SANDVINE

Enterprise Network Observability

ENTERPRISE NETWORK OBSERVABILITY DELIVERS:

Deep Visibility
Rich, multi-layer correlated data provides wide-ranging information about all aspects of your network to give you comprehensive visibility.

Faster Troubleshooting
Use scores, performance metrics and attributes for full problem contextualization and drill-down to rapidly identify, isolate and resolve problems.

Identify Optimizations
Make data-driven decisions on where, when and how to optimize network traffic to maximize bandwidth use and application and user Quality of Experience.

Meet Service-Level Agreements
Use analytics and scores to constantly monitor SLA commitments to ensure they are met, rapidly troubleshoot issues that impact SLAs and generate reports on your SLAs.

Continuous Process
Use analytics to continuously understand how your network is operating to make evolutionary decisions on how to optimize it.

INTRODUCTION

Enterprise networks are reaching unprecedented levels of complexity. Cloud and digital transformation have made enterprise business users even more reliant on business applications to execute key business processes and maintain productivity. SaaS "super apps", with multiple rich content types and interaction styles heavily tax enterprise networks impacting the user experience and performance.

These super apps are now far more sensitive to network issues than ever before and user productivity can quickly erode when these issues occur, hurting the business. Waiting for users to complain or file trouble tickets and manual remedies to fix issues further exasperate the problem by elongating the mean time to repair.

NetOps teams are challenged in two key ways to better operate their networks:

- Gain a higher view of how the network is serving the business from an application and user level to meet operational needs and Service Level Agreements (SLAs), and
- Get greater visibility into network performance at all possible angles to isolate problems faster and identify better ways to optimize the network.

A NEW MODEL FOR NETWORK OPERATIONS

The traditional way of managing enterprise networks is based on performance and capacity – in other words, bandwidth. Network engineers design the network to support the capacity required and NetOps teams monitor and triage the network based on performance, throughput and other metrics.

A new, more effective network operations model has emerged – an application-/user-centric one. In the application-/user-centric model, networks are managed to maintain the best possible Quality of Experience (QoE) for critical business applications and users to maximize productivity and optimize the network for the betterment of the business.

BANDWIDTH-CENTRIC	APPLICATION-/USER-CENTRIC
Deliver Capacity	Deliver SLAs
Runaway CAPEX and OPEX Costs	Manage Costs to the Business
Blind/Dark Spots	Full Visibility of Business Impact
Guesswork Optimization	Data-driven Optimization
Plan by Volume	Plan by Business Needs and SLAs

Table 1: New Application-/User-centric Network Operations Model versus Older Bandwidth-centric

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The most important aspect of the Application-/User-centric model is that it associates all aspects of the network to the business – costs, productivity, SLAs, optimization and planning. This model not only makes the network more responsive to the business but also allows the network to make the business more successful.

The Secret to Greater Visibility

An October 2022 research report by Enterprise Management Associates (EMA) – Network Observability: Delivering Actionable Insights to Network Operations – explored the trends and drivers behind new Network Observability tools. EMA surveyed over 400 enterprise IT stakeholders for the report finding:

- Only 43.8% of respondents believe they have a network observability tool that can truly answer any question about the network, and
- Three of the top five complaints about their network monitoring and network observability tools are Limited scope – I can't monitor everything I need to monitor (26.1%), Lack of Insights (20.9%) and Poor data quality (20.9%)

Figure 1

October 2022 EMA Survey of 402 Enterprise IT Stakeholders: Top complaints about network monitoring and network observability tools

Complaint	Percentage
Limited scope - I can't monitor everything I need to monitor	26.1%
Difficult to implement/maintain	22.1%
Too noisy - alert fatigue	21.1%
Lack of insights	20.9%
Poor data quality	20.9%
Insufficient scalability	20.6%
Too expensive	20.1%
Too difficult to use	14.9%
Poor customer support	13.7%
Other	0.2%

Most network monitoring and network observability tools offer only a small set of metrics and highly limited contextualization – the ability to show metrics across different attribute dimensions of the network. This leads to limited visibility and holes in the insights.

