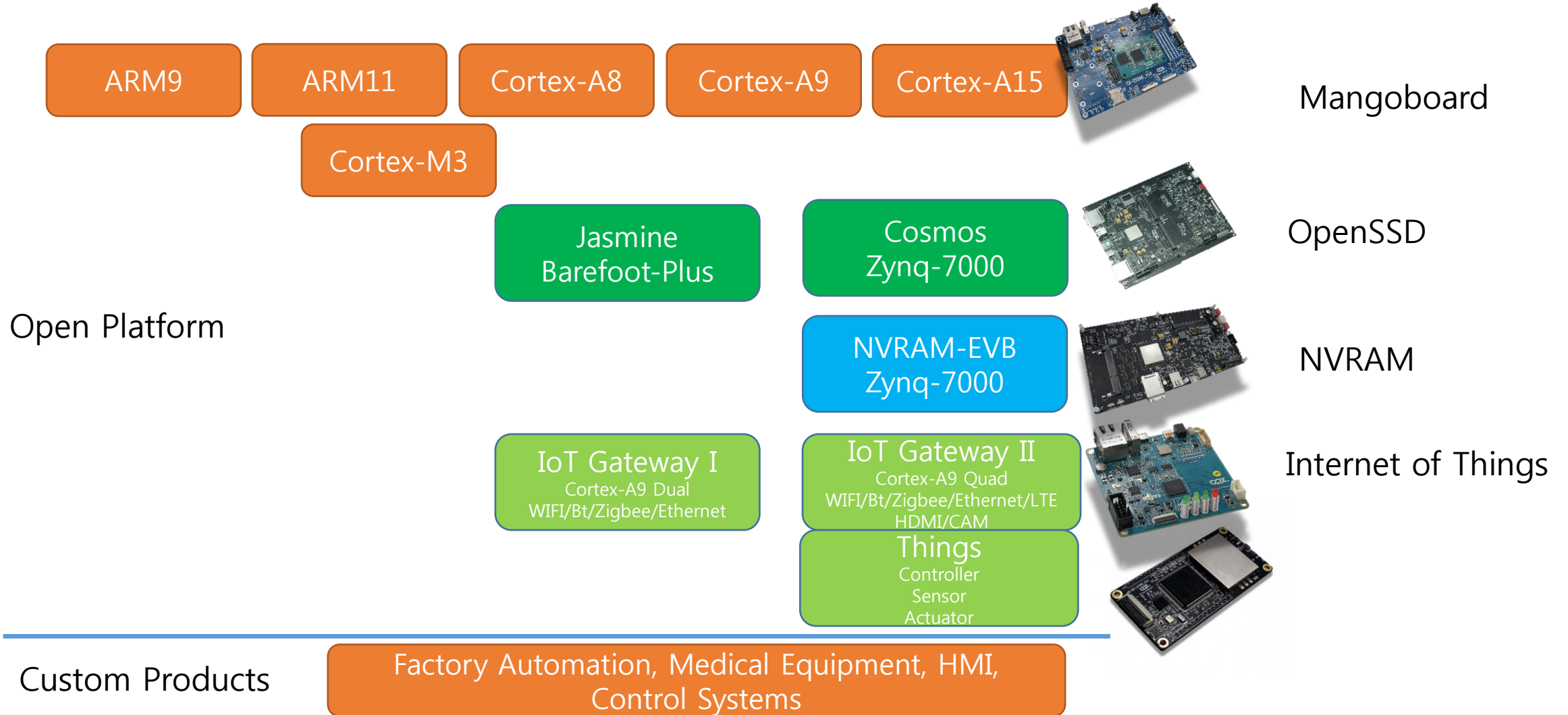


CRZ Technology

Cosmos OpenSSD Platform

Sunho Park

Company Introduction



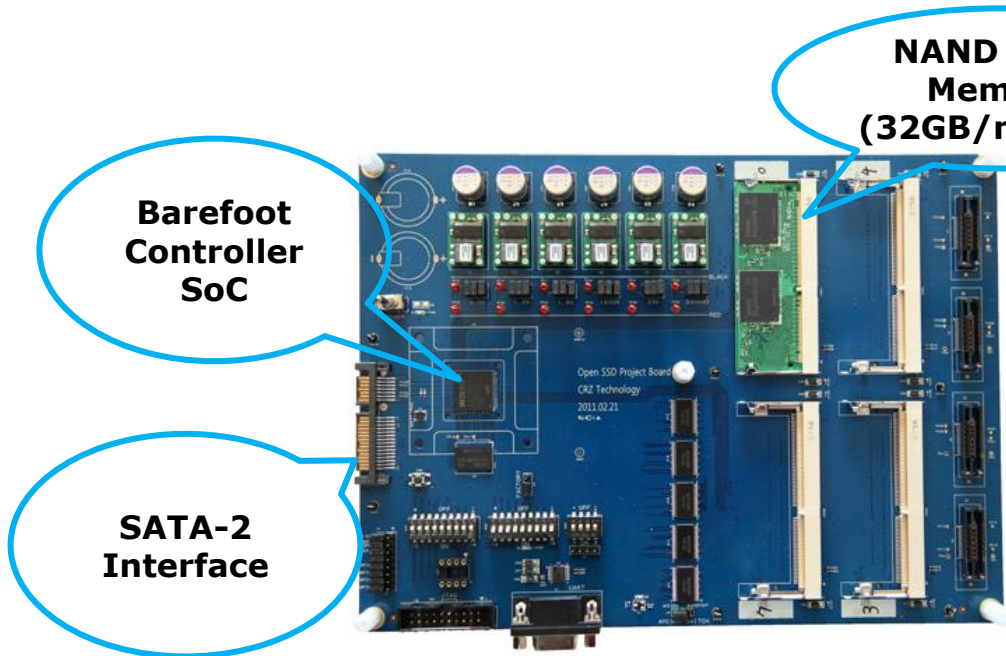
OpenSSD Project

- Open-source SSD platform for research and education on the SSD technology since 2011
 - <http://www.openssd-project.org>
