

PowerDNS Lightning Stream Enterprise

Continuous DNS Synchronization. Simple. Scalable. Cloud-Native.

The Challenge

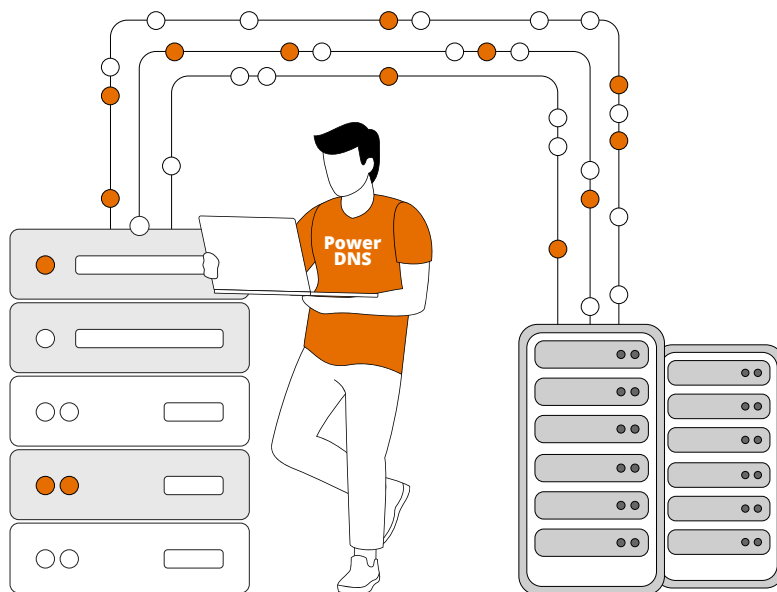
Operating authoritative DNS across multiple servers or data centers traditionally relies on DNS zone transfers or database replication to keep all data consistent. These approaches often require complex configurations, SQL database expertise, or operationally intensive replication mechanisms. They can also introduce limitations for multi-primary deployments, while DNSSEC keys and metadata require additional synchronization strategies.

Modern DNS infrastructures require a more efficient and simpler approach that enables distributed authoritative servers to maintain a consistent view of DNS data while supporting cloud-native architectures and high availability.

The Solution

PowerDNS Lightning Stream Enterprise synchronizes changes between the LMDB backend of PowerDNS Authoritative Server and an S3-compatible object store in near real-time. Changes are automatically propagated between authoritative servers, enabling one-way or two-way synchronization without SQL database replication or traditional DNS zone transfer configurations.

Lightning Stream Enterprise supports distributed deployments across multiple data centers while keeping DNS zones and DNSSEC keys synchronized with a globally consistent view of DNS data within seconds.



Key Capabilities

Continuous Synchronization

Synchronize DNS zone data and DNSSEC information between multiple PowerDNS Authoritative Servers through an S3-compatible object store. Automatic synchronization minimizes operational effort while ensuring consistent DNS data across distributed environments.

- ✓ **Near real-time synchronization**
- ✓ **One-way or two-way synchronization**
- ✓ **Multi-data-center deployments**
- ✓ **Automatic DNS data synchronization**
- ✓ **Global data consistency**

Multi-Primary Architectures

Multiple authoritative servers can independently manage DNS data while Lightning Stream Enterprise automatically keeps all systems synchronized. This simplifies highly available DNS deployments without complex database replication.

- ✓ **Multi-primary support**
- ✓ **Active-active deployments**
- ✓ **Independent DNS updates**
- ✓ **Simplified synchronization**

S3-Based Synchronization

Instead of relying on SQL replication or traditional zone transfers, Lightning Stream Enterprise uses S3-compatible object storage as the synchronization layer. This significantly reduces deployment complexity while leveraging widely available cloud and on-premises object storage platforms.

