

SystemC 4 Proposal: Hierarchy/Connectivity Exploration



THE ANALOG AND DIGITAL SYSTEM LEVEL COMPANY



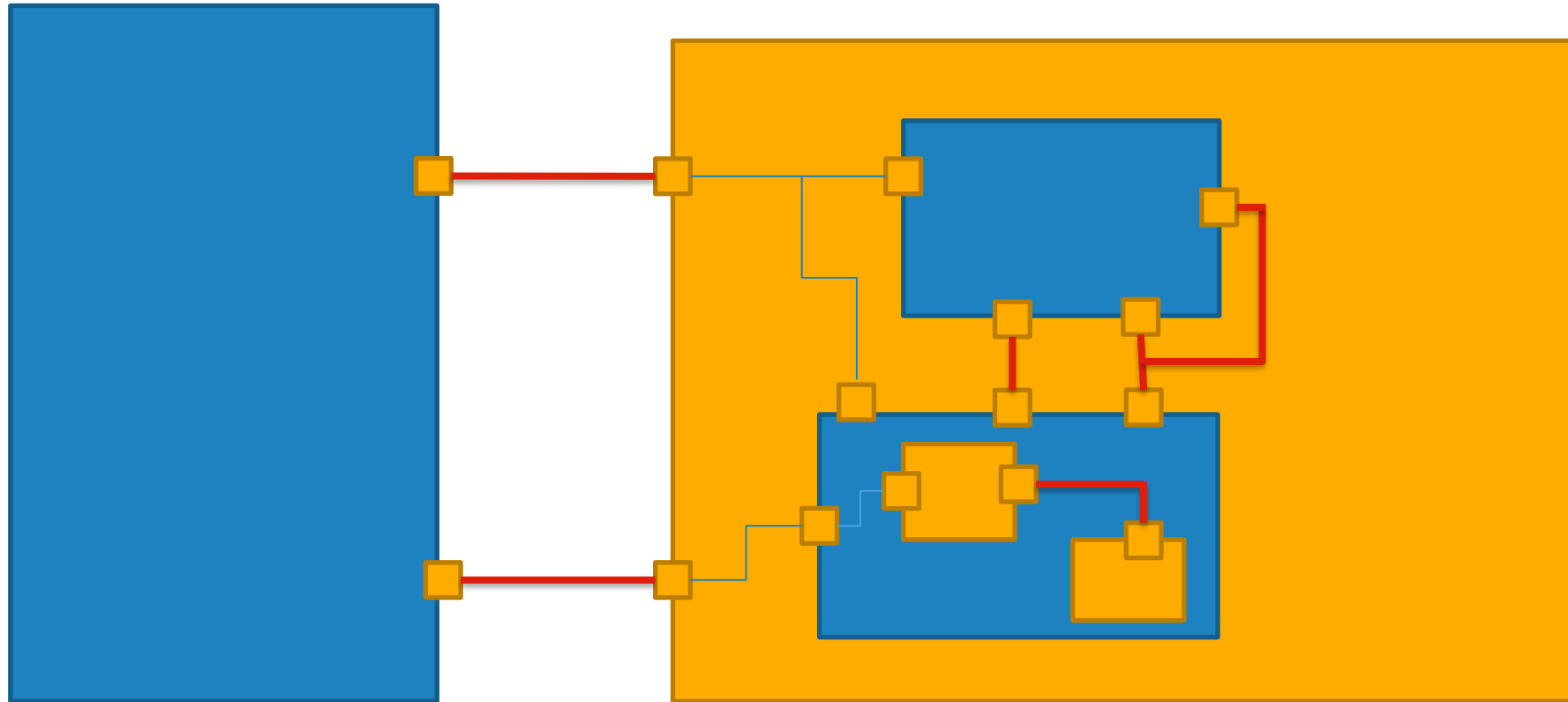
SystemC 4 Proposal: Hierarchy/Connectivity Exploration

Motivation

- Interface for tools
- Static analysis / Rule checks
- Connectivity exploration e.g. for address/index exploration for TLM
- Debug tools/libraries/messages

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Motivation



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Current State

- Hierarchic module exploration possible (`sc_get_top_level_objects`, `get_child_objects`, `get_parent_object`, ...)
- Ports of modules can be found
- TLM sockets possible but not straight forward
- Port-port-binding not always possible - tricky
- Port-interface binding not directly possible
- TLM socket binding tricky or impossible
- Signal/interface bounded ports not possible
- `sc_export` binding not directly possible

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Additional Methods `sc_port_base`

```
class sc_port_base : public sc_object
{
public:

    struct bind_element
    {
        sc_interface* interface=NULL;
        sc_port_base* port=NULL;
        sc_export_base* export_sc=NULL;
    };

    unsigned int bound_elements_size() const;

    bind_element get_bound_element(int index_);
    const bind_element get_bound_element(int index_) const;

    virtual sc_interface* get_interface(int index_);

    ...
}
```

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Additional method `sc_export_base`

```
class sc_export_base : public sc_object
{
    struct bind_element
    {
        sc_interface* interface=NULL;
        sc_export_base* export_sc=NULL;
    };

    bind_element get_bound_element(int idx=0);

    ...

};
```

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Additional method `sc_interface`

```
class sc_interface
{
...

const std::vector<sc_port_base*>& get_binding_ports() const;
const std::vector<sc_export_base*>& get_binding_exports() const;

...
};
```

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TLM sockets

- Principally they consist of `sc_export/sc_port`
- Sockets themselves have no binding information
- General issue: a `sc_port/sc_export` cannot be directly recognized as socket port/export
- Especially convenient socket partially skip there port/export
- Partially intermediate interfaces are used especially for convenient sockets

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Current State

- First proposal for sc_port_base/sc_export_base/sc_interface available
- Open: TLM sockets
- Experimental implementation available
- Example available