

EXFO Worx

CONVERGED SERVICE ASSURANCE



Delivers end-to-end network visibility and continuous real-time service monitoring and verification in multiplay environments.

KEY FEATURES

Roll out new services and applications quickly, confidently and profitably

Manage the rollout and operations of multiplay services with a single platform

Gain market share and maximize customer retention

Compete on quality and build customer loyalty

Implement service assurance throughout the service lifecycle

Ensure and verify high-quality service for all subscribers

Combine service performance active testing and infrastructure performance monitoring

Performance monitoring of large and complex networks, and sub-second polling for near real-time performance assessment

SPEC SHEET

SERVICE QUALITY MATTERS

Converged IP-based voice, video, data, and mobile services and applications offer service providers and enterprises flexible, efficient and cost-effective options for delivering critical communications services for business and residential users. While convergence can result in operational efficiencies, cost savings and competitive advantages, the real marker of success depends squarely upon the performance and quality of the applications and services.

As new real-time services are deployed, networks continue to grow in complexity with multiple access technologies, vendors, quality of service (QoS) mechanisms and operations support systems (OSS). Increased complexity creates significant risk, which could lead to quality and performance issues resulting in customer churn, downtime and lost revenue. To mitigate risk, service providers and enterprises must implement a solution, like EXFO Worx, that scrutinizes any IP service, over any network, to any endpoint.

EXFO Service Assurance's value proposition is its multiservice management and monitoring approach. The addition of realtime, interactive services, such as voice and video, to the IP data network is generating a whole new set of management challenges as the focus now shifts from pure network management or performance management to service management. As a result, service providers and enterprises must look beyond vendor-specific management tools and simple SNMP reporting, and implement a service assurance solution that accounts for end-to-end delivery of critical IP services. Mobile service providers, cable companies, Telcos and carriers that offer guaranteed, measurable and reportable service levels, will have a competitive advantage, along with a new source of revenue.

Service quality and service-level agreements (SLAs) matter—your business success depends on it.

EXFO WORX: COMPREHENSIVE CONVERGED SERVICE ASSURANCE SOLUTION

A seamlessly integrated hardware and software solution, EXFO Worx delivers end-to-end network visibility and continuous real-time service monitoring and verification in multiplay environments. Built on a distributed architecture for maximum deployment flexibility and system scalability, EXFO Worx ensures the successful launch and ongoing, profitable operation of all types of IP-based voice, video, data, and mobile applications and services. EXFO Worx is unique in its ability to collect real-time and historical statistics and measure the key performance indicators (KPIs) that truly reflect the end-to-end performance of any IP service whether it is a worldwide, multiservice MPLS network, a Carrier Ethernet infrastructure, a VoIP backbone for long-distance wireless or wireline traffic, a mobile network for wireless services, an IPTV distribution network, a network in transition to the IP multimedia subsystem (IMS) architecture, or a managed IP telephony offering for enterprise customers.

EXFO Worx is comprised of the EXFO Worx™ service assurance and performance management software engine that configures and manages a distributed network of monitoring and measurement points. EXFO Worx supports open standards to work with new and existing measurement points. These measurement points vary from EXFO Service Assurance hardware devices called EXFO Verifiers to Cisco's IP SLA system and include third-party devices that support standards for quality management. The real-time data collected from a host of proactive tests and live traffic monitoring is correlated and analyzed by EXFO Worx to deliver detailed, actionable information reports for proactively managing end-to-end IP service assurance and continually guaranteeing that service levels are met. EXFO Worx correlates service information and KPIs to formulate key quality indicators (KQIs) that are actionable by network operations and engineering personnel. KQIs provide actionable and service-aware aggregate statistics of network health such as acceptable call quality (ACQ), which provides an operator with an indication of the percentage of calls that are meeting their network standard.

EXFO Worx is a key component that complements deployment at all phases of the IP service lifecycle, including service turn-up, birth certificate generation and management, service qualification, rollout verification, continuous operational monitoring, and on-demand troubleshooting.

