



Freedom

Perfect in-home networks,
today and tomorrow

devolo

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1. OPTIMUM SERVICE DELIVERY THROUGHOUT THE WHOLE HOME

It's no secret: Looking at the average number of devices within households worldwide, there will be a major increase during the next years. According to a study¹, the share of smartphones in Internet traffic will more than double by 2021 compared with 2017.

Customers add continuously devices to their home network, with the desire to perform more and more bandwidth-intensive tasks with and on these devices. Nowadays, carriers are able to provide gigabit access to millions of customers but leave the delivery and distribution of their services to their customers.

Not only are customers demanding, when it comes to quality of service, they want to access those services whenever and wherever they want. Taking into consideration that every home situation is different for every customer, these demands develop into a threatening challenge for operators.

Therefore, it is important to not only think about gigabit access, but also about gigabit delivery. For a carrier, this is crucial because a customer who is frustrated by a weak performance might not think that the problem lies within his home network but with the services the carrier provides.

¹ Source: Cisco Whitepaper „The Zettabyte Era“: <http://bit.ly/2h3jXbJ>

SHIFTING THE SPOTLIGHT FROM GIGABIT ACCESS TO GIGABIT DELIVERY

In the past, carriers and ISPs have often only focused on delivering high-speed connections to the door-step, because the number of devices within customers' homes was small or customers were content if they could access the internet within a dedicated room such as the living room.

But more and more carriers realize, that this is not enough anymore. Many technology trends have a strong impact on the networks customers use within their homes – which has an impact on the customer experience. If the home network cannot keep up with the trends to deliver the network performance needed, it becomes a bottleneck with weak signal and without the possibility to move around freely.

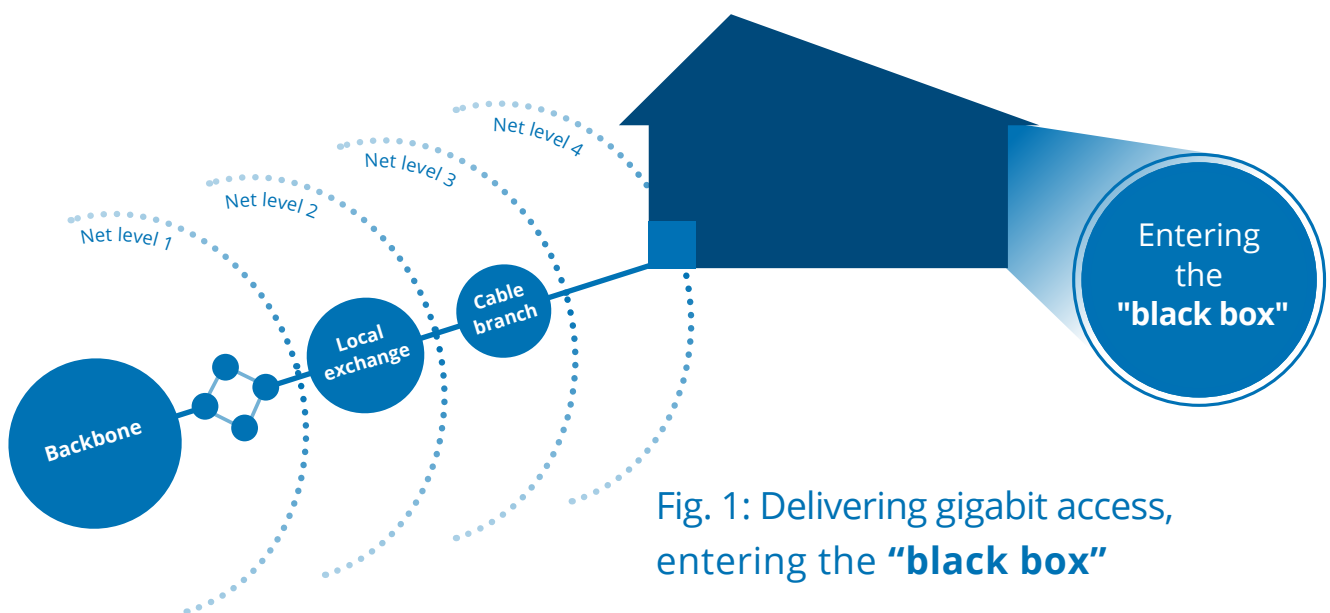


Fig. 1: Delivering gigabit access, entering the **"black box"**

How can carriers ensure that customers are free to use whatever service they want, wherever they want in their home? They must enter what's often called a black box for them so far: the customer's home.

They can do so with partners knowing extremely well, what is needed inside that black box. What is needed are high-performing home networks.



2. THE 3 KEYS TO HIGH-PERFORMANCE NETWORKS

Looking at the needs of future high-performance networks, there are three aspects that need to be taken into consideration:

- Availability
- Performance
- Convenience

Let us have a closer look what these aspects mean in detail.

