Whitepaper

Avast Smart Life:
A Fully Converged
Security and Privacy
Solution for 5G
Environments

Introduction

5G is a paradigm shift in how we think about connectivity, devices, and the consumer digital experience. 5G promises a new era of innovation, enabling new ecosystems of products and services. In parallel, 5G is poised to create new security challenges and opportunities for service providers. For example, more devices will allow for larger botnets, more bandwidth enables larger DDoS attack capacity, and more visibility of endpoints create new attack vectors for hackers. In these security challenges also lies new opportunities for security vendors and network providers.

In this paper, we will unpack how 5G is expected to transform the industry, how Avast securely manages consumer devices to protect people's digital lives, and lastly, how operators are delivering compelling value-added services (VAS) to customers. Specifically, we will discuss how Avast is leveraging their vast global footprint of loyal end-user and expertise to have cybersecurity ready for this new generation of connectivity.

Amplification of Concurrent Trends

Convergence: Mobile and Broadband Services

The network communications industry as a whole is experiencing a general drive towards greater convergence when it comes to technology and services — especially as we think about traditional services such as voice, text, TV, and internet. Looking globally, there is no dearth of M&A activity between Mobile and Broadband players. Notably in 2019, we saw Vodafone's $21B acquisition of 5 Liberty Global properties — growing their footprint to 116M mobile customers, 24M broadband customers, and 22M TV customers across Europe.

Technological convergence will continue to drive mobile and fixed networking together. This goes beyond hosting network functions on the same infrastructure, but creating common credentials, policies, and user data management. Additionally, operators are moving to create a native interface between common core networks and wireless access networks, rather than interworking functions.

This convergence shows no signs of slowing down, with more operators electing to offer comprehensive connectivity services to their customers. While customers benefit from single-vendor options for their entire connected lives, it's also important to understand the challenges that this convergence brings to both the industry and the consumers.

Avast is already delivering solutions that create a fully converged experience for customers. Through their router-embedded smart home solution coupled with end-point or point applications for mobile phones and computers, customers can stay protected wherever they go. With virtualization, network operators are able to offer a more seamless security and privacy experience.
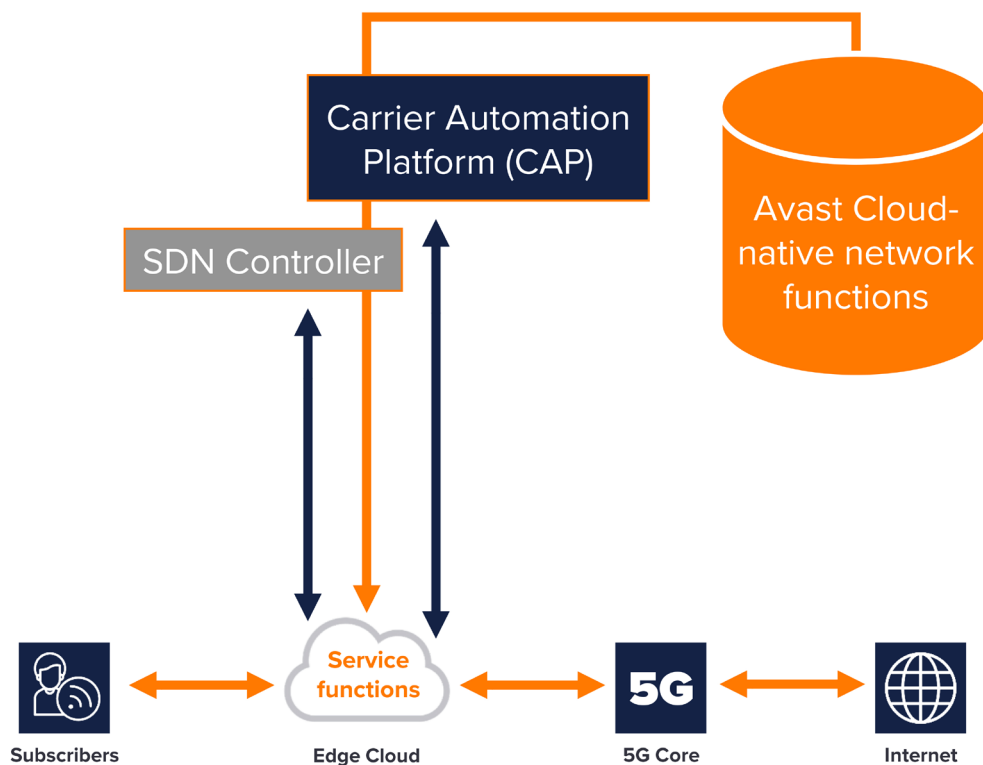
Virtualization: Software Defined Networking (SDN) and Network Function Virtualization (NFV)

Operators are transforming how they manage their networks through virtualization and automation in order to achieve the scalability required to support consumers and their data. Added complexity in networking brought on by convergence, new services, surges in data needs, and connections necessitates operators to innovate to continue providing services profitably.

