Better online video analytics for the streaming era

Use case

Video streaming from Netflix, YouTube, Amazon Prime and other online sources is dominating the internet and service provider networks. Today, video represents more than 50 percent of overall traffic in many networks.

As captured in the Nokia Deepfield Network Intelligence Report 2020, there has been an noticeable increase in new eyeballs on content from online streaming services (also known as subscription video on demand, or SVOD) during the pandemic. Between March and September 2020, the number of video endpoints grew by 30 percent in North America.

Pandemic-induced shutdowns and stay-at-home orders have also changed the world's online behavior and viewing patterns. People now stream video throughout the day, with traffic continuing to peak in evening prime-time hours. In addition, households commonly have subscriptions to multiple online video services.

Challenge

Service providers have a vested interest in obtaining the most accurate information about how their services are delivered because their networks are now used as vehicles for two types of video service delivery to subscribers.

Most popular content is served as on-net – from content caches located within the service provider network. Hyperscale companies such as Netflix and Google allow service providers to host their content within service provider networks to improve delivery and quality of experience to end users.

Other content (not hosted in caches) is delivered directly from the internet as off-net, often over private peering links from the largest content delivery networks (CDNs) and video service providers, or through transit links. Often, the term over-the-top (OTT) is used to denote this type of content. This internet-based traffic is of interest to network planning teams because there is a higher cost associated with peering and transit traffic.

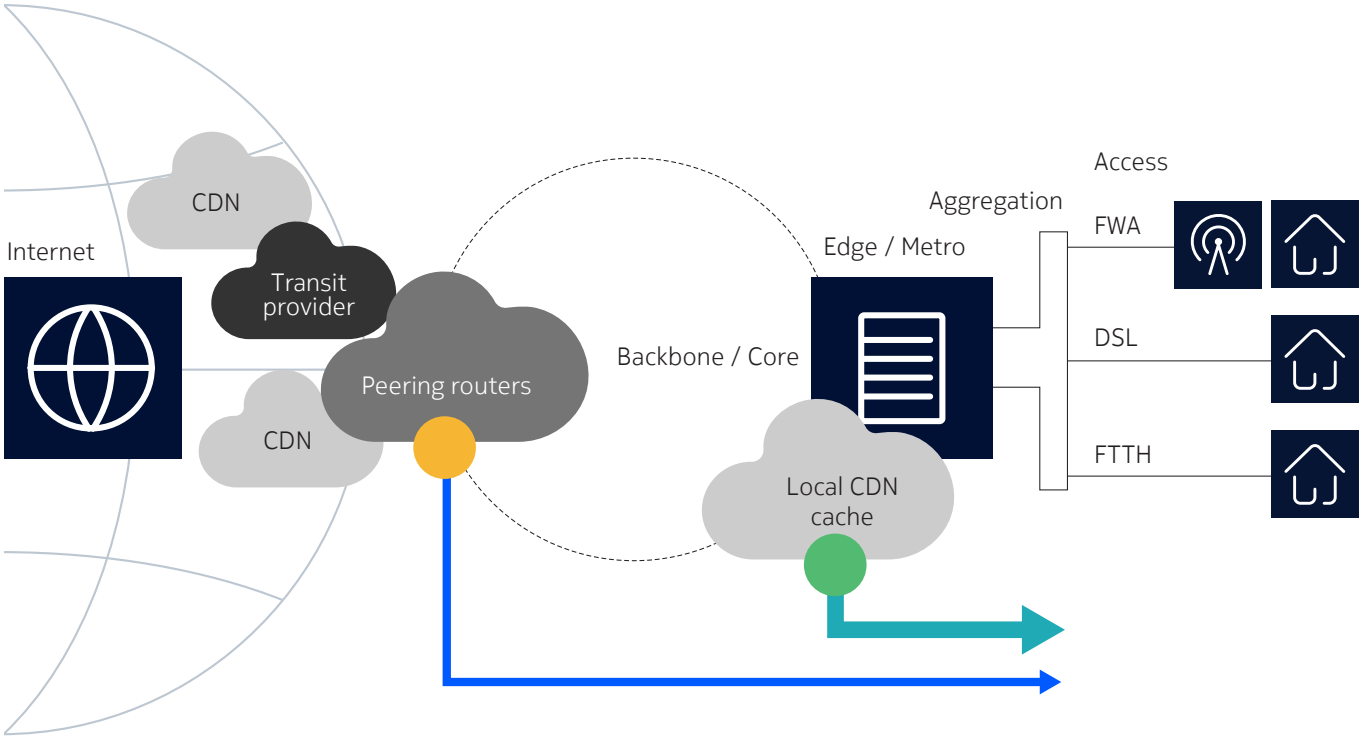
In normal circumstances, more than 60 percent of all streaming video content is delivered from on-net caches. It is important for service providers to understand how both of these service delivery mechanisms – on-net and off-net - are performing for all video services that run across their networks. The ability to deliver high-quality online video streaming services is becoming an increasingly important competitive differentiator – and something customers consider when they choose a service provider.

