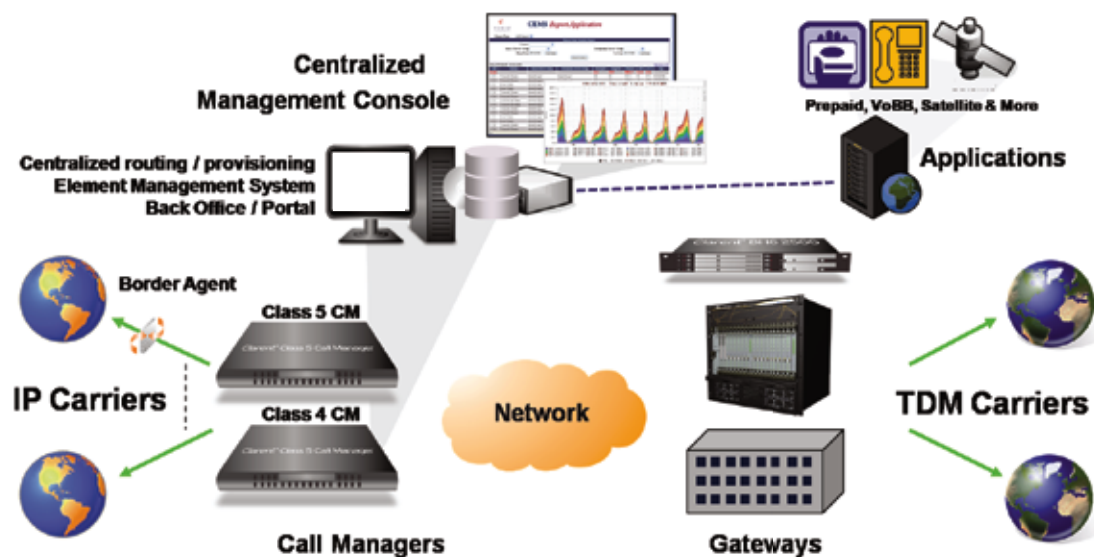


Carrier-Class IP/TDM Interconnect Solutions for Wholesale, IP Peering and Class 4 Replacement Applications

The CarrierNet VoIP gateway platform provides a cost-effective, turnkey solution for wholesale, interconnect and value-add voice telecommunications applications with IP and TDM connectivity requirements.

CarrierNet is an all-IP, modular tandem trunking solution built on the field-proven carrier-grade Distributed Softswitch architecture. By combining software-defined intelligence and high performance/high-availability media gateway options, the CarrierNet platform enables high-quality any-to-any voice network connectivity and SIP service delivery into legacy PRI, CAS and SS7 environments.



A COMPLETE SOLUTION

CarrierNet brings carriers and networks together and offers a clear migration path to an all-IP architecture and high-margin service delivery opportunities. CarrierNet integrates legacy TDM or IP infrastructure requirements and provides a complete solution for profitable Class 4 deployments, PSTN-to-VoIP interconnects and value-added services. CarrierNet cost effectively scales from competitive start-up to high density configurations and facilitates evolutionary service models via options such as a prepaid calling card solution and Class 5 VoBB (Voice over Broadband) solution.

The software-centric CarrierNet solution features softswitch capabilities, including the Command Center, the Class 4 Call Manager and Element Management components. These elements are integrated with media gateways to provide carriers with scalable deployment options. Pre-tested, port-based configurations provide out-of-the-box solutions for applications including VoIP transport, IP peering, VoIP termination and more. Flexible “build as you grow” capabilities make it easy to expand capacity and leverage optional features such as SS7 network connectivity, enterprise management, prepaid, toll free services (800 services), satellite trunking and VoBB services.

WHOLESALE VoIP TRANSPORT

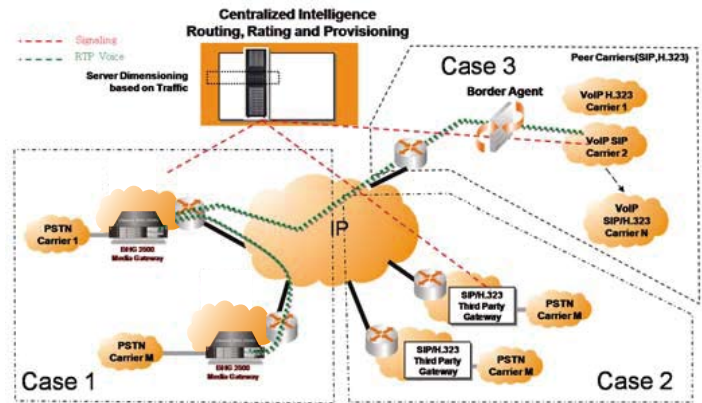
IP-based voice transport offers economical and feature-rich alternatives to traditional circuit-switched communications. However, successful deployments require intelligent, scalable gateways with signaling and management options that facilitate profitable routing schemes and customized VoIP services. Additionally, these platforms must provide reliability, easy management and low operational costs that help ensure profitable, high margin service delivery.