The key to better insights is more data (greater breadth), increased depth of data (more dimensions) and the ability to correlate this data for maximum contextualization.
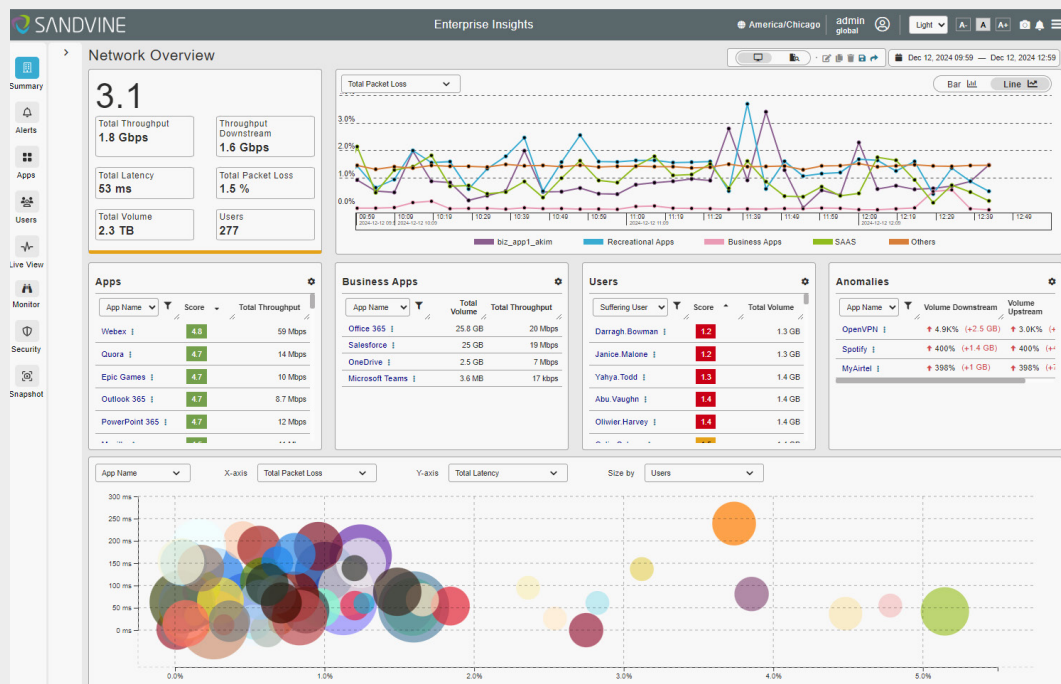
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Sandvine Enterprise Network Observability

Sandvine's enterprise network observability provides the breadth and depth of analytics and actionable insights to provide the comprehensive visibility needed to effectively operate and optimize enterprise networks. It supports day-to-day observability to identify, troubleshoot and resolve problems, application classification and QoE scoring to manage SLAs and mechanisms to identify network optimizations.

Figure 2

Enterprise Insights Network Overview Home Dashboard

Application ID, Classification and Scoring

Sandvine's Network Observability leverages the company's industry-leading application identification and classification technology and unique machine learning-powered QoE scoring capabilities. It provides the underpinnings for the advanced insights and contextualization in the Network Observability solution.

AppLogic, the application identification and classification technology, provides greater than 95% accuracy for app identification and classification – far greater than the 50 to 60 percent of similar technology – even on encrypted traffic which often doubles or triples the CPU consumption (and cost) of other solutions. This accuracy ensures confident visibility into application traffic and provides a unique content classification no other vendor provides that allows you to see and manage traffic by content type.

AppQoE, the QoE scoring engine, uses advanced machine learning models that are tuned to the 18 different metrics provided by the Sandvine real-time dataplane to provide accurate scoring and insights to NetOps teams across multiple dimensions. Each model understands the impact of various metrics on different applications and content to deliver unique scores that are accurate and concise.

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Visibility

Sandvine Network Observability provides comprehensive dashboards for network, user, location, content and application performance with actionable insights. It goes beyond traditional pure network-level metrics provided by other solutions by providing actionable insights at an application, content, location, device and user level to measure the business impact, identify the root cause of issues, and recommend ways to optimize traffic.

Sandvine's real-time dataplane provides 18 network performance metrics to feed Enterprise Insights, far greater than the few found in other network observability tools. These metrics include throughput, volume, latency, packet loss, jitter and more while measuring in different directions (upstream, downstream) and side of the network (internal and external).

These metrics feed the machine learning scoring models and populate a time-series multi-dimensional model to provide 360-degree contextualized views of the network performance. The dimensions include applications, application categories, content categories, application groups, users, user groups and locations (with multiple hierarchies).

The metrics and contextualization power the dashboards and insights to provide comprehensive visibility for NetOps teams.