To ensure high-quality video delivery, service providers must have a good understanding of all traffic that runs across their networks. This is a challenge because more than 90 percent of services originate from a few large internet domains, and because subscribers use a diverse mix of services. The number and variety of video streaming services are also increasing as multichannel video programming distributors (MVPDs) diversify their offers and more virtual MVPDs jump into the market. This is encouraging more people to subscribe to multiple online video streaming services.

When it comes to video, service providers must:

- Accurately identify traffic for all video streaming services that run across their networks
- Understand how IP flows carrying video streams traverse the network and impact network infrastructure
- Quantify video performance and end-user experience.

Figure 1: SVOD traffic is delivered on-net, through local caches, or off-net, through peering or transit links



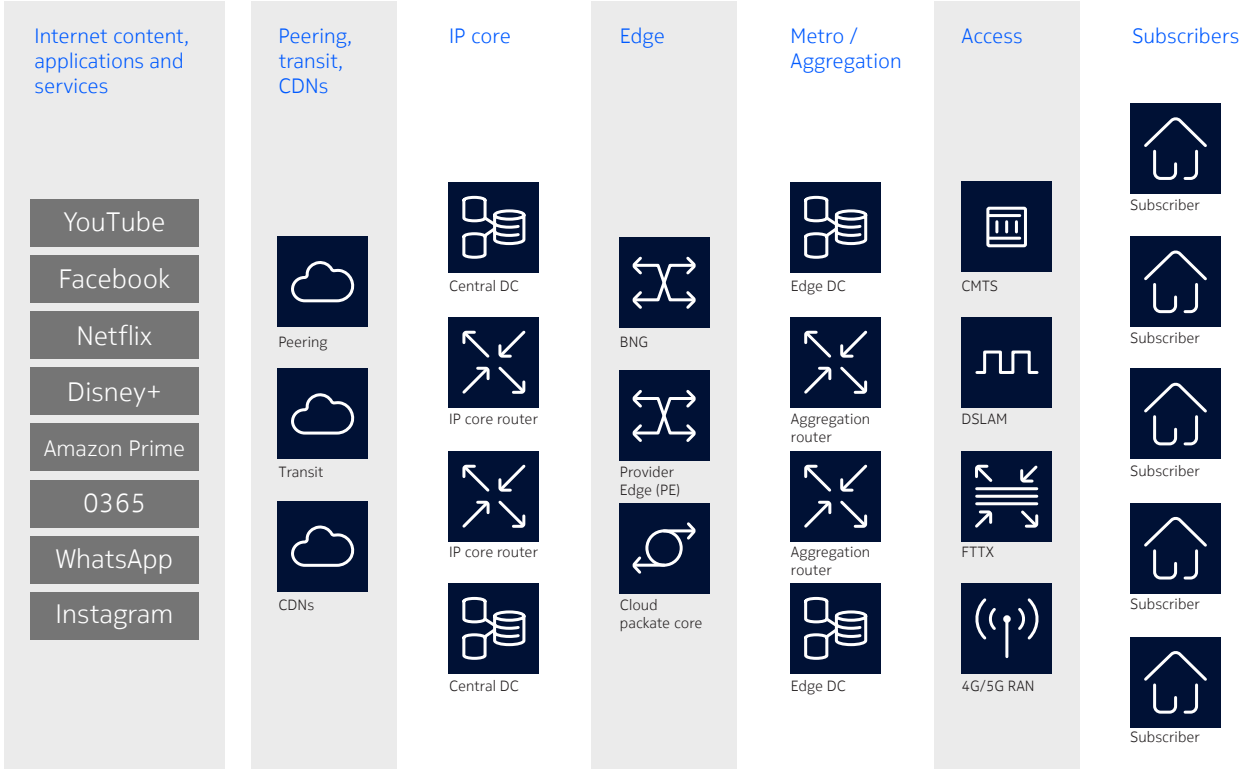
Solution

Nokia Deepfield Service Intelligence helps service providers address these challenges by providing meaningful insights into online video streaming traffic. These insights rely on detailed information about the internet service delivery chain from Nokia Deepfield Cloud Genome™, which powers the entire Deepfield portfolio of network insight and analytics applications.

Deepfield Cloud Genome provides a comprehensive and continuously updated map of the internet service delivery chain, tracking more than 5 billion IPv4 and IPv6 addresses and categorizing traffic across internet applications. Using cloud-based agents, it crawls up to 1 billion of the most relevant IP addresses each day to maintain an up-to-date snapshot of what is happening on the internet. In addition, it tags additional IP addresses against entities such as CDNs, ISPs, servers and hosting companies. Through the use of machine learning, Deepfield Cloud Genome automatically classifies traffic across more than 30 categories, and provides a holistic and detailed view of the entire internet video service delivery chain – from sources and CDNs to end users.