Virtualization and software-defined networking enable operators to achieve network optimization all the way from the network core, edge network, and the services and devices that rely on them. There is a shift from hardware to software to enable easier delivery, updates, testing, and scalability. Virtual network functions (VNF) serve as the basis of their solution to 5G security.

The softwarization of networks facilitates innovation and opens the vendor ecosystem for new entrants to partner with operators. New software components are packaged in the form of a VNF. After a new VNF passes operator-specific compliance tests, they can be easily integrated in an existing operator networking stack, because of the open, standardized interfaces they use.

Avast leverages SDN/NFV to scale security services based on demand. Provisioning services to new customers happens rapidly within seconds. 5G carries the promise of high speed and immersive applications, so users will expect the same to hold for their security services. This demand is met through dynamically provisioning the services close to the user in the edge cloud.

Provisioning the VNF in the 5G Edge Cloud happens when an operator's OSS/BSS indicate that a new subscriber should receive the service. The Carrier Automation Platform (CAP) then fetches the appropriate cloud-native network functions that comprise the Avast VNF and inserts them into the subscriber's service function chain in the 5G Edge Cloud. As a consequence, data traffic from and to the subscriber's endpoint passes through the Avast VNF and is checked for risk indicators.

Connectivity: Rapid Proliferation of Connected Devices

IoT devices are becoming more common-place in our lives, often-times, without us even fully understanding the security implications. Whether it's your smart speaker, smart TV, or even light-bulbs, any device connecting through the router serves as an attack vector to penetrate the entire home network. Avast's Threat Labs conducted a scan of 15M+ global homes and found a prevalence of IoT devices and vulnerabilities, which largely consisted of weak and / or default credentials.
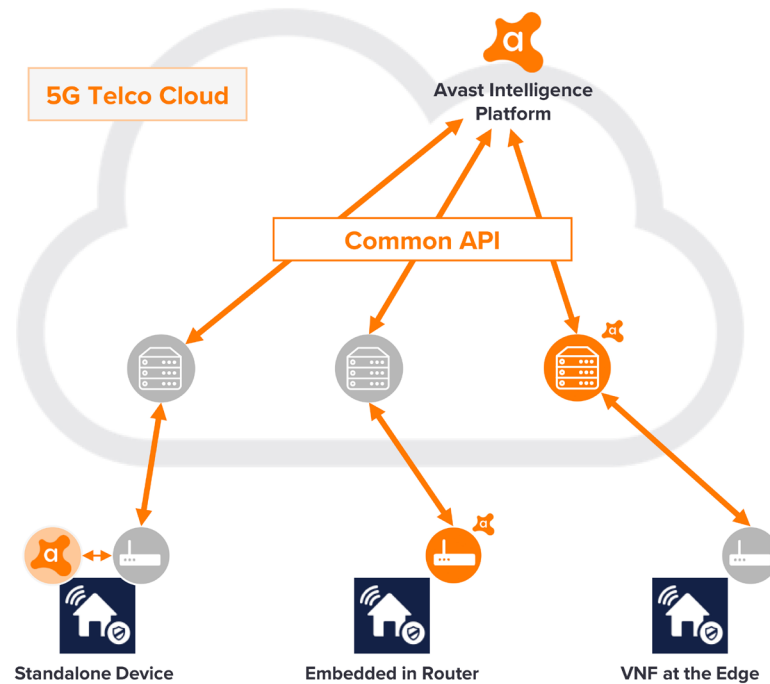
Consumer behavior will continue to move towards smart homes and 4K streaming requiring more and faster connectivity from 5G. Networks will see a rise in the number, types, and mobility of devices coming online. The added volume and complexity of connected systems increases access points for hackers to infiltrate into personal lives.

Avast Smart Life Platform: 5G Security

Solution Overview: Virtualized Security Analytics in the Edge Cloud

Avast Smart Life is an AI-powered and cloud-based solution that quickly identifies all devices connected to a network, monitors network traffic flow data, and detects anomalous behavior, keeping consumers and their devices safe. The 5G network deployment solution can be deployed at three tiers: at the router level and also at the Edge Cloud. Together, they create a converged solution across mobile and broadband networks. Each combines Avast's threat intelligence, security, and privacy features by sending network telemetry data to the Avast Cloud and empowering users to react to threats through their smartphone app.

