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Multilayered Advanced eRM Architecture for Ethernet eVC

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Introduction

- ▶ Layering is the new 'buzz word' in eVC methodology
- ▶ This presentation aims to explain why layering is important
- ▶ Will use 10G Ethernet as an example



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Traditional approach to data generation

- ▶ High level data structure with control fields for low level behaviour:

```
struct my_packet {  
    header : my_header_s;  
    payload : my_payload_s;  
    parity_error_positions : list of uint;  
};
```



A complex protocol: Ethernet over XSBI

Ethernet packet:

Preamble	SFD	Header	Payload	FCS
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XGMII columns:

/S/	data	data	data
data	data	data	data
data	data	data	data

...
...

XSBI blocks:

10	0x78	data						
01	data							
01	data							

...
...



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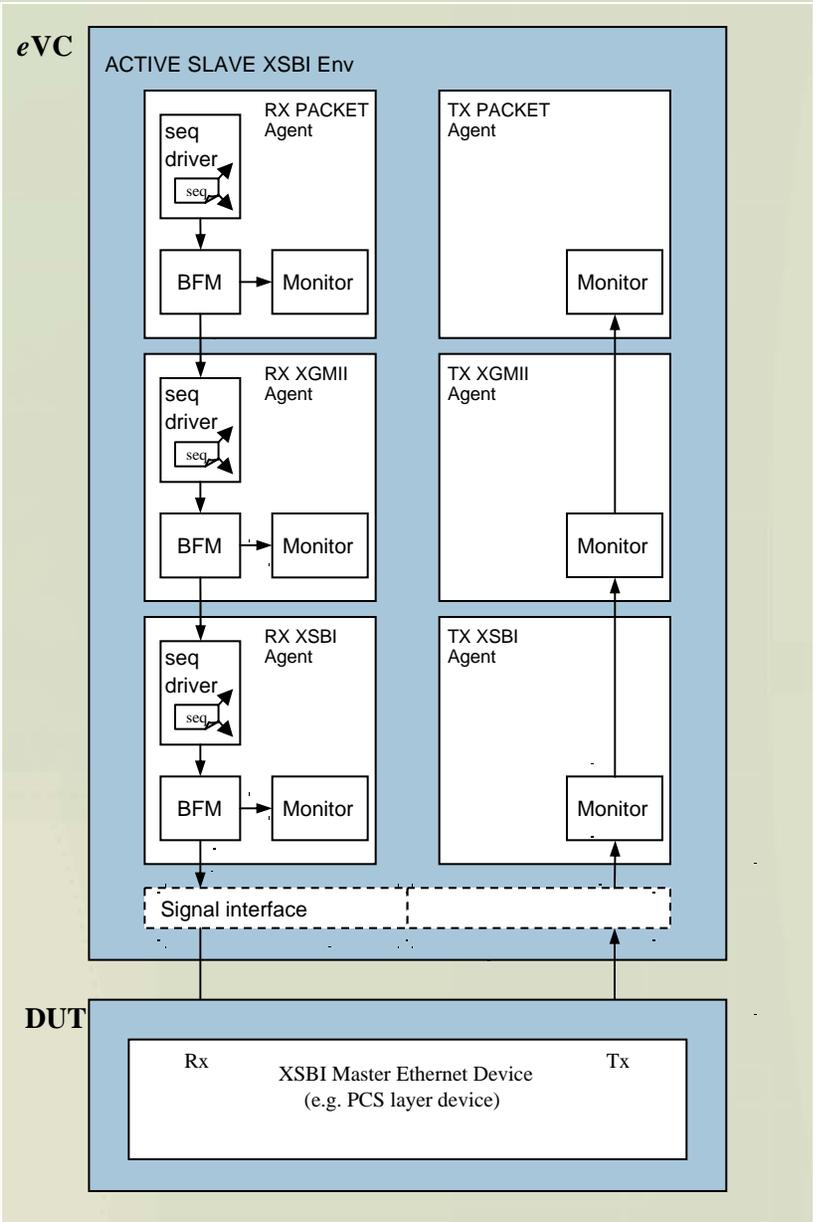
Single layer approach breaks down