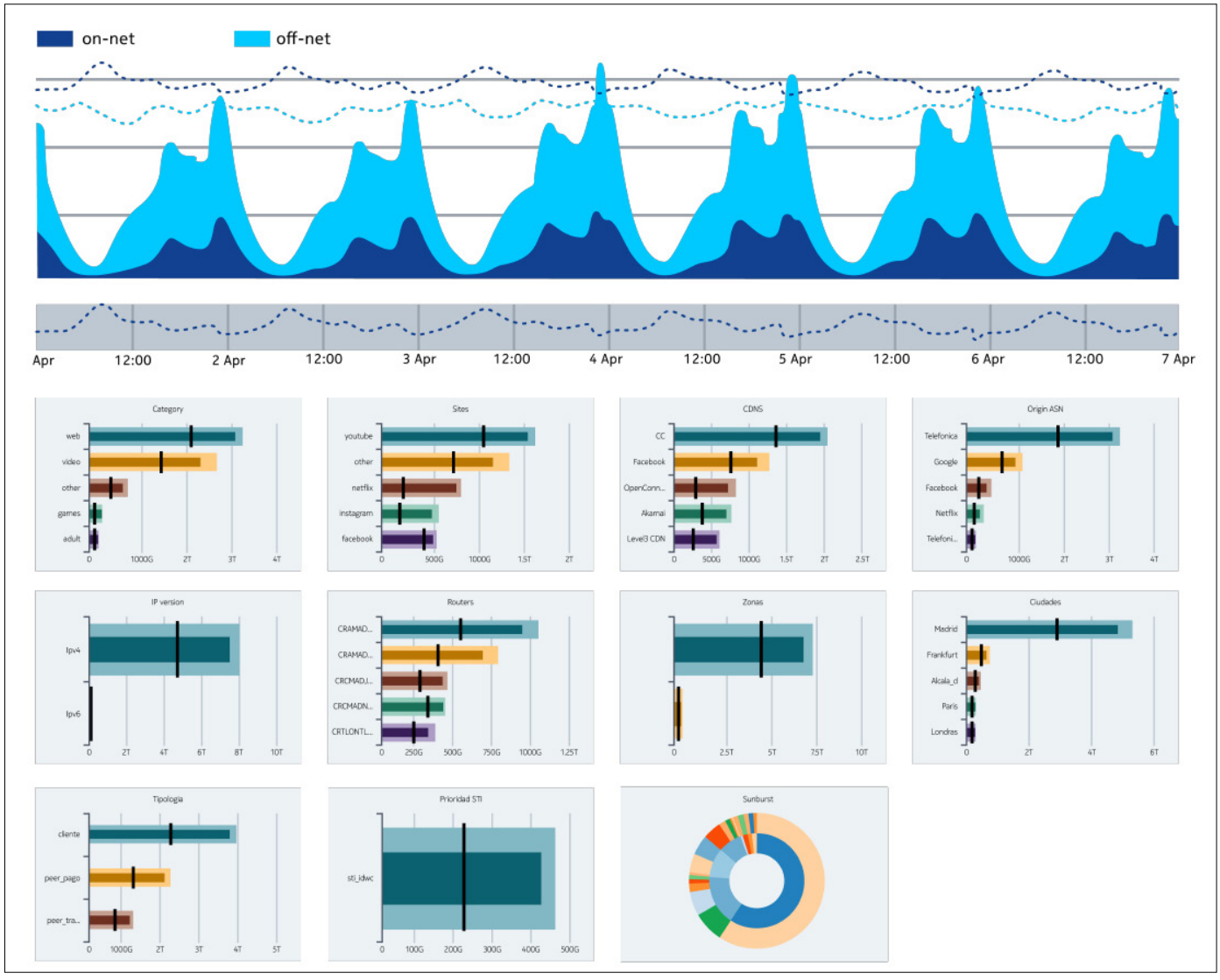
Deepfield Cloud Genome provides all this knowledge to service provider deployments of Deepfield applications through regular updates. By correlating information from the service provider's network with information obtained from Deepfield Cloud Genome, Deepfield Service Intelligence helps a service provider get