- ✓ **S3-compatible storage**
- ✓ **No SQL replication required**
- ✓ **Reduced operational complexity**
- ✓ **Simplified deployment**
- ✓ **Flexible storage backends**

DNSSEC Synchronization

Lightning Stream Enterprise synchronizes DNSSEC keys together with DNS zone data, eliminating one of the major operational limitations of traditional DNS zone transfers.

- ✓ **DNSSEC key synchronization**
- ✓ **Consistent security configuration**
- ✓ **Simplified DNSSEC operations**
- ✓ **Automated key distribution**

Incremental Synchronization

Lightning Stream Enterprise supports incremental synchronization, significantly reducing the amount of data transferred between authoritative servers and S3 storage. Instead of synchronizing complete databases, only changed data is replicated, resulting in faster synchronization, lower bandwidth consumption, and improved scalability for large deployments.

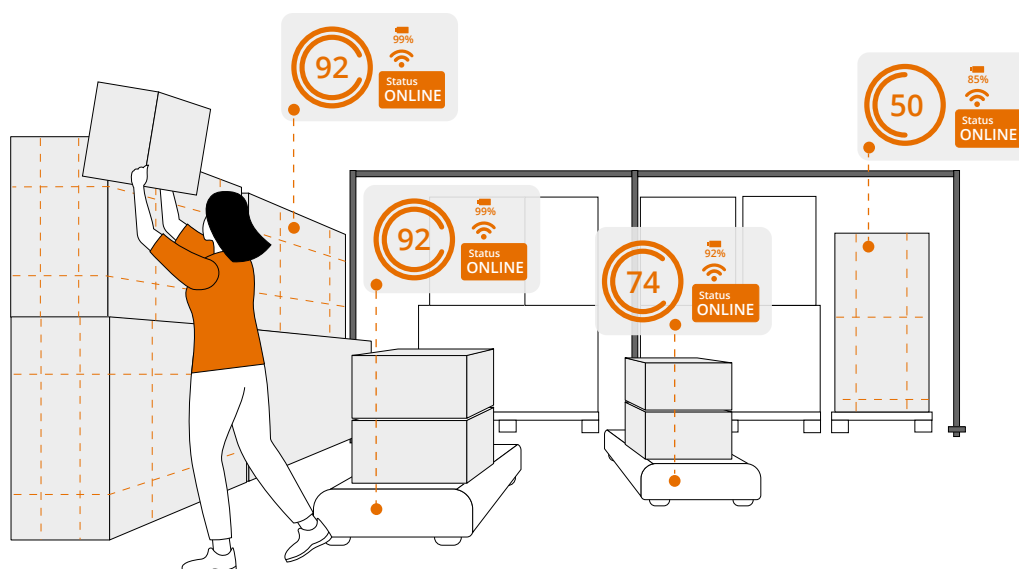
Regular configurable full synchronizations continue to ensure long-term consistency across all participating servers.

- ✓ **Incremental synchronization**
- ✓ **Faster replication**
- ✓ **Lower bandwidth consumption**
- ✓ **Reduced storage and infrastructure load**
- ✓ **Configurable full synchronizations**

Cloud-Native DNS Integration

Lightning Stream Enterprise serves as the default synchronization backend for cloud-native deployments of the PowerDNS Authoritative Server with PowerDNS Cloud Control. Together, they provide automated deployment, centralized management, elastic scaling, and highly available DNS synchronization for Kubernetes-based infrastructures.

- ✓ **Cloud-native deployment model**
- ✓ **Automatic synchronization**
- ✓ **Scalable DNS infrastructure**



Key Benefits at a Glance



Near real-time **DNS synchronization**



DNSSEC key synchronization



Multi-primary architectures



Cloud-native deployment support



S3-based synchronization



Reduced operational **complexity**



No SQL replication required



Enterprise **scalability**

Ready to Simplify DNS Synchronization?

Discover how PowerDNS Lightning Stream Enterprise enables fast, reliable, and cloud-native synchronization for your distributed PowerDNS Authoritative Server deployments.

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