapid deployment
  - Ease of use

- Fault-tolerant Redis in-memory database implementation

# Similar architectures combined




Virtual private cloud
K8 services
Application containers
Load balancer
VPC
VPC
Load balancer
Database cluster

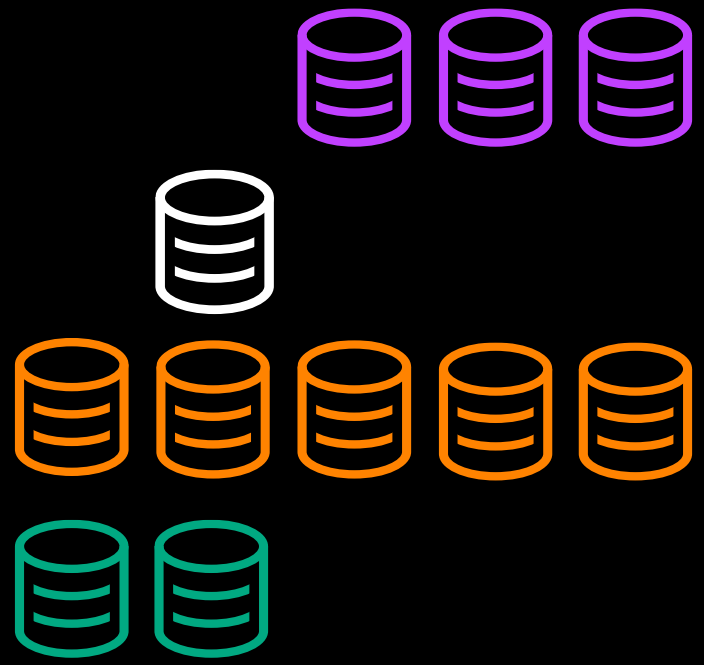
# API Driven NonStop SQL/MX DBS

- Client Access via JDBC/ODBC
  - Clients running off-platform
- Multi-tenant
- Resource sharing
- Isolation between tenants
- Ease of use
  - System administrators
  - Database users

# Best practices: Database Storage

- Automatic distribution of data across available storage
  - Relieves developers of knowing NonStop specific naming
- Supported for tables and indexes
  - Automatically hash-partitioned
- Range partitions supported
  - Requires location to be specified

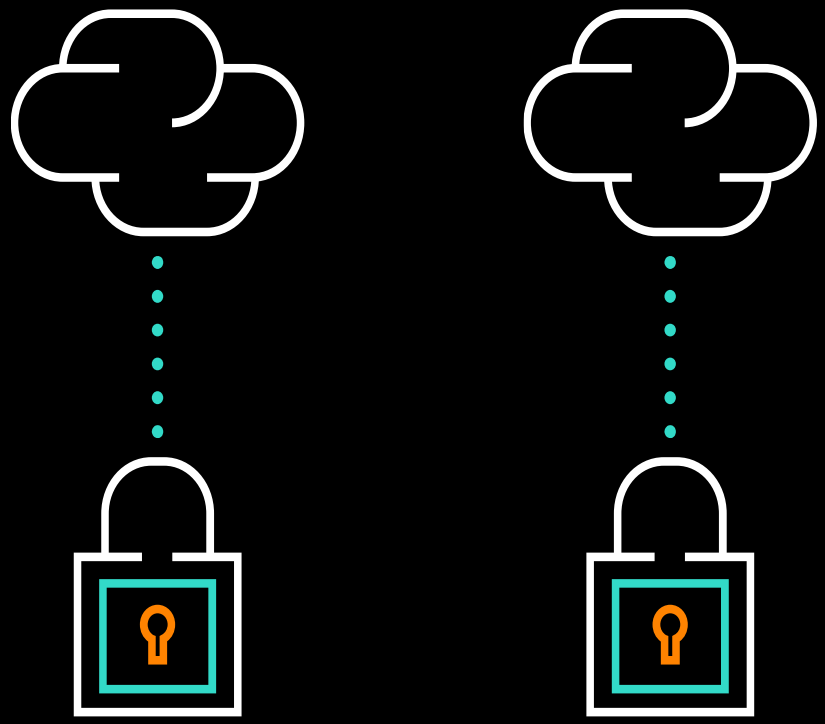
- Ownership of data by the schema owner
- Backup/Restore by schema



# Best practices: Database isolation

- Exclusive assign of volumes to databases
  - User access only to database users
    - Access rules enforced by Safeguard
  - Database cache exclusively
  - I/O contention avoided
  - Lock space reserved
  - Metadata only visible to database users

