



**Thoughts on 3D Integration
Standard support**

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OK to Click Next

Accellera + The SPIRIT Consortium

Combination is an industry changing event

- **Accellera: World class language based Design & Verification standards**
- **The SPIRIT Consortium: IP Deployment & Reuse standards.**
- **Complementary standards for Design, Verification & IP Reuse**
- **Leverages operational strength of two organizations**

Together addressing the electronics industry needs

- **standards for design & verification community.**
- **IP and tool integration standards to improve IP reuse.**



Standard Synergies

– Data & MetaData

- IP-XACT is Meta-Data
 - information about
 - the information about
 - the design – Electronic Databook
- Provides for simplified and codified data transfer semantics across languages
- Provides an Abstract Abstraction description
 - Systems composed of components
 - Composed of systems
 - Composed of Components
- Integration Constraints
 - IP-XACT can express limitations or requirements on adjoining IP's not available in VHDL or Verilog
 - Generators can check the use of an IP.
- E.g. Standard Xtensions for Power Management, VIP, Bus Interconnections, Version tracking, . . .

Design/Component Hierarchy

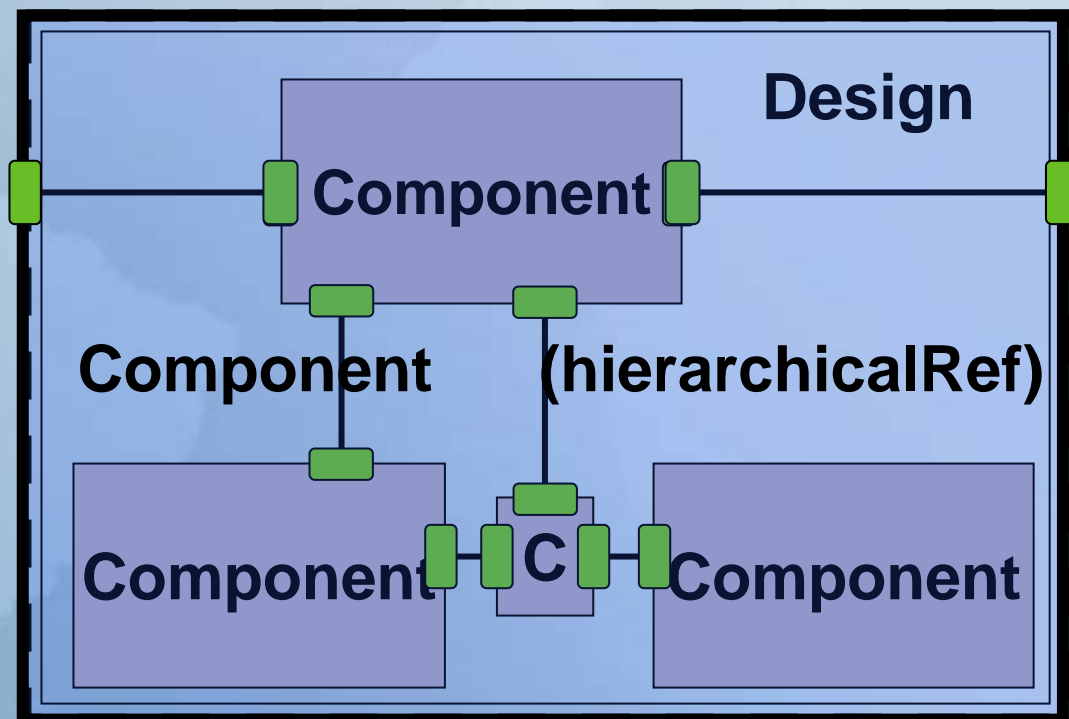
Managing Complexity:

Design and Conquer

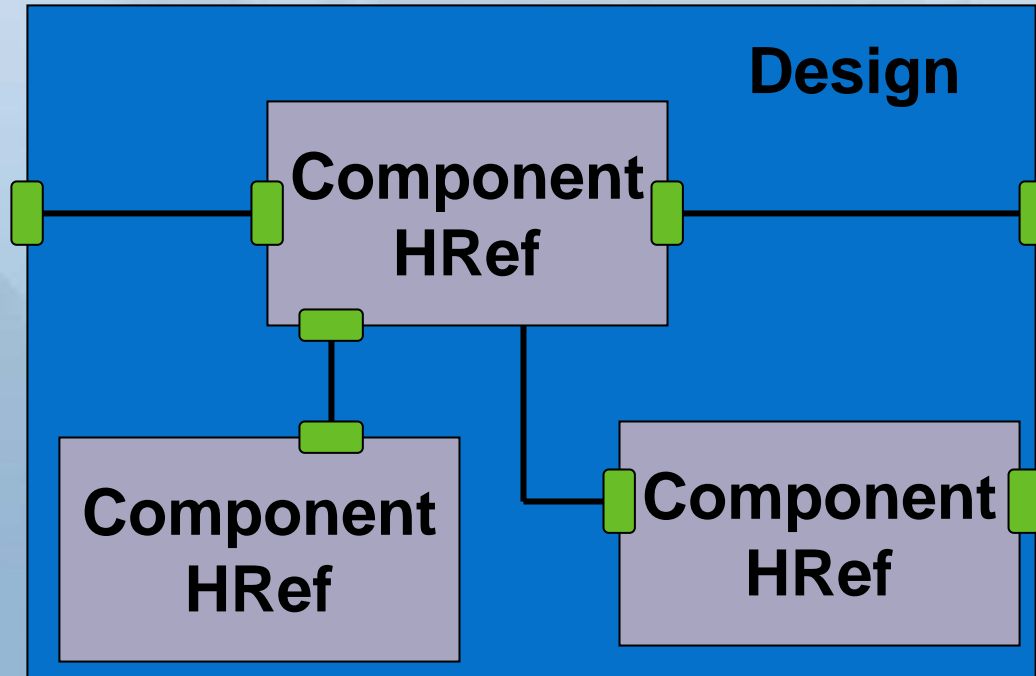
Divide and Conquer

Reuse

Provide Robust Interfaces



Design/Component Hierarchy



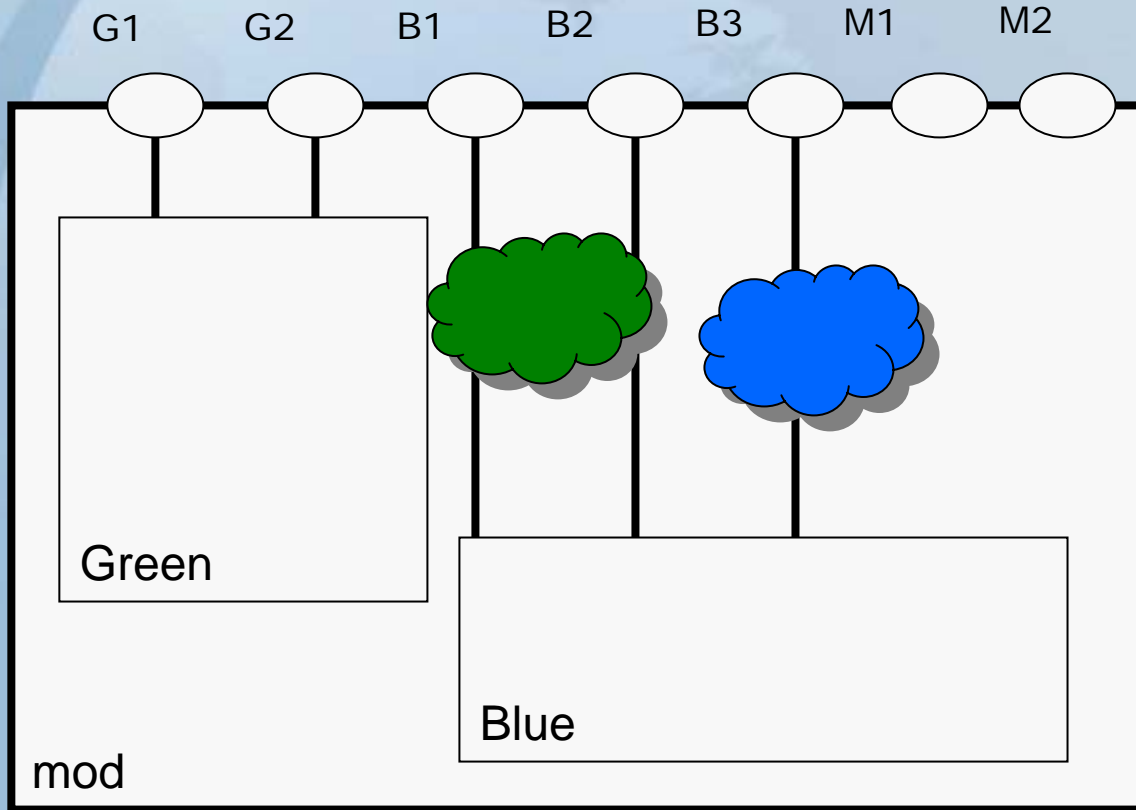
The Interface specification is common to:

- the design of the component and
- the Reuse of the component.