The CarrierNet solution facilitates carrier class VoIP transport that seamlessly interworks with SIP, SIP-T, H.323, legacy TDM, SS7, ISDN, R2 and CAS services worldwide. Globally-certified custom hardware matched with an open, distributed architecture provides flexible, secure and dependable VoIP transport via public and private IP networks. Service providers can rely on standards-based native SIP and XML scripting capabilities to ensure interoperability and accelerate time-to-revenue with voice and enhanced SIP services. CarrierNet also incorporates enhanced security features that control access, improve ASR and avoid service interruptions.

By adopting this framework, carriers can accelerate their time to market for advanced, high margin opportunities. CarrierNet also provides a smooth and reusable investment path that leads to consistent service innovation, decreased subscriber churn and increased revenue per user.

VoIP PEERING

VoIP peering solutions bypass public telephone networks and enable direct carrier-to-carrier exchange of VoIP traffic. CarrierNet VoIP peering solutions provide high-quality end-to-end IP connections that improve control and minimize or eliminate costly interconnection fees. CarrierNet avoids legacy PSTN limitations and offers attractive revenue and service opportunities for competitive startups, VoBB providers and other innovative carriers.



CarrierNet's flexible architecture can be adapted to support a variety of technical network requirements and peering business models. A key issue in VoIP peering is translating phone numbers to IP addresses and vice versa. The Command Center's ENUM look-up capability can seamlessly identify calls that qualify for direct VoIP termination. These CarrierNet capabilities help ensure efficient, profitable peering operation.

VoIP TERMINATION

Carriers providing wholesale VoIP termination services struggle to efficiently leverage existing TDM infrastructure while delivering ever-increasing volumes of IP voice traffic.

CarrierNet is a proven solution for VoIP termination with advanced capabilities for TDM/IP conversion, call control, call routing and more. It allows wholesale carriers to profitably terminate high-volume SIP-based voice traffic onto the PSTN. Global homologation allows wholesalers to offer scalable and profitable VoIP services worldwide. Software-driven intelligence combined with high-performance/high-availability media gateways ensure carrier-grade performance and VoIP CLASS 5 reliability.

TECHNICAL HIGHLIGHTS

Legacy TDM and VoIP protocol interconnection

- » Open architecture, standard SIP, SIP-T, H.323
- » TDM protocol support: SS7, ISDN, R2, CAS
- » VoIP protocol and VoIP to TDM inter-working
- » Seamless interconnection for H.323, SIP, SIP-T Peer Carrier
- » Seamless interconnection for H.323, SIP and MGCP-based edge devices including customer premises gateways, integrated access devices and IP endpoints
- » Multi-vendor third party Peering and GW interoperability
- » Topology hiding using the Clarent Border Agent

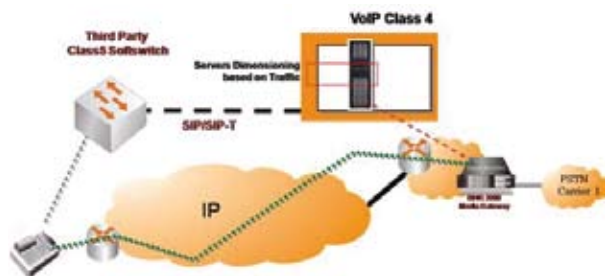
Centralized routing, rating and provisioning

- » Flexible routing and billing of traffic to and from the carrier
- » Routing based on the Ingress Server Group (Source Based Routing)
- » ASR-based routing / least cost routing / domain based routing
- » Basic routing by country/city code
- » Sub-city and multi-city routing with wildcards
- » Local number routing with user-defined local number ranges
- » Time-of-day routing
- » Route exclusions
- » Re-route mechanism
- » Ingress Port-Based Routing (IPBR)
- » Priority routing by server group, with proportioning control

- » Source trunk group routing
- » Telephone number exclusion
- » ENUM routing
- » Multiple routes; up to 10 alternate destinations, configurable based on cause code

