

# [The applications need a memory, networking chip such](https://assignbuster.com/the-applications-need-a-memory-networking-chip-such/)

The importantdesign challenges of IoT are power efficiency, incompatible interferences andcompatibility with new processors. These design constraints can be addressedwith a Field Programmable gate array (FPGA). FPGA provide smooth interface withthe outside world, low power solutions and lowest latency which are ideal forIoT applications. FPGA can connect with storage devices such as memories whichalso allow for Bluetooth communication, Ethernet and wireless components.

Mostof the IoT applications need a memory, networking chip such as BLE, Wifi, Zigbee, processor core and a controller to actuate external devices. An FPGA caninteract with memory/storage devices through serialiser/deserialiser interfaces(SERDES)12. FPGA take HTTP request packet received from a wireless Ethernetcomponent and decode its request, fetch/get required information from memoryand send back the requested result back through the Ethernet devices. The FPGA can bea replacement for the processor core in the IoT .

If we require higher level ofprocessing , the FPGA can be coupled with Advanced RISC Machines (ARM)processors to get advantage of high level software functions such as webservers. FPGA is a programmable special purposeprocessors. It can handle signals at its input pins, process this signals andsend the signals on its output pins.  The sensor nodesmay rely on FPGAs, either based upon standalone platforms or as a combinationof FPGA and microcontroller. The low power optimized FPGAs can improve thecomputation of several types of algorithms in terms of power consumption andspeed if we compare with the microcontrollers of commercial sensor nodes. Moreover the architectures based on the combination of microcontrollers andFPGA can play a major role in the future of sensor networks.

They showoutstanding results in the processing capabilities like strong cryptography, data compression 13, and self-testing. 14