

# Proximus

## Keeping Subscribers Satisfied During Broadband Architecture Migration



### Project Type:

- Move from centralized to decentralized BNG architecture
- Meet requirement for increasing number of IP addresses
- Replace error-prone management of IP addresses with an automated solution
- Implement a DHCP solution capable of handling mass volumes
- Ensure future scalability & redundancy

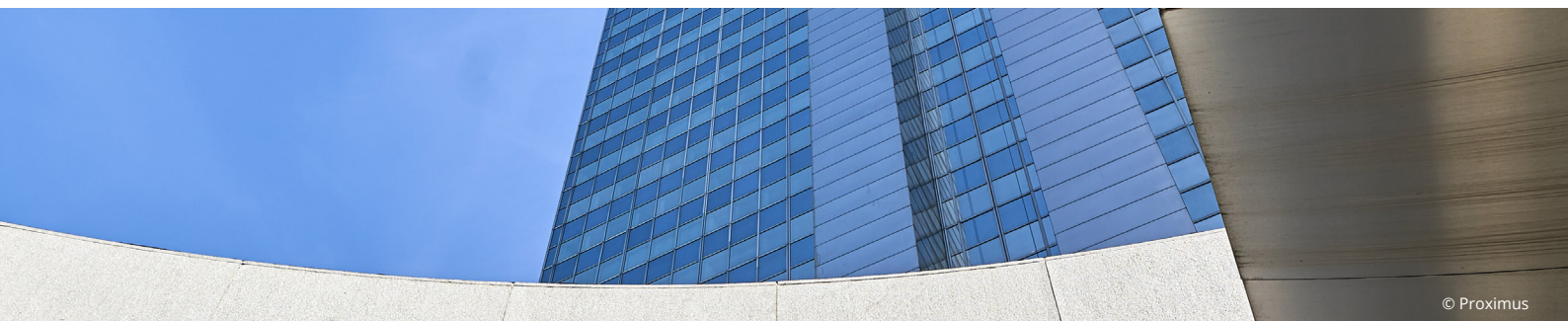
### Key Benefits:

- Removed complexity for management of local IP pools
- Ensured error-free configurations thanks to process automation via API calls
- Enabled smooth migration of customers to IPv6
- Enhanced service continuity through resiliency and failover
- Improved scalability and agility with high-performance DHCP

Proximus NV is the largest quadplay operator in Belgium, offering Internet, TV, ICT, voice and mobile services. Proximus currently has 2,089,000 Fix internet lines, 1,642,000 Digital TV subscriptions and 4,111,000 Mobile Postpaid customers. Their advanced interconnected fixed and mobile networks deliver innovative communication and entertainment experiences for residential consumers and enable digital transformation for enterprises. Proximus is the first operator in Belgium to launch 5G and is a pioneer in ICT innovation with integrated solutions based on IoT, data analytics, cloud and security. In 2016 Proximus announced "Fiber for Belgium" to bring fiber to the center of cities and communes and cover the majority of the professional market customers. The group currently has 12,931 employees, and also operates in Luxembourg and Netherlands.

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Koen VAN CAUWENBERGHE, Solution Engineer,  
responsible for transport and subscriber management services



## Project Overview

Telecom markets like those in Belgium are constantly asking for more bandwidth, more volume and more services. To cope with the exponential growth, Proximus had upgraded its backbone to a capacity of multi-Terabit/s. The Broadband Network Gateway (BNG) functionalities were decentralized while optimizing the topology between the central backbone and its edges. This resulted in a migration from 10 central BNG-nodes towards 700+ existing decentralized nodes.

With the previous DHCP architecture and solution, local pools at BNG were used for IPv4 and IPv6 in order to serve DHCP requests arriving from the end users. In addition, some pools were directly served from central servers located in national data centers. With the new design planning to deploy more than 700 devices for the BNG service, management of local pools was no longer possible. Proximus therefore needed to unify DHCP service via a central solution capable of providing high capacity and performances.

The challenge was to migrate customers to the new broadband infrastructure with little to no impact on uptime. A new centralized DHCP architecture was planned with smooth migration of end users. In order to do so, the edge BNG devices needed to be 100% ready to provide the IPv4 address and IPv6 prefixes to the customers. During the migration, Proximus had to create a solution to add new scopes and ranges to the centralized DHCP service, while at the same time enabling the adequate routing on the backbone to the newly created infrastructure.