High-density and carrier-grade reliability capabilities

- » Carrier grade, fully redundant configurations with 120-16000 ports
- » High density interfaces available in compact design
- » Hot-Swappable MG Components; N+1 High Availability
- » Redundant MG Ethernet switches and power supplies
- » Redundant cards with call preservation during card failure - SS7 and ISDN only



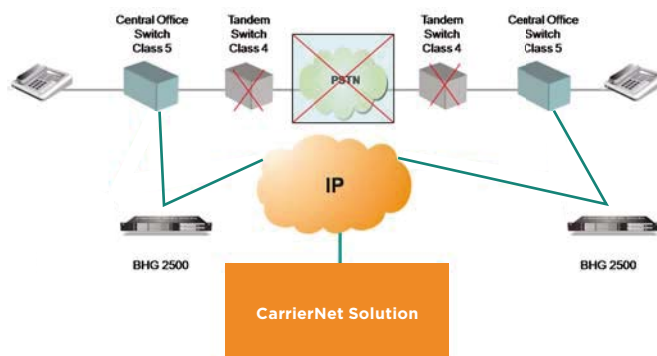
CarrierNet enables VoIP termination services for multiple retail service providers and offers flexible pay-as-you-grow configurations that can scale as service demand increases. CarrierNet also makes it easy to offload IP-based traffic and helps extend the service life of port-constrained TDM equipment.

Standards-based SIP and XML service provisioning dramatically reduces time-to-revenue, facilitates retail carrier interoperability and enables value-added services, such as prepaid or VOBB. CarrierNet also incorporates enhanced security features that help prevent service interruption and customer churn.

CLASS 4 REPLACEMENT

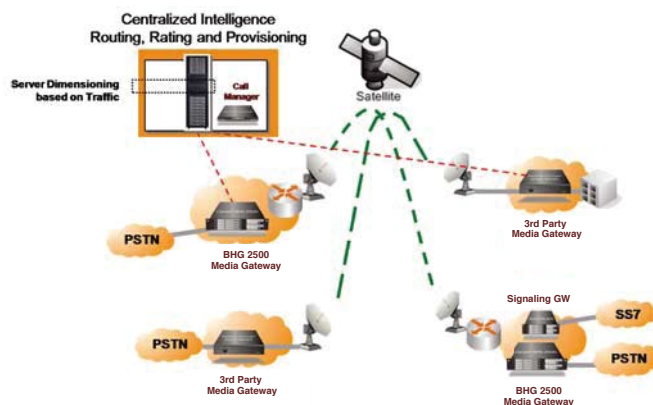
CarrierNet may be deployed as an IP-based Class 4 replacement to provide a cost-effective and scalable alternative to legacy-architecture tandem circuit switches. CarrierNet Class 4 configurations provide a true IP-based alternative and deliver cost-effective, reliable IP voice and data transport with ISDN and SS7 interoperability.

Advanced softswitching technology significantly reduces capital and operating costs, reduces reliance on overlay networks, simplifies service provisioning and enables new revenue-generating services. Class 4 and related solutions uniquely address specialized service requirements as defined in satellite-based trunking.



Designed for carrier grade availability, CarrierNet Class 4 replacement solutions are available with NEBS-compliant, redundant platforms that ensure availability and high-quality service delivery. CarrierNet solutions can be deployed, configured and managed remotely via a web-based interface and SNMP-enabled consoles.

CarrierNet Class 4 solutions provide a reliable, flexible and scalable way for global service providers to offer profitable, high-volume IP voice services and reduce operating expenses.



- » Server group redundancy, including multiple NEs in single group and one NE in multiple groups
- » Active/Active command centers, automatic detection of primary command center failure
- » Database Replication, H.323 Alternate Gatekeeper
- » Broad set of wireline, cable and wireless codecs
- » Comprehensive TDM protocols: SS7, ISDN, R2, CAS with country variants
- » Universal ports supporting any combination of G.711, G.723, G.729, T.38, etc usage without density loss
- » Comprehensive fax, modem and DTMF support
- » Server group/route monitoring
- » Multiple route choice with route prioritization, proportionalization and load balancing
- » Standard SNMP management and notifications for low ASR

Advanced management and control capabilities

- » Price list association for ingress/egress call legs
- » Automatic traffic billing, carrier credit limit management *
- » Profitability reports at carrier and route levels*
- » Release error code reporting
- » Topology hiding and NAT traversal via Clarent Border Agent
- » Server Groups concept = "IP Trunk Group" or "TDM Trunk Group"
- » Simultaneous ingress and egress call limiting, per server group
- » Edge device configuration
- » Monitor and Control NEs: Start/Stop processes; provides status & statistics on the NEs

