Product Profile

Vmux-420

Large Capacity GSM A-bis/A-ter Optimization Gateway

RAD's Vmux-420 large capacity GSM A-bis/A-ter optimization gateway enables operators to achieve better bandwidth utilization and improve the efficiency of backhaul infrastructure, as well as pave the way to next generation cellular solutions.

Providing up to 3:1 optimization of GSM BTS-to-BSC (A-bis) and BSC-to-MSC (A-ter) traffic, the Vmux-420 is particularly beneficial for applications in which backhaul is over expensive terrestrial, satellite or microwave links, delivering dramatic savings on cellular transport expenses.

Cuts BTS-to-BSC and BSC-to-MSC Backhaul Expenses for Cellular Operators in Half

Industry experts estimate that backhauling GSM traffic from radio cells and base stations (BTS) to base station controllers (BSC), mobile switching centers (MSC) and the fixed line telephone network (PSTN), accounts for up to 60% of a cellular operator's transport operating expenses. Therefore, maximizing bandwidth efficiency in the backhaul network is of immense importance to operators.

Regular voice compression technologies enable mobile operators to optimize bandwidth on the BSC-to-MSC (A) segment of the backhaul network, as well as between MSCs, and the MSC-to-PSTN (E) section. Since voice traffic between the BTS and the BSC (the A-bis segment) is already encapsulated, no further compression is recommended. This is also true for the segment between the BSC and the MSC if the traffic is encapsulated at the BSC (then referred to as A-ter). By applying technology that optimizes the A-bis/A-ter protocol, however, it is possible to realize a significant reduction in bandwidth on these segments as well.

A-bis/A-ter Optimization

Employing silence suppression algorithms, the Vmux-420 gateway eliminates redundant silence and idle frames or channels. Moreover, since the traffic from a single BTS transceiver does not typically utilize a full E1 or T1 link capacity, it is possible to multiplex traffic from two separate BTS E1/T1 lines into one. By providing A-bis/A-ter optimization, together with E1/T1 multiplexing, the Vmux-420 can achieve up to 3:1 optimization (depending on the amount of call silence).

The Vmux-420 supports either four, eight or 12 A-bis/A-ter E1/T1 voice trunks, allowing it to function as a higher-capacity remote A-bis/A-ter optimization gateway that complements the smaller Vmux-400 with dual E1/T1 trunk capacity. Alternatively, it can be deployed as a central GSM A-bis/A-ter optimization gateway.

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Optimizing up to 12 E1/T1 cellular voice trunks over IP and TDM networks with full redundancy in a compact 1U-high solution, RAD's Vmux-420 optimization gateway provides the best price-performance and smallest footprint of any similar device with equivalent capacity on the market.

Full Redundancy

For carrier-class dependability, the Vmux-420 offers full redundancy for the main module including the uplinks, and the power supply modules, with switchover in case of malfunction. Both power supply and main modules are hot-swappable for easy field repairs without interrupting operation. Both AC and DC input power supplies are available.

Clock Regeneration for Backhaul over Both IP and TDM Networks

Vmux-420 is equipped with multiple E1/T1 uplinks for transmitting over TDM-based networks. In addition, it has 10/100 Mbps Ethernet uplinks and a unique feature that allows for reliable regeneration of the TDM-based clock for synchronized IP network operation. This enables the use of packet-switched networks for the transport of cellular voice traffic without dependence on a GPS timing service for accurate timing.

This versatility gives operators the flexibility to choose the most efficient and cost-effective network for backhauling their cellular traffic. It also means that operators don't have to swap out equipment when migrating from a TDM to a packet-switched transport network.

