



OPEN
Compute Project

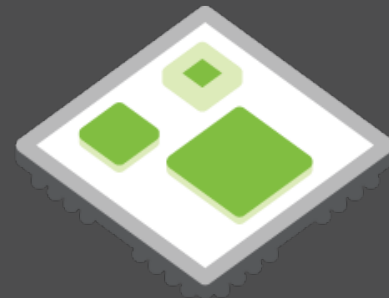
Chiplet Design Exchange (CDX)

Jawad Nasrullah, zGlue Inc: Alex Wright, Ayar Labs

ODSA Workshop

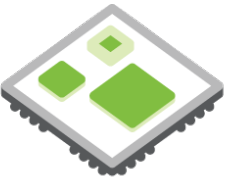
12/18/2019

Consume. Collaborate. Contribute.



Outline

- Background and Charter
- Chiplet Info File Formats
- Chiplet Catalog
- RFC for Power Model and Virtual Prototyping
- Call for Participation



Background

A standard machine-readable format for Chiplet Representation can help with sharing of chiplet information across different services and different tools.

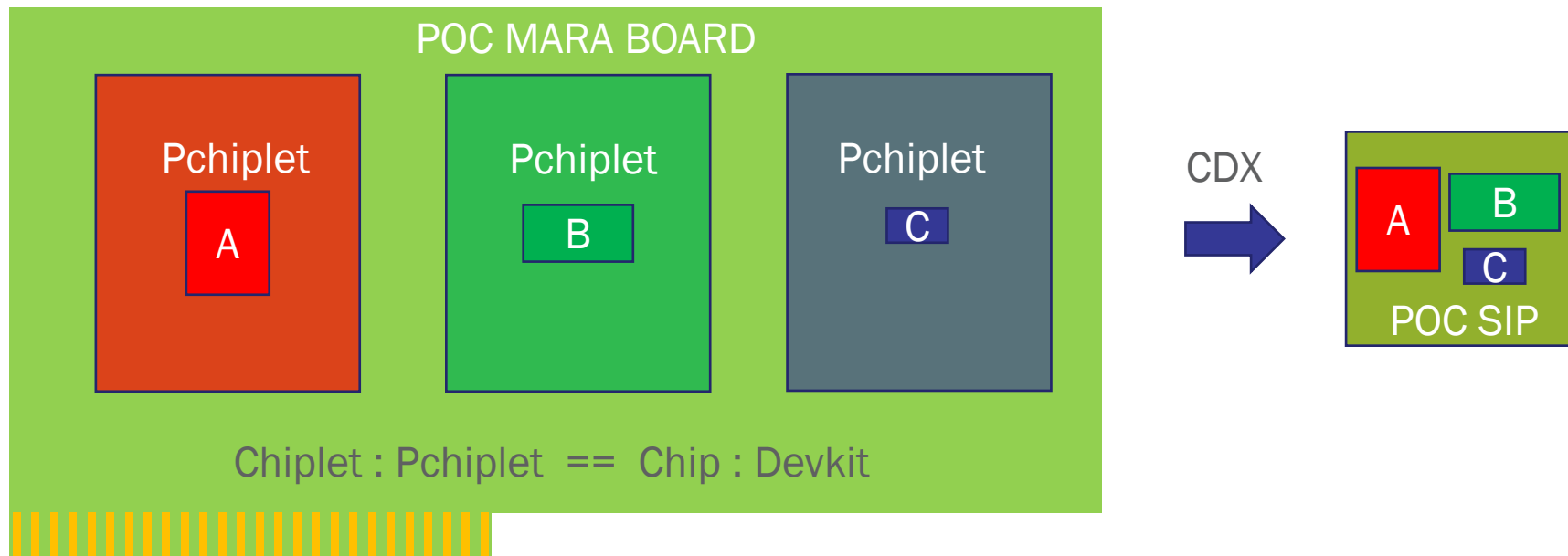
Some of the tools that can use standardized chiplet information

- Design Entry tools
- Layout and Artwork tools
- Solvers (PI/SI, Thermal, EMI)
- Testing
- Catalogs



CDX Subgroup Charter

- 1- Chiplet Machine Readable Description Format Standardization
- 2- Chiplet Catalog
- 3- Pchiplet-to-SIP conversion flow



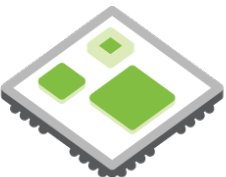
Chiplet Info File Formats

We reviewed industry file formats (Courtesy John Park). There are a few options to choose from.