- » Advanced ASR network monitoring, reporting and alarming

- » Integrated alarm summary: configurable e-mail notification for selected alarms

Advanced security

- » Admission control; authentication per session/registration
- » H.323 ID; optional RADIUS Authentication
- » Hosted NAT traversal and support for all known types of NATs; interwork with other NAT traversal solutions
- » Topology hiding using Clarent's Border Agent
- » Simultaneous ingress call limiting on a per server group basis both ingress/egress NE and intra server group (within a server group)

*Feature available with Back Office option



BUSINESS SOLUTION HIGHLIGHTS

Scalable, packaged solution

- » Everything a service provider needs to offer wholesale and interconnect services
- » Fully-integrated scalable VoIP solution bundles minimize time to revenue
- » Pay-as-you-grow capabilities support your evolving business requirements
- » Centralized management and extensible, reusable components minimize CapEx and OpEx
- » Pre-packaged CarrierNet partner portal makes it easy to resell minutes with ASR and CDR Reporting
- » Bundled elements and plug-and-play value-add services enable easy, profitable VoIP deployment

Flexible service definition

- » Vertically integrated product offering combines advanced off-net switching, access switching, and application technologies in a cost-effective service delivery platform.
- » Extensible, pre-integrated applications make it easy to launch competitive services
- » Wholesale VoIP transport / IP peering
 - Satellite trunking
 - VoIP termination
 - Class 4 replacement
 - Advanced services: prepaid, toll free services, VoBB and more

Centralized control

- » Centralized intelligence routing, rating and provisioning
- » Carrier class routing engine
- » Advanced ASR routing, monitoring and reporting
- » Centralized CDRs with off-line availability; profitability reports



MEDIA GATEWAY SPECIFICATIONS

Media Gateway Blades

- » TP 1610 Media Gateway Blade (low-density applications)
 - cPCI form factor
 - Best in class VQT as measured by ETSI
 - 4, 8, 16 E1/T1 spans
 - 120-480 ports
 - PIC MG 2.16
 - H.110
 - Dual 10/100BaseT Ethernet
 - SIP, H.323, MGCP, MEGACO, TPNCP (API)
- » 6310 High-Density Media Gateway Blade
 - cPCI form factor
 - Best in class VQT as measured by ETSI
 - Three DS-3 or 1 OC3/STM-1
 - 2016 ports
 - PIC MG 2.16
 - H.110
 - Dual 10/100BaseT Ethernet
 - SIP, MGCP, TPNCP

- » SG 5601 SS7 Signaling Gateway Blade
 - Provides SS7 connectivity for PSTN access and SS7 over IP
 - via SIGTRAN
 - Facilitates SS7 port code conservation
 - SSP configurations
 - Supports multiple destination SSPs
 - F-link grooming with the TP-1610 telephony blade via the BHG2500 H.110 bus
 - Support A and F-links
 - Supports up to 16 SS7 links per blade
 - Active/active SS7 redundancy solution providing load sharing as well as load balancing for routes, links and chassis
 - MTP1, MTP2, MTP3
 - SIGTRAN Protocols: M2PA, M3UA

Clarent® BHG 2500 Universal Gateway - Cost-effective, scalable solution for lower-density configurations

- » Supports 120 - 4032 ports
- » Minimum configuration is 4 E1/T1

- » Hot swappable components and telephony blades
- » Hot swappable redundant power supplies (AC and DC power options)
- » Up to 2 TP6310 media gateway blades
- » Up to 4 TP1610-16 media gateway blades
- » Universal ports supporting any combination of G.711, G.723, G.729, T.38, etc. Supports voice, fax and data; all ports available for VoIP with standard compression
- » GSM, CDMA and other codec options such as ilbc are available
- » H.110 backplane for internal SS7 F-link grooming (only applied to TP1610)
- » 2U heavy-duty steel rack or shelf mountable chassis

CONTACT

1725 BRECKINRIDGE PLAZA
DULUTH, GA 30096
TEL / 678 924 2449
EMAIL / HARRY.STRIBOS@VIASAT.COM



6155 EL CAMINO REAL CARLSBAD - CALIFORNIA 92009
TEL / 760 476 2200 FAX / 760 795 1046 WWW.VIASAT.COM

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