

### OVERVIEW

The rapid adoption of IP for real time voice and multimedia communications enjoyed every day by enterprises and consumers alike is resulting in a growing array of IP networks, user devices and IP endpoints. Customers increasingly expect secure access to these advanced networks, in real time, all the time. At the network edge, issues like security, interoperability, protocol interworking, vendor implementations, system complexity, and service assurance are critical issues for network operators, and in turn they are demanding carrier grade, intelligent session border controllers (SBCs) and border gateways (BGs) to ensure a seamless and secure communications experience.

### SOFTWARE MEDIA PROCESSING

For over a decade, GENBAND has been an acknowledged industry innovator in session border control, developing products to resolve the growing challenges of IP. QUANTiX™ SBC products are deployed worldwide in some of the world’s largest IP networks run by fixed, mobile and cable operators, as well as by Over-the-Top (OTT) service providers, and enterprises. The QUANTiX™ Q21 SBC is a market-leading, intelligent Session Border Controller utilizing innovative software based media processing to enable high-performance, high-density session management, and high scale media throughput in a highly energy efficient 2RU form factor. The Q21 provides security, policy control, and deployment flexibility to enable seamless solutions including SIP Trunking, IP eXchange (IPX), Peering, Intra-Network Interconnect, Multimedia and Unified Communications, VoLTE, and RCS-e, in fixed, wireless, cable, IMS LiTE and IMS networks.

### QUANTiX™ SBC – The Intelligent SBC

The QUANTiX™ Q21 has smart management technology that reduces operational complexity and simplifies the network edge by securely managing, routing, and controlling real-time voice and multimedia sessions, while providing intelligent insight into network performance. With the QUANTiX™ Q21 SBC, operators gain predictability and assurance to the delivery of secure rich multimedia services. Through its adaptive security, insightful policy enforcement, flexible interworking and normalization, and advanced session routing capabilities, the QUANTiX™ Q21 SBC adds an unparalleled layer of intelligence in managing SIP and other IP-based voice and multimedia sessions. GENBAND’s Network Wide Licensing model offers additional flexibility as well as cost efficiency and savings.



### Market Flexibility at the Edge

- Carrier-to-Consumer
- Carrier-to-Enterprise
- Carrier-to-Carrier
- Enterprise-to-Enterprise

### Simplified Operational Control

- Centralized quality and performance management
- Intuitive web-based user access with granular controls
- Centralized open APIs for back office integration
- CDR mediation
- Advanced troubleshooting

### Insightful Policy Management and Session Visibility

- Intelligent traffic & user screening, authentication, authorization
- Comprehensive SLA management
- Multi-stage rate limiting and traffic shaping
- Pattern recognition to dynamically blacklist malicious sources
- Detection & alarming for fraud & spam

### Intelligent Interworking and Normalization

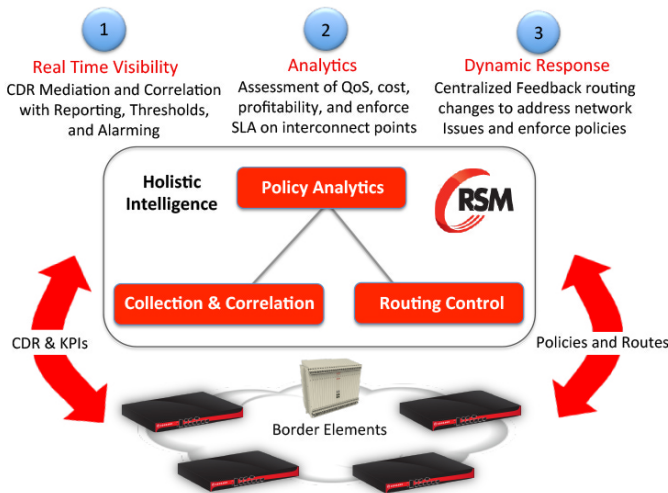
- Diverse, multi-vendor, multi-protocol interworking
- Software based media processing
- High performance on-board transcoding
- Real-time SIP Message Manipulation
- Separation of media and control planes for maximum network efficiency
- Network-proven interoperability with common end user and operator edge and core platforms

### Advanced Security and Routing

- Routing based on capabilities, availability, profitability, and performance/quality of the destination
- Sophisticated routing intelligence with a variety of options including adaptive, least cost, dynamic route, percent-based
- Multi-layered security including intelligent access/admission control, NAT/PAT, topology hiding

