



# A 5G Perspective

## Leverage the Power of Application Intelligence

### FIVE KEY INGREDIENTS FOR SUCCESS ARE:

- Architecture
- Application Classification
- Measurement
- Data Layer
- Visualization layer and workflow

### OVERVIEW

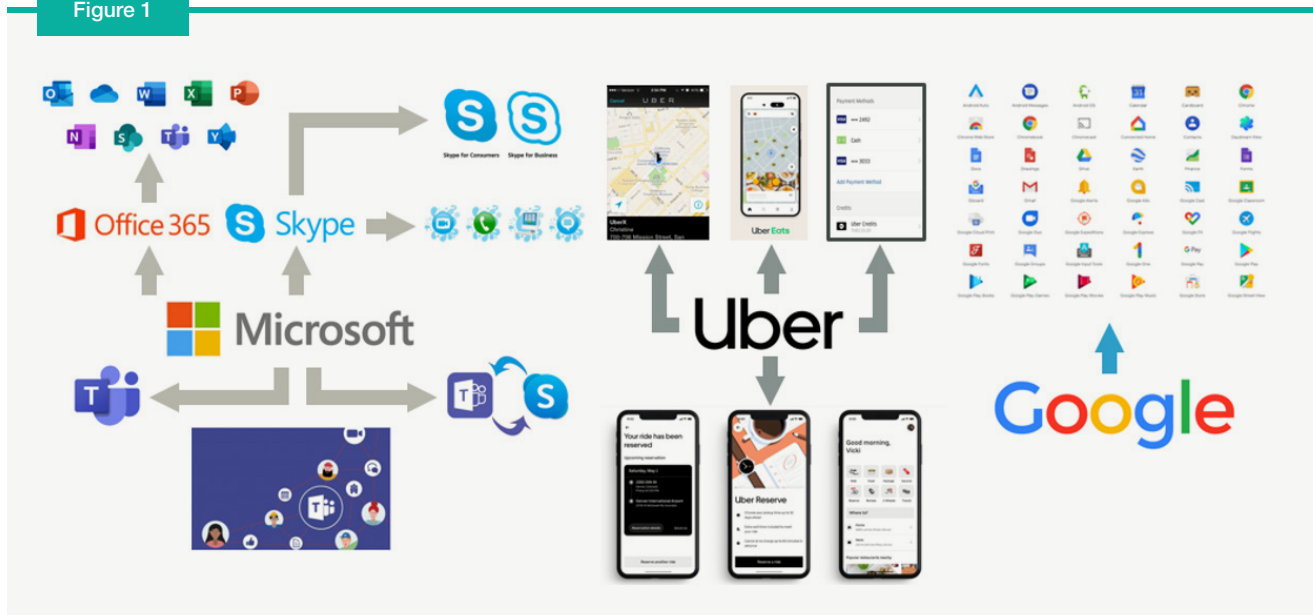
In this 5G tech turn, if you're a CTO or VP of Planning, Big Data, Ops or Engineering you need to engineer massive capacity growth as we all become "heavy users." You also need to improve application quality of experience, and create better digital engagement for your customers — all within a challenging CAPEX and OPEX budget.

You've also got to amp up customer acquisition and revenue growth during a time when customers are flooded with influences from strong digital players in the marketplace, like the big companies delivering over the top applications.

The "product" you are producing and selling is [Application Quality of Experience \(QoE\)](#), and it is essential to understand which applications are most profoundly impacting networks, and conversely, which networks are positively or negatively affecting application performance and the value perceived by customers — be they enterprise, consumer, or government.

Not only are individual applications overwhelming networks, but complex mashups of mobile and streaming video, gaming, messaging, communication, collaboration, and productivity apps and tools are making it harder for service providers to measure and cost effectively deliver consistent experiences — not to mention meet complex SLAs, catch fraud, security risks, revenue leaks, and adhere to regulatory requirements.

Figure 1





Most passive/active probes and gateways in the market today only scratch the surface...they provide poor classification accuracy and insufficient application depth.

This is made worse by the fact that COVID-19 has redrawn the lines between people's personal, professional, and educational lives. More members of the average household or business are now "heavy users" demanding more intricate mixes of services and apps increasingly embedded with combinations of payments, maps, chat, and other features. Regardless of the many moving parts, people have come to expect high performance and seamless experiences across their favorite applications, regardless of the time of day, the device, the location, or the access network.

