ScoreCard

Contextual QoE Scoring and Measurement of Delivered Network Experience

SCORECARD KEY BENEFITS

- Most granular application classification and measurements; intelligence for service and network performance
- QoE metrics that support understanding the network's capability of delivering services subscribers understand and care about
- Deployed in all access network types, provides data that helps operators manage their networks with network-wide visibility of all traffic, all subscribers, all the time
- Easy to access, export, and develop data with a consistent data model across the entire network

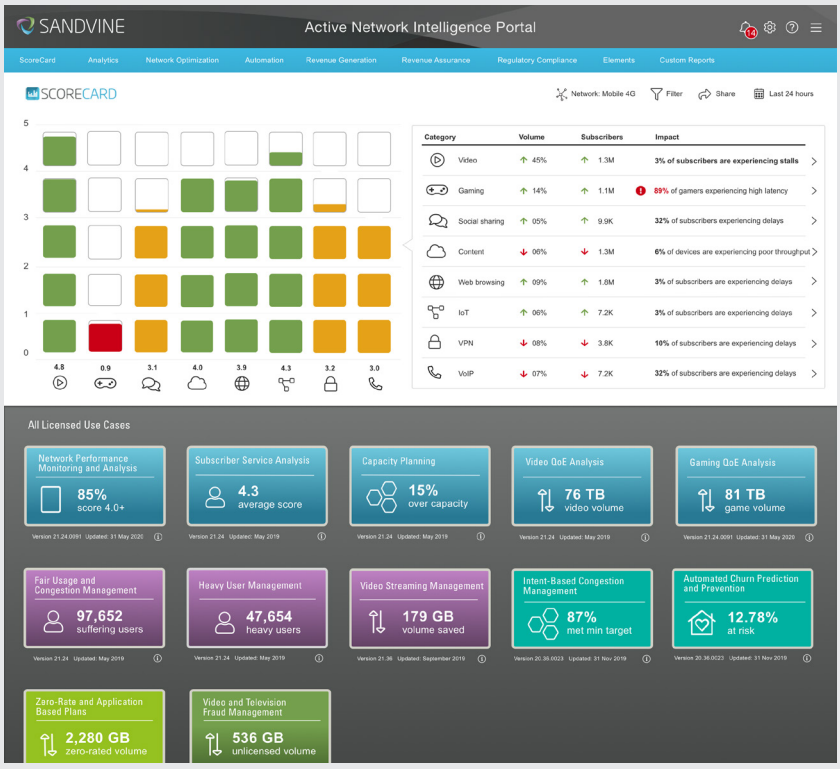
Network performance is often touted as the ultimate measure of quality. However, many of the applications that drive consumer perception of quality require more from the network than just throughput.

For example, voice and gaming applications are very latency-sensitive, whereas web browsing and social networking are sensitive to packet loss. Churn is highly likely when a network does not deliver a good experience for the applications that consumers consider high value. In order to meet consumer expectations without breaking the bank, operators need to measure the delivered QoE with the right context – location, device, service plan, and applications – to optimize investments.

Sandvine's ScoreCard is a unique quality of experience (QoE) measurement solution that provides contextual QoE intelligence. Deployed in any access network and agnostic to infrastructure vendors, ScoreCard measures QoE with the right level of granularity to ensure that the network operator is meeting user expectations. Unlike many QoE measurement solutions, ScoreCard measures all traffic, from all subscribers, all of the time – ensuring that the true measure of delivered QoE is not lost in massive samples that miss low bandwidth applications like VoIP and gaming.

Figure 1

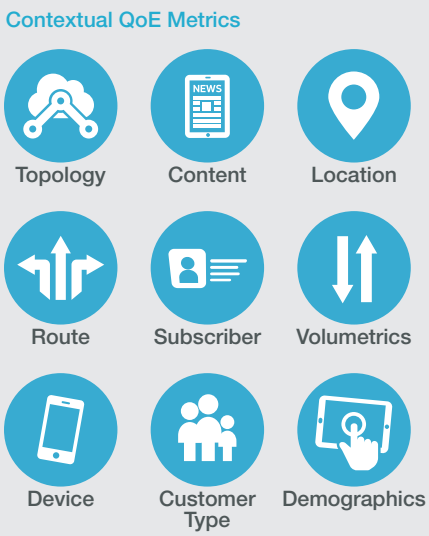
ScoreCard is an executive-level view displayed within Sandvine's ANI Portal



ScoreCard measures each subscriber's throughput, latency, and packet loss at sub-second intervals to gauge the network's ability to deliver a high-quality experience to the subscriber. ScoreCard is enriched with volumetric, network topology, location, device, and service plan information to provide context for each subscriber's traffic, ensuring that the intelligence is actionable without complex post-processing.

Figure 2

ScoreCard Data Schema



Network Scoring

Network score metrics reflect the performance during peak usage applied to the expectations for each application class, and measure the throughput, latency, and packet loss delivered per contextual view in the network applied against the requirements of the major application classes:

- Web Surfing
- Streaming Video
- Social Media
- Real-Time Gaming
- Upload
- Download
- Voice Applications

Understand how your network delivers what customers care about

Service Scoring

Service-specific scoring is designed to measure the delivered QoE for specific, high-value applications that define network experience in the eyes of subscribers. Specifically, Netflix, YouTube, Facebook, Instagram, WhatsApp, and other critical applications have their QoE uniquely measured to determine the delivered experience for users.

ScoreCard QoE Intelligence

ScoreCard's QoE intelligence is designed to be easy to access, visualize, and export to make business decisions on investments and even to support customer care. The KPIs are streamed to Sandvine's Insights Data Storage and visualized in the Active Network Intelligence (ANI) Portal, with multiple use case dashboards leveraging the unique intelligence. Utilizing the ANI Portal, specific workflows are built around use cases and to support out-of-the-box business integration.

