Arria 10 IDK OpenCL BSP

OpenCL

```
__kernel void sum
(    __global float *a,
     __global float *b,
     __global float *y)
{
     int gid = get_global_id(0);
     y[gid] = a[gid] + b[gid];
}
```

ALTERA
PREFERRED BOARD FOR
OpenCL™

ReFLEX CES OpenCL Board Support Packages (BSP) enables programming our Arria 10 Instant Devkits using OpenCL language thru Altera SDK for OpenCL.

ReFLEX CES strongly supports OpenCL on FPGA, and introduces "IDK OpenCL bundles", ready to use on PCIe Arria10 FPGA-based hardware accelerator and offers the user a quick way of implementing complex parallel algorithms targeted on our FPGA accelerators.

Why OpenCL?

OpenCL provides the user with a high level language, enabling massive parallel description of his design. This open standard, royalty free language offers a homogenous environment to address CPU, GPU and FPGA accelerators.
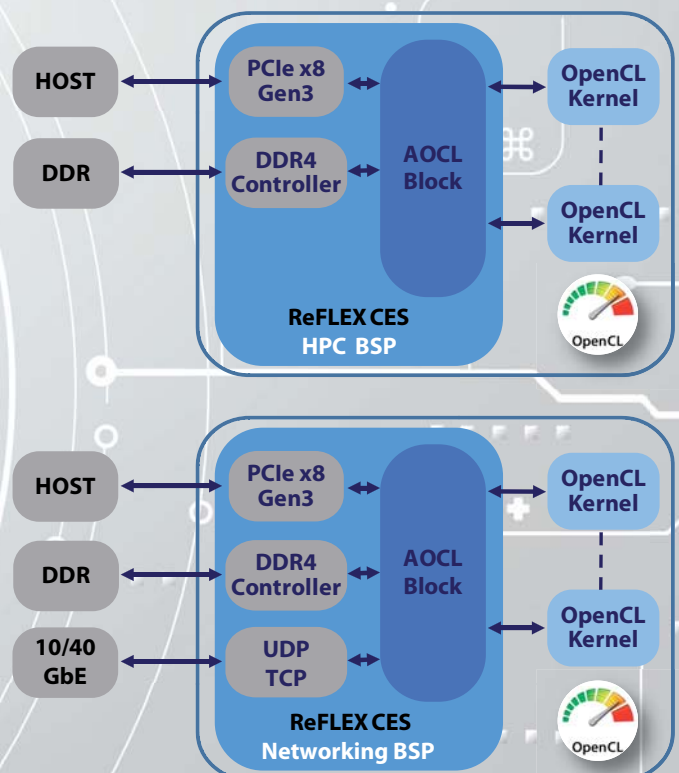
OpenCL abstracts the hardware layer from the programmer and allows him, even with little or no FPGA development skills, a quick and easy way to run his algorithms on a 100% FPGA accelerator target.

High Performance Computing BSP

This BSP offers DDR4 and PCIe support. This is the minimum resources required for HPC applications

HOST — PCIe x8 Gen3 — AOCL Block — OpenCL Kernel
DDR — DDR4 Controller — AOCL Block — OpenCL Kernel
ReFLEX CES HPC BSP