- Provides an “OpenSSD platform” for developing SSD firmware, controller hardware, and host software
- Contribution from Indilinx (later merged to OCZ), SKKU (Sungkyunkwan University), HYU (Hanyang University), etc.
- Hardware design and production from CRZ Technology

OpenSSD Project History

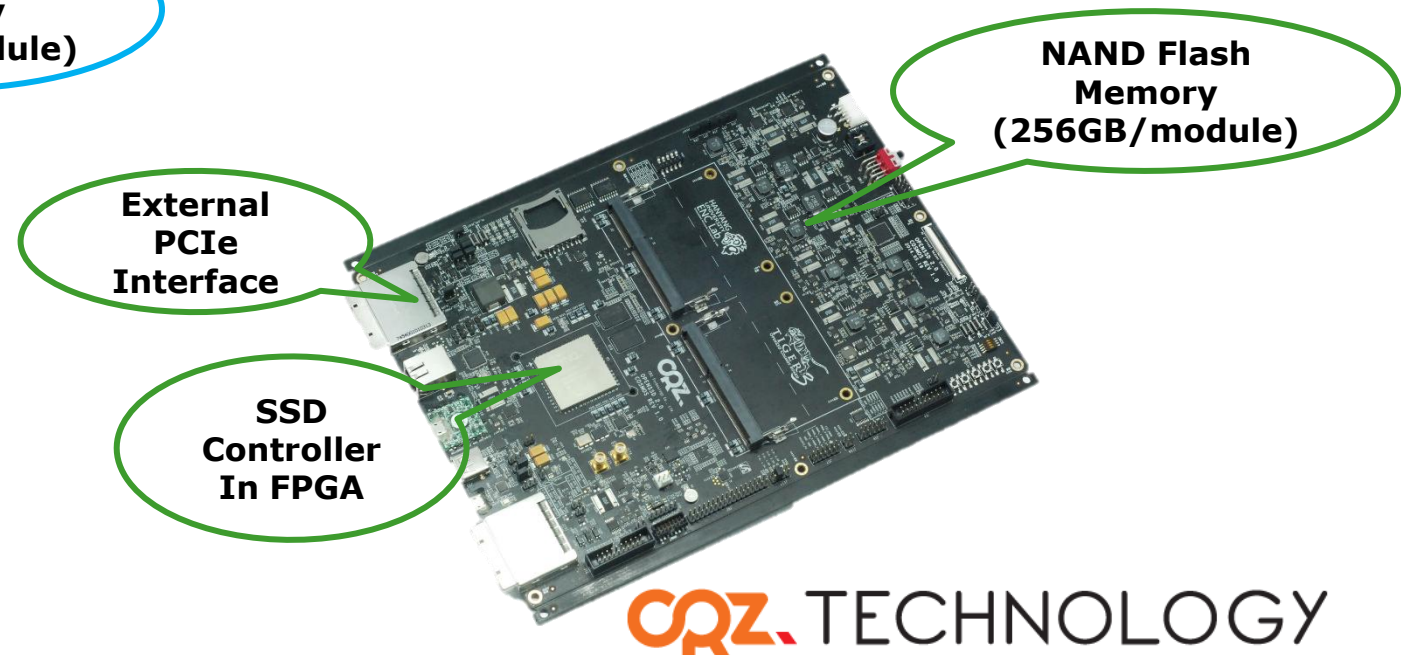
Jasmine OpenSSD (2011)