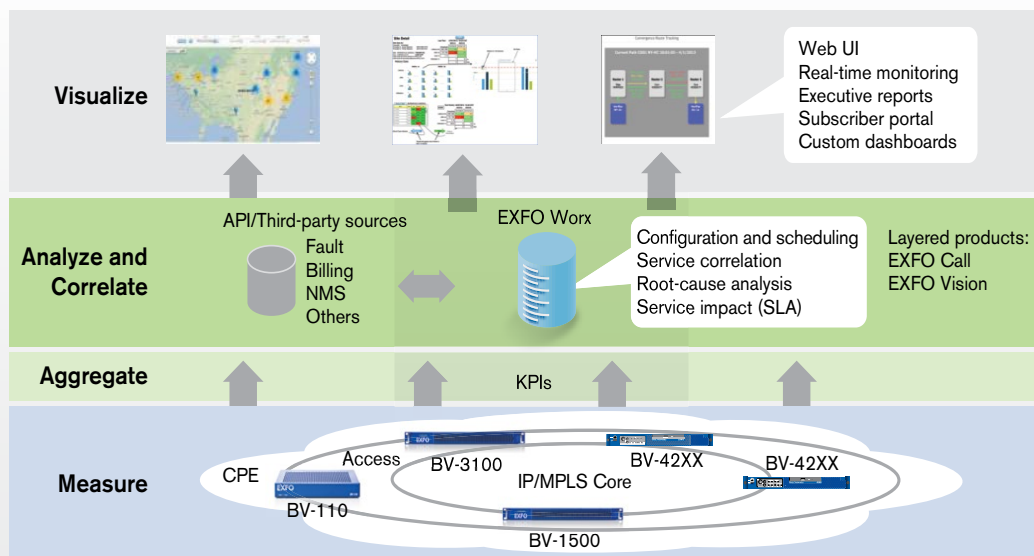


Figure 1. EXFO Worx advantages

EXFO WORX

EXFO Worx is a central software engine that controls, from one location, all aspects of EXFO Worx operation, from the specification and verification of service-level objectives to scheduling tests, setting alarms and thresholds, remotely configuring settings of distributed EXFO Verifiers and creating detailed, actionable information and performance reports. With EXFO Worx, network operators can quickly establish their specific KPIs across any class of service and network traffic such as voice and video quality scores, IMS transaction metrics, SMS success/failure rates, channel change times, network latency, packet loss, jitter and more, and continuously run automated tests against service-specific thresholds. EXFO Worx commissions network and IP service tests while collecting, storing, correlating and analyzing essential test data to produce detailed, graphical reports that prove end-to-end service verification. Working with EXFO Verifiers and other measurement sources, EXFO Worx supports active tests that simulate end-user experience and passive monitoring of actual live network traffic. These tests are part of a host of network and IP service-specific test suites and additional layered products that allow EXFO Worx to deliver the information and drill down capabilities customers need to continually ensure quality and performance.

The highly scalable, distributed EXFO Worx architecture is especially suited for service provider and large enterprise networks.

With EXFO Worx, network operators can:

- › Turn up services and produce birth certificates
- › Qualify services before customer handover
- › Ensure and verify a high-quality experience for subscribers/users
- › Conduct infrastructure assessments
- › Effectively troubleshoot and pinpoint potential service problems
- › Manage service performance and verify SLAs
- › Create scheduled and on-demand reports, which provide executive summary or detailed technical information about customer SLA or specific service performance

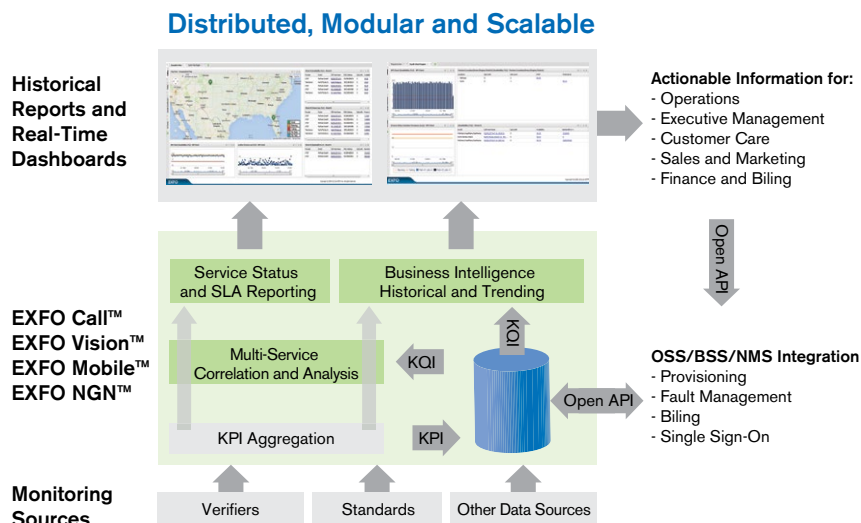


Figure 2. EXFO Worx advantages

EXFO WORX LAYERED PRODUCTS

Today's converged networks support a variety of IP services and applications that require comprehensive testing and monitoring to continually ensure quality. EXFO Service Assurance offers a modular approach with various optional layered products that further enhance the capabilities of EXFO Worx with service-relevant test suites, dashboards, analysis and correlation capabilities.