This complexity will only grow, perhaps exponentially, once 5G comes to its full potential with mission-critical apps for smart manufacturing, remote surgery, public safety, precision farming, and AR/VR.

With literally millions of apps emerging around the world, there's also the complexity of new protocols (like QUIC), emerging security and privacy concerns (i.e., encryption, Apple Private Relay), and ever-growing latency, reliability, and speed demands. These challenges are rendering the once-reliable predictors of traffic patterns, customer behaviors and peak usage somewhat obsolete. In fact, most passive/active probes and gateways in the market today only scratch the surface, managing to see traffic as HTTP, SSL, UDP/QUIC or "web browsing." In other words, they provide poor classification accuracy and insufficient "application depth." These legacy solutions are not providing answers to your most pressing questions about subscriber and application QoE, macro trends of traffic across millions of subscribers, or about congestion and the health of the network.

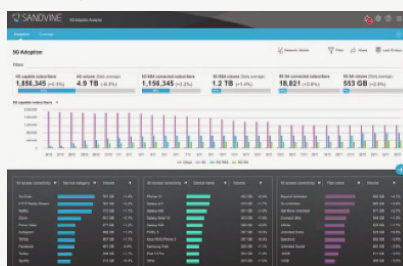
Simply put, if you can't classify the traffic with accuracy and granularity, to know exactly what it is, you can't possibly know if it's performing well or poorly. Without knowing whether the performance is good or bad, how can you market your strengths, improve and optimize the experience, troubleshoot the performance problems, or plan your future expansions properly?

### The Solution?

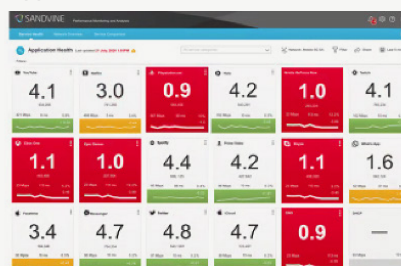
To manage and prioritize apps and traffic, and to monetize through usage- and application-based plans, you have to go beyond the status quo of seeing your traffic with this limited "70% accurate" view of the traffic. You have to accurately classify at least 95% or more of your traffic to understand what's going on in your networks and how the apps you're differentiating on and monetizing over those networks are behaving and performing.

Figure 2

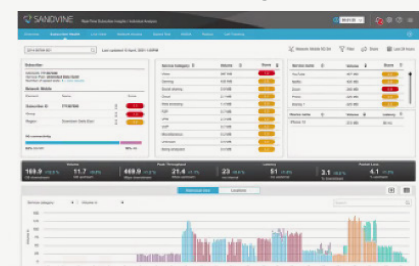
#### 5G Adoption

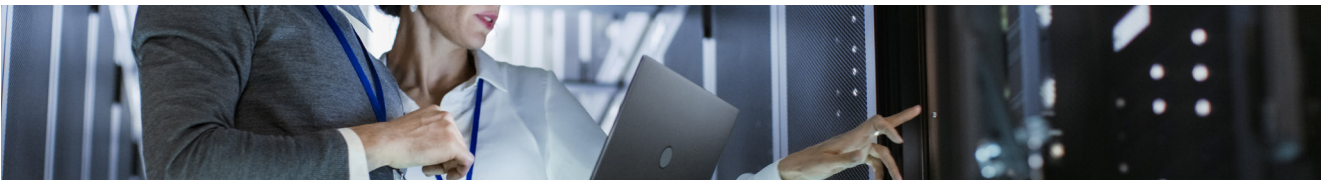


#### Application QoE Performance



#### Real-Time Subscriber Insights





To achieve true application and network intelligence, there are five key ingredients, with the foundational one being Architecture and then the essential capabilities of Classification, Measurements, Data Model, and Visualization. This is explained in more detail below:

### Architecture is what drives the necessary components of Integration, Redundancy, Scale and Management

- **Integration:** A good application and network intelligence platform is critical for automation. It must have a rich API layer, robust asymmetric traffic management, and an intelligent system for user and application awareness so that it can communicate with IT and network systems, building value from the analytics and policy of an intelligence solution. Because we have integrated with hundreds of multiaccess networks, we have a robust toolkit for building integration that produces the best business outcomes.
- **Redundancy:** To survive in networks today, you need to thrive in the chaos of the Internet. Redundancy and resiliency yields continuity and accuracy even under the most rigid business standards. Every internal and external pressure point, failure scenario, and traffic scenario must be tested in real-network scenarios.
- **Scalability and Performance:** Scale and Performance means managing total cost of ownership, so a good solution must be able to perform really well, scale up, down, and horizontally, and in terms of terabits per second. At Sandvine, we help customers scale up, which means hardening the breakpoints of every interface and process; scaling down means we help them cost effectively shrink-to-fit, distribute, and move closer to the subscriber; horizontal means we help customers expand outwards with more instances that can work together in a single domain. This requires strength in interfaces, state synchronization, redundancy, and the management layer. This means allowing increasing density of compute, memory, and network I/O per node. Bottom line, the overall TCO of deploying the solution must be low, including operational aspects of running the system.
- **Management:** A good element management layer is essential for an application and network intelligence solution, as it manages scale, redundancy, and integration, along with fault, configuration, accounting, performance and security. It also delivers usability and business outcomes with operational efficiency. It can exist on its own or work with manager-of-manager systems. Sandvine's management layer provides access to a broad suite of management functions under one umbrella in the largest telecommunications providers in the world.

### Application Classification

Identifying and analyzing network traffic by measuring client-server communication, detecting patterns in the traffic, and associating context with the application flows is critical. Application traffic can be mashed up, polymorphic, multiplexed, obfuscated and encrypted. The latter requires significant compute, memory, and mathematics, as well as speed. For example, Sandvine's analysis and classification take place at 250 millisecond intervals for better real-time insights on users and proactive predictions and resolutions of customer issues. Additionally, application traffic varies by service, content type, location, device, and intention, and it changes frequently, so a solution should frequently adjust for new application classification logic (signature bundles/ app profile identification). Sandvine has a weekly release of signature bundles, and allows customers and their partners to write their own application classifications.

### Measurements

An intelligence solution should enable you to dig into the trends most important to you. Do you want to analyze macro trends of traffic across millions of subscribers? Or perhaps detect congestion and measure application QOE? Want to know if an individual user is having a good experience or bad experience...and why? The measurements must be highly granular, scalable and robust. There is no one-size-fits-all for measurements, so fine grained measurements and correlation of multiple data points is needed to measure app QOE.



### Data Layer

Data ingestion, modeling, processing and export are essential for extracting value. For that reason, the data layer should be open, scalable, and customizable. It must support flexible data export and strict privacy controls, and it should bring out the maximum value from the solution, easily integrating into the business for automation. The data layer must also serve different user personas with different requirements for accessing the data. For this reason, Sandvine's data model is built to be open and scalable, as well as easily exportable.

### Visualization Layer and Workflow

Purpose-built User Interface workflow and tools unlock value from application and network intelligence by including a framework for accessing and customizing visualization of the data. Sandvine has a comprehensive visualization workflow library and supports rapid custom reporting.

For each of these requirements, it really comes down to the integrity and accuracy of application data. Good data equals good business outcomes. It means accuracy and the ability to measure application QOE, the starting point from which you design, build and manage networks more efficiently, while also delivering a better user experience.

To learn more about how we can help you achieve three pillars of success with our [Application and Network Intelligence Portfolio](#), [5G Service Intelligence Engine](#), and [Analytics](#), contact us and see our 5G Solutions [here](#).

Figure 3

Three pillars of 5G success: innovate, transition, automate



5G Service Innovation



5G Transition



5G Automation

## ABOUT SANDVINE

Sandvine's cloud-based Application and Network Intelligence portfolio helps customers deliver high quality, optimized experiences to consumers and enterprises. Customers use our solutions to analyze, optimize, and monetize application experiences using contextual machine learning-based insights and real-time actions. Market-leading classification of more than 95% of traffic across mobile and fixed networks by user, application, device, and location creates uniquely rich, real-time data that significantly enhances interactions between users and applications and drives revenues. For more information visit <http://www.sandvine.com> or follow Sandvine on Twitter [@Sandvine](#).



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