Troubleshooting

The Enterprise Insights dashboards, scoring, and metrics combine to form actionable insights that allow NetOps teams to rapidly identify, isolate and troubleshoot problems on the network. The contextualized insights can help identify problems across various dimensions such as applications, users, locations, and more.

Enterprise Insights uses a multi-dimensional data model and hierarchical information architecture to allow NetOps users to drill-down and drill-across network metrics and information to aid in troubleshooting. The information hierarchy is structured as:

- In Overview dashboards users can see top-level metrics and information organized by various dimensions such as applications, application categories, application groups, etc. and can easily drill-down to contextualized dashboards for specific dimensional values,
- Each contextualized sub-dashboard provides metrics and information about specific dimensional values – i.e. specific applications such as Salesforce or specific network locations,
- In contextualized dashboards, users can see metrics specific to that dimensional value (i.e. metrics for application Salesforce or content category video calls) and cross-information across other dimensions (i.e. the scores of that dimensional value cut across various network locations or user groups).
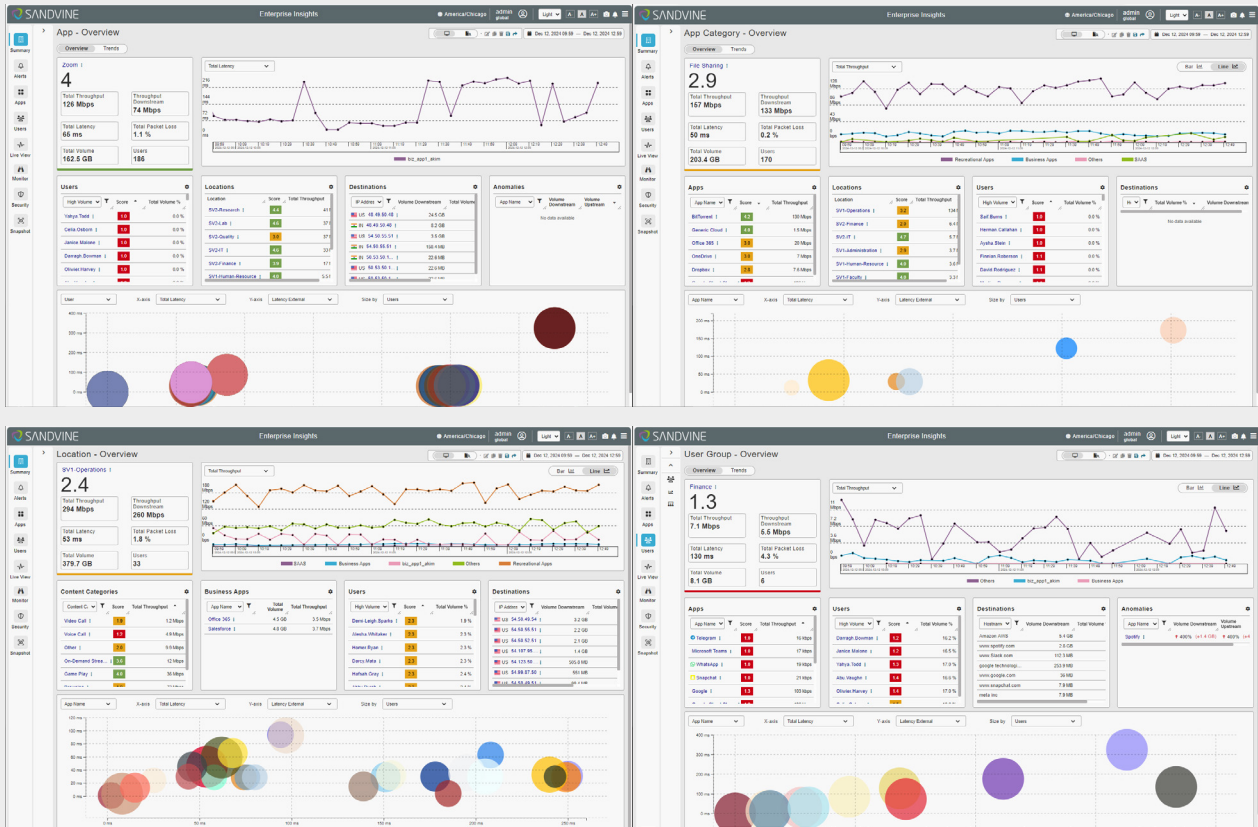
This robust and easily navigable information architecture facilitates agile drill-down and drill-across to isolate problems and their root causes.