### SMART MANAGEMENT

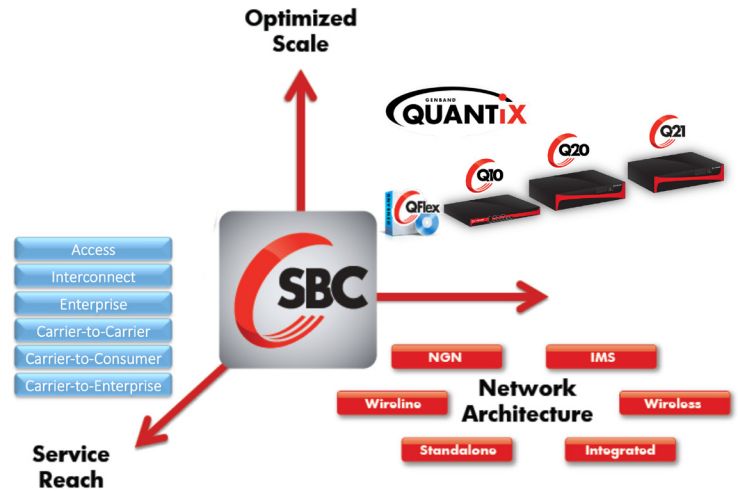
Accompanying the QUANTIX™ Q21 SBC is the market leading GENView Real Time Session Management tool (RSM) a smart management solution that simplifies day-to-day operations. The RSM monitors, analyzes, reports, and enforces quality and performance at the network borders, providing visibility into edge traffic along with the ability to dynamically modify call-routing behavior based on a combination of business policies, network QoS, and subscriber usage patterns. The RSM offers users a web-based provisioning interface with simple drop down menus and configuration templates for vendor-specific profiles, enabling faster time-to-market for services.



### DELIVERING HOLISTIC VISIBILITY AND DYNAMIC ADAPTATION

- Quality/QoS Monitoring: providing visibility into how the network is delivering service
- Comprehensive Reporting: exposing historic and real-time network performance
- Business Reporting: providing visibility into route profitability
- Adaptive Call Routing: re-shaping routing policies to ensure network quality targets are met
- Advanced Call Diagnostics: enabling views into sessions that may straddle multiple SBCs

### MULTI-DIMENSION ADAPTABILITY



Delivered on a “commercial off the shelf” (COTS) 2RU server platform, and using media processing in software, not hardware, the QUANTIX™ Q21 SBC provides substantial and measurable deployment benefits, providing a price/performance ratio that leads the industry. Combining the benefits of a software-centric architecture, and deployment flexibility, the QUANTIX™ Q21 SBC addresses a wide-range of performance needs while ensuring lowest total cost of ownership (TCO).

The Q21 is ideal for environments such as large carriers or service providers, yet equally well suited to medium service providers and enterprises, who are looking for high scale, high-density session capacity, with high throughput media handling where scale is important. It is optimally sized to support up to 70,000\* concurrent VoIP sessions in a small footprint with market leading energy efficiency, to drive significant reduction in energy and data center costs.

GENBAND’s portfolio of SBC’s are available as a best-of-breed carrier-grade, stand-alone SBC on a family of rack mount servers. The SBC leverages common software across all versions of target hardware options, offering deployment flexibility, and the ability to seamlessly grow the network as needed.

\*Performance can vary depending on customer deployment scenario

### Network Functions

- Access SBC, Interconnect SBC, Enterprise SBC, IPX Proxy, B2BUA, Outbound Proxy, Mirror Proxy, H.323 gatekeeper

### IP Network Security

- Topology hiding with signaling and media NAT traversal, Rogue RTP Detection, Denial of Service (DoS / DDoS) protection
- Multi-stage Rate Limiting – Layer 2,3 Rate Limiting, including TCP, ICMP, Syn; Registration Rate Limiting, SIP methods Transaction Rate Limiting
- Detect and Drop Malformed Packets
- Dynamic Blacklisting, Access Control Lists, Session Admission Controls
- Per flow Bandwidth Call Admission Control (CAC)
- TLS, IPSec (IKEv1) for signaling encryption
- Secure RTP/RTCP for media encryption

### Interworking and Interoperability

- IPV4, IPV6, IPV4/IPV6 interworking
- H.323/SIP Interworking Function (IWF), SIP over UDP/ TCP/ TLS/ SCTP interworking
- H.245 Tunneling; H.225 RAS messages support for alternative gatekeeper functionality; stateful H.225 and H.245 routing
- SIP Flexible Message Manipulation (FMM)
- Hosted NAT traversal
- Overlapping realm and IP signaling addresses

### Transcoding and Media Adaptation

- Voice Transcoding and DTMF Translation, G.711 / T.38 Fax Relay, SIP Info, SIP Notify, RFC 2833
- Software based media processing
- Flexible transcoding deployment options
- Per device codec profiles, re-ordering and prioritization

