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The Infoblox Grid™

CENTRALIZED MANAGEMENT OF DISTRIBUTED ARCHITECTURES

Infoblox physical and virtual appliances deliver core network services—including DNS, DHCP, IPAM, NTP and TFTP—in a reliable, secure, easy-to-deploy and manage platform. The Infoblox Grid™ is created by linking appliances across a distributed enterprise. The Grid is not a separate management and reporting application that overlays the individual appliances. Rather, appliances in a Grid are linked using sophisticated distributed database technology embedded within each appliance. This transforms the collection of appliances into a unified system with very unique and beneficial attributes.

The Infoblox Grid addresses basic problems that remain unresolved when independent servers or appliances are deployed within a distributed enterprise—namely, that each server or appliance must be individually deployed, configured, managed and upgraded, and that each server or appliance acting on its own cannot ensure the availability, accuracy and timeliness of network services data. Individual servers or appliances do not act as an integrated system, cannot offer high availability, are not robust in the face of network outages, increase the burden on IT staff and fail to reduce total cost of ownership. The Infoblox Grid addresses all of these issues and more.

The Grid architecture provides a highly scalable, reliable and fault-tolerant solution unique to Infoblox. At the heart of the Grid architecture is the Grid Manager, an Infoblox appliance that holds and maintains the central database of the Grid. The Grid Manager pushes global configuration data and needed information out to Grid Members, monitors member operations, synchronizes member changes back into the central database and distributes updates. A key function of the Grid Manager is the prevention of a single point of failure through an interconnected chain of failovers. The Grid Manager is commonly deployed as a high-availability (HA) pair. If one of the pair fails, the HA-paired device automatically takes over. If a catastrophic failure wipes out the pair, a Grid Manager Candidate in a disaster-recovery location replaces it with a single click and syncs up with the remaining Grid members. If a link between a Grid member and a Grid Manager fails, all the data at the Grid member is queued until the connection is restored, and then the data is synced to the Grid Manager.

KEY FEATURES

- A high-availability architecture and real-time database
- Consolidated and centralized management control across network subnets, zones, and sites
- Automation for scalability and staff productivity
- Secure communications between grid members
- Remote administration via an efficient and elegant web interface
- Fast search capabilities in both Global Search and Smart Folders
- Intelligent scheduled restarts for DNS and DHCP services
- Near real-time data synchronization across Grid members supporting Multi-manager DNS

INFOBLOX GRID™ TECHNOLOGY OVERVIEW

Infoblox Grid™ technology enables distributed Infoblox appliances to function as a unified, centrally managed system—instead of independent devices—providing a real-time distribution, synchronization and management framework. Infoblox Grids are implemented using physical or virtual appliances licensed with the NS1 Grid (NS1GD) package, which enables the functions of the Grid module in the Infoblox NIOS software. The Grid module leverages and enhances underlying subsystems in the Infoblox NIOS software included with every Infoblox appliance.

The NIOS software includes service modules such as DNS, DNSSEC, DHCP, TFTP and NTP services that are implemented using industry-standard protocol engines that have been modified to work with the Infoblox database. The Infoblox database engine provides:

- **Zero administration:** The database is built-in and requires no user installation or maintenance.
- **Persistent transactional subsystem:** This prevents data loss throughout a single or distributed system, even in the event of a failure.
- **Semantic constraints:** These provide data validation and consistency checks.