detailed insights into all video streaming services running across its network.

Figure 2: A simplified representation of internet service delivery chain



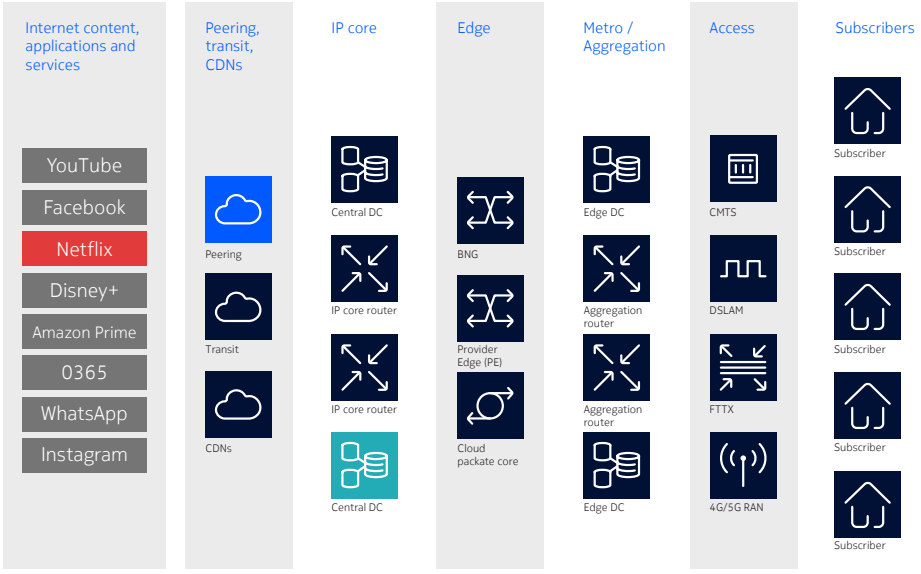
Deepfield provides a powerful graphical user interface and multidimensional insights that allow service providers to drill down to specific network perspectives.

