Entropia™ IV

Entropia IV is the latest high-density System-on-Chip (SoC) addition to the Centillium Voice-over-IP (VoIP) Entropia product family. Entropia IV's embedded proprietary DSP and RISC network processor farms provide industry leading voice processing horse power on a single chip with over 30 GMACs of DSP processing and one GOP of network processing. All delivered at the industry's lowest mW per compressed and uncompressed channel including external SDRAM.

Pin-compatible IC and backward compatible proven Entropia API and Software allow immediate hardware and software switching from Entropia III to Entropia IV, therefore enabling existing Entropia customers to extend their system performance advantages over alternative solutions. Higher density/performance becomes instantly possible with the same field-harden carrier-grade quality, proven rich features, and low power per voice channel.

Like Entropia-III, Entropia IV targets a wide range of advanced convergence applications from fixed and/or wireless access to convergence core media gateways, to Class 4 and 5 switches, to digital loop carriers (DLC), to voice enabled IP routers/SBC, to centralized-VoIP card DSLAM/OLT/ONT's, and to IP private branch exchange (PBX) systems.

Entropia's embedded true system software is field-proven and is now well recognized and valued by OEM customers as it brings the benefits of a plethora of rich IMS 3GN features enabling customers to achieve fastest-time-to-market and lowest development and deployment costs. Designed from the ground up for true convergence next-generation media processing systems, the Entropia IMS-on-a-chip single common software (3GN SW Releases) for multiple and converged applications includes all feature sets encompassing (1) common VoIP for voice/fax/modem/text services, (2) NGN-VoIP, (3) mobile GSM/3GPP, (4) mobile CDMA2000, and (5) Advanced Media Resource Function/Server.

The Entropia IMS-on-a-chip software includes multi-application rich DSP and network protocol features and provides flexible cross-connects and network interworking and transcoding (IP-IP, IP-ATM, and TDM-IP/ATM) with highest voice/service quality and the low delay and channel definitions are uncompromising in included DSP/NP features.

the edge in broadband™

System Block Diagram
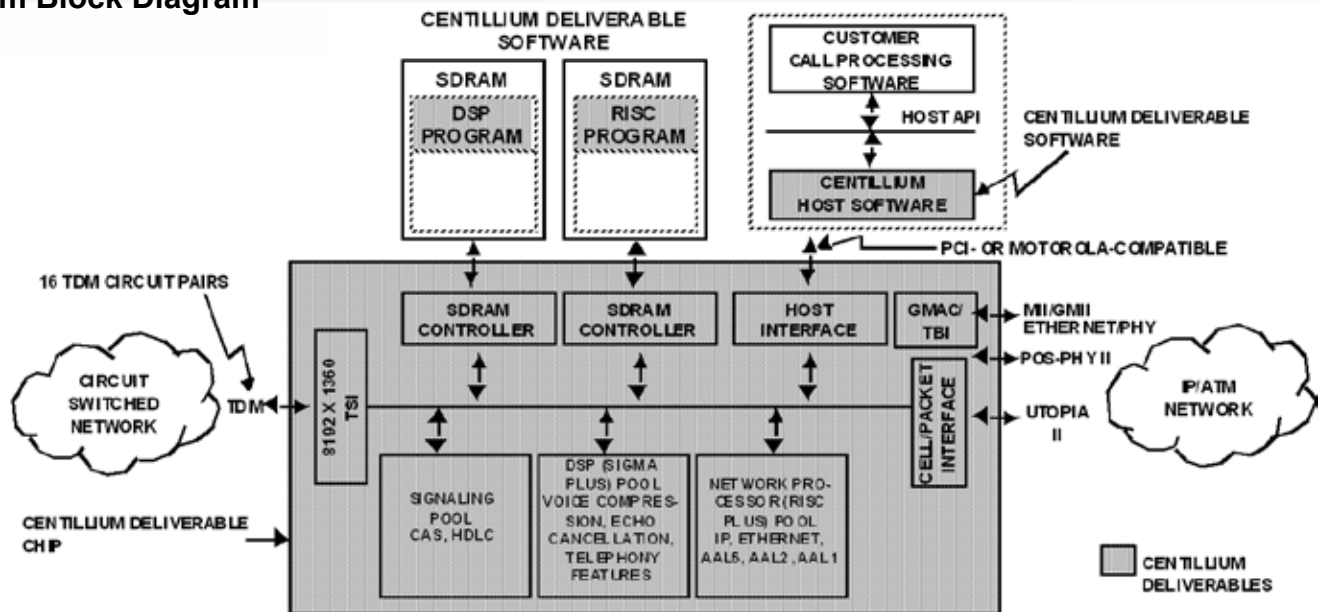
Features

- Embedded DSP and Network packet processors
- Flexibly bridges TDM and IP/ATM VoIP wireless and wireline converged voice calls
- Industry-leading capacity of 1008 G.711 (PCM) VoIP and/or VoATM carrier-class voice channels with 128-ms echo cancellation and extensive telephony features, and over 300 channels of LBR Voice codecs for both Wireline and Wireless with included base features such as channel definition