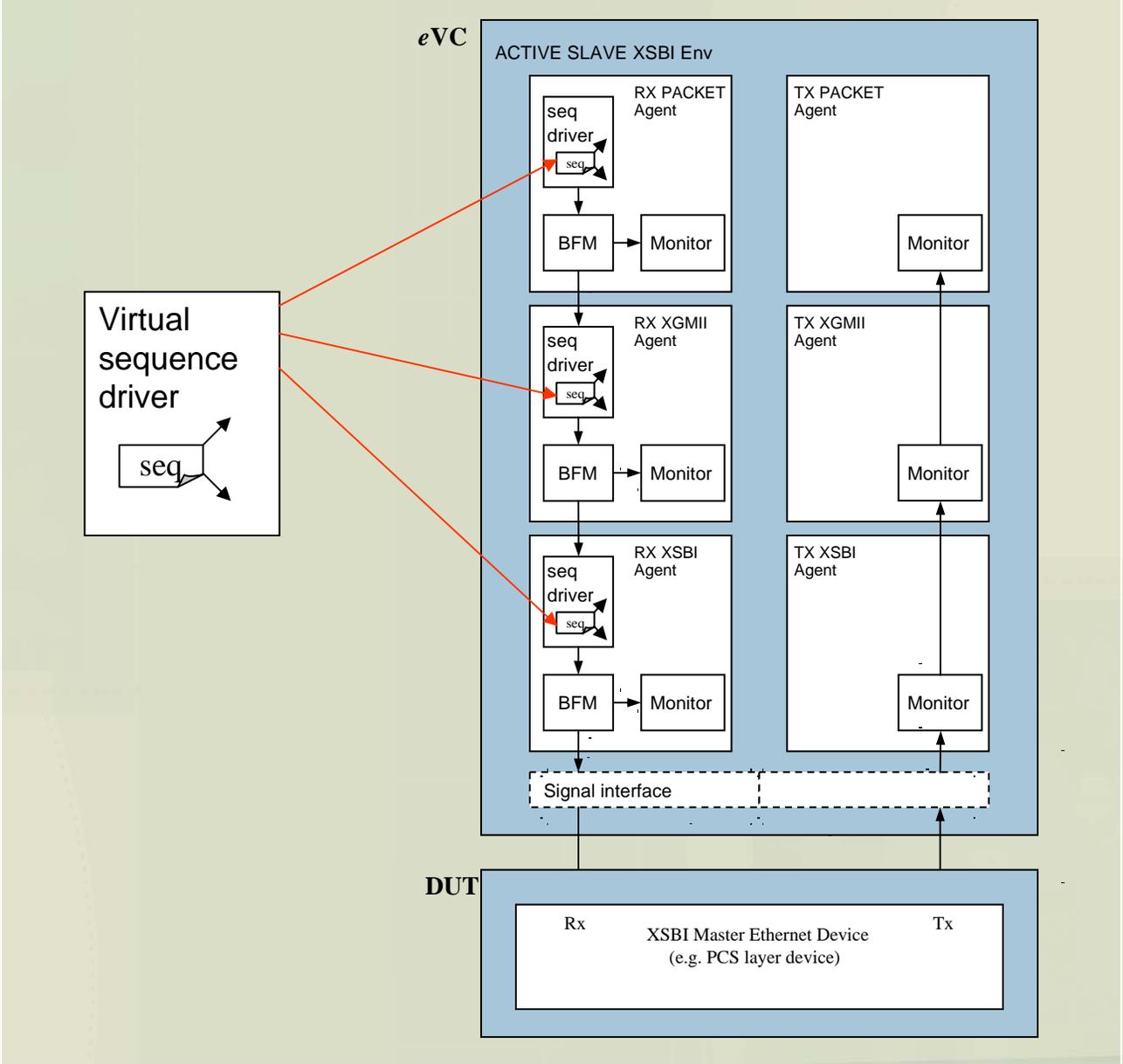
- ▶ Difficult to control lower layer behaviour from high layer data structures
- ▶ Often want to concentrate on lower-layer testing
- ▶ Often need control of behaviour between 'packets'
- ▶ Often need to co-ordinate low and high level behaviour



Enter layering

- ▶ Layering allows separation of control and observability
- ▶ Should break layers at natural boundaries for protocol
- ▶ Layering has only become viable as a result of introduction of **eRM**
- ▶ Use of **eRM** very important to get full advantages of layered approach







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Co-ordinated testing – Virtual sequences

- ▶ Can build virtual sequences to control simultaneous behaviour across multiple layers.
- ▶ E.g. 1: Ethernet packet with XSBI block error on last block.
- ▶ E.g. 2: Disconnection of XAUI signal during packet.



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More Virtual Sequences

- ▶ Can also co-ordinate behaviour across multiple layers AND multiple **eVCs**.
- ▶ E.g.: Set up DMA transfer on PCI interface to receive Ethernet packet that has error in last XSBI block.



Summary

- ▶ Layering solves complex test scenario problems
- ▶ Paradigm Works Ethernet **eVC** is state-of-the-art layered **eVC**
- ▶ Layering will be necessary to solve tomorrows verification problems.
- ▶ For more info on layering see Verisity