

MakDNS – Next Generation Domain Name System

MakDNS is a fresh new approach to building and deploying intelligent global-scale domain name-based services. At its core, MakDNS offers a highly-scalable highly-redundant authoritative global DNS infrastructure enabling state-of-the-art DNS features including geographical load balancing services, geo-directional Internet Protocol traffic control and transparent traffic redirection and management services, industry's first and fastest name-based server auto-failover and auto-recovery, industry's first name-based 'stealth' hot-standby, IP-based remote server and service monitoring and email/SMS alert and notification services, plus an IPv6-enabled and DNSSEC compliant Distributed DNS infrastructure. All of these advanced next-generation DNS services are already available with MakDNS.



Makani MakDNS offers one of the world's smartest distributed DNS infrastructure

Global Multi-Master Multi-Slave Fully-Synchronized DNS Architecture

MakDNS deploys smart DNS servers at some of the most strategic locations around the globe. This global DNS infrastructure spanning three continents offers a geographically distributed multi-master multi-slave fully-synchronized DNS architecture enabling quick DNS resolution times, supporting very low DNS TTLs (Time-to-Live) and capable of handling more than 10 billion unique DNS queries per day.

Fully-automated Distributed DNS with no single point of failure

MakDNS implements a multi-master system whereby the primary and secondary master servers are intentionally located in different continents. Because master servers continuously provide mission-critical network intelligence and real-time updates to their slaves, these master servers and slave servers (hosted either in Tier-I or Tier-II data-centers offering highly-redundant multi-gigabit network connectivity) are continuously monitored and synchronized. If ever an active master server fails, slaves automatically resynchronize with a new master server to receive real-time updates. The MakDNS architecture also avoids the split-brain condition in distributed DNS by elevating one of the slaves to act as the new master server even in the improbable scenario when all the master servers fail. The infrastructure is fully automated and requires minimal human intervention.

Geographical Load Balancing DNS

By distributing compute-intensive workload functions across a number of data-centers located around the globe, MakDNS users can scale their domain name-based services to unprecedented levels. Additionally, by geographically scaling services around the globe, MakDNS also ensures that cascaded data-center failures or even outages in a few data-centers potentially emanating due to competing national, economical, technical, political or even environmental factors will have little or no significant adverse impact on users' global-scale domain name-based services.

Geo-Directional Internet Protocol-based Traffic Control and Redirection Services

MakDNS continuously collects and disseminates application-level, session-level, transport-level, and network-level intelligence, in real-time, from a number of monitor nodes located around the globe. These nodes monitor end-user IP-based services thereby enabling MakDNS to exploit fine-grained network intelligence available from multiple protocol layers. Because MakDNS offers network visibility and control of network-wide intelligence to MakDNS users, these users can now make use of this intelligence to dynamically control, customize, or even redirect Internet Protocol traffic for optimized access to their global-scale services. For example, MakDNS users have multiple choices to customize access to their Internet Protocol-based services; they can choose to optimize latency, optimize bandwidth, optimize service price, optimize energy costs etc. for access to their domain name-based services.

Location-aware DNS Georecords

Georecords are DNS records that enable location-aware access to domain name-based services. Georecords are user-activated, hierarchical, custom DNS records that operate depending on the location of the source IP address available from the DNS query. For instance, Continent-level records, called Geo-continent records, operate at the continent level. Geo-country DNS records operate at the country level whereas Geo-region records operate at the region level of a country. With such fine-grained, location-aware abstraction of DNS records available using Georecords, MakDNS ensures that users can seamlessly create, build, and deploy their own highly-personalized highly-redundant highly-available location-aware domain-name based services.

Instant Global DNS Updates

Using (asynchronous) log-position-based native database replication and well-provisioned servers, MakDNS ensures that changes made to the DNS records and other real-time updates are near-instantaneously propagated from master servers to slave servers.

Domain Name-based Auto-failover

MakDNS infrastructure employs multiple monitor nodes located at some of the most strategic locations around the globe. These monitor nodes facilitate remote monitoring for an IP address and its service. To enable name-based auto-failover, MakDNS users specify the IP address and the service they wish to monitor for that IP address. If a monitored service associated with an IP address fails, all DNS (i.e., DNS 'A') records using that IP address are immediately deactivated in MakDNS. The decision to detect and declare failure of an IP address (i.e., its monitored service) is based on a quorum vector derived from the results available from the global monitors.

Domain Name-based Auto-recovery

Similar to domain name-based auto-failover service, name-based auto-recovery service ensures that as soon as monitored service associated with an IP address recovers, all DNS (i.e., A) records using that IP address are immediately restored (reactivated) in MakDNS. Again, the decision to detect and declare recovery of an IP address (i.e., its monitored service) is based on a quorum vector inferred from the results available from the monitors.

Name-based Hot-Standby

MakDNS implements a new type of proprietary DNS 'A' record known as the “standby” record. The “standby” record is a stealth DNS record that remains deactivated within MakDNS under normal circumstances (i.e., under no service failures). However whenever an actively monitored IP address (i.e., its monitored service) fails, all the primary DNS (i.e., A) records using that failed IP address are immediately deactivated in MakDNS. However, if “standby” records are defined by the MakDNS user for active primary DNS records within MakDNS, then IP addresses of the standby DNS (i.e., 'A') records automatically and immediately take over for the failed primary DNS 'A' records. Standby records are activated as soon as quorum vector indicates a failure of the primary DNS record. Similarly, standby records are deactivated in MakDNS as soon as quorum vector indicates recovery of primary DNS records.

Remote IP Monitoring and Instant E-mail/SMS Alert Notification Services

Any IP address and its service can be remotely monitored in MakDNS. Standard services that can be remotely monitored include WWW, SMTP, DNS, SQL etc. In addition, non-standard Custom TCP ports and UDP ports can be seamlessly monitored in MakDNS. For remotely monitored IP addresses, E-mail/SMS alert notification can be enabled so that MakDNS users are quickly notified of any service failure or recovery.

IPv6-enabled and DNSSEC Compliant DNS Servers

MakDNS deploys smart DNS servers at some of most strategic locations around the globe. These DNS servers are hosted either in tier-1 or tier-2 data centers offering highly-redundant multi-gigabit network connectivity. Some of these MakDNS server support IPv6 through a mix of tunneled-brokered and native-IPv6 connectivity. MakDNS servers are DNSSEC compliant and are capable of full DNSSEC processing in the future.



Makani offers high-performance, easy-to-use and technically innovative solutions for next-generation wide-area networked data services. Makani Enhancers™ are deployed for wide-area data acceleration and optimization. Makani Mobilizer™ appliances are deployed in the customer's network for blazing-speed data access over a wide-range of access networks. Makani MakDNS™ is a technically-advanced next-generation Distributed DNS service. Makani MakCDN™ is one the world's smartest, multimedia- and mobile- optimized, next-generation global content distribution network. Founded in 2006, Makani is headquartered in San Francisco with regional offices all over the world.