

# Afilias<sup>SM</sup>

## Ancast Solution

---

*Security through Diversity™*



Afilias<sup>SM</sup>  
GLOBAL REGISTRY SERVICES

# About Afilias

- Afilias Limited is a leading provider of advanced domain name registry services and currently supports over 13,000,000 registrations
- Afilias Offices:
  - Headquarters in Dublin, Ireland
  - Sales offices in London, England
  - Operational facilities in Toronto, CA
  - Admin. offices Philadelphia, USA
  - Operational offices in New Delhi, IN

The Afilias logo features the word "Afilias" in a white, sans-serif font. The letter "i" is replaced by a stylized globe icon. A small "SM" trademark symbol is positioned at the top right of the "s".

- *Founded in 2000*
- *Irish-based entity*
- *Privately held*
- *13 million domain supported*
  - *2 generic Top Level Domains (gTLD's)*
    - *.ORG and .INFO*
  - *3 Sponsored TLD (sTLD's)*
    - *.mobi, .asia, .aero*
  - *9 country code TLD's (ccTLD's)*

# What is Anycast?

- Anycast addressing is simply assigning a common IP address to multiple instances of the same service
- Provides redundancy and load sharing to specific types of network services on the Internet
- Utilizes routing infrastructure of the Internet, IP packets are forwarded to the nearest instance of the anycast service
- Usually, one node receives each packet
- The node that receives a specific packet is determined by routing

## *Anycast*

**Leverages existing infrastructure of the Internet**

**Does not negatively effect existing networks**

**Routers, clients and servers require no special software**

# The Afilias difference

- Since 2001, Afilias has delivered 100% uptime of its name servers
  - See [www.icann.org](http://www.icann.org) for our record
- Afilias operates on a distributed basis for security and stability
- Operates in many locations around the world, with 5 major “hub” sites
  - Also distributed to dozens of “pod” sites around the world
- Diverse hardware, and software simultaneously operating in Anycast and Unicast for the

## Maximum in security and stability.

No single site is considered “primary,” since all sites are updated in near real time from the registry database

The Afilias logo features the word "Afilias" in a white, sans-serif font on a dark blue background. A small globe icon is positioned between the 'i' and 'l'.

**Guaranteed 100% resolution uptime**

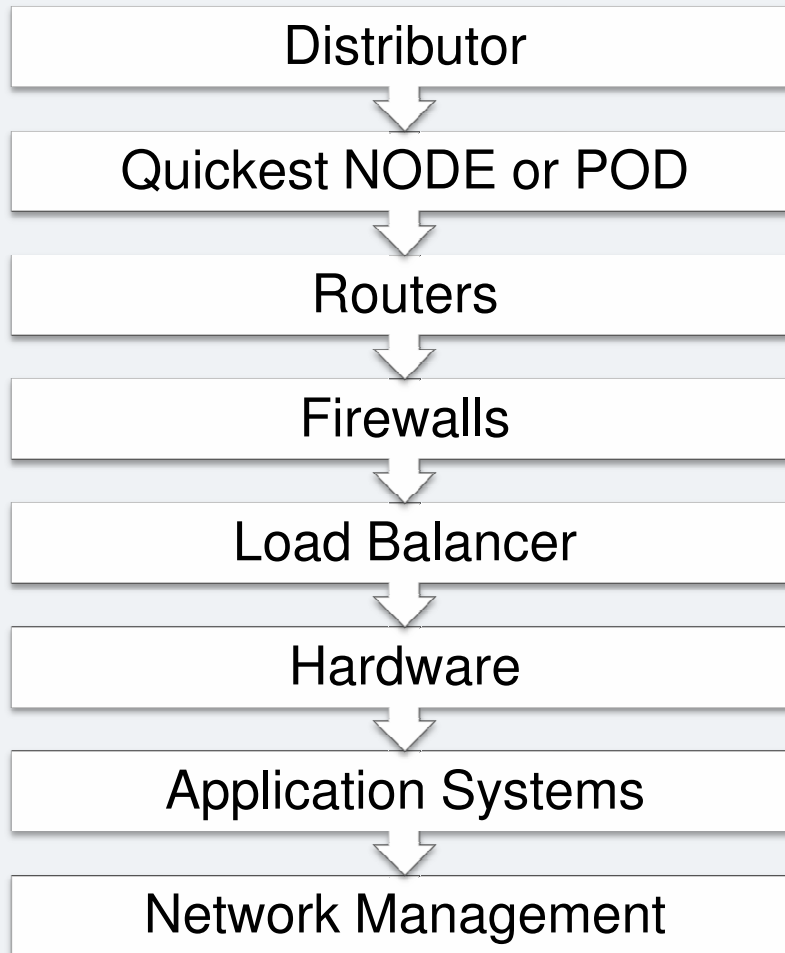
**Globally distributed “hubs” and “pods”**

