



# Virgin Media Upgrades Its DNS Infrastructure for Quad-Play Services

## CASE STUDY

### CUSTOMER PROFILE

Leading UK cable service provider with 10 million subscribers

### BUSINESS SITUATION

- Deploying quad-play services
- Consolidating multiple networks
- Experiencing traffic growth due to social networking

### SOLUTION

- Nominum Foundation CNS
- Nominum Foundation ANS

### KEY BENEFITS

- "Future-proof" DNS infrastructure
- Enhanced resilience
- Optimization of Web 2.0 traffic

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Network Systems Product Architect  
Virgin Media

Virgin Media is a leading communications and entertainment company in the UK, with more than 10 million subscribers. The result of a merger of multiple communications and wireless operators, Virgin Media is the first UK provider to offer "quad-play" services combining video, broadband data, and mobile and fixed-line telephony.

Virgin Media needed to combine existing (pre-merger) IP networks into a single network capable of supporting next-generation communications. Specifically, the carrier upgraded its DNS infrastructure to support new services and traffic patterns with optimal performance and resilience. Today the company relies on DNS software from Nominum to power its converged network.

### Converging Services and Networks

Virgin Media is experiencing convergence on several fronts:

- Converging networks and businesses: Virgin Media is the result of the merger of communication providers ntl and Telewest, and mobile provider Virgin Mobile. The new business needed to consolidate its networks into a single network capable of handling the subscriber base, while supporting new services and subscribers.
- Converged services: Quad-play services – combining broadband data, television, and fixed and mobile telephony – increase traffic while escalating the need for responsive and secure service. Delays or bottlenecks that might be acceptable for data are disastrous in voice or television service.

DNS is essential to the subscriber's quality of experience, whether using voice, video or data. Slow DNS responses delay service delivery and make the network appear slow. There is no point selling fast pipes if you don't have a fast DNS. To optimize performance and security on its converging networks, Virgin Media needed a scalable and robust DNS infrastructure.

### Designing a Resilient DNS Architecture

Before the DNS re-architecture, Virgin Media used a centralized DNS deployment. A single DNS server failure would slow DNS responsiveness (and hence connectivity) for a number of subscribers, over some period of time.

For its new DNS architecture, Virgin Media selected a decentralized DNS model deployment with the anycast protocol. Using anycast, any of a set of DNS servers may respond to a query. This strategy automatically balances load and enhances resiliency, as a failure of any server would only have a marginal performance impact on a fraction of service users, and only for a few seconds.

## The Impact of Social Networking on DNS Traffic

Social networking sites like MySpace generate significantly more DNS traffic per page view than traditional Web sites due to the way that their pages are structured. A single MySpace page might generate dozens or even hundreds of DNS queries. Virgin Media started tracking the top social networking sites, and found that MySpace grew to 10% of Virgin Media's DNS traffic, up from 7.2% nine months earlier.

Making the problem more difficult, MySpace and other sites use content-distribution networks to distribute their content. These networks typically set very short expiration times on DNS data, to retain real-time control over traffic. With the DNS data constantly expiring from the caching DNS server, the social networking queries always need to go back to authoritative servers – reducing the effectiveness of DNS caching. Virgin Media had to factor these changing traffic patterns into its DNS strategy.

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## The Upgraded DNS Infrastructure Using Nominum Software

Virgin Media turned to Nominum's carrier-grade DNS servers: Foundation Caching Name Server (CNS) and Authoritative Name Server (ANS). The Nominum DNS solutions had already proven themselves as trusted, resilient components of the ntl and Telewest networks before the merger.

According to the Network Systems Product Architect for Virgin Media, "Based on the success of our previous projects with Nominum, we decided its products offered the best solution to deliver on our quality-of-experience goals, while enabling our anticipated growth."

The newly designed DNS infrastructure uses a distributed network of CNS servers for caching DNS, as well as redundant ANS servers providing authoritative name services. Each server uses a small percentage of its total processing capacity – providing significantly more DNS capacity than the network's current needs. Using anycast, any CNS server can respond to a query from a client.

This approach provides the scalability, resilience and performance Virgin Media needs:

- **Converging, quad-play services:** Virgin Media's DNS architecture handles the increased traffic of quad-play services with low-latency performance. No single server can become a bottleneck.
- **Resilience:** The network is resilient to attacks or overloads. If one or more servers fails, the network continues to operate without degradation. Three DNS servers can fail simultaneously without adverse effect. In addition, Nominum CNS implements advanced security features to prevent cache poisoning and other attacks.
- **Social networking traffic:** Nominum CNS uses a "pre-fetch" feature that helps

carriers minimize the additional DNS load of social networking sites by pre-fetching short-lived domains before they expire. As a result, CNS servers can serve more responses with cached data.

With its upgraded DNS infrastructure in place, Virgin Media is in position to expand its innovative IP-enabled service offerings, while maintaining the best possible quality of experience for its millions of subscribers.

## ABOUT NOMINUM

Nominum's network naming and addressing solutions power the world's largest always-on networks. Nominum is a global provider of ENUM-based IP-application routing directory, DNS and DHCP solutions that enable communication providers to deliver high-quality, always-on broadband Internet and innovative services to their customers, including VoIP, push to talk, fixed-mobile convergence, IPTV, and triple-play. For more information, visit [www.nominum.com](http://www.nominum.com).

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