It is important to note that the Infoblox database is able to provide these services to all protocols supported in the NIOS software. This makes it possible to transform a protocol module such as TFTP, which has no inherent concept of distributed operation across multiple systems, into a Grid-enabled protocol that provides centralized management and control and ensures file consistency across multiple sites.
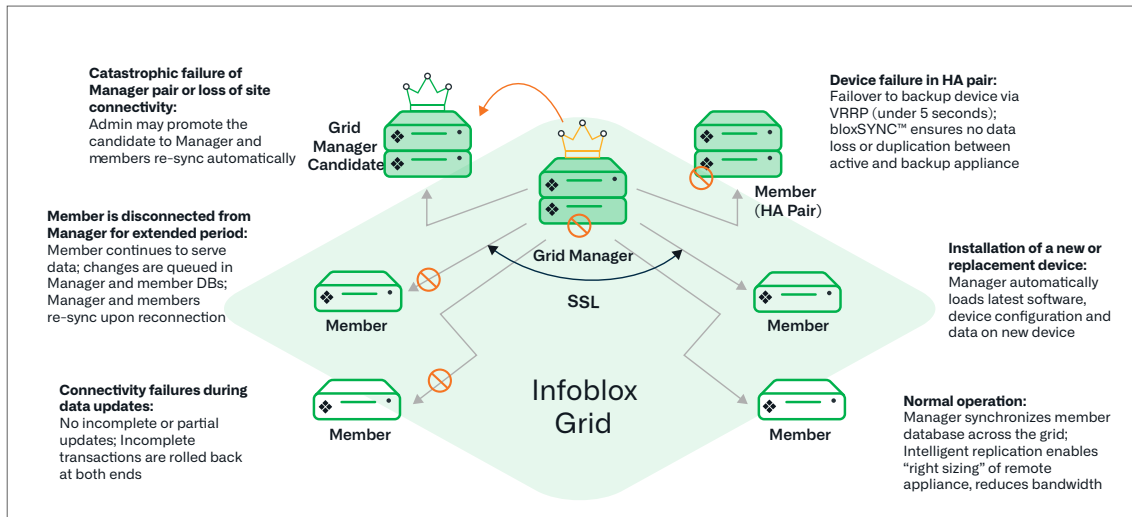

Figure 1. Infoblox Grid architecture is designed for maximum service uptime

BENEFITS

- Enables efficient administration with centralized management of Grid members, network devices and Microsoft servers
- Guarantees data integrity and availability through a distributed database
- Enables software upgrades and patch distribution with zero down-time
- Ensures reliability via secure network communication among Grid members

GRID MANAGER AND GRID MANAGER APPLICATION

In an Infoblox Grid, the Grid Manager is responsible for coordinating and synchronizing data and configurations across other appliances designated as Grid members. The Grid Manager may serve protocol data, but it also has several special roles.

Providing the Seat of Administration for the Grid

The Infoblox Grid Manager application communicates with the Grid Manager appliance, which in turn provides configuration data to each of the member appliances in the Grid.

Managing Software Updates

New software revisions for appliances in the Grid are uploaded to the Grid Manager which is responsible for managing the software distribution and upgrade process on remote members. Files for delivery via TFTP are also distributed to member appliances via the Grid Manager.

Synchronizing Grid Data

Changes that occur on member devices, such as changes to DNS zone data due to dynamic DNS updates, are transmitted in real time from each member to the Grid Manager, which in turn sends updates to those member devices (and only those devices) that serve data for the affected zones.

Most data is partitioned so that member appliances only contain the data they serve. Further, the replication mechanism is intelligent so the appliance capacity required at each member site is reduced, and the bandwidth required for synchronizing data across members is minimized. Intelligent partitioning and replication also minimize the replication load on the Grid Manager.

Providing Grid-wide Monitoring and Reporting

The Grid Manager serves all monitoring and reporting data to the Infoblox Grid Manager application, including the status of member devices, real-time and historical views of DNS and DHCP data, and service logs.

Grid Managers are typically deployed in high-availability pairs at key data centers, network operations centers and disaster-recovery sites. Any Infoblox appliance (or HA pair) in a Grid can be designated as a Grid Manager, as long as it has sufficient database capacity to support all of the unique database objects in the Grid. The database includes hosts, static IP addresses, dynamic IP addresses and other network services data elements.

In addition, any appliance (or HA pair) in the Grid with capacity equal to or greater than the Grid Manager can be designated as a Grid Manager Candidate. At any time, an administrator can promote a Candidate to become the Grid Manager, at which time it will contact all member appliances and automatically assume the Grid Manager role, making disaster recovery extremely natural and easy to do.

INFOBLOX GRID—SUPERIOR ARCHITECTURE FOR CORE NETWORK SERVICES DELIVERY

The Grid sets the Infoblox core network service delivery apart from all other architectural platforms for enterprise-grade DDI. As part of the overall solution rather than a management overlay, the Grid ensures maximum service uptime, ease of use of including centralized management, and accurate, available, real-time data distributed across all physical and virtual appliances requiring the information.

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Infoblox unites networking and security to deliver unmatched performance and protection. Trusted by Fortune 100 companies and emerging innovators, we provide real-time visibility and control over who and what connects to your network, so your organization runs faster and stops threats earlier.

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