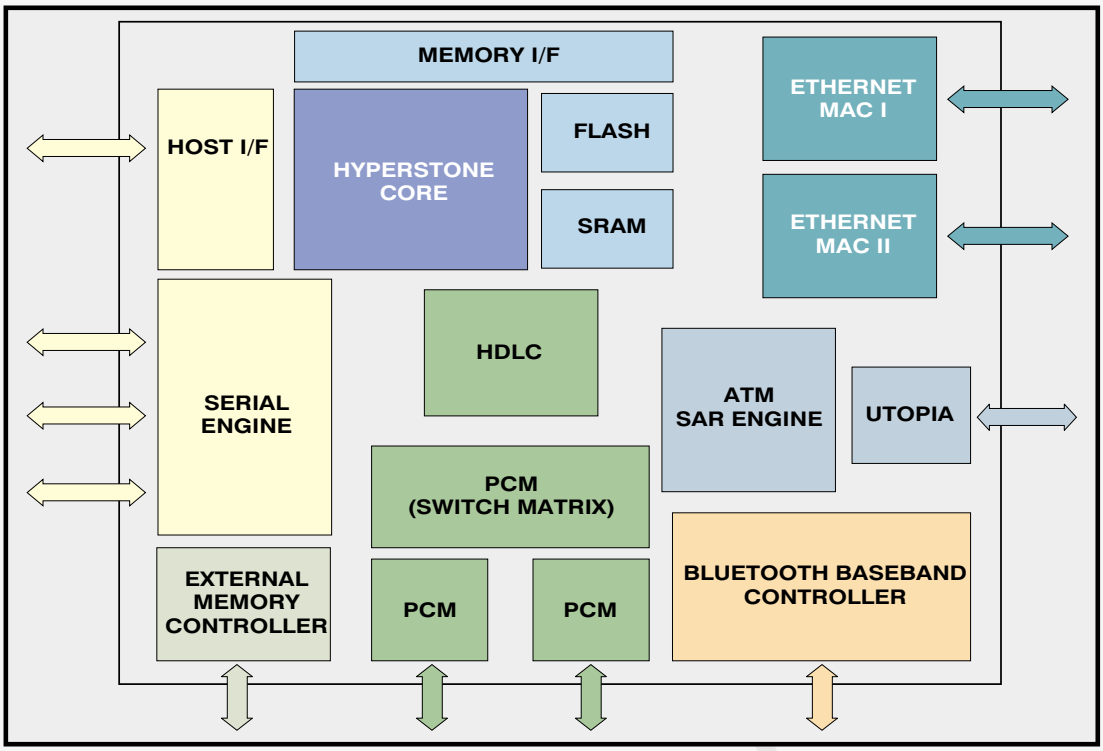
A flexible, yet highly integrated system controller for Integrated Access Devices

ECIAD (HyNet1) is a sophisticated system controller for integrated communications devices. It is the enabling building block for the delivery of sophisticated, yet low cost, customer premises equipment. The IC supports a wealth of wireless and wire-line communication interfaces, together with ample on-chip resources to facilitate true single-chip system implementation. The chip integrates a 32 bit RISC/DSP, 256K of on-chip RAM and 256K of on-chip flash memory. Deliberately, the ECIAD IC does not integrate the mixed-signal physical layer communication devices, thus resulting into a very compact and silicon efficient implementation. With a target price of 12 EUR in volume, low cost customer premises equipment can be assembled using ECIAD and a handful of application specific physical layer interface devices.



Supported interfaces:

- Bluetooth V1.1 (RF serial)
- ATM (UL1)
- Dual Ethernet MAC (MII) interfaces
- Dual PCM highways
- Dual configurable serial links (UART, SPI, I^2C, I^2S)
- Serial Codec interface (AC97)
- Host (microprocessor) interface

Communication among the high bandwidth interfaces and the on-chip processor is facilitated by an optimized packet bus topology, which minimizes data latency and processor overhead. The integration of "layer-2" communication interfaces yields an IC implemented in full digital technology. The result is the cost efficient implementation of a *range of applications* and devices: Instead of increasing the cost of the core IC with "Silicon hungry" analog cores, physical layer transceivers are integrated at the system level through standard interfaces, taking advantage of the cheapest device available at the time of system integration.

Processing capabilities:

- E1-32XS RISC/DSP core from Hyperstone with 16K L1 cache, providing up to 180 MIPS/MACs (@180MHz)
- 256K (64Kx32) on-chip fast RAM
- 256K (64Kx32) on-chip flash
- Integrated DRAM controller, supporting up to 128M off-chip low cost SDRAM for large S/W applications.
- Integrated Bluetooth controller
- Integrated HDLC controller (4 channels)
- Fast serial controller (PCM voice and data)
- Integrated ATM and AAL5 controllers

Due to it's inherited flexibility, ECIAD is suitable for a multitude of applications, without any compromises in cost, system performance or time to market. ECIAD is ideally suited for advanced residential CPEs. Combined with appropriate physical layer transceivers, it supports ALL types of existing and emerging access networks (ISDN, xDSL). ECIAD's abundant RISC/DSP processing capabilities allow the implementation of almost any kind of voice and data services and can host a wealth of communication applications. ECIAD's low cost and small footprint enables the cost-efficient implementation of "small" devices (such as embedded networked controllers for white appliances). Bluetooth support -combined with Ethernet and xDSL interfaces- facilitates the implementation of a range of Bluetooth base station devices. This includes daisy-chained devices for the cost efficient deployment of a wireless network (large building coverage) or stand-alone base stations, for wireless internet access via ISDN or xDSL.

Target applications:

- Intelligent Residential gateways and integrated access devices.
- Small office advanced PBXs and routers.
- Bluetooth base stations and gateways.
- Embedded, networked, internet enabled appliances
- Set-top boxes with integrated broadband communication interfaces

Application development:

Extensive support for software development is provided through the already established toolchain, including a GNU C/C++ compiler and linker, Source and System level Debugger, DSP library, library Manager and Profiler. A small footprint real time kernel, together with 3rd party S/W (Java K VM, HyNetOS, IP/ATM communication protocol stacks, echo and noise cancellation) provides a solid basis for application development. GDT supports ECIAD with a full range of native drivers for all processing modules and communication interfaces.

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