**Diversity at all levels**  
*(hardware, software, firmware, monitoring equipment -- even DNS providers)*

The Afilias logo features the word "Afilias" in a black, sans-serif font with a small globe icon between the 'i' and 'l'. Below it, the text "GLOBAL REGISTRY SERVICES" is written in a smaller, black, sans-serif font.

**Afilias**  
GLOBAL REGISTRY SERVICES

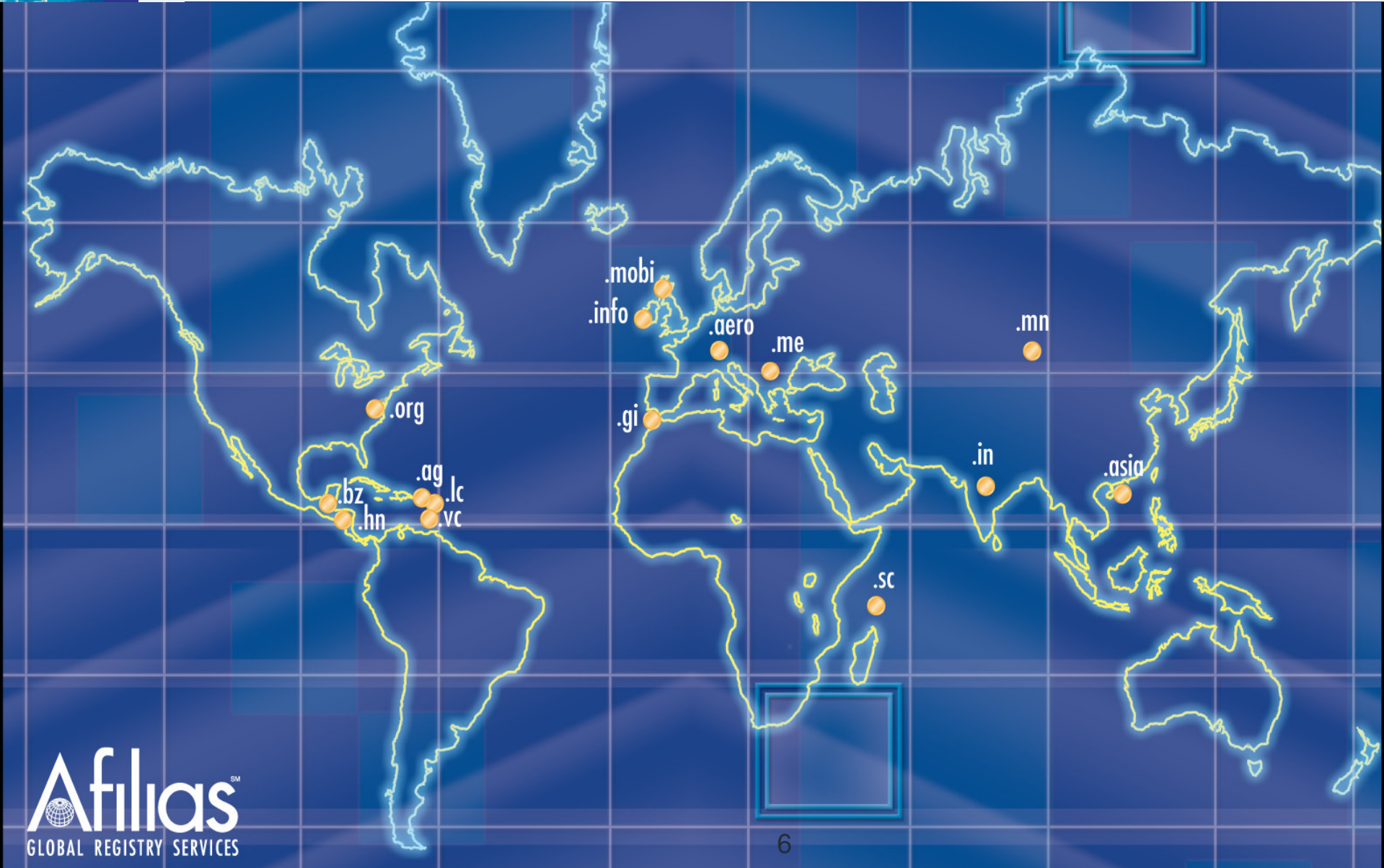
# Afilias DNS Architecture



## *Diversity at all levels*

- *Multiple DNS providers*
- *Bandwidth providers with a minimum of 1 gbps*
- *Geographically diverse datacenters*
  - *in 20 locations worldwide*
- *Cisco and Juniper Routers*
- *Multiple firewall and load balancer providers*
- *Servers with varied architecture*
- *Bind 9.5 and NSD (NLnet Labs)*
- *3 network monitoring tools*