- **Standalone Device (router attachment) -** Avast Smart Life can be deployed as a hardware attachment to the router, enabling operators to provide network security services even if they are not the broadband provider

- **Embedded in Router -** Avast Smart Life can be embedded directly onto routers as a small firmware layer, securing all devices that are connected through their broadband routers.

- **VNF at Telco Edge -** Avast Smart Life is placed as a dockerized software solution at the Telco Edge, extending network-based security in and out-of-the-home. Additionally, the solution leverages the Edge Cloud as a point of integration to be closer to the user, keeping customers safe with seamless security and privacy both at-home and on-the-go.

5G Telco Cloud

Avast Intelligence Platform

Common API

Standalone Device · Embedded in Router · VNF at the Edge

This architecture embodies the completeness of their vision in protecting users in a quickly evolving digital world. In the next few years, the market will begin to adopt 5G environments, and Avast is poised to deliver solutions at every level of that transition with their Avast Smart Life solution. The key components of Avast Smart Life are device intelligence, network telemetry analysis, global threat intelligence, digital parenting, and an intuitive end user interface.
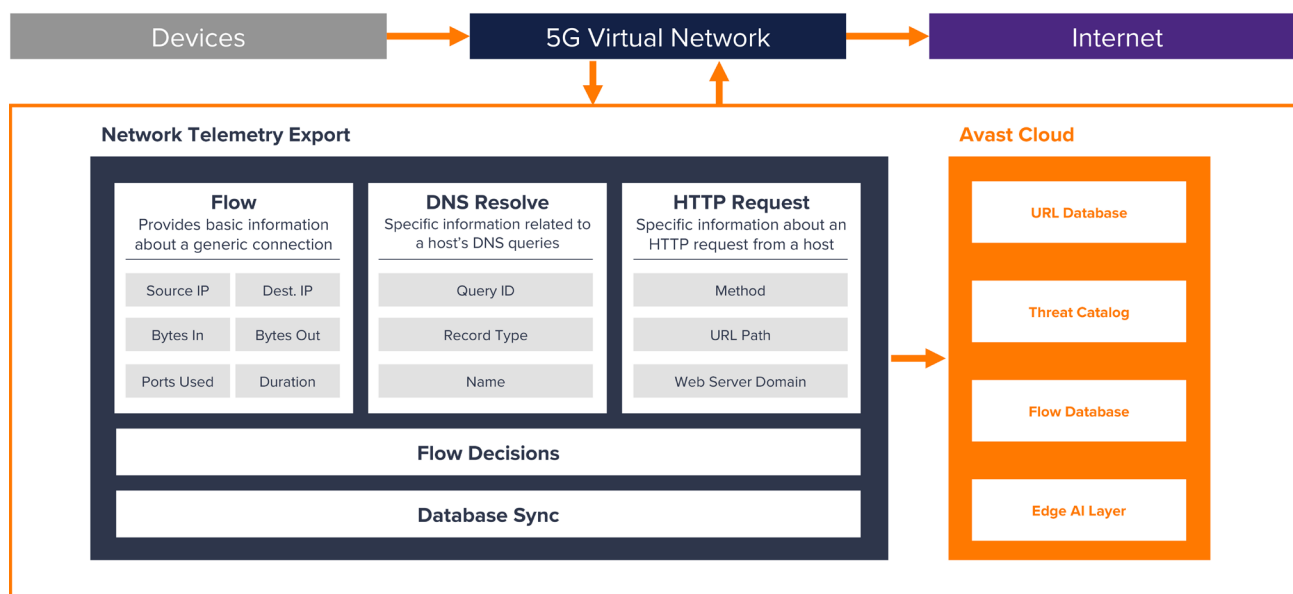
Device Intelligence: Using AI to Identify Devices

A core capability of any advance network security solution is being able to identify devices and building an inventory of devices on the network. Using this inventory, Avast Smart Life can alert users when new unknown devices connect to the network and protect individual devices from being infiltrated. By quarantining potentially infected devices, the rest of a home network can stay protected. Using their AI-models, trained with data from their 435M global users, Avast Smart Life can quickly detect and identify each individual device connected through the network. Using this robust device intelligence, users can assign them to profiles and begin to layer security rules and parental control settings.