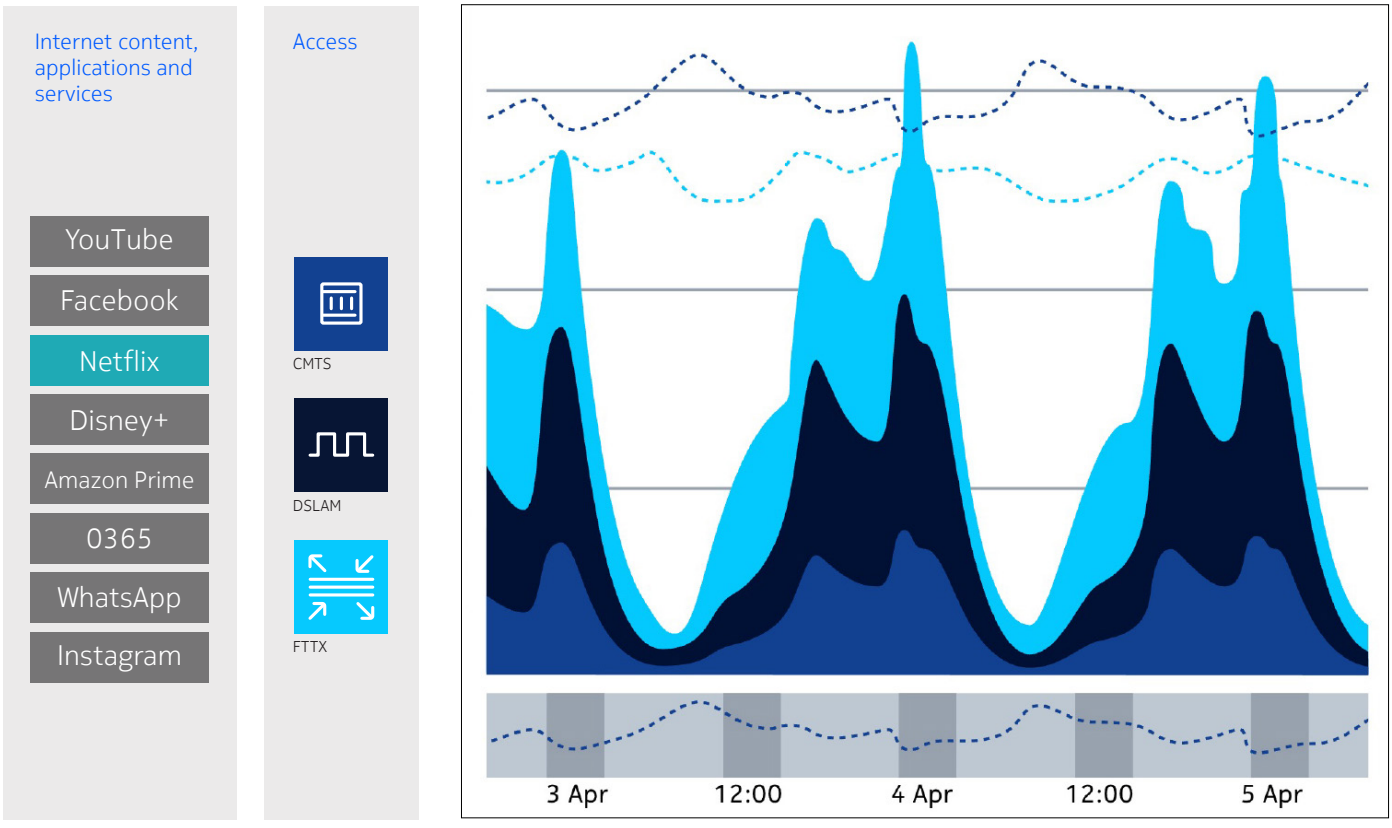
Figure 3: SVOD dashboard comparing bit rate and performance of streaming video delivered from on-net caches vs. off-net (across peering routers)



Service providers can also drill down to look at consumption of specific video services by access type and compare video delivery to FTTx (fiber), cable and DSL customers.