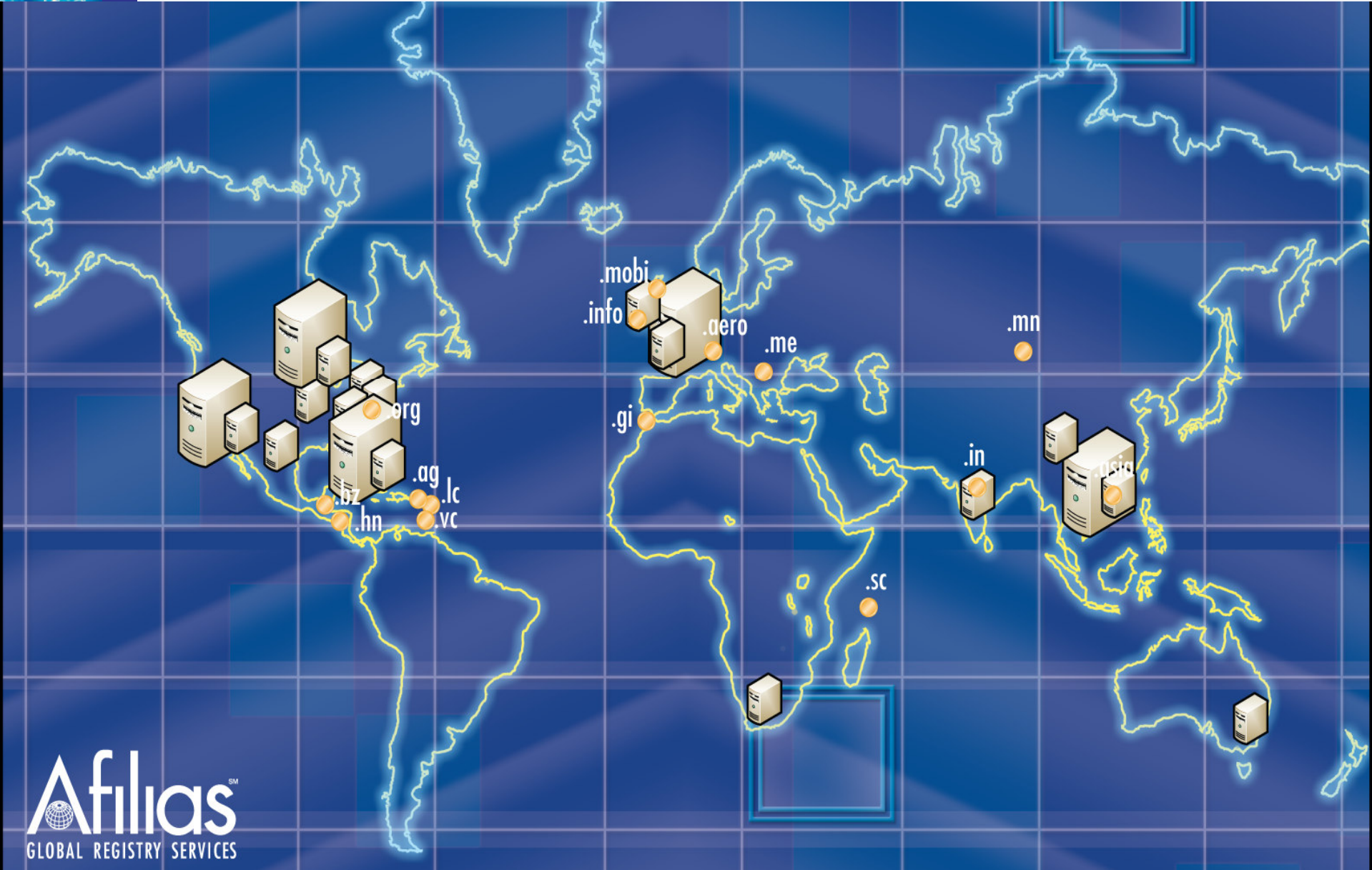
# Afilias TLDs under management



# Afilias DNS network



# Afilias TLD + DNS coverage



# Afilias DNS coverage by location

Location	Afilias Hubs	Secondary Pods *
<b>Canada</b>		
Toronto	✓	✓
<b>USA</b>		
Florida	✓	✓
Washington	✓	✓
California		✓
Illinois		✓
Virginia		✓
New York		✓
Texas		✓
<b>Europe</b>		
Amsterdam	✓	
Luxembourg		✓
UK		✓
<b>Asia</b>		
India		✓
Hong Kong	✓	✓
China		✓
<b>Australia</b>		
Sydney		✓
<b>Africa</b>		
South Africa		✓

\* Secondary pods are provided through our extended DNS network

# Resiliency + Resistance to Attack

- Zone data received by multiple Distribution Masters sending data to multiple name servers
- 2 DNS Distribution Masters located in each Afilias Hub
  - each acting autonomously
- Network access for each Distribution Master provided by a pair of management routers
  - each connected to a different transit provider
- Geographic separation affords even further protection against cyberstorms, as well as real storms
- Each Afilias Distribution Master can receive zone updates from every other Distribution Master + the DNS Distributor

**Afilias**<sup>SM</sup>

## **Tiered design**

*more resilient and secure*

## **Redundancy**

*Distribution Masters, routers, bandwidth, and geographic location*

## **Superior global fail over capability**

*Each DM can receive data from each other + the Distributor*

**Afilias**<sup>SM</sup>  
GLOBAL REGISTRY SERVICES

# Data Center Overview

- Afilias operates in data centers engineered to eliminate any single point of failure, with multiple layers of redundancy
- Two different power substations
- Dual entry on different sides of the building
- Automatic throw-over switches
- Multiple diesel generators and guaranteed fuel supply
- Halon and water suppression technology
- Multiple air conditioning units configured in a fully redundant array
- Multiple UPS power units with battery backup to provide electrical power
