

DxNetOps High Availability

A Cost-Effective VMware vSphere Solution

Broadcom DxNetOps + VMware vSphere

Executive Summary

Objective: Achieve High Availability (HA) and Disaster Recovery (DR) for Broadcom DxNetOps without the prohibitive cost of duplicate physical hardware.

Solution: Leverage **VMware vSphere HA** and **Fault Tolerance (FT)** to provide infrastructure-level resilience.

Outcome:

- Reduced Hardware Costs
- Simplified Management
- Near-Zero RTO for Critical Components

The Challenge: Traditional Physical HA

Deploying DxNetOps on bare metal requires:

- **Double Hardware:** 1-to-1 mapping for Active/Standby clusters.
- **Complex Licensing:** Idle standby licenses often required.
- **Manual Failover:** Physical failover can be complex and slow.
- **High TCO:** Significant CapEx and OpEx for minimal resilience gain.

The Solution: Virtualized Resilience

By virtualizing DxNetOps on VMware vSphere, we shift resilience from the *Application* layer to the *Infrastructure* layer.

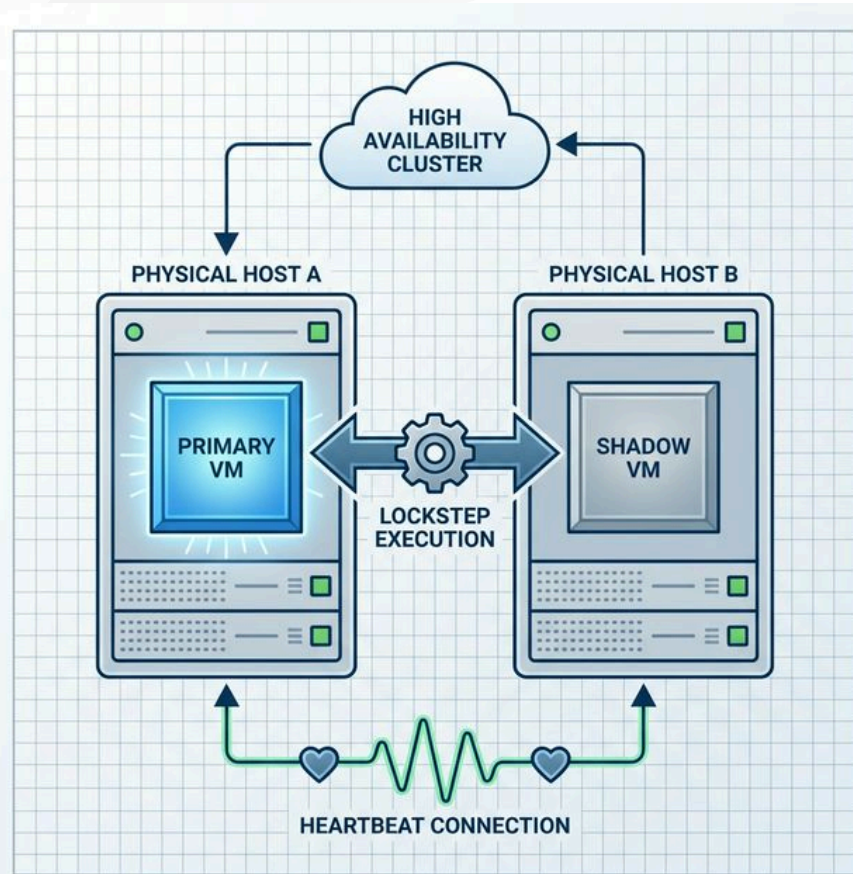
Key Technologies

1. **vSphere HA:** Automatic restart of VMs on healthy hosts.
2. **vSphere Fault Tolerance (SMP-FT):** Instant failover with zero data loss.
3. **vMotion:** Zero-downtime maintenance.