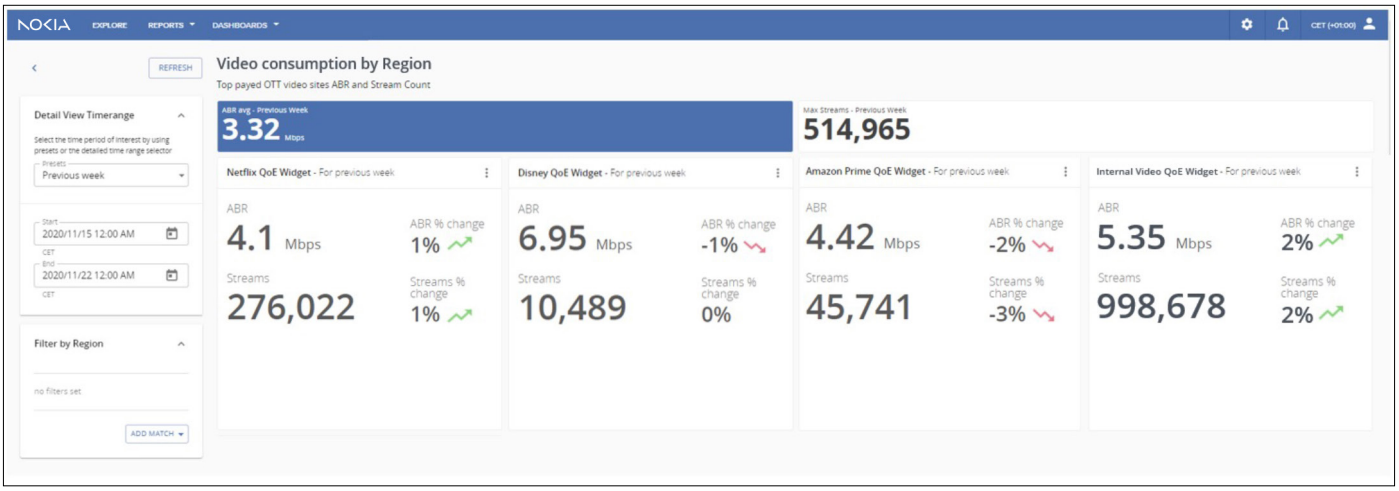
Figure 4: SVOD dashboard comparing bit rate and performance of streaming video services by access type





Or, they can get specific “sliced” views using many other data dimensions, including CMTS, rate plan service group, CPE type, region, cache or peering partners/links.