Network Telemetry: Security Without Compromising User Experience

The solution works asynchronously by sending network telemetry data simultaneously to the operator and their Cloud Intelligence Platform. By monitoring flow and traffic data, the solution doesn't rely on decrypting data as it flows to the cloud platform, enabling real-time analysis and flow decisions to be made. With separate data and control planes, Avast achieves rapid analytics through a series of patented technology allowing customers to have little or no impact to their connection speeds. Some examples include:

- Using their machine learning models, Smart Life can quickly detect botnet attacks

- Using their reputation database, Smart Life can block malicious URLs instantly

- Using their patent-pending blacklist feature, Smart Life can anticipate potential future malicious access attempts

The distributed model for workload (agent, edge, and cloud) and decoupled control and data planes allows Avast Smart Life to be highly scalable. A scalable and efficient decomposition into microservices is obligatory when VNFs operate in 5G networks as cloud-native network functions. That way, components can scale individually, for instance, based on the number of subscribers per site, or type of traffic at a given daytime. Moreover, distributing the workload across agent, edge, and cloud achieves optimal responsiveness and a seamless internet experience for the users while keeping them secure.

Threat Monitoring & Intelligence: Smart Life Gets Smarter Everyday

Data (quality and quantity) is the foundation of any artificial intelligence or machine learning solution. Avast is the largest consumer cybersecurity company in the world. Operating in more than 50 countries with over 1M users and protecting 400M+ global devices, Avast's Threat Labs checks over 200B URLs each, 300M files each month, and blocks over 36B malware attacks each year.

All threat data is collected and cataloged by their Threats team, allowing for all future connected systems to benefit from a rich and robust history of award-winning cyber-security. Avast is taking their same expertise in traditional AV software and expanding that capability for networking data. The Cloud Intelligence Platform learns directly from Avast's threat labs, and as new data is encoded into the platform, that threat intelligence flows throughout all systems to the connected devices. Avast Smart Life was built to both lean on this threat database but also continue to provide a network effect when it comes to the identification of new threats, helping to keep all customers protected with real-time security.

Digital Parenting: Providing Families with Peace of Mind

The internet is evolving quickly and becoming only a more fundamental part of our digital lives. With all the convenience and entertainment the internet can bring, parents look for support and tools to help their children become responsible digital citizens. Avast Smart Life comes with their Family Protection product, allowing parents to assign devices to user profiles, monitor usage, manage content filters, and even get real-time location updates with mobile devices.

User Experience: A Simple Solution for Their Entire Digital Lives

Avast Smart Life comes with a simple and intuitive interface that brings together their family and security products. Using this single interface, consumers can manage the security and privacy of their digital lives.

With more than 15 years of partnering with operators, Avast has the internal capability to provide these solutions as white-labeled or co-branded. Additionally, operators retain the flexibility to deliver separate solutions for security and family protection using the same interface or two separate applications.

Operators can deliver this fully-converged solution helping consumers take control over the security of their digital lives simply and seamlessly.

Converged Value-Added Services in a 5G World

Traditionally, operators have sourced VAS from multiple vendors, creating piecewise solutions. However, the ongoing industry convergence and advent of 5G environments creates an opportunity for operators to rethink how services are delivered in this new world. Through a fully-converged solution that is managed with a single interface, operators can provide customers with a seamless and end-to-end experience that matches the future promises of connectivity.

For security and privacy, an end-to-end experience is critical. A network is only as protected as its weakest link — that weak link can often provide intruders with a backdoor to the rest of the network. The rapid expansion and further growth in consumer connected devices will bring these challenges in an already fragmented consumer security space. Poor patching behavior and weak or default passwords put consumers at risk everyday.

Avast Smart Life provides comprehensive security in an ecosystem where mobile and broadband distinctions will continue to blend. A VNF solution will keep customers and their devices protected wherever they go and however they connect through a single fully-converged and seamless solution.

	At Home	On The Go	
Traditionally			• Individual end-point solutions for desktop and mobile devices • Stitched solution sets across multiple vendors requiring multiple downloads
Today			• Router solution keeps all devices at home protected • End-point solutions for mobile devices when they are on-the-go
5G Future			• Router + 5G VNF solution provides seamless security across all devices, wherever they are and however they are connected

Avast Solution Agent
● Protected
● Not Protected

Summary

Everyone is excited to talk about the possibilities of 5G, but it is also equally important to address the security challenges that will accompany the convenience of future connected ecosystems. As 5G will radically transform our connectivity, we must apply the same innovation to cybersecurity and how we deliver those services to end consumers in a simple manner.

In the converging environment and increasing virtualization of networking, Avast is well poised to deliver a seamless security and privacy solution with network operators.

- **A fully converged offering:** Avast provides comprehensive security and privacy with their multi-tier architecture keeping customers protected wherever they go and however they connect.

- **Largest threat detection network:** Avast's Threat Labs is at the forefront of AI / ML-based security innovation, with decades of learning from 435M global users.

- **Partnerships with operators:** Avast has over 15 years of experience successfully bringing products to market in partnership with global operators.

To learn more about how your network can deploy Avast Smart Life Platform, visit avast.com/mno or reach out to partners@avast.com to schedule a meeting.