It is the contract made at the boundary between design teams.

Top-down and Bottom-up are really just two views of the Component/Interface-based design flow.

Power Portion of Robust Interface Designing within a context



UPF Commands: mod if

```
Create_power_domain mod_PD
-include_scope
```

```
Create_power_domain G
```

```
Create_power_domain B
```

```
Set_port_attributes
-ports {G1, G2}
-supply_set G.primary
```

```
Set_port_attributes
-ports {B1, B2, B3}
-supply_set B.primary
```

```
<Set_port_attributes
-ports {M1, M2}
-supply_set mod_pd.primary>
```

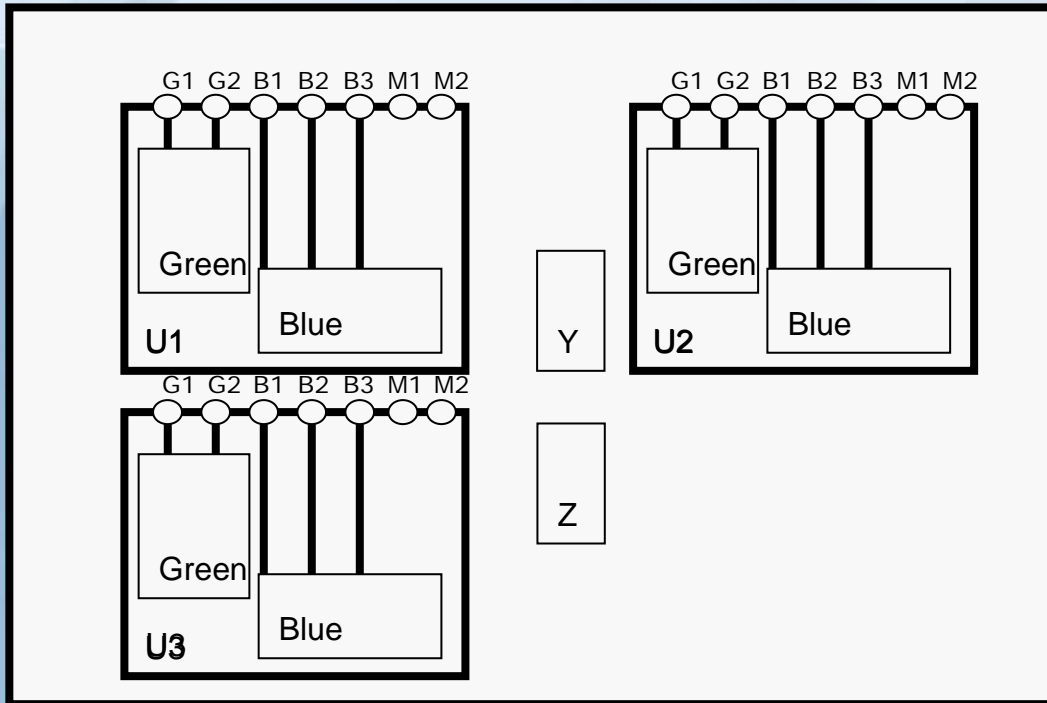
mod details:

```
Create_power_domain G -update
-elements {Green}
```

```
Create_power_domain B-update
-elements {Blue}
```

UPF 2.0 Supply sets and
set_port_attributes

Using UPF 2.0 Components in a Design



UPF Commands: top

```
create_power_domain top_PD  
-include_scope
```

```
create_power_domain pd_G  
-elements {Y}
```

```
create_power_domain pd_B  
-elements {Z}
```

```
set base set_scope
```

```
foreach {el} {U1 U2 U3} {  
    set_scope $base/$el  
    load_upf "mod_if.upf"  
}
```

```
set_scope $base
```

```
create_composite_domain topc_PD –  
subdomains {top_PD U1/mod_PD  
U2/mod_PD U3/mod_PD}
```

```
create_composite_domain pdc_G –  
subdomains {pd_G U1/G U2/G U3/B}
```

```
create_composite_domain pdc_B –  
subdomains {pd_B U1/B U2/B U3/G}
```

Equivalent application to the 3-D composition space

- Components are composed into systems
- Standard Interfaces are defined
- Constraints may be simple or complex
- Bundling the descriptions requires agreed semantics
- IP-XACT Architecture and Xtensions workgroup in Accellera is a good place to share agreement on semantics
- Progressive refinement of Metadata Descriptions – part of the process

Thank You

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