Format	Usage	Includes Connectivity	Format	Open Source	Circa	Owned By	Used By	Extendable
Die Text	Basic Chip/Package Abstract	Yes	Columnized Data	Yes	1990	Microsoft	Entire Packaging Community	Yes
AIF	Chip(s)/BGA Abstract & Bond Shell	Yes	ASCII Documented Format	Yes	1995	Artwork	Cadence/Mentor	Yes
XDA	Chip to Package Co-Design	Yes	XML	Possible	2010	Cadence	Cadence	Yes
LPB	Chip, Package & Board	Yes	ASCII Documented Format	Yes	2012	IEEE	Ansys, Zuken	No
ZEF	Chiplet Modeling	No	CSV like	Yes	2015	zGlue	zGlue	Yes

Die Text, AIF, XDA, and ZEF are Promising Candidates for Chiplet Representation

Extensions Needed for Power and Thermal Modeling



Chiplet Catalog Activity

1- zGlue ChipletStore (www.ChipletStore.com):

- 1500 chiplets listed
- First Implementation of a Chiplet Catalog using ZEF format by a Member Company.
- Chiplet Listing and Access Control in place according to CDX survey.
- Invitation-only secure access available to ODSA members.

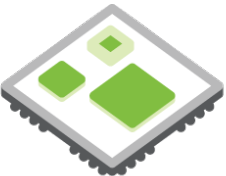
2- ODSA/OCP Catalog:

Goals: Provide a repository for product architects to discover available chiplets.

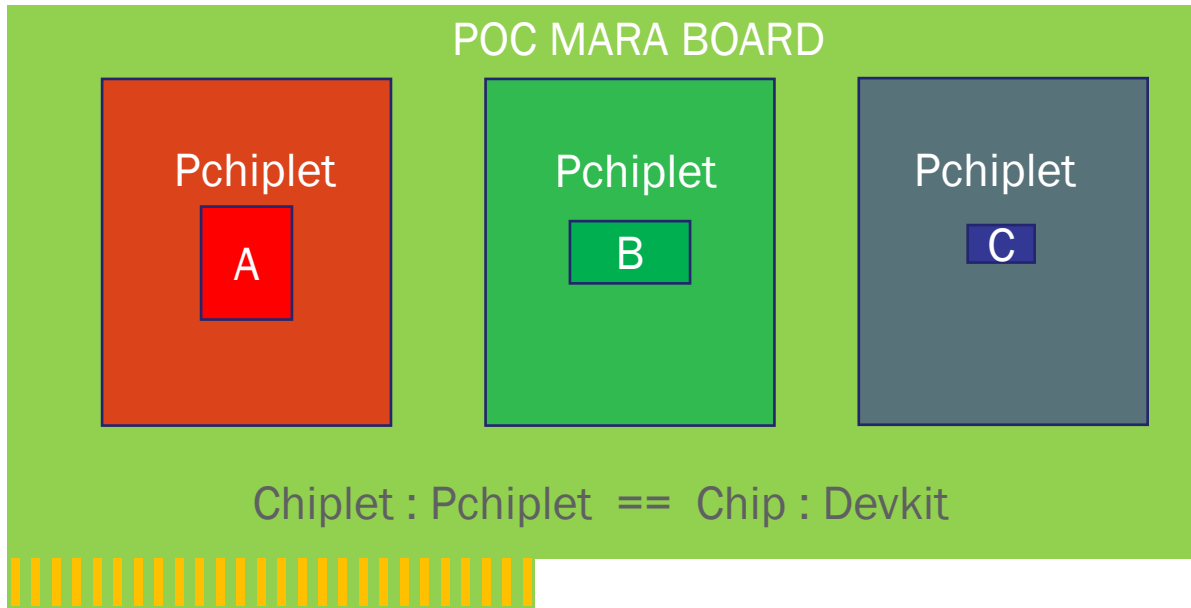
Hosting: For now a wiki page.