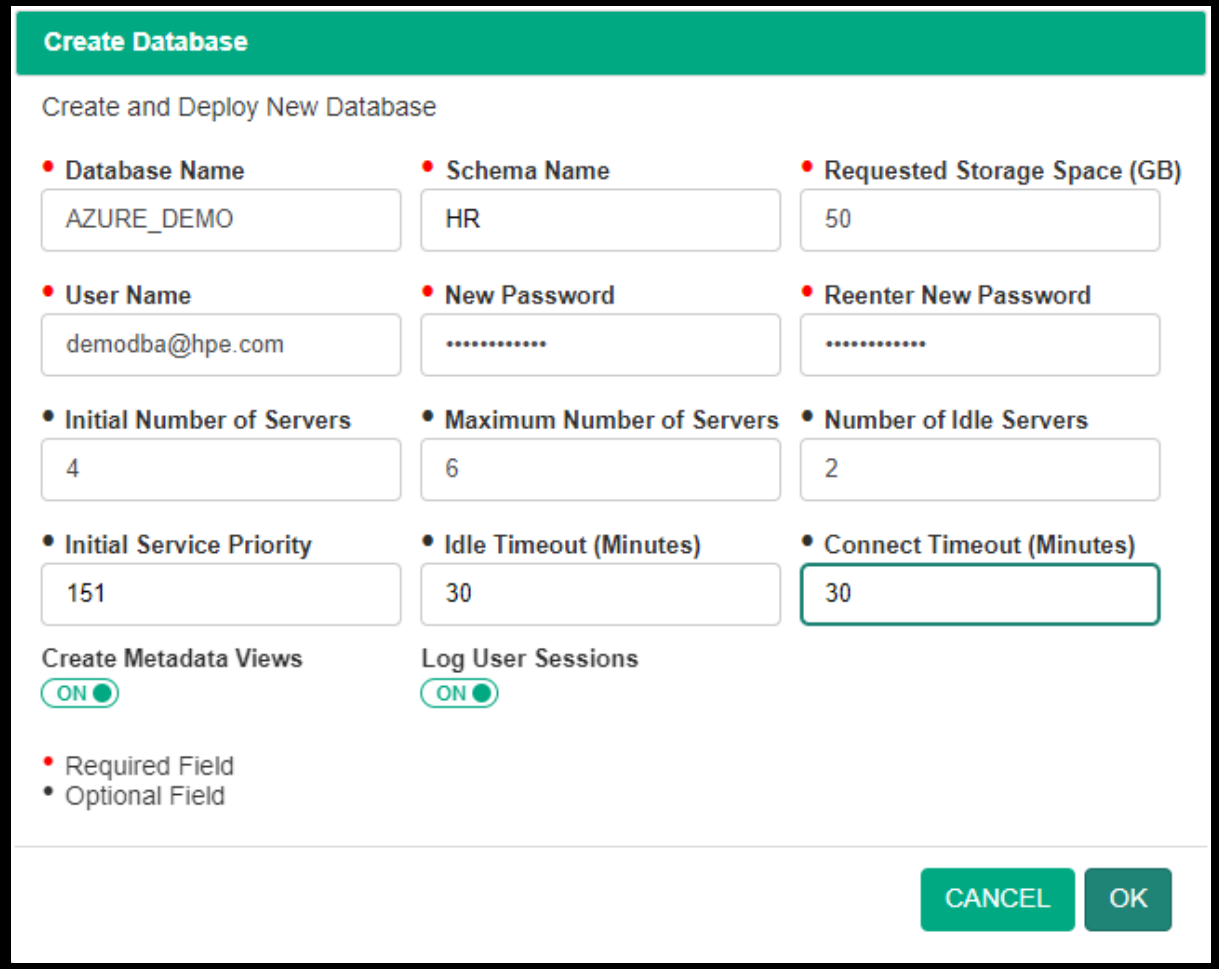
- Separate MXCS Datasource per database
  - Created automatically with each database
    - Priority
    - Number of connections
  - Automatically started
  - Only assigned users have access



# SQL/MX DBS separation of duties

- System administrator creates database
- Database owner
  - Manages
  - Cannot see other tenant's  data
  - Gets exclusive storage

- Shared system resources
- Isolated databases



# Welcome message to tenant

- Once database created, tenant receives a notification
- Message in workflow queue
- Simple email