- Highest integration of digital-signal processors (DSP) and network processors
  - Voice, telephony, and networking bearer functions
  - Signaling (HDLC, CAS, CCS)
  - Control processing and transport
- Highly scalable architecture for gateway designs
- Standards-compliant interfaces
  - TDM: T1, E1, MVIP, HMVIP, H.100, and H.110 (8192 x 1360 embedded TDM TSI)

CENTILLIUM COMMUNICATIONS

Entropia™ IV..... CT-GWC6672 VoIP SoC

- - Packet: Utopia-II, POS-PHY II, GMII or MII
  - - Host: PCI or Motorola processor
- Standards-compliant software
  - - 3GPP, 3GPP2, ITU, IETF, and ATM-Forum
- Voice compression codecs and features
  - - G.711 (&A1/2), G.726, G.729A/B, and G.723.1/A
  - - CDMA/CDMA2K 3GPP2: EVRC, EVRC-B and QCELP13K
  - - GSM/WCDMA 3GPP: NB-AMR, GSM-FR, and TFO
- Echo cancellation
  - - Adaptive 128-ms Tail Length
  - - G.168-200n and G.165 third-party certified
  - - Fast convergence time
  - - World class, field proven
- Fax, Modem, and text-phone
  - - Fax, modem, text tone/signal detection and revert (pass through/clear)
  - - T.38 Fax Relay over IP
- Jitter buffer
  - - Up to 320-ms adaptive jitter buffers – programmable per channel
- Telephony and class features
  - - Comprehensive tone generation and detection: DTMF (U.S.A. and Japan), MF R1/R2, COT, call progress tones with national variations
  - - Announcement with dynamic loading, recording and playback, unlimited length with server option
  - - Multi-way conferencing, Caller ID with national variations, and Lawful Interception (CALEA)
  - - Packet loss concealment
  - - Voice activity detection (VAD)
  - - Silence suppression (SID)
  - - Comfort noise generation (CNG)
- High performance
  - - Optimized for Low Delay end-to-end voice calls
- Wireless and wireline voice network packet processing and inter-networking
  - - Standards-compliant RTP/UDP/IP and Ethernet

- - Encapsulation for VLAN, and IPv6
  - - RFC 1483 IPoAAL5, VLAN tagging
  - - IETF RFC 2833 DTMF Tone Relay, CAS, and embedded RTCP transport
  - - Packet-to-Packet interworking
- Signaling, control processing, and transport
  - - Programmable CAS, CCS event filtering
  - - Embedded HDLC controller
  - - Signaling and Control transport, including ARP and OAM
  - - AAL2 Type 3 Messages, over-subscription, SSTED/SSAR and Frame Mode Data
  - - AAL1 NxDS0 (CES) with CAS
- Inter-networking and cross-connect flexibility
  - - TDM-DSP-NP-PKT: TDM/Packet (PKT) bridge
  - - TDM-DSP-TDM: TDM echo cancellation and telephony
  - - TDM-NP-PKT: low-delay clear channel data
  - - TDM-HDLC-Host: V5 TDM signaling
  - - PKT-NP-PKT: Packet-to-packet interworking AMR ↔ G711, G729 ↔ G711
  - - PKT-NP-DSP-PKT: Packet-to-packet interworking with transcoding
- CESoPSN (Circuit-emulation-services over packet -switched network) for pseudo-wire emulation (PWE)
- Designed for advanced end-system models and ease of system software integration
  - - Redundancy support: 1:1 or 1:N
  - - Packet-to-packet interworking with or without transcoding, TDM and packet digit collection
  - - Dynamic updates of call features, parameters
- Advanced API (application programming interface)
  - - Comprehensive and programmable high-level API
  - - Portable ANSI 'C', modular and RTOS independent
  - - Abstracted OS and hardware layers
  - - High-level compact API provisioning
  - - Unmatched ease of integration and flexibility on a per-channel basis
  - - Advanced statistics, diagnostics and signal monitoring
  - - Portable on Linux

Product Components Information

Deliverable	Format	Functions	Comments
CT-GWC6672 device	772 BGA (31 x 31 mm)	Hardware functions	
Embedded DSP Firmware	DSP executable code	Voice compression, echo cancellation and telephony functions	Loaded upon power up
Embedded RISC software	RISC executable code	Networking functions	Loaded upon power up
Host API software	'C' source code	Host API, device drivers, Switch fabric management, and device resource management	Code is to be integrated with customer software running on customer host processor

Note: This product brief describes the capabilities of the Entropia IV CT-GWC6672 device. Some of these features are still under development. Please contact Centillium Communications for product availability.

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