An RFQ for a DHCP solution was launched towards ten different vendors, and EfficientIP was one of the two top-ranked vendors to be selected for a proof-of-concept in the Proximus lab, because the solution met requirements for scalability, performance and ease of management.

Koen Van Cauwenberge, Solution Engineer responsible for transport and subscriber management services, summarized the EfficientIP PoC as follows:

*“The product was tested in depth, with a focus on the required features, possible future needs, manageability, performance, failure scenarios, API-calls, and monitoring aspects. The solution passed with flying colors, so EfficientIP was selected at the end of the RFQ. Compared to the competitors, EfficientIP had a winning product, helped by their capability to offer a very simplified architecture made up of a much lower number of servers required, which correlated to enhanced performance and scalability.”*

## Key Benefits

EfficientIP's high-performance DHCP offered unique capability to simplify the network with a centralized architecture, while at the same time handling mass volumes of clients. Only one pair of geo-redundant management servers (active / hot-standby) was needed, with one pair of geo-redundant DHCP servers. A total of just four servers was therefore capable of handling the current number of customers, leaving a spare capacity of 40% for the management servers and more than 1 million customers on the DHCP servers. Fewer servers also meant less power consumption, reduced complexity and a lower price.

Other factors which made selection of EfficientIP evident included support of IPv6 and simplified management of IP pools, which removed risks of configuration errors. Capability to automate processes was also a big advantage, made possible by how easy it was to use API calls in a structured manner.



Lastly, the failover scenario proposed by EfficientIP was important as it helped make problem detection much easier.

Van Cauwenberge commented: “The business needs were 100% covered by EfficientIP. Proximus wanted a solution with high stability meaning 99.999% uptime of the DHCP service towards the customers, which is easily manageable via intuitive GUI and API-calls, and supports all the features we asked for.”

## Transition Process

During the PoC phase the product was extensively tested for more than two months. After that, all servers were installed in the production environment. Another two months were reserved and used to implement the servers and test the failover mechanisms on the network level. The DHCP servers were then activated on the production network for a very limited number of test users. Sanity checks were made, failovers were tested, and some foreseen software upgrades were performed without any impact.

Within a few months, the first hundred customers were migrated to a decentralized BNG, using the DHCP services of EfficientIP. The ability to capture traffic via the tools within the GUI was great added value during this phase. These tools enabled Proximus to detect unexpected DHCP options, helping to simplify and accelerate diagnostics and remediation. During the following weeks, around 50,000 customers were added on top of that. After an evaluation period of six weeks, used mainly to confirm the stability of the decentralized BNGs, the real migration of all customers was started.

For any features that were not present out-of-the-box, EfficientIP provided solutions within a few days. These included counters for shared networks needed to reflect numbers like free leases, total leases, percentage used, maximum percentages and a reset for these maxima. In addition, improvements requested by Proximus regarding GUI support for IPv6-PD (Prefix Delegation) were included in the following software release.

## Conclusions

Proximus was pleased by EfficientIP’s ability to deliver a stable service with the high capacity and performance that had been promised. Van Cauwenberghe stated: “The promised stability and uptime are unique. It’s a huge advantage that the DHCP scopes and ranges remain so easy to manage. The way alarming thresholds can be set via the GUI is also a great help for avoiding issues.”

Next on the agenda is migration of Proximus’s OLO (Other Licensed Operator) customers, after which Proximus say they have no hesitation exploring future offerings using EfficientIP solutions, particularly for use cases in the areas of digital transformation and 5G.



REV: C-200421

As one of the world’s fastest growing DDI vendors, EfficientIP helps organizations drive business efficiency through agile, secure and reliable network infrastructures. Our unified management framework for DNS-DHCP-IPAM (DDI) and network configurations ensures end-to-end visibility, consistency control and advanced automation. Additionally, our unique 360° DNS security solution protects data confidentiality and application access from anywhere at any time. Companies rely on us to help control the risks and reduce the complexity of challenges they face with modern key IT initiatives such as cloud applications, virtualization, and mobility. Institutions across a variety of industries and government sectors worldwide rely on our offerings to assure business continuity, reduce operating costs and increase the management efficiency of their network and security teams. Copyright © 2022 EfficientIP, SAS. All rights reserved. EfficientIP and SOLIDserver logo are trademarks or registered trademarks of EfficientIP SAS. All registered trademarks are property of their respective owners. EfficientIP assumes no responsibility for any inaccuracies in this document or for any obligation to update information in this document.