TRINITY convergence

VeriCall™ VoIP Software Framework

Trinity's VeriCall software framework coupled with high-performance processors from Motorola, provide telecommunications equipment manufacturers with a flexible, open architecture VoIP solution. This comprehensive hardware and software approach is designed to reduce product development time, cost, and risk.

VeriCall incorporates the intrinsic software elements to develop robust enterprise and carrier-class VoIP equipment for both wireless and wireline applications. VeriCall offers a comprehensive framework, algorithms, stacks, and protocols to support Motorola's Smart Networks Platform, including the MSC8100 family of DSPs based on StarCore® technology, the PowerQUICC™ family of integrated communications processors, PowerPC® host processors and C-3/C-5 network processors.

VeriCall's published API and algorithm interface specification allows OEMs to seamlessly integrate custom or third-party algorithms, protocols, and control applications into the system. VeriCall is an embedded software framework employing a tightly integrated system-aware architecture. The framework includes media processing, packet processing, system management and control, telephony signaling, gateway call control, data transport, and the integration of these interdependent functions.

Key Benefits

- Open architecture preserves OEM's differentiation and intellectual property investment
- Improves time-to-market and saves OEM's product development resources
- Allows OEMs to leverage applications software across product lines
- Abstracts developer from underlying DSP, allowing for easier code portability

Target Applications

- ► Media Gateways
- ► Trunking Gateways
- ► Softswitch
- ► Media Servers
- ► IP-PBXs
- ► Wireless Transcoders
- ► Wireless Interworking Gateways
- ► Mobile Switching Centers
- ► DSLAM
- ► CMTS
- ► Converged Broadband Switches
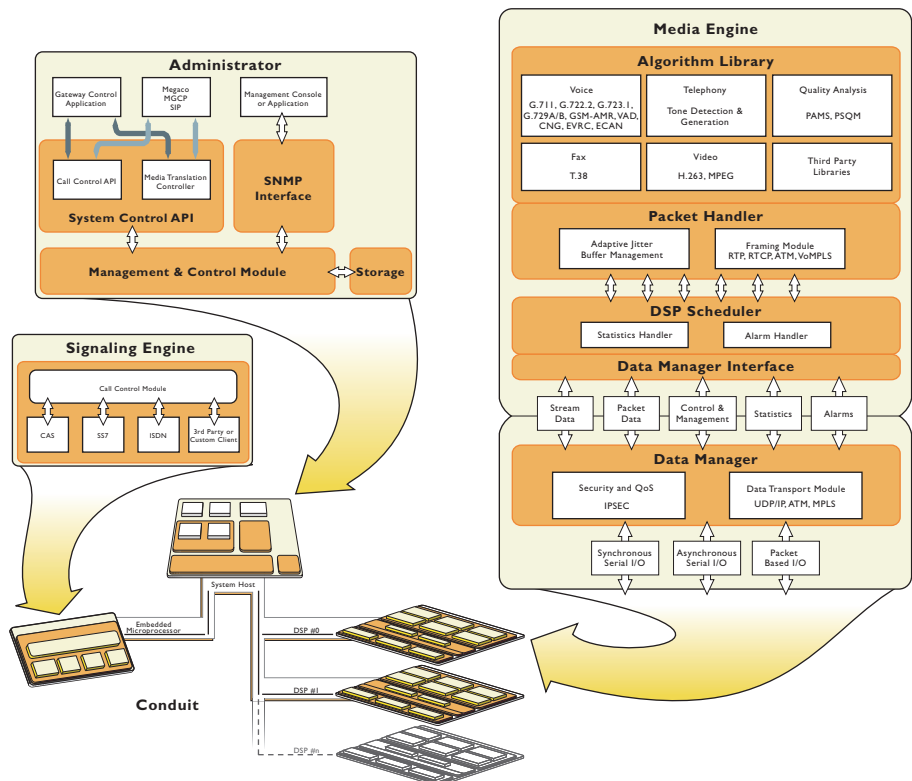
VeriCall System Interfaces

► **Media Engine** - This DSP resident module performs media stream processing, packet handling and data transport.