AVAILABILITY – HOW PHYSICS INFLUENCE THE AVAILABILITY OF YOUR SERVICE

First of all, availability means coverage across the entire home. In most cases this is provided through WiFi, because most applications and most devices will use WiFi as the preferred connection. But LAN connections are needed as well, e.g. for gaming, home offices etc. Now the question is: Can one device secure availability across the entire home? Before answering the question, let's take a quick excursion into the physical limitations of the WiFi signal.

Availability in terms of WiFi depends on a very important factor: The housing situation of the customer – and that situation is different from customer to customer and differs from country to country. In Spain, for example, almost 66 percent of the population live in flats, in Germany 60 percent, in Italy 54 percent. And there are also different housing types: In Belgium 41 percent live in a semi-detached house, in the Netherlands it is 60 percent.²

² Source: Eurostat: <https://bit.ly/2bqs0Kx>

While semi-detached houses might not necessarily be larger, but the way they are built (floors, stairs) is different and more importantly, houses that are built from different materials. When it comes to the distribution of a WiFi signal, the reach of WiFi through reinforced concrete is only one third of the reach through drywalls.

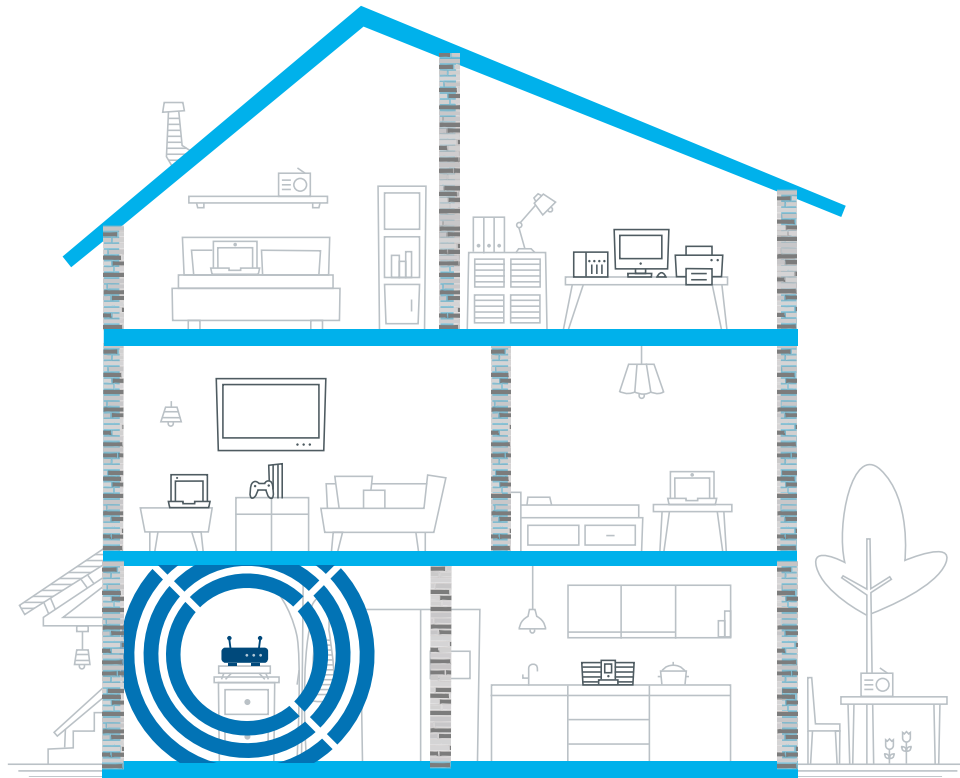


Fig. 2: Securing availability with a single device

So, the answer to the question if one single device (gateway, router) can secure availability is: no. No matter how strong it is. This is still a misconception of many ISPs, carriers and, of course, consumers. What you need is a distributed solution with several well-placed access points right to provide access where you need it.

PERFORMANCE – IT'S ALL ABOUT CHOOSING THE RIGHT BACKBONE

If you secure availability through a distributed network, you have to make sure this network performs in terms of delivering high-speed connections at a reasonable price-performance-ratio.

THE ILLUSION OF PURE WIFI HOME NETWORKS

Currently, pure WiFi solutions are fashionable, sure, we've seen a lot of these solutions being introduced to the market. But still: The WiFi problem remains – materials, thick walls or ceilings block the signal. Moreover, we have to keep in mind, the WiFi spectrum is often used in the backchannel – but saving WiFi spectrum is essential because we know the need for additional bandwidth will further increase.



Fig. 3: The effect of bricks and concrete on a WiFi-only home network solution

SPECTRUM IS A LIMITED RESOURCE

We've heard it before: Global data traffic will grow immensely during the next years. What is often not mentioned in this context: Data growth demands spectrum and data transport on WiFi channels will grow immensely in the future as well. Even in the 5 GHz band with more bandwidth, spectrum will become a limited resource.