- Indilinx Barefoot-Plus SSD Controller
- Firmware from SKKU VLDB Lab
- SATA-II, 32GB x4 Flash Modules



Cosmos OpenSSD (2014)

- HYU Tiger3 SSD Controller (in Xilinx Zynq-7000 FPGA)
- Firmware : HYU ENC Lab, SKKU VLDB Lab
- PCIe Gen2 x8, 64/128/256GB x2 Flash Modules
- Auxiliary interface : GBE, USB, UART



Comparison among the Platforms

	Jasmine OpenSSD	Cosmos Prototype (Tiger2)	Cosmos OpenSSD (Tiger3)
SSD Controller	Indilinx Barefoot (SoC)	HYU Tiger2 (FPGA)	HYU Tiger3 (FPGA)
Year	2011	2012	2014
Host Interface	SATA-2	PCIe Gen1.1 (AHCI Subset)	PCIe Gen2 (AHCI Subset)
Storage Capacity	128 GB	512 GB	512 GB
NAND Data Interface	Asynchronous	Asynchronous	Synchronous
DRAM Capacity	64 MB	512 MB	1 GB



OpenSSD Project wiki



The screenshot shows a web browser window displaying the OpenSSD Project wiki page. The browser's address bar shows the URL http://www.openssd-project.org/wiki/The_OpenSSD_Project. The page title is "The OpenSSD Project". The main content area contains the following text:

The OpenSSD Project is an initiative to promote research and education on the recent SSD (Solid State Drive) technology by providing easy access to *OpenSSD platforms* on which open source SSD firmware can be developed. Currently, we offer an OpenSSD platform based on the commercially successful Barefoot™ controller from [Indilinx Co., Ltd.](#) This site is also intended to be a forum to share various simulators, tools, and workload generators and traces related to SSDs, among researchers in academia and industry.

Navigation tabs include: [page](#), [discussion](#), [view source](#), and [history](#).

Left sidebar navigation:

- navigation
 - Home
 - Downloads
 - Events
 - Recent changes
 - Random page
 - Help
- forum menu
 - Forum
 - Search
 - Today's Posts
- search
 - Go
 - Search
- toolbox
 - What links here
 - Related changes
 - Special pages
 - Printable version
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- 2 Events
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Section: OpenSSD Platforms

Note: A new OpenSSD platform is coming this year...