- Redundant Internet connectivity from diverse vendors
- High-level Service Level Agreements (SLA)

## *Data Centers*

**Geographically distributed**

**Tier 1 providers; complete backup and redundancy**

**24/7/365 internal & external monitoring**

# System Monitoring Tools

- Afilias utilizes three different systems to monitor each component for security, performance and stability both from within the data center, and from our redundant Network Operations Centers (NOC)
- All NOC sites are manned 24/7/365
- This allows the earliest possible warning of trouble, in order to allow ample preparation in case of a detected fault

## *Monitoring*

**Continuous monitoring of all network and server infrastructure components**

**Network availability monitoring**

**Network performance management**

**Application performance monitoring**

**Alert management**

# Backup

- The “master location” for creation of DNS zones is securely stored within the registry systems
- Each Afilias DNS node has a current “hot” copy of the zone, which can be retrieved at any time
- In the event of an entire registry system failure, the Afilias DNS infrastructure would continue to answer DNS queries without performance degradation
- If an individual name server cluster should somehow corrupt a zone, that node can immediately be taken out of service without causing system interruption

The Afilias logo features the word "Afilias" in a white, sans-serif font. A small globe icon is positioned between the 'i' and 'l' of "Afilias". The logo is set against a dark blue background.

**All DNS nodes have “hot”  
copies of the zone**

**Globally distributed “hubs”  
and “pods”**

**Clusters can be taken down  
independently without any  
impact on the overall  
system**

# Excellence in DNS



# Questions?

---

**John Kane**

VP, Corporate Services  
Afilias

[jkane@afilias.info](mailto:jkane@afilias.info)



**Afilias**<sup>SM</sup>  
GLOBAL REGISTRY SERVICES