Visualizing Fault Tolerance



Comparison of active execution path between Primary and Shadow

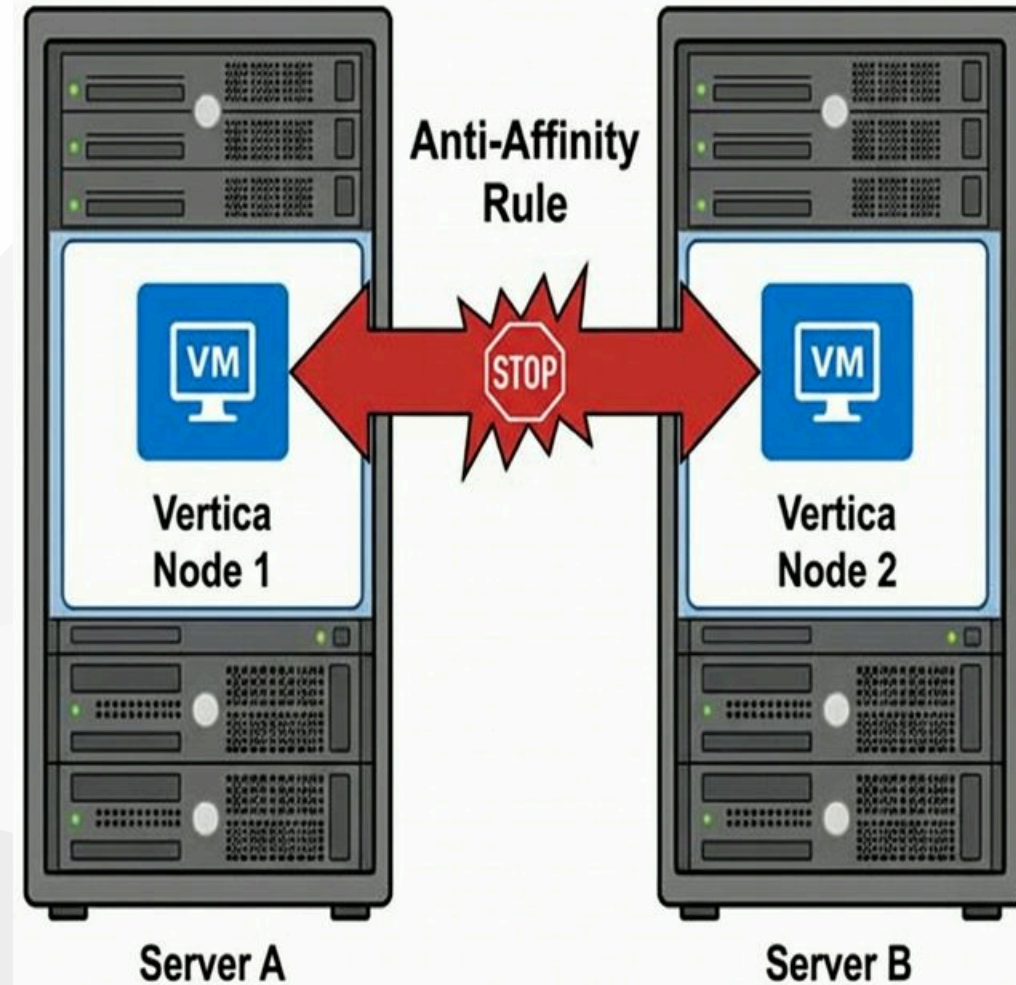
Deep Dive: Component Strategy

| Component | Strategy | RTO (Recovery Time) | Why? |
|--------------------|-------------------------|------------------------|------------------------------------|
| Data Aggregator | vSphere Fault Tolerance | Zero | Critical; no polling gaps allowed. |
| Performance Center | vSphere HA | Minutes | UI critical; tolerates reboot. |
| Data Collectors | vSphere HA | Minutes | Buffers data during outages. |

Vertica on VMware: Best Practices

To ensure bare-metal performance for the Data Repository:

- **100% Memory Reservation:**
Prevent swapping/ballooning.
- **Paravirtual SCSI (PVSCSI):** Low CPU overhead for high I/O.
- **Thick Provision Eager Zeroed:**
Eliminate first-write latency.



Cost-Benefit Analysis

| Feature | Physical Active-Active | VMware vSphere Solution |
|----------------------|------------------------------|-----------------------------|
| CapEx (Hardware) | \$\$\$\$\$ (2x Full Stack) | \$\$ (Shared Pool) |
| OpEx (Power/Cooling) | \$\$\$\$\$ | \$\$ |
| Licensing | Application Standby Licenses | vSphere Standard/Enterprise |
| Complexity | High (Custom Scripts) | Low (Native feature) |

Conclusion

Adopting a **VMware vSphere-based HA architecture** for Broadcom DxNetOps offers the optimal balance of:

1. **Resilience:** Enterprise-grade protection (up to 99.99%).
2. **Simplicity:** No complex application clustering to manage.
3. **Cost Efficiency:** Maximizes hardware utilization.

Recommendation: Proceed with virtualized deployment using Fault Tolerance for the Data Aggregator and HA for all other components.