NonStop database service created

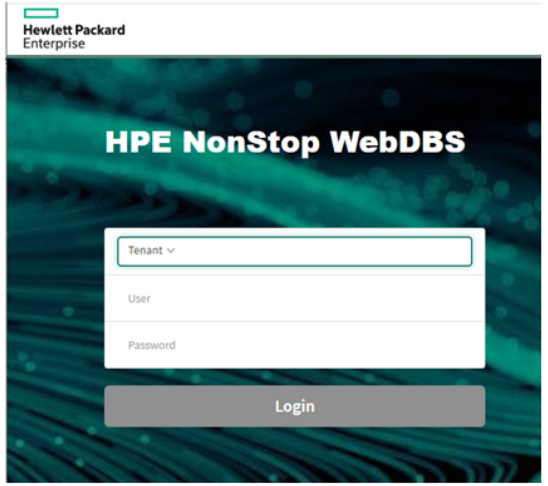
Jongma, Frans
To Jongma, Frans

Reply | Reply All | Forward

Wed 03-May-23 11:11

Dear test_user,

The NonStop SQL/MX database service has been created for you.
Your user name is **test_user@hpe.com**
The password will be mailed to you in a separate email.
Please access our WebDBS portal on https://azure.services-uk-m-2.skytap.nonstop:3443/webdbs/




Select login type “tenant” and provide your user name and password.

From this portal you will be able to change your assigned password and perform other administrative tasks.
For new users we recommend to download the following from the Downloads view:

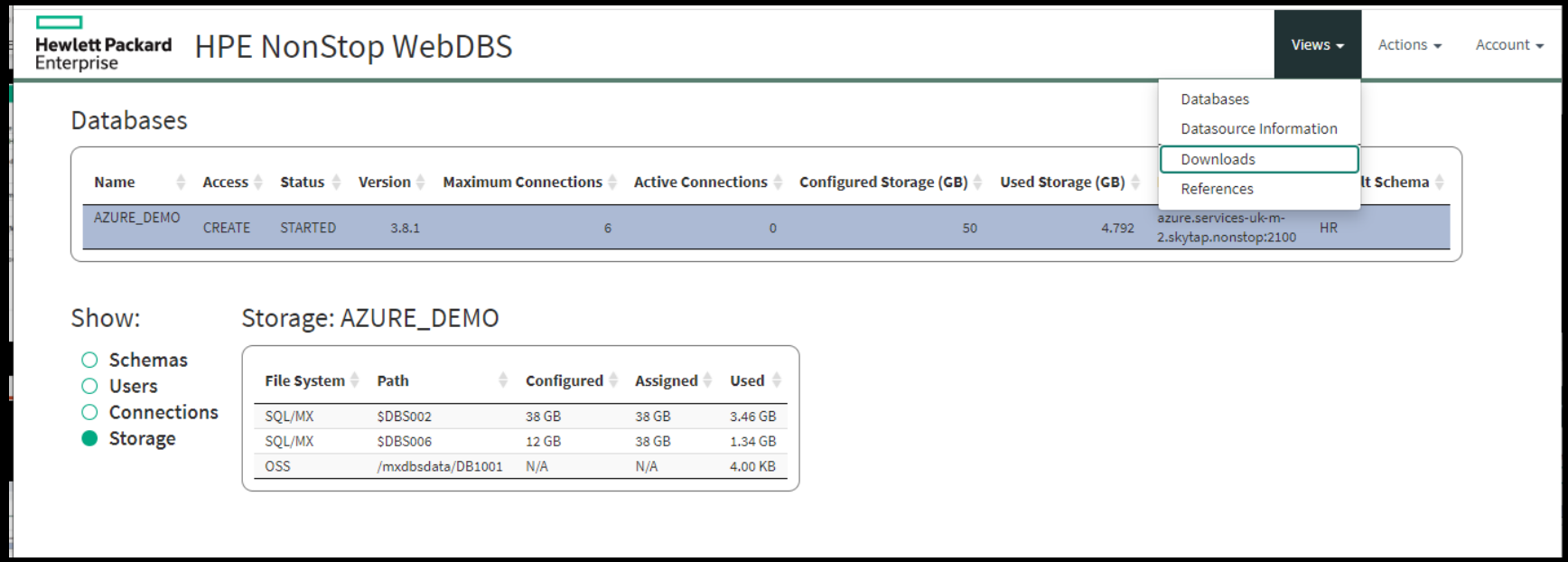
- Introduction to HPE NonStop Webdbs.pdf
- The example SQL files that allow you to create your first tables
- rmxci.cmd.sh a windows command file to run the conversational interface
  - Linux/Unix users probably do not require a script.
- rmxci.jar and t4sqlmx.jar files needed by rmxci.cmd

To access your database, use the following database URL:
`azure.services-uk-m-2.skytap.nonstop:2100`, and provide your database name (in UPPERCASE) together with the connection parameters.