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Figure 2

Contextualized Dashboards: Zoom app, File Sharing application category, Specific Network Location (Operations) and Specific User Group (Finance)

Real-time network metrics can be seen in Enterprise Insights LiveView to identify and isolate problems as they occur. Just as in the time-series data, metrics can be viewed and filtered across various dimensions and dimensional values to drill into the real-time metrics. Enterprise Insights also provides anomaly detection and alarms to proactively alert NetOps teams to network conditions and problems as they occur so they can be acted upon immediately before trouble-tickets and user complaints:

- Anomalies detect large statistical changes in network performance metrics. Anomaly thresholds are configurable and can be detected across various dimensions and dimensional values.
- Alerts are specific network conditions detected across various dimensions, dimension values and metrics. Alerts are configured via a wizard and can be multi-faceted (i.e. alert when for application category "Conferencing" the score < 2, total latency is > 150 ms and total packet loss is > 3%)

When anomalies or alarms are triggered, NetOps users can be notified via Email, Slack and SNMP as well as in the Enterprise Insights UI. They can drill down into the specifics of the anomaly or alert. To help teams get started, a set of default alarms are built into the solution.

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Optimization

The contextualization and information architecture of Enterprise Insights provides insights into optimizations for the network. When problems or unwanted conditions are identified via troubleshooting or alarms, these can often lead to tips on when, where, what and how to optimize the network. This information can be used to define traffic management policies in the Network Optimization of Sandvine's Enterprise Solution. Specifically:

- The network conditions seen – specific metrics (e.g. total latency) or overall conditions (e.g. congestion) – can tell you when you want to apply a traffic management policy,

- The dimension values – application, application category, users, locations – can tell you what and where to apply the traffic management policy, and

- The conditions within the specific dimensional values can tell how I want to apply the traffic management policy – how I want to allocate bandwidth or prioritize/de-prioritize traffic.

Without the insights from Sandvine's network observability, you are essentially flying blind when applying optimization policies and guessing as to the when, where, what and how of your policies. Without network observability, you could easily apply policies that hurt and hinder your network rather than optimize it.

Continuous

Your enterprise network is a living, breathing entity. New users are added all the time. New applications and network services are rolled out – some on-premises and some in the cloud. Usage patterns change or anomalies occur. The ways in which you optimize your network today may need to change tomorrow. How will you know and how will you know how?

Sandvine Enterprise Observability provides a continuous flow of analytics and insights about your network. It shows you when conditions change and what, where and how it has changed. It can show you the impact of changes you have made to your network and application portfolio.

Network Observability combined with Network Optimization (both in Sandvine's Enterprise Solution) work together to let you continuously analyze and optimize your network. This lets you gain the utmost performance, and make the best use of bandwidth and resources to deliver the best QoE constantly.

The Results

With Sandvine Network Observability you get better results and return on investment in your network, network resources and applications. You:

- Maximize Quality of Experience (QoE) – via deep, contextualized insights you can raise the application and user QoE to raise business user productivity and satisfaction.

- Gain Deep Network Visibility – the rich, multi-layer correlated data provides wide-ranging information about all aspects of your network to give you comprehensive visibility.

- Increase NetOps Productivity – fully contextualized scoring and metrics along with drill-down rapidly identify, isolate and resolve problems to make your team more productive.

- Use Data-driven Optimization – identify optimizations using insights on where, when and how to optimize network traffic to maximize application and user Quality of Experience.

- Have a Continuous Process – use analytics to continuously understand how your network is operating to make evolutionary decisions on how to optimize it.

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Key Capabilities

- High-speed data plane with real-time metrics that scales to the largest networks

- High-speed, low latency data with 250ms data capture

- 18 detailed metrics on network conditions and performance

- AppLogic app ID, app classification and content classification with weekly updates

- Fully contextual insights that show metrics and scoring across many dimensions

- Multi-dimensional data model

- High performance data management with open data models

- Built-in, customizable dashboards with actionable insights, drill-down and drill-across

- AppQoE machine learning-based Quality of Experience scoring

- LiveView real-time performance metrics and monitoring

- Multiple enterprise integration points (Active Directory, LDAP, RADIUS, SOAP/REST)

- Application-, user-, situation and location-aware analytics

- Anomaly detection and alarm engine

- Report definition & generation

- Complete flow record logging

- Drill-down and drill-across troubleshooting & problem resolution

- Integrated data export via Kafka to data lakes

ABOUT SANDVINE

Sandvine's cloud-based App QoE 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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