Support Data, GPRS and EDGE Today, Ease 3G Migration Tomorrow

To meet the growing demand for popular data and image services over GSM networks, the Vmux-420 supports data, GPRS and EDGE, as well as standard GSM speech codecs such as Full Rate (FR), Enhanced Full Rate (EFR), Adaptive Multiple Rates (AMR), and Half Rate (HR). The Vmux-420 supports dynamic HR operation, which enables switching between the FR/EFR/AMR codecs and the HR mode, and vice versa. To meet customer service agreements for GPRS and EDGE data services that require bandwidth greater than 64 kbps, the data is assigned over multiple timeslots.

The Vmux-420 is also suitable for mobile operators in their migration to 3G. Because most GSM and UMTS cell sites are co-located, the Vmux-420 enables operators to free up leased lines used for 2G/2.5G traffic and apply them to their 3G networks. In this way, they can avoid the delay and costs associated with installing additional leased lines.

Interoperable with Major Switch Vendors' Equipment

Conforming to all relevant industry standards, Vmux-420 is interoperable with equipment from major switch vendors, such as Alcatel, Nokia, Ericsson, Siemens, Huawei, and Motorola. This ensures its compatibility in any network, as well as facilitating connectivity in multi-vendor environments.

The Vmux-420 automatically detects and assigns the timeslot types that are employed by the switch vendors' equipment. This user-friendly feature facilitates the Vmux-420 deployment.

Convenient SNMP Management

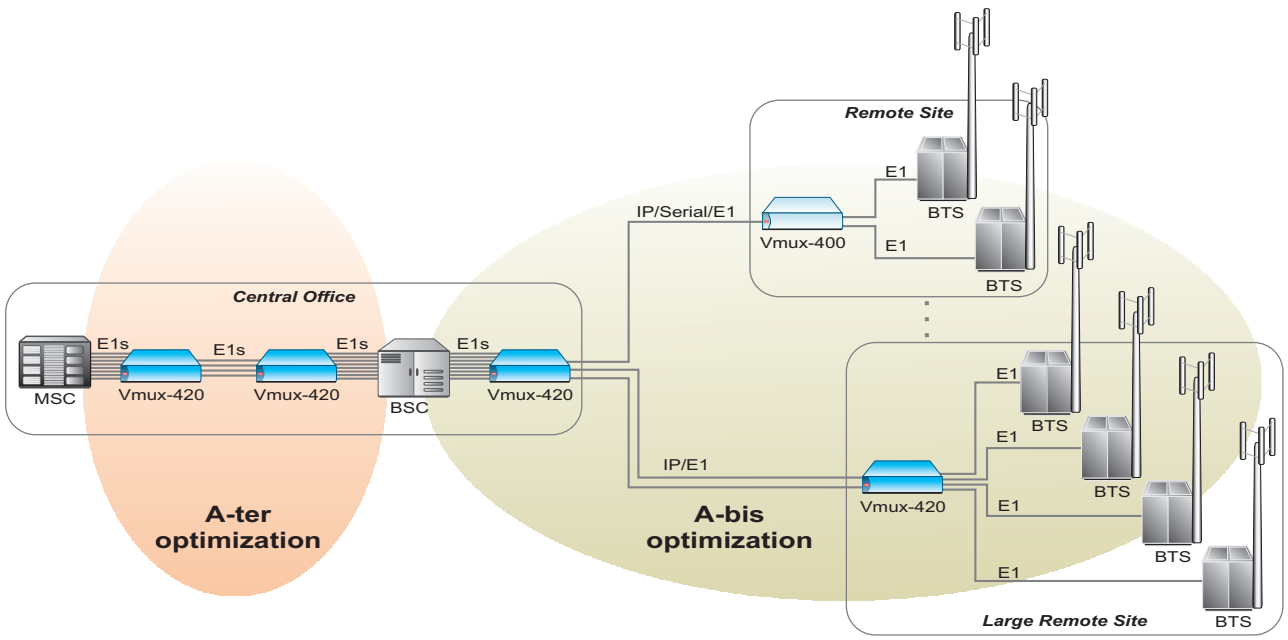
The Vmux-420 includes an SNMP agent so that it can be managed either via the RADview SNMP application or by third-party path management applications. RADview features a user-friendly graphic interface and intuitive zoom applications, and is a simple yet powerful configuration tool that facilitates device configuration tasks, allowing off-line network planning and simulation. Control and monitoring can also be performed via a local ASCII terminal, Telnet, or Web client. All operating parameters are configured using a simple menu-based software. For upgrades or backup, software download can be performed via TFTP.