### Advanced Routing and Policy

- Least Cost, Profitability based, and Percentage Based Routing
- Quality and Performance based Routing
- Digit Matching / Manipulation; Called Number Translation; Calling Number Translation / Randomizations; Call Blocking; Call Loop Detection and Prevention
- Flexible policy to enable hosted direct media routing between end points behind same NAT
- ENUM, DNS, SIP Redirect (RFC 4903) based route query
- Service partitioning based on customer and service type

### QoS and SLA Assurance

- Bandwidth call admission control
- Per session network quality analytics: jitter, packet loss, latency, R-factor
- Per session service quality analytics: ASR, NER, post dial delay
- Per call statistics
- DSCP packet marking for TOS / COS

### Regulatory

- Lawful Interception
- Emergency Call Routing

### Management

- Intuitive Graphical User Interface (GUI) for ease of configuration
- Embedded web-based management/GUI access via secure HTTPS access
- Command Line Interface (CLI) for local and SSH access
- Secure RADIUS-based user authentication
- Role-based user access
- SNMP V2 status and statistics
- Local logging of events, alarms, and traps; call trace
- Support for storing CDRs; RADIUS accounting records
- 1:1 redundant management control ports

### Q21 Performance & Resiliency

- 1:1 high availability redundant system with stateful call migration of signaling and media with no loss of service
- Up to 500 Call Attempts Per Second (CPS)
- Up to 160,000 simultaneous SIP Signaling sessions
- Up to 70,000\* simultaneous media sessions (G.711)
- Up to 200,000 SIP registered endpoints
- Up to 2,000,000 routes and calling plans

\*Performance can vary depending on customer deployment scenario

### Q21 Hardware

#### Chassis

- 2U, rack mount
- Inches: 17.14" Wide x 3.45" High x 20" Deep
- Metric: 435mm Wide x 88mm High x 508mm Deep
- 19" or 23" adjustable brackets for mounting
- Maximum weight: 45lb

#### Memory / Hard Drives

- 32 GB RAM for central processing
- 2 Hot-Swappable 300GB 10K SAS HDD

#### Front Panel

- Status Indicators front panel LED's; Power Indicator; HDD Indicator; Fan Alarm; Telco Alarm; ID Indicator
- 1 USB V2.0 interface
- ESD ground point

#### Rear Panel

- 12 Ethernet Ports
  - 4 SFP+ ports for media. Dual Rate Single or Multimode 1G/10G and Copper 1G Ethernet supported
  - 4 SFP ports for signaling, management and redundancy. 1000Base-TX/SX/LX Ethernet supported
  - 4 RJ45 ports for signaling, management and redundancy. 10/100/1000 Ethernet supported
- Serial console port, 9600 Baud default
- Video Port Interface VGA-compatible 15-pin
- 4 USB V2.0 interface
- Telco Alarm Relay indicator Standard DB15
- ID Indicator
- Chassis ground connection
- Remote Management Port (RMM) RJ45
- Power Input – AC or DC

#### Power Option:

- 650W AC or DC hot-swap, 80+% efficient redundant power supplies

#### DC Power Option:

- Input: -40 to -72 V DC redundant inputs
- Nominal Current: 7.3A @ -48VDC input
- Peak Current: 13A

#### AC Power Option:

- RMS Input Voltage: Minimum 90 VAC; Nominal 100-240 VAC; Maximum 264 VAC
- Nominal RMS Current: 3A @115 VAC input; 1.4A-1.5A @230 VAC input
- Peak RMS Current:6A @115 VAC input; 3A @ 230VAC input
- Input Frequency: Minimum 47 Hz; Nominal 50/60 Hz; Maximum 63 Hz

#### Heat Dissipation:

- Fully-populated typical 350 Watts; 1194 BTU per Hour

#### Operating Altitude:

- Up to 1,800m @ 40° C
- Up to 5,000m @ 30° C

#### Environmental:

- 5° to 55° C Operating
- -40° to 75° C Non-Operating
- Humidity, Operating: 95% Non-Condensing at temperatures of 20° C to 40° C
- RoHS
- WEEE

#### Safety:

- UL 60950-1 – United States
- CAN/CSA-C22.2 NO. 60950-1-03 – Canada
- IEC/ EN 60950-1 – European Union
- IEC 60950; IECEE CB Scheme – International
- IS 13252:2010 – India

#### EMI/EMC:

- FCC Part 15 Class A – United States
- ICES-003 – Canada Compatibility (EMC) requirements
- EN 300-386
- EN 55022
- EN 55024
- CISPR 22. CISPR 24
- KN22 / KN24
- IEC 61000
- CNS 13438
- VCCI V-3/2012-04