We are preparing the second OpenSSD platform called Cosmos. The Cosmos OpenSSD platform is based on the PCIe interface and will debut in the [Flash Memory Summit](#) in August, 2014. So, stay tuned!

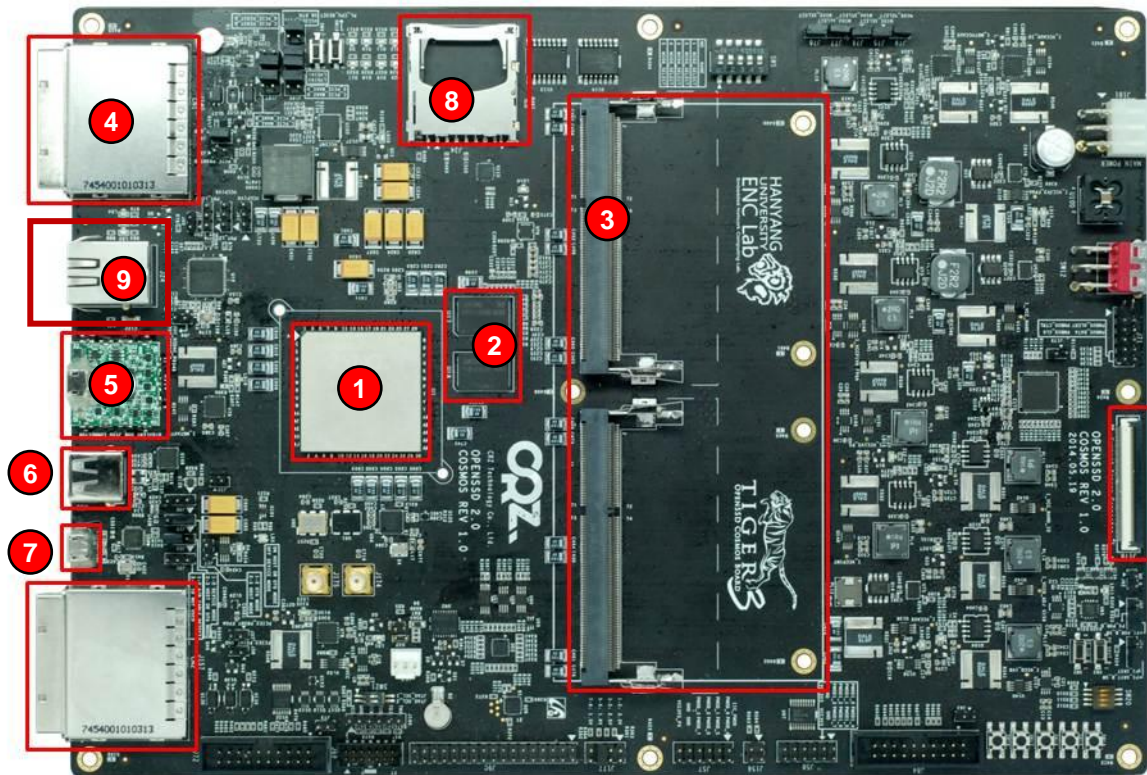
Cosmos OpenSSD Platform

Coming soon...

Jasmine OpenSSD Platform

<http://www.openssd-project.org>

Cosmos OpenSSD Platform Board



No.	Description
1	Xilinx Zynq-7000 (HYU Tiger3 Controller)
2	DDR3 SDRAM 1GBytes
3	NAND Option Module Connectors (2 SODIMM)
4	External PCIe Gen2 x8 1port
5	USB JTAG (Digilent)
6	USB-UART
7	USB 2.0 Host/Device
8	SD Card
9	Gigabit Ethernet Connector

Open Platform...

- Sources will be available soon at the OpenSSD webpage
- Sources could be updated by other users except us (welcome all the time!)
- And more activities will be posted to the webpage as well

Future Topics...

- Flash memory technology
- New ideas in SSD technology
- Participation from industries and research groups
- Direction of evolution of OpenSSD?

Thank you

For further information,
visit <http://www.openssd-project.org>