For customized data exploration, Sandvine's Deep Insights can be used to create ad hoc and scheduled reports for multiple departments. If desired, the ScoreCard intelligence can be streamed to other big data platforms for consumption by other departments in the operator's business. Sandvine platforms are able to scale ScoreCard for network-wide coverage, agnostic to vendor, in either active or offline configuration to meet the needs of the world's largest network operators.

KEY FEATURES

Granular QoE Metrics

ScoreCard measures the end-to-end performance from the user's perspective, offering a unique level of intelligence because of the measurement frequency and the context added to each QoE metric. For each ScoreCard sample, the following granularity is measured:

- Throughput (up/down), 250 milliseconds
- RTT, five second average
- Packet loss (up/down), five second average

Score Methodology and Transformation Matrix

ScoreCard also measures the service and application QoE performance, comparing the network needs of each application and mapping them to Sandvine's constantly updated score Transformation Matrix.

Sandvine's Transformation Matrix considers the following parameters:

- Quality-affecting parameters (application, throughput, service category, latency, and packet loss)
- Subset of network conditions that mirror real-world conditions and represent degraded conditions that materially affect user experience
- Customized mean opinion score – per application and per service category scores are on a graded scale from A to F

Sandvine's A-F Scoring Guide

Score	Experience Delivered
A	Exceptional experience
B	Almost perfect, but some slight impairments noticed
C	Good experience but noticeable impairments
D	Usable with frustrating impairments
E	Poor experience
F	Unusable

QoE Data Model

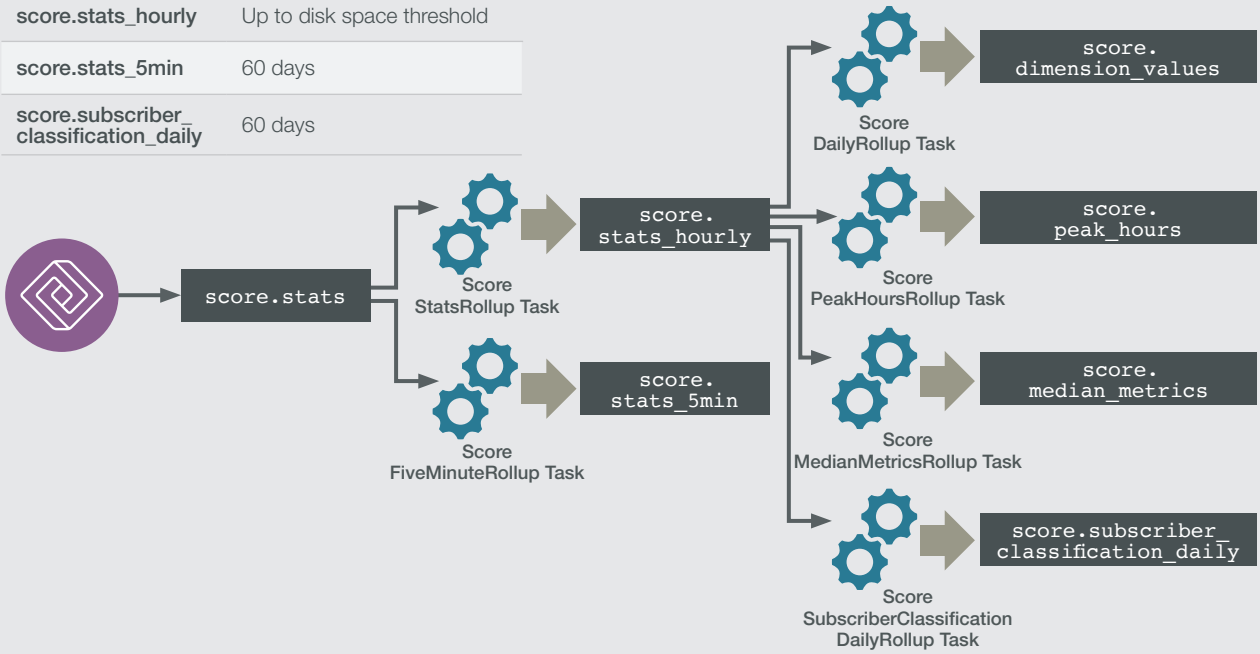
QoE metrics are designed around a contextually fixed schema to simplify and speed up reporting. With every QoE metric revealing an individual network subscriber experience, engineering, customer care, operations, and even marketing can use the QoE results to operate a more profitable business.

To ensure the highest performance, ScoreCard intelligence is pre-processed to allow for the minimization of storage resources into pre-packaged tables of one hour and five minute granularity, which is retained for 60 days before being optionally aggregated to reduce storage requirements.

Figure 3

Score Schema

Table	Retention
score.stats_hourly	Up to disk space threshold
score.stats_5min	60 days
score.subscriber_classification_daily	60 days



Multi-Use Case Application

ScoreCard QoE intelligence is the foundation of a large portion of Sandvine's Analytics and Network Optimization use cases, and is requisite for Sandvine's intent-based Automation use cases. ScoreCard QoE intelligence represents a unique value for Sandvine deployments because no other QoE measurement offering on the market can match the combination of granularity, context, and visualization with the ANI Portal across multiple pre-packaged use cases.

ABOUT SANDVINE

Sandvine helps organizations run world-class networks with Active Network Intelligence, leveraging machine learning analytics and closed-loop automation to identify and adapt to network behavior in real-time. With Sandvine, organizations have the power of a highly automated platform from a single vendor that delivers a deep understanding of their network data to drive faster, better decisions. For more information, visit **sandvine.com** or follow Sandvine on Twitter at **@Sandvine.**

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