- › EXFO Call: comprehensive VoIP/IMS call analysis and correlation application
- › EXFO Vision: end-to-end video-over-IP service assurance solution for IPTV, telepresence, and over-the-top applications
- › EXFO NGN: comprehensive IP/MPLS and Carrier Ethernet monitoring solution APIs, portals and integrations
- › EXFO Mobile: comprehensive mobile network monitoring for 2G/3G/4G networks

EXFO Flex extends the benefits and capabilities of EXFO's EXFO Worx system by focusing on the distinct requirements of your environment. EXFO Flex lets you integrate your complex operations support system (OSS) ecosystem by either extending or leveraging capabilities to fit into your specific environment or other domains.

CUSTOMIZED FRAMEWORK

Our EXFO Flex team starts the process using our library of application frameworks, and then customizes one or more frameworks to your specific network/operations setting. Some examples of common frameworks include:

- › Map-based portals
- › Dashboards/Custom portals
- › Reports (including custom EXFO View)
- › Third-party OSS integration
- › Data extraction application programming interface (API)
- › Data integration from external systems
- › EXFO Worx provisioning API
- › Data transformation
- › Data analytics
- › Custom alarming

PACKAGED SOLUTIONS

EXFO's EXFO Flex team also offers packaged solutions targeting specific market needs. In many cases, these solutions can be used right out of the box to reduce time to deployment, yet remain highly customizable for integration into your environment. The following examples represent just some of the solutions being deployed:

- › Mobile backhaul solution
- › Metro-E solution
- › Capacity management solution

EXFO Flex also lets you fast-track your EXFO Worx expansion by sidestepping the regular roadmap queue, which typically involves competing with other feature requests and core development work. Our EXFO Flex team is dedicated to providing you, our valued customer, with tailored solutions enabling you to obtain your personalized EXFO Flex solution without having to wait for development cycles or prioritization queues.

EXFO VERIFIERS

EXFO Verifiers are designed to provide end-to-end service assurance coverage of the most complex and demanding networks. Comprised of a full array of hardware appliances and leveraging standards-based in-network devices wherever possible, EXFO Verifiers offer maximum deployment flexibility and support any combination IP services with proactive and live traffic monitoring solutions for mobile 2G/3G/LTE networks, VoIP/IMS, IP video, data, VPN, Ethernet, network infrastructure and network performance testing. Easy to deploy and manage, EXFO Verifiers deliver proven accuracy, with hardware time-stamping and detailed testing, and QoS metrics correlation. By installing verifiers in MPLS core networks, data centers, points of presence (PoPs), peering points for backbone-based services, and directly at the customer premises, network operators can segment their networks to easily localize problems and proactively identify root causes of service and network performance issues.

EXFO offers a range of Verifiers for different applications and networks ranging from Verifiers for IP/MPLS and Carrier Ethernet services to Verifiers for mobile and IPTV networks.



Figure 3. EXFO Vision video quality analysis

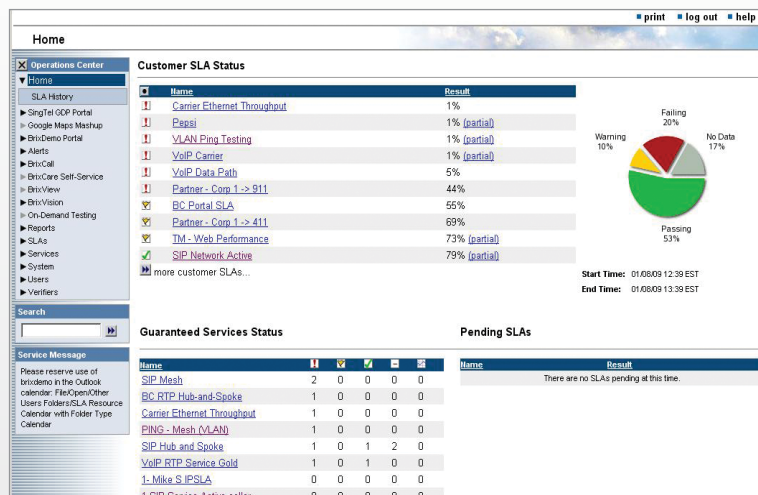


Figure 4. EXFO Worx customer SLA status

In addition to EXFO Verifiers, EXFO Worx supports select third-party measurement sources and open standards. With EXFO Worx, users can employ the right performance data collection approach for their environments—EXFO Verifiers exclusively, third-party devices only, or a combination of both. The use of third-party measurement devices provides a cost-effective way to extend and deploy EXFO Worx throughout the network while protecting investments in existing network infrastructure and end-user equipment. EXFO Service Assurance provides a connector for each supported measurement source that enables management of the third-party device (just as if it were a EXFO Verifier) via EXFO Worx, and configures and schedules tests, in addition to retrieving, viewing and analyzing test results. EXFO Worx currently supports the following third-party performance measurement sources:

- › Cisco IP SLA
- › IETF RFC 2925-compliant network elements (such as equipment from Extreme Networks, Juniper Networks and 3Com)
- › End-user broadband equipment (SIP and PacketCable NCS-compliant end-user equipment)
- › IETF RFC 5357-compliant network elements
- › IEEE 802.1ag- and ITU-T Y.1731 Ethernet OA&M-compliant devices

INTEGRATIONS OPTIONS

Service providers and enterprise network operators can increase the value and reach of EXFO Worx by incorporating its actionable information into pre-existing OSS, back-office applications and network management systems (NMS), including network and fault management, provisioning, inventory, trouble-ticketing, workflow, capacity planning and billing systems.

EXFO Worx integrates with third-party applications via:

- › Product-specific connectors: provide seamless links to several off-the-shelf OSS products such as Harris NetBoss, HP Openview, IBM Netcool and CA eHealth
- › Developer's kits: enable integration with proprietary applications or create highly customized northbound and southbound integration with OSS applications with industry-standard, XML-based APIs
- › Fault management tools: forward EXFO Service Assurance SNMP traps to the consoles of fault and network management tools and manager of manager systems for performance alerting

PROFESSIONAL SERVICES AND CUSTOM SOLUTIONS

By utilizing EXFO Service Assurance's professional services organization, service providers and large enterprises can rapidly realize the full potential of their converged service assurance solutions. We offer a range of services designed to support the full lifecycle of the service-level verification process. From installation, to optimization, to customization, EXFO Service Assurance can help you maximize the return on your investment, minimize the impact on your critical internal resources, and deliver the services to make you successful.

COMPREHENSIVE TEST SUITES

Available tests include:

- › EXFO Worx Layered Test Suites
 - › EXFO Call: voice assurance
 - › EXFO Vision: video assurance
 - › EXFO NGN: IP/MPLS, Ethernet and data assurance
 - › EXFO Mobile: 2G/3G/4G mobile networks
 - › Infrastructure performance monitoring (network element health, ports, CPU, memory, etc.)
- › VoIP
 - › H.323, SIP, NCS, MGCP, RADIUS, SCCP, RTP/SRTP-XR
 - › Signaling quality
 - › Delivery quality
 - › Call quality
- › IMS
 - › Diameter, SIP, ENUM, DNS and H.248
 - › Full IPv6/IPv4 dual-stack compliance SS7/SIGTRAN support
 - › Session establish success/failure rate
 - › Latency and success rate of transactions
 - › KPIs aggregation by location and user
- › IP Video and IPTV
 - › H.323, RTSP, RTP
 - › Infrastructure quality
 - › Content quality
 - › Customer experience quality
- › NGN-IP, MPLS, VPN, Carrier Ethernet
 - › Route analysis
 - › QoS, DiffServ, VLAN and performance
 - › Loss, RT, one-way latency, jitter
 - › Availability: connect/disconnect time
 - › End-to-end solution for turn-up, service assurance and troubleshooting of Carrier Ethernet services (802.1ag, Y.1731, EtherSAM and TWAMP)
- › Web Performance
 - › HTTP, HTTPS, FTP, NTP, SMTP, IMAP, POP round-trip capabilities

EXFO SERVICE ASSURANCE

EXFO Service Assurance is a global provider of converged service assurance solutions that allow the world's largest service providers and enterprises to offer reliable and high-quality experiences in voice, video, data and mobile services to their customers, partners and employees. The company brings a proven heritage of IP expertise unique to the service assurance marketplace, and collaborates closely with its customers and partners to assure the delivery of any IP-based service, over any network, to any endpoint.

EXFO Service Assurance's seamlessly integrated hardware and software products, collectively called EXFO Worx, are converged service assurance solutions that proactively monitor IP service and application quality. Network operators use EXFO Worx to guarantee the successful launch and ongoing, profitable operation of their various IP services.



EXFO Headquarters > Tel.: +1 418 683-0211 | Toll-free: +1 800 663-3936 (USA and Canada) | Fax: +1 418 683-2170 | info@EXFO.com | www.EXFO.com

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