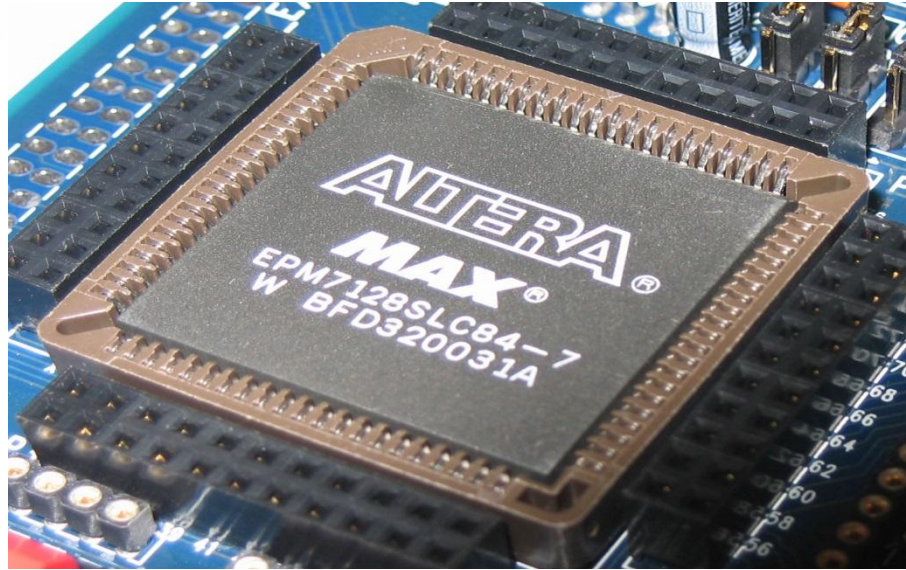


Programmable Logic. Types.



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Izhevsk 2017

Programmable Logic

- The maximum number of gates in an FPGA is currently around 500,000 and doubling every 18 months.
- What all of this means is that the price of an individual element is rapidly approaching zero

Types of programmable logic

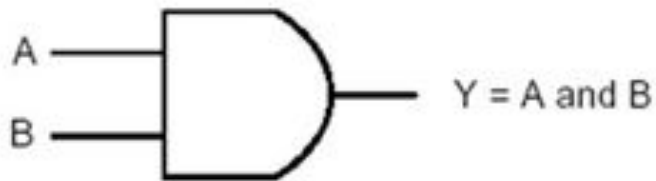
- PLD - Programmable Logic Devices
- CPLD - Complex Programmable Logic Devices
- FPGA - Field Programmable Gate Arrays

PLD - Programmable Logic Devices

- These were the first chips that could be used to implement a flexible digital logic design in hardware.
- Other name:
 - 1. Programmable Logic Array (PLA);
 - 2. Programmable Array Logic (PAL);
 - 3. Generic Array Logic (GAL).

