TOOLFLOW

Flow

- Run System Generator; generate netlist
- Copy base system package
- Take XSG result netlist, create pcore
- Instantiate XSG design in XPS project
- Instantiate interface pcores in XPS project based on yellow blocks
- Write UCF constraints
- Generate project software
- Run XPS

“Yellow Blocks”

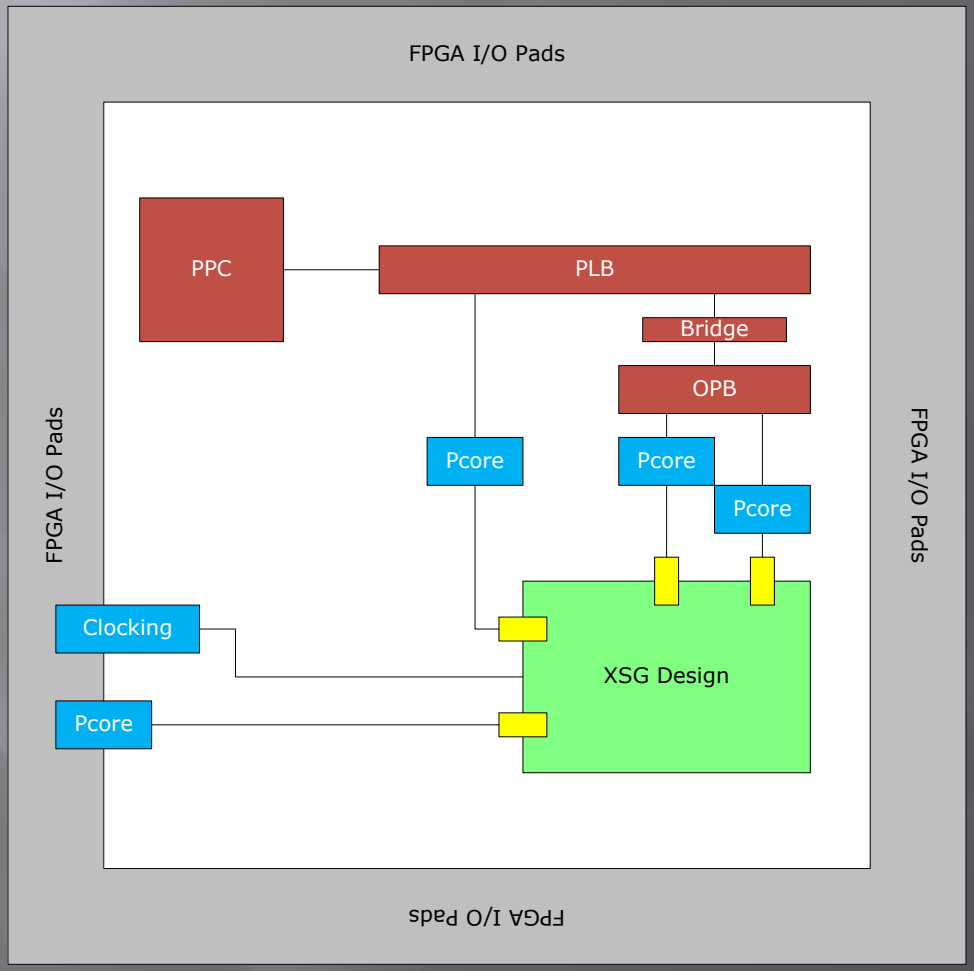
- Wrapper for XSG Gateway Blocks
- Each GW name should contain full block hierarchy & port name
- Each type of yellow block corresponds to an interface pcore by “Tag” in Block Properties

XPS Block Class Objects

- Yellow blocks used to create Matlab objects
- *xps_block* parent class
- All interface types have associated child class
- Each yellow block creates object instantiation
  - Stores parameters in object fields
  - Uses member functions to aid in project generation

- Matlab OOP reference:
  http://www.mathworks.com/access/helpdesk/help/techdoc/matlab_oop/ug_intropage.html
- XPS_Block class reference:
  http://casper.ssl.berkeley.edu/wiki/XPS_Block_Class_Reference

Building the EDK Project



Building the EDK Project

- gen_xps_files.m acts as primary interface to all parts of toolflow
- Combs through all blocks in design and looks for **`xps:*`** tag
- Uses tag to call appropriate class constructor to create *xps_object* for each yellow block

Building the EDK Project

- XSG Core Config yellow block sets parameters in Xilinx System Generator Token
  - Sets part based on hardware platform
  - Output directory from design name
  - All other static setting
- gen_xps_files.m issues call to XSG Token's Generate
- Compiled NGC netlist at fixed path in output directory

Building the EDK Project

- Checks XSGCC block for HW platform; copies appropriate base system from *xps_lib* (XPS_LIB_PATH environment variable)
- Creates a pcore in XPS_*hw_platform*_base\pcores*design_name*_v1_00_a
- Copies netlist from XSG output directory
- Writes BBD to point to netlist
- Uses **`gen_mpd`** method of each *xps_object* to write MPD for pcore

Building the EDK Project

- New for ROACH: selects an XMP file based on *hw_subsys*

Building the EDK Project

- Backup and preprocess *system.mhs*
  - Used for non-core-instance-specific structures
  - `elseMHSLine #IF# Matlabconditional# ifMHSLine #`
- Instantiate XSG design pcore using **`gen_mhs_xsg`**
- Initialize buses & address space usage based on base system & skeleton infrastructure
- Cycles through all *xps_objects* to instantiate interface pcores
  - Calls **`gen_mhs`** method for each *xps_object*; each instantiation increments bus address space
  - Uses **`probe_bus_usage`** to determine bus usage

Building the EDK Project

- Backup and preprocess *system.mss*
- Cycles through all *xps_objects* to instantiate interface pcore drivers
  - Calls **`gen_mss`** method for each *xps_object*

- Backup and preprocess *system.ucf*
- Write clock & timing constraints for *usr_clk*
- Cycles through all *xps_objects* to write interface pcore constraints
  - Calls **`gen_ucf`** method for each *xps_object*

Building the EDK Project

- If using TinySH, incorporates TinySH code
- Parses custom code
  - main.c needs to be aware of all user-accessible functions, looping functions, init functions
- Modifies *system.xmp* to include software source in project

Running EDK on Project

- Runs EDK in command line mode to build project