Figure 5: Video consumption by region

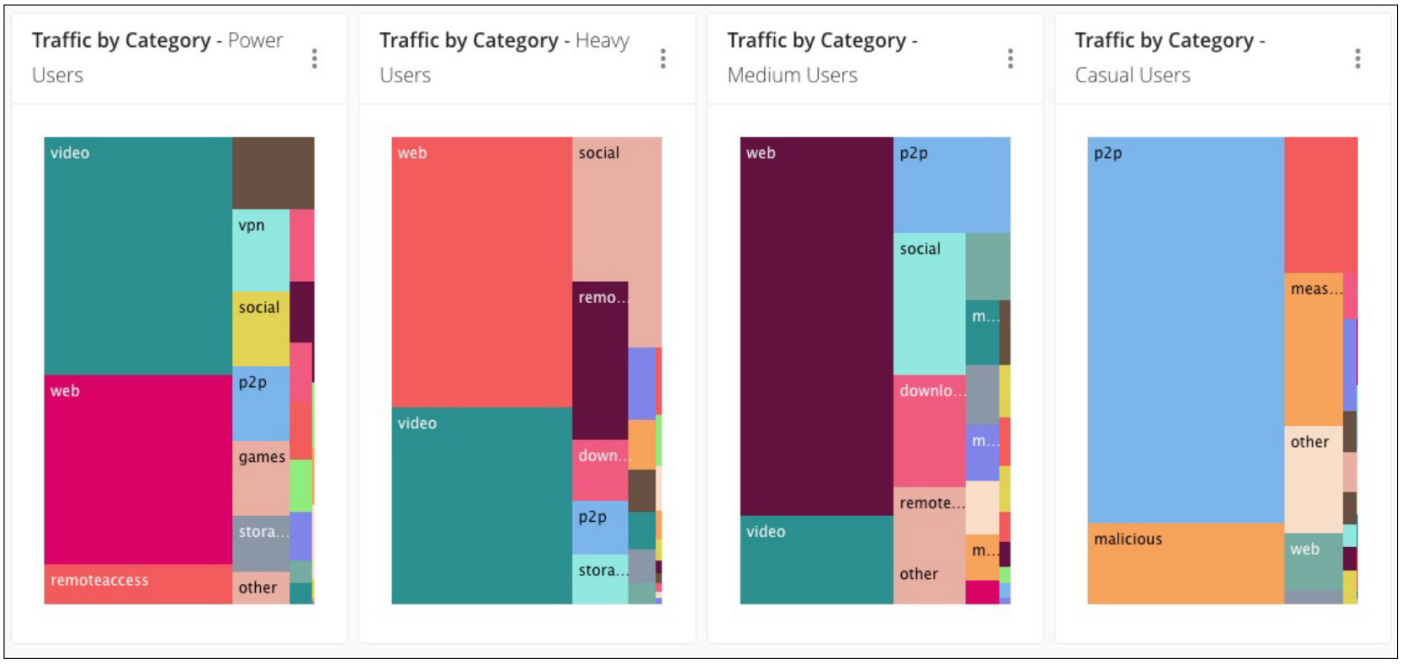


By expanding these insights, service providers can look at video consumption by specific subscriber categories, from casual users to super-heavy users that devour terabytes of bandwidth per month.

It’s also easy to go further and gain deep insights into the ways subscribers or groups of subscribers consume video and other services.

This type of profiling can help marketing and service planning teams optimize existing service plans or create new ones, such as special subscription plans for gamers or heavy video streamers.

Figure 6: Visualization of main traffic categories used by different types of users



Benefits

Video traffic insights from Deepfield Service Intelligence can help service providers capitalize on the growing popularity of streaming video and gain new opportunities to monetize their networks. For example, they can use these insights to explore options such as:

- Offering special plans that support premium video quality
- Providing service bundles that include subscriptions to popular streaming video services
- Becoming online video content or service providers
- Developing business partnerships with online video distributors

Service providers need better tools to cope with the growing popularity of streaming video services (SVOD, OTT) and the continuing domination of video-based network traffic. Deepfield Service Intelligence addresses this need by providing sophisticated set of video analytics features. Deepfield Cloud Intelligence and Deepfield Subscriber intelligence complement these capabilities with a wide range of use cases – from capacity planning, service planning to detailed cloud, network and subscriber analytics – to provide detailed insights that show how online services and applications are delivered to customers and impact the network.

Service providers can use this knowledge to improve network performance, optimize service delivery and enhance the customer experience.

Monetization options

Offer special plans for premium quality of video

Become online video content provider

Bundles

Partner with online video distributors

Insights from Deepfield Service Intelligence can help service providers capitalize on the growing popularity of streaming video and gain new opportunities to monetize their networks.

About Nokia

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As a B2B technology innovation leader, we are pioneering networks that sense, think and act by leveraging our work across mobile, fixed and cloud networks. In addition, we create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs.

Service providers, enterprises and partners worldwide trust Nokia to deliver secure, reliable and sustainable networks today – and work with us to create the digital services and applications of the future.

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