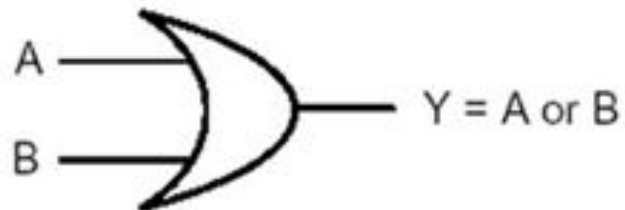
Basic logic gates

And Gate



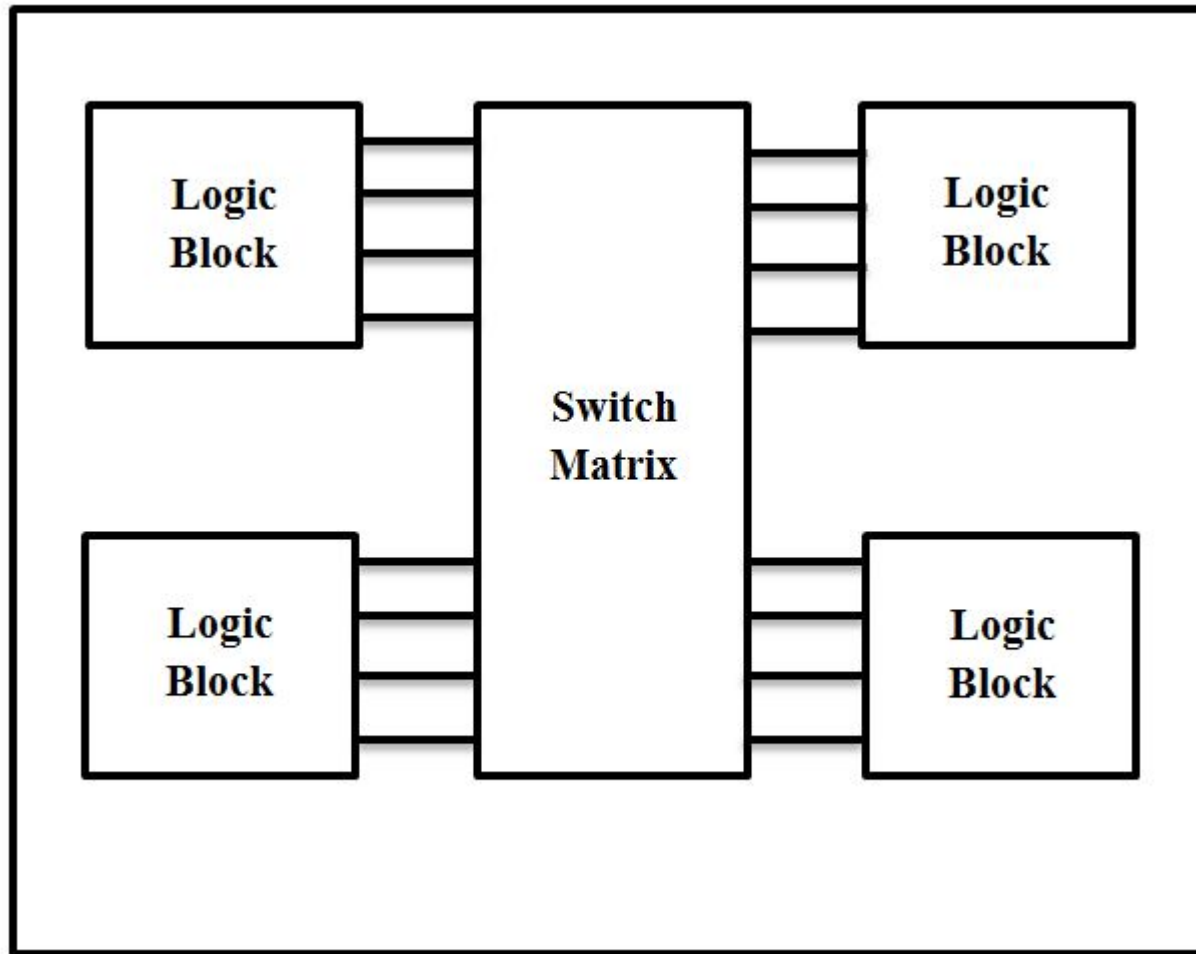
A	B	$Y = AB$
0	0	0
0	1	0
1	0	0
1	1	1

Or Gate

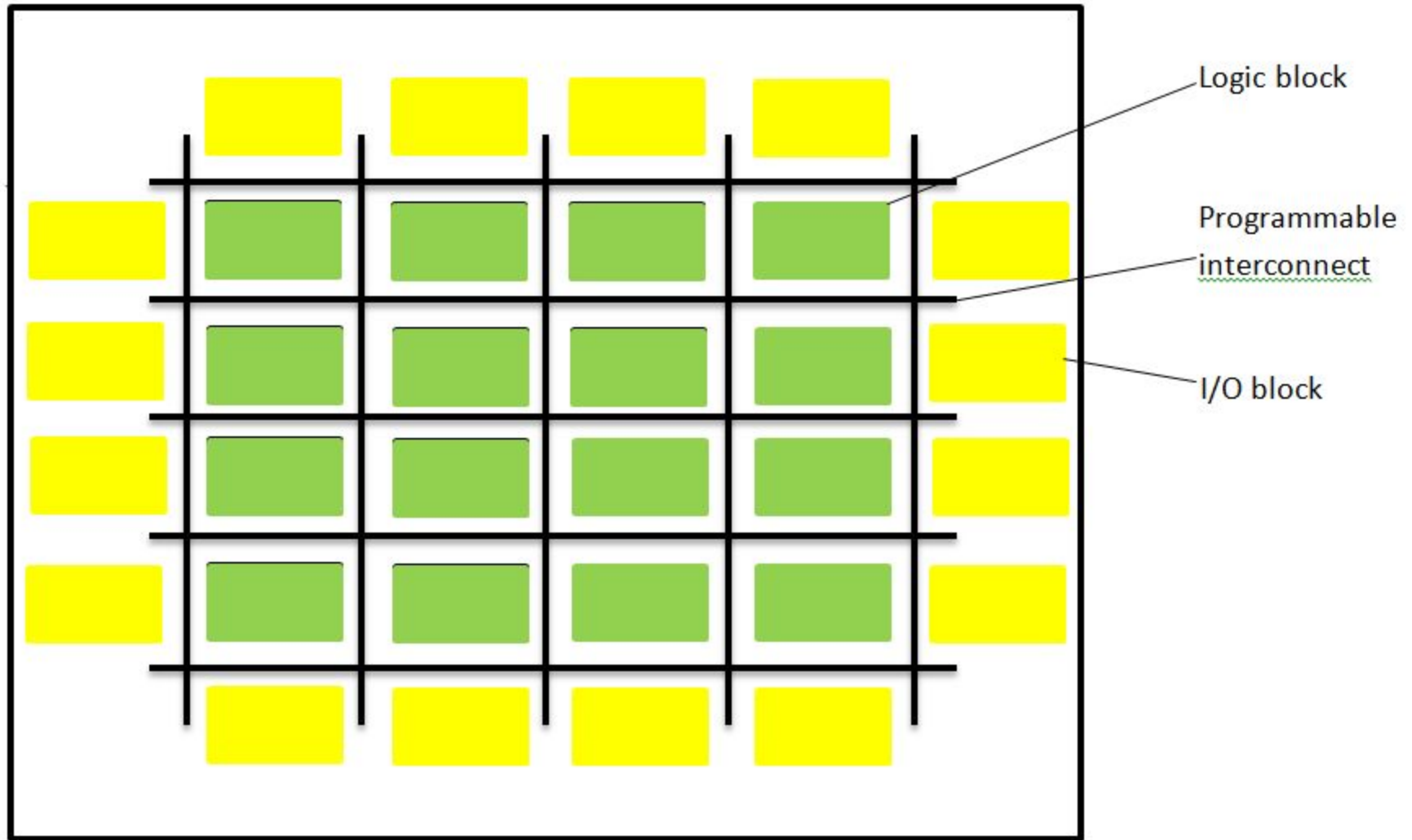


A	B	$Y = A + B$
0	0	0
0	1	1
1	0	1
1	1	1

CPLD - Complex Programmable Logic Devices



FPGA - Field Programmable Gate Arrays



Conclusions

- CPLDs can hold larger designs than PLDs.
- CPLDs have been chosen over FPGAs whenever high-performance logic is required.
- Delay through a CPLD (measured in nanoseconds) is more predictable and usually shorter.
- The architecture of an FPGA is much more flexible than that of a CPLD.
- FPGAs are usually denser (more gates in a given area) and cost less than their.