

APEX Integrated Content Addressable Memory (CAM)

Greatly Accelerates Applications Requiring List and Data Searches

APEX CAM Applications

- Ethernet address look-up
- Internet protocol filtering
- Data compression
- Pattern recognition
- Cache tags
- Fast look-up for routing tables
- High-bandwidth packet searches for data switches, firewalls, bridges, and routers

APEX CAM Architecture

- 32-word x 32-bit CAM in each ESB
- Programmable width and depth expansion
- Faster access time (4 ns) than discrete CAM
- ESBs can be cascaded for wider and deeper CAMs

CAM Accelerates Fast Searches

Content-addressable memory (CAM), a memory technology developed from random access memory (RAM), accelerates applications requiring fast searches of databases, lists, and patterns. CAM simultaneously compares input data against an entire list of pre-stored entries in a single clock cycle, which provides an extremely significant reduction in search time when compared to RAM.

APEX Devices: The Only PLDs with CAM

Altera's APEX™ devices, the only programmable logic devices (PLDs) to offer integrated CAM, have up to one million gates (2.67 million system gates) and allow for complete System-on-a-Programmable-Chip™ integration. Designers can use the

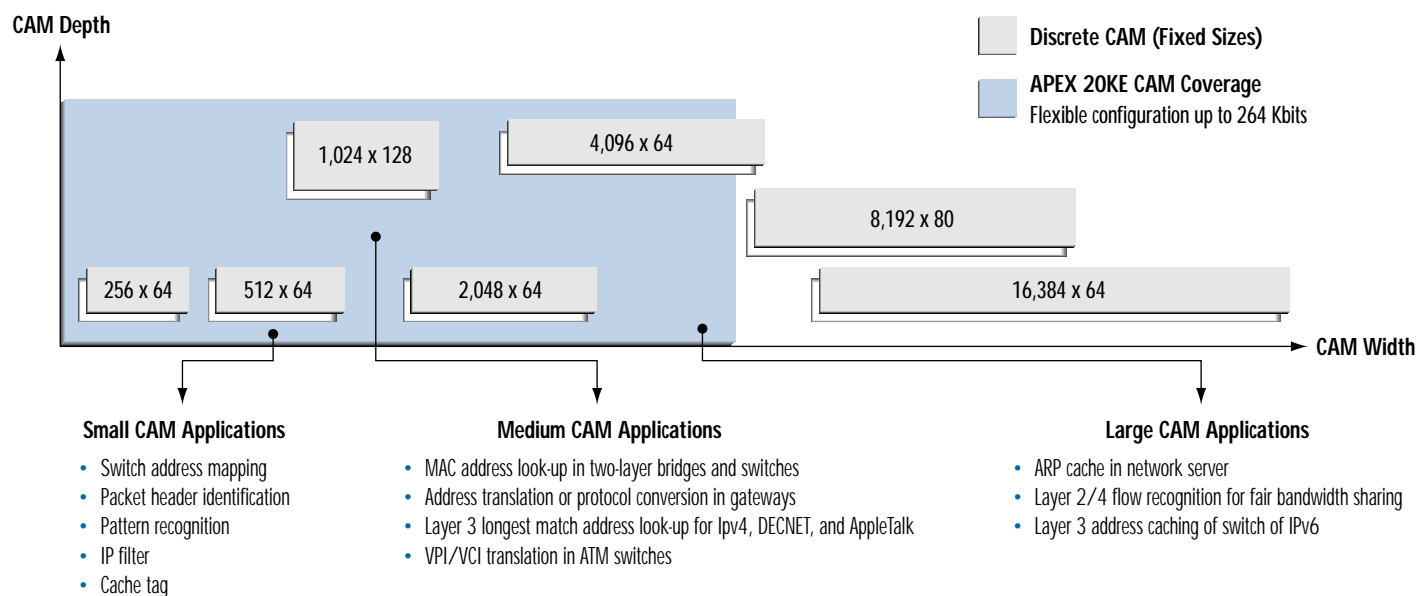
APEX CAM to simplify applications that require the searching of lists and tables of data. The APEX integrated CAM provides significant system performance enhancements and allows for more efficient resource utilization in the system design.

CAM Available in Each APEX Embedded System Block

The embedded system block (ESB) is at the heart of the Altera® APEX architecture. One APEX ESB can be configured to be a 32-word x 32-bit CAM, and multiple ESBs can be cascaded together to implement wider and deeper CAMs. The APEX CAM architecture provides great flexibility because the designer can create a wide range of CAM depths or widths.

APEX Device Densities and ESB Resources							
	EP20K100E	EP20K160E	EP20K200E	EP20K300E	EP20K400E	EP20K600E	EP20K1000E
Maximum System Gates	263K	404K	526K	728K	1,052K	1,537K	2,670K
Typical Gates	53K - 106K	82K - 163K	106K - 211K	147K - 293K	213K - 423K	311K - 618K	541K - 1,073K
Logic Elements	4,160	6,400	8,320	11,520	16,640	24,320	42,240
ESBs	26	40	52	72	104	152	264
Maximum CAM Bits	26,624	40,960	53,248	73,728	106,496	155,648	270,336

APEX Provides Flexible CAM Configurations to Meet Market Demands



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CAM Applications

The superior performance advantages of CAM have attracted much attention from the communications industry.

The CAM architecture is ideally suited for high-level pattern matching and data searching operations. Because APEX devices provide the superior performance of a single-chip solution as well as greatly enhanced size and configuration flexibility, the APEX CAM provides significant advantages over discrete CAMs.

Advantages of APEX Integrated CAM

By eliminating on-/off-chip and PCB board delays, the APEX integrated CAM provides greatly enhanced system performance over discrete CAM. The advanced APEX process technology also enables a 4x to 5x faster CAM access time than discrete CAMs. With the programmable CAM configuration

APEX Integrated CAM Provides Superior Performance

	Discrete CAM	APEX CAM
Access Time	20 ns	4 ns
System Performance	Multi-chip solution 28.2 ns	Single-chip solution 4.9 ns

flexibility, APEX devices provide a true programmable solution to meet the market demand for CAM.

Contact Altera Today!

To determine which APEX device will work best for you, contact your local Altera sales representative or visit the Altera web site at <http://www.altera.com/apex>.