► **Administrator** - Control plane interface into the application. The system controller-based Administrator is responsible for controlling the media processing and signaling elements within the system. The host API provides easy interface to SIP, Megaco and MGCP gateway call control protocols.

► **Signaling Engine** - The signaling engine is responsible for providing access to PSTN signaling protocols (CAS, SS7, ISDN, V5.2, GR303) and can be implemented on an integrated communications processor or run native on the DSP in highly embedded applications.

► **Conduit** - An inter-module communications interface provides a transport mechanism for the control plane. The Conduit links the Administrator control utility to the Media Engine and Signaling Engine.

VeriCall Features

Media Engine - Voice Coders/Fax

G.711 Appendix 1 & 2	Linear PCM 64 Kbps A Law/mu Law, VAD/CNG, and PLC
G.723.1	MP-MLQ 6.3 Kbps/ACELP 5.3 Kbps
G.726	ADPCM 16, 24, 32, 40 Kbps
G.729 A/B	CS-ACELP 8 Kbps
GSM-AMR	4.75-12.2 Kbps
T.38 Fax Relay	G3 Fax Relay 2.4-14.4 Kpbs
SMV (wideband)	0.8-8.55 Kbps
EVRC	0.8-8.55 Kbps

Media Engine - Voice Processing/Quality Enhancement

Echo Canceller	Per ITU-T G.168-2000 ECAN 10 ms, 16 ms, 32 ms, 128 ms tail sparse window
Voice Activity Detect	Analyzes voice activity to detect silence intervals
Packet Loss Concealment	Per ITU-T G.711 Specification Appendix 1
Comfort Noise Generation	Per ITU-T G.711 Specification Appendix 2
Adaptive Jitter Buffer Manager	Fully adaptive or static; De-jitter and packet reodering

Media Engine - Telephony Algorithms

DTMF Detect and Generate	Per Bellcore GR-506-CORE, TIA 464-B, ITU-T Q.23 and Q.24
DTMF Relay	Per RFC 2833
Call Progress Tone Handling	Per Bellcore GR-506-CORE, ITU-T Q.35

Media Engine - Data Transport

RTP/RTCP	Per RFC 1889 and 3550
UDP	Per RFC 768
IP	Per RFC 791

Signaling Engine - Telephony Signaling Protocols

Channel Associated Signaling: E&M, FXS/FXO Loop Start & Ground Start

Administrator - System Control Functions

'C' Host-based API on PowerPC®, MPC82xx, or Pentium® host processors, designed to provide easy control of system

SIP User Agent

VxWorks® or Redhat Linux® operating system support

Adheres to standard-based SNMP for remote management

Conduit - Control Plane Transport

A highly portable transport mechanism linking the Media Engine, Signaling Engine, and Administrator software elements

Implementations for ethernet, shared memory, CPCI, PCI, RapidIO™ interconnect architecture, proprietary

VeriCall Package	Definition	MSC8101/3 300 MHz	MSC8102 275 MHz
High Density Voice 1	G.711, G.168-2002 Compliant ECAN with 16 ms tail	75	296
High Density Voice 2	G.711, G.168-2002 Compliant ECAN with 128 ms tail	48	168
Premium Voice 1	G.711, G.726, G.729AB, G.168-2002 Compliant ECAN with 128 ms tail	39	108
Premium Voice 2	G.711 (70%), G.723.1A (10%), G.729AB (20%), G.168-2002 Compliant ECAN with 128 ms tail	44	120
Premium Voice & Fax 1	G.711, T.38, G.726, G.729AB, G.168-2002 Compliant ECAN with 128 ms tail	36	96
Premium Voice & Fax 2	G.711, T.38, G.723.1A, G.726, G.729AB, G.168-2002 Compliant ECAN with 128 ms tail	24	88
Wireless Voice 1	G.711, GSM/AMR, G.168-2002 Compliant ECAN with 128 ms tail (options for SMV, EVRC, G.723.1, G.726, G.729AB)	22	88

Learn More

For more information on products from Trinity Convergence, visit www.trinityconvergence.com.

For more information on Motorola's products, visit www.motorola.com/semiconductors.