



Etisalat secures robust DNS infrastructure with DNSBOX

CHALLENGE

- Rapid customer growth meant Google's DNS solution was failing to efficiently handle DNS requests
- Unwanted latency in DNS responses - up to 120 milliseconds - caused the internet to feel slow for customers
- It was impossible to ensure good service levels for customers at all times

SOLUTION

- 1 x **DNSBOX300** master and 8 x **DNSBOX200** slaves

BENEFIT

- Easily deployed, fit-for-purpose DNS solution
- Latency eliminated - customer experience now lightning fast
- Etisalat able to take back control of DNS management and plan for growth easily

ABOUT ETISALAT

Founded in 1976, Etisalat is a multinational Emirati-based telecommunications service provider. It currently operates in 16 countries across Asia, the Middle East and Africa. Etisalat is the 14th largest mobile network operator in the world, with a customer base of over 167 million.

Its operations in Afghanistan include 2G/3G/4G data and voice services, as well as internet services for around 500 ISP and corporate customers. Today, around 1 million customers subscribe to its 3G network.

Outgrowing Google's DNS

When Etisalat's network infrastructure was first set up in Afghanistan over a decade ago, it deployed Google's public DNS service to resolve customers' DNS queries.

However, with customer numbers now growing rapidly, Etisalat's Manager Rafi Jami was concerned about its impact on the quality of service:

- With DNS requests sent across the internet to remote Google servers, there was unwanted latency – up to 120ms in many cases. This led to an increasing number of customer complaints about the Internet connection feeling slow.
- The Google DNS servers placed restrictions on the amount of DNS queries coming from each of Etisalat's sites. This resulted in customer requests being dropped altogether.

"OpenDNS wasn't responsive at times, and this meant some queries were left unresolved. On bad days, requests were blocked by Google's DNS service, causing no responses altogether. Our customers noticed this," says Rafi.

Needing to eliminate these symptoms and facilitate future growth, Rafi decided it was time to bring in a dedicated system.

Looking for a more reliable, secure recursive DNS solution, he discussed various options with Technical Manager, Naser Hakimyar at Micro Systems ICT Services - an integrated solutions provider.

The search for a dedicated DNS solution

A request for proposal (RFP) was put forward, detailing the requirements of a new DNS solution for Etisalat's Afghanistan 3G network across 5 different sites. Key requirements were:

- High performance DNS recursive servers, with support for Anycast
- Central control and visibility, together with secure remote administration
- Security features to protect against Denial of Service (DoS) and cache poisoning attacks



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Naser and Rafi compared solutions from two vendors: ApplianSys and Infobox. They were immediately drawn by the affordability of ApplianSys' **DNSBOX**. For the same functionality, **DNSBOX** was just a fraction of the cost.

"Not only was **DNSBOX** significantly cheaper, it also offered more flexibility to fit Etisalat's exact recursive DNS requirement – with the option to scale this in future, in line with their growing business needs," says Naser.

Easy deployment, fit for purpose solution

A **DNSBOX300** master appliance and eight **DNSBOX200** recursive DNS slaves were deployed across Etisalat's five sites:

- The **DNSBOX300** master is deployed at the ISP's core and manages each of the slaves
- At three sites, clustered pairs of **DNSBOX200** slaves resolve customers' DNS queries. The other two have one **DNSBOX200** each

"In contrast with Infoblox servers, **DNSBOX200** slaves are modular in design. These servers can be licensed for any or all of three services – authoritative DNS, recursive DNS and DHCP. In Etisalat's case, the main requirement is recursive DNS and that's all they pay for, making **DNSBOX** a truly affordable solution," says ApplianSys **DNSBOX** Consultant, Harminder Heer.

"Another factor to consider was making sure the deployment process was seamless. ApplianSys Engineers worked closely with Micro Systems ICT Services to ensure each of Etisalat's five sites had a smooth deployment and that training requirements were met. We then thoroughly tested each location before switching the services on," says Naser.

BENEFITS: Ultra-secure, high performance DNS caching

DNSBOX has transformed the quality of service for Etisalat's customers by providing reliable DNS services and drastically reducing latency in response times. The operator now has full control over its DNS network and can affordably scale its solution to meet future demand.



*The previous response time we had of 120ms with Google's DNS is now only 10ms with **DNSBOX**! The impact has been significant for customers who can really feel the improvement in service.*



High performance DNSBOX200 DNS slaves – each capable of handling up to 60,000 queries per second - deliver fast and secure DNS caching to customers.

- **Carrier-grade recursive performance** - with parallel processing of multiple queries resulting in 2.5x the performance of BIND
- **Maximum security** - with DNSSEC validation of responses, multiple features to protect against DoS attacks and cache poisoning

"Each of the **DNSBOX200**'s cache between 60-80% of all DNS requests. This not only eliminates the previous latency issue but means requests are many times more responsive – making the overall customer experience lightning fast," says Naser.

"DNS cache servers are most vulnerable to DoS attacks since they are external-facing. **DNSBOX200** uses UNBOUND to handle recursive DNS – this resolver is purpose-built to deal with the threats to a DNS cache. On top of this, **DNSBOX200** is built on the ApplianSys server appliance platform: its intuitive GUI, smart server management, hardened operating system and practical hardware design give Etisalat the highest levels of security, reliability and ease of use," says ApplianSys **DNSBOX** Consultant, Harminder Heer.



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Taking back control of DNS management

The **DNSBOX300** master appliance centrally controls and manages the **DNSBOX200** slaves. Etisalat's Network administrators can log in remotely via a secure web interface and push configurations from the **DNSBOX300** master to the remote slaves.

ApplianSys **DNSBOX** Technical Engineer, Alex Garood comments: "The recursive reporting feature allows Etisalat's engineers to view important statistics like the total number of queries per second being made at each site. This wasn't possible with Google's DNS service, but now gives them far more control over what's going on in the network. Statistics can be monitored remotely in real time, as well as reported back on a scheduled basis. They can also monitor appliance health – for instance, server load - to see how much work the **DNSBOX200**s are tackling."

Saving time, saving money

"Custom templates for recursive settings enable admins to create a single template on the master and simply push this out to slaves, saving hours of time," says Alex.

Scalability, business growth

With much greater visibility and control over its DNS, Etisalat is now fully equipped to monitor DNS at all five remote sites, and make considered decisions for future growth.

Additional **DNSBOX200** slaves can easily - and affordably - be added to existing clusters or at new sites, and be configured to communicate securely with the **DNSBOX300** master.

"Thanks to its DNS reporting, **DNSBOX** makes it much easier to monitor the demand for DNS requests at each of our 5 sites. What it means for us is the ability to make considered decisions when extending our service offerings or taking on new subscribers," says Rafi.



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