Space Saving Unit

The Vmux-420 is a compact, 1U high, 17-inch wide unit that can be mounted in a 19-inch rack. It has the smallest footprint of any optimization gateway of equivalent capacity on the market.

Complements Vmux Voice Trunking Gateways

Vmux-420 complement RAD's Vmux family of voice compression (trunking) gateways, providing cellular network managers with a comprehensive, single-vendor solution. While the Vmux-420 optimizes the A-bis/A-ter segments, both the non-encapsulated A (BSC-to-MSC) and E (MSC-to-PSTN) interfaces can also be optimized by the popular Vmux-2100. Compressing the voice traffic by up to 16:1, the Vmux-2100 can dramatically reduce trunking expenditures on BSC-to-MSC and MSC-to-MSC interconnectivity.



Vmux-420 and Vmux-400 optimize both A-bis (BTS-to-BSC) and A-ter (BSC-to-MSC) bandwidth in a point-to-multipoint topology

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Product Details

Uplink (Network) Ports

The Vmux-420 main module provides multiple E1/T1 uplinks and a single Ethernet uplink. A second main module can be installed for uplink redundancy.

E1 Ports

- Number of Ports: 2, 4 or 6
- Compliance: ITU G.703, G.706, G.732, G.823
- Framing: G.732N, with/without CRC-4
- Bit Rate: 2.048 Mbps
- Line Code: HDB3
- Impedance: 120Ω, balanced; 75Ω, unbalanced
- Jitter Performance: As per ITU G.823
- Connector: RJ-45
- Timing: Internal or external (from receive clock of any E1 port)

T1 Ports

- Number of Ports: 2, 4 or 6
- Compliance: ANSI T1.403, AT&T TR-62411, ITU-T Rec. G.703
- Framing: SF, ESF
- Bit Rate: 1.544 Mbps
- Line Code: AMI
- Zero Suppression: B8ZS
- Jitter Performance: Per AT&T TR-62411
- Line Type: Balanced 4-wire, 100Ω
- Connector: RJ-45
- Timing: Internal or external (from receive clock of any T1 port)

Ethernet Port

- Compliance: IEEE 802.3
- Data Rate: 10 or 100 Mbps, half-duplex or full-duplex, auto-negotiation
- Statistics: According to RFC 3638, or RFC 3635
- Range: Up to 100 m on UTP Cat.5 cable
- Connector: RJ-45

User E1/T1 Ports

- Number of Ports: 4, 8 or 12

Same specifications as for E1/T1 Uplink Ports above

Control Port

- Compliance: RS-232/V.24 (DCE)
- Data Rate: 9.6, 19.2, 38.4, 57.6 or 115.2 kbps
- Connector: RS-232

General

- Codec Support:
  - Dynamic Half Rate (HR)
  - Full Rate (FR), Enhanced Full Rate (EFR), Adaptive Multiple Rates (AMR)
- Performance Monitoring: TRAU frame statistics, signaling statistics; monitoring and statistics according to RFC 3638 on Ethernet port
- Diagnostics:
  - Ping on Ethernet ports
  - Local and remote loops on E1/T1 and serial ports
- Physical:
  Height: 4.3 cm/1.7 in (1U)
  Width: 43.5 cm/17.1 in
  Depth: 24.0 cm/9.5 in
  Weight: 7.0 kg/15.5 lb
- Power Supply: Two hot-swappable PS modules for redundancy
- Power Input:
  100 to 240 VAC or 48 VDC

For complete product specifications, please see the data sheet online at www.rad.com.

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