Networking BSP

ReFLEX CES offers a networking extension, integrating a low latency UDP/TCP IP for networking and latency critical networking applications
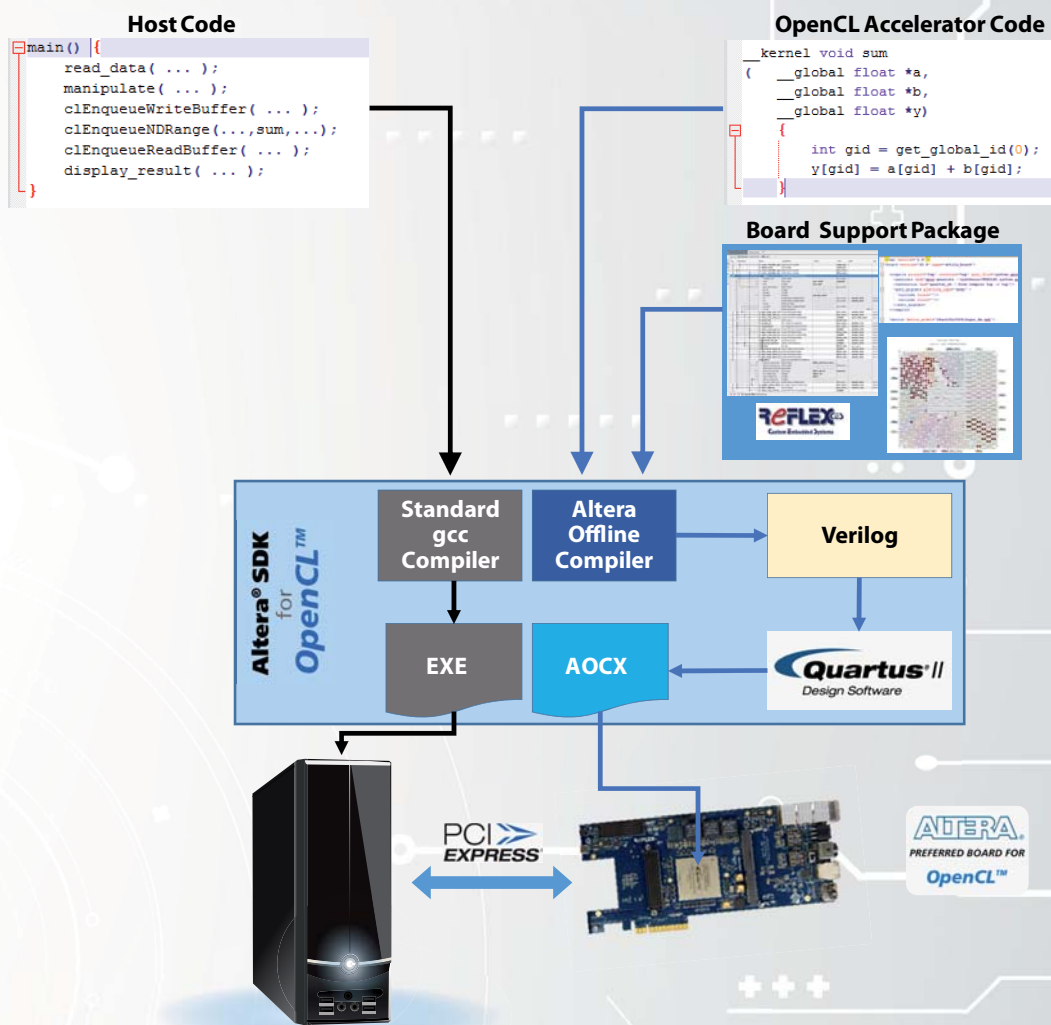
HOST — PCIe x8 Gen3 — AOCL Block — OpenCL Kernel
DDR — DDR4 Controller — AOCL Block — OpenCL Kernel
10/40 GbE — UDP TCP — AOCL Block
ReFLEX CES Networking BSP

Host Code

```
main() {
    read_data( ... );
    manipulate( ... );
    clEnqueueWriteBuffer( ... );
    clEnqueueNDRange(...,sum,...);
    clEnqueueReadBuffer( ... );
    display_result( ... );
}
```

OpenCL Accelerator Code

```
__kernel void sum
(   __global float *a,
    __global float *b,
    __global float *y)
{
    int gid = get_global_id(0);
    y[gid] = a[gid] + b[gid];
}
```

Board Support Package

Altera® SDK for OpenCL™

| Standard gcc Compiler | Altera Offline Compiler | Verilog |

EXE | AOCX | Quartus II Design Software

PCI EXPRESS

ALTERA PREFERRED BOARD FOR OpenCL™

The OpenCL bundle kit content:

- Arria 10 Instant DevKit (Attila or Alaric, see ordering information)
- OpenCL BSP (Board Support Package) based on Altera SDK for OpenCL
- Functional OpenCL Example designs

- Quartus II DKE license (Development Kit Edition Software) One-year evaluation
- Altera SDK for OpenCL license
- 6 months warranty and support

ReFLEX CES Hardware:

Attila Instant DevKit:

- PCIe (Gen3 x 8) board based on ARRIA 10 GX 660KLE or 1150KLE versions (F40 package)
- 4GB DDR4 SODIMM
- See Attila Instant DevKit datasheet for complete interfaces description

Alaric Instant DevKit:

- PCIe (Gen3 x 4) board based on ARRIA 10 SoC 660KLE version (F34 package).
- 2 banks of 2GB DDR3 on board
- See Alaric Instant DevKit datasheet for complete interfaces description

Ordering information and kit content:

Part number	Description
RXCA10X0000F40-BSP00B :	Attila HPC OPENCL BSP + OpenCL SDK / Quartus II DKE licenses (available now)
RXCA10X0000F40-BSP00C :	Attila Networking OPENCL BSP + OpenCL SDK / Quartus II DKE licenses (available Q4'2015)
RXCA10S0000F34-BSP00B :	Alaric HPC OPENCL BSP + OpenCL SDK / Quartus II DKE licenses (available now)
RXCA10S0000F34-BSP00C :	Alaric Networking OPENCL BSP + OpenCL SDK / Quartus II DKE licenses (available Q4'2015)

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[RXCA10S0000F34-BSP00E](#) [RXCA10S0000F34-BSP00D](#)