Enjoy the NonStop experience!

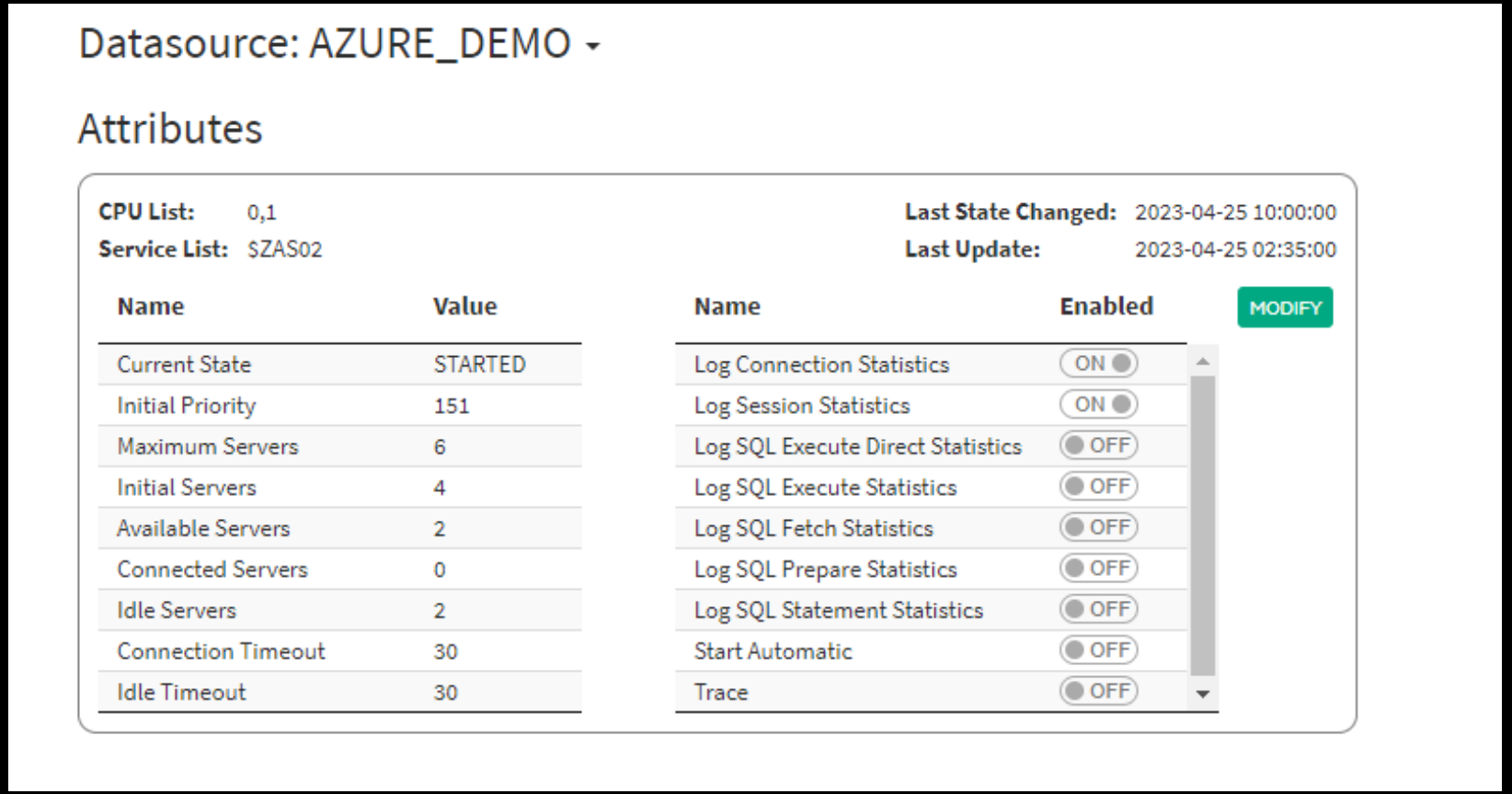
# And here is your instance

- Downloads of
  - JDBC and ODBC Drivers
  - WebDBS User Guide
  - Sample database
- Actions to
  - Manage users
  - Datasource configuration
  - Start & Stop database
  - Remove database & free resources



# Self-service resource management

- Web-based interface for database owner
- Relieve system manager from database resource tasks
- Owner permitted to change specific parameters



**“Automation brings velocity, standardization and includes best practices for setting up databases”**

Iqbaal Singh, HPE Global Solutions Engineering

# Thank you

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