Categories of Chiplets:

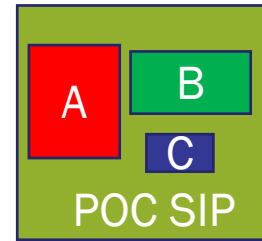
- Processors: MCU, CPU,
- Memory: DRAM, FLASH
- Accelerator: GPU, DSP, Audio, Video, ML, NPU, NIC, CRYPTO, NOC, FPAA
- PMIC: DCDC, PMU
- Sensors: Orientation, Motion, Temperature, Shock
- FPGA:
- IO: Fabric, Level Translators, IO Expanders
- Interposers: Passive, Active
- SideBand Management: I2C, SPI, JTAG, USB2UART



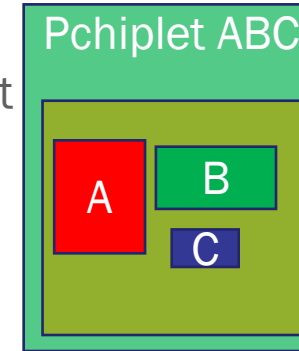
ODSA Design Flow



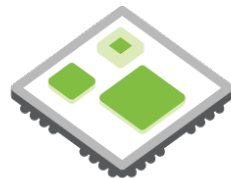
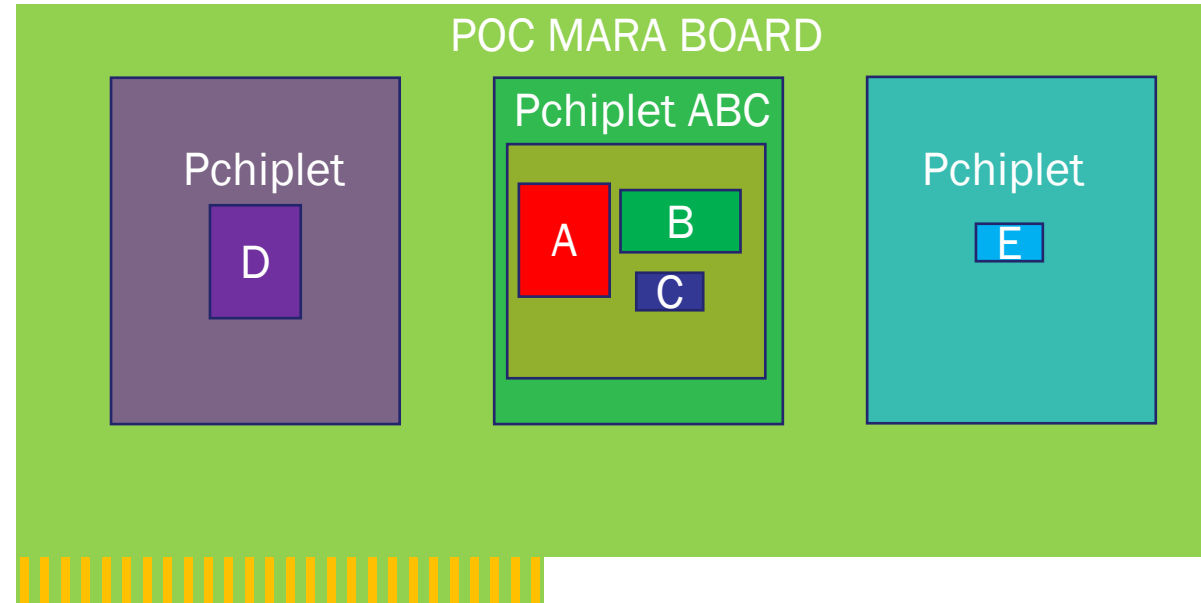
CDX



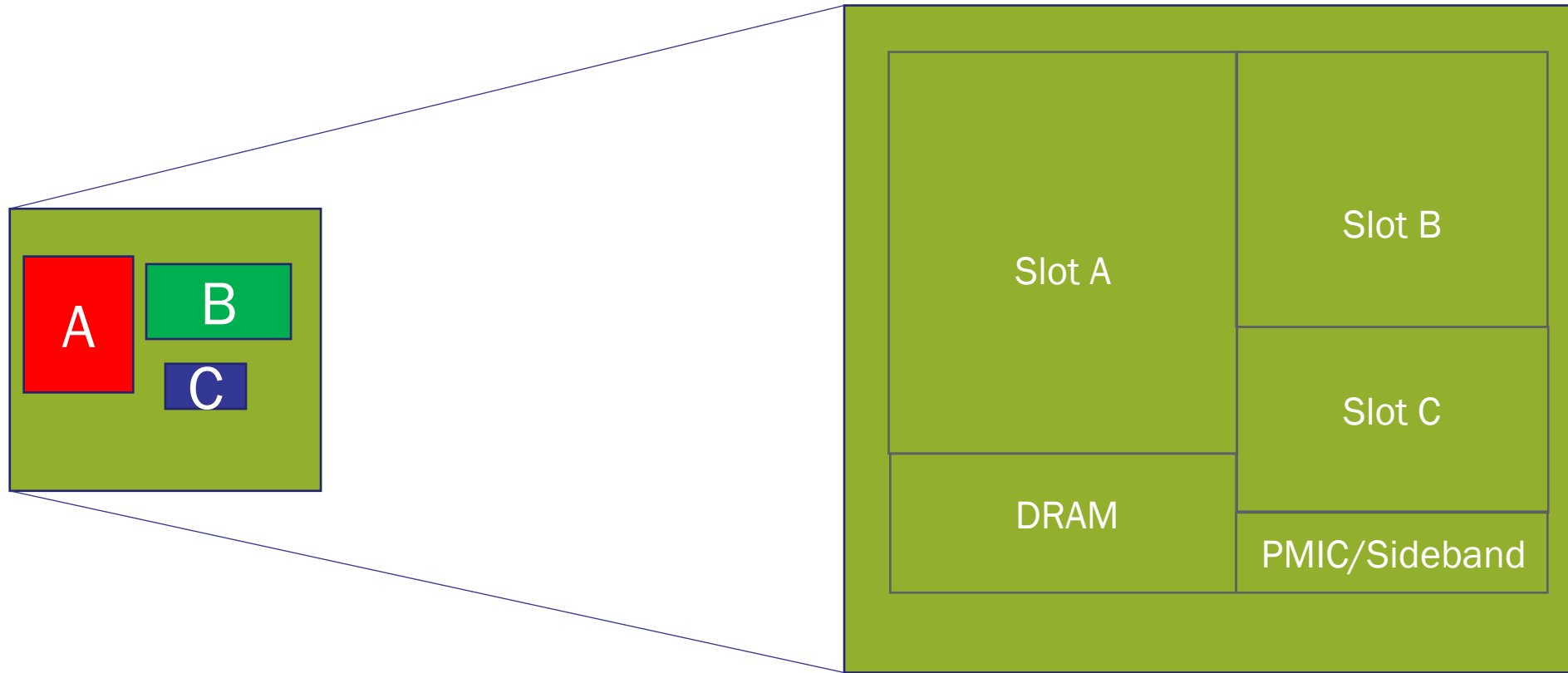
Pchiptet



SDV



Pathfinding for Structured SIP Virtual Prototyping



Does there exist a structured substrate solution that preserves work done with Pchiplet prototyping?

Contact CDX group if you want to think more about it



RFC: Power Modeling and Virtual Prototyping

Thermal modeling of chiplet-based systems is critical.

A Power calculator that can be used to estimate dissipated heat can help early architecture decisions.

We propose building a simple power calculator based on

- Chiplet Type
- Typical Power Density for the type of structures in the chiplet (datapath, RAM, etc)
- Normalization of power dissipation with process, voltage, temperature,

This will be an important step towards virtual prototyping and simulation

Please Share Your Comments



Call to Action

- Join Us: EDA, OSAT, Design Service, Chiplet Vendor, Distributor participation.
- Define a flow for PCB to Package conversion
- Setup a CDX catalog service of your own
- List your Chiplets
- Share your requirements and wishlist for Chiplet Modeling

Looking for Volunteers

Send an email to jawad@zglue.com for participation
<https://www.opencompute.org/wiki/Server/ODSA>



Backup