Increasing the efficiency of the 5 GHz band could be done by simply adding more antennas. But: Adding more antennas leads to a linear growth of component costs per chain, which can be significant if it ends up with multiple MiMo chains. In addition to that, each additional antenna enlarges the product, making it more expensive in production, BOM and use (energy).

SAVING AS MUCH SPECTRUM AS POSSIBLE ON THE BACKBONE

WiFi is needed on the last meter, there is no way around that. To fulfill the WiFi demands on the last meter, there should be as much bandwidth available for the client as possible.

Adding a third WiFi radio for a dedicated WiFi backbone has all drawbacks shown before. An efficient triple radio device needs complex shielding and band separation mechanisms which increases cost. Therefore, the best approach for saving spectrum is to implement the separate backbone chain over the powerline.

THE BENEFITS OF A POWERLINE BACKBONE

The beauty of a powerline backbone is: It doesn't get blocked by concrete or bricks -and it's available in almost every home. In Germany, 43% of the households have 4-6 power outlets per home. Every power outlet could be a WiFi AP (access point). And each AP offers pure last meter WiFi, which means full performance in every corner for WiFi Client Services.

A powerline backbone is easy to install, maintain and operate, eliminates most of the current WiFi obstacles – which translates directly into a higher NPS. At the moment, there is no better combination of full bandwidth and coverage.

CONVENIENCE: TRANSLATING NETWORK COMPLEXITY INTO USER SIMPLICITY

Regardless of the underlying technology of the backbone, a technical system delivering internet connectivity has to hide all the technical complexity behind automation and simplification. Only hassle-free installation, setup and maintenance of a home network results in a perfect end-to-end service experience and a high NPS.

To enable the best customer experience when it comes to service quality, the focus of home networks need to be shifted from a device-centric to a network-centric approach. Through a distributed network setup, the customer perception can be changed from a network of different individual devices into one single entity optimizing the network experience. This is supported through self-organizing network features, and features like devolo ConfigSync (for more details on this topic, please refer to eBook IV, Smart WiFi Mobility: Freedom for your customers).

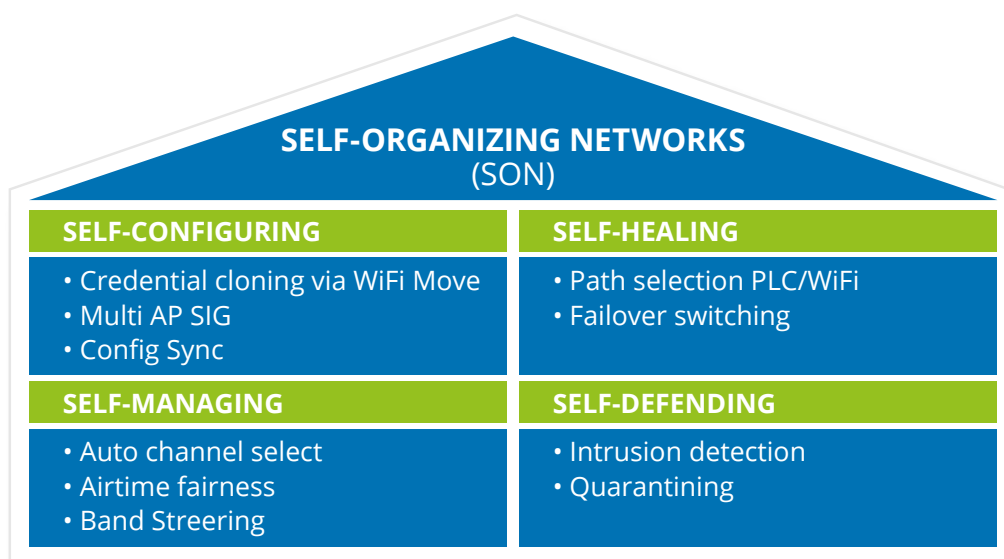


Fig. 4: Benefits of self-organizing networks



3. SUMMARY: SCALABLE HIGH-PERFORMANCE INHOME NETWORK SOLUTIONS

In a nutshell, there are several aspects that strongly influence how to conquer the challenge of growing data traffic and the limitations of the WiFi spectrum.

The secret lies in distributing carrier services over an in-home network, while reserving the maximum of the WiFi spectrum for customer premises. No matter the size, location or construction type – services can be distributed in any kind of customer home. The quick and easy installation process of the solutions doesn't require a service technician. Self-organizing network features with mesh, Multi Access Points and intelligent comfort feature management ensure that you're prepared for every use case your customer can think of today and tomorrow. Lower your service call rate and increase your NPS as well as your revenue.

PERFECT IN-HOME NETWORKING – ANYWHERE, ANYTIME.

devolo

CONTACT US

We would be happy to discuss our solutions with you in person.
You have multiple options to reach out to us:

Visit: www.operator-solutions.com

Email us: sales@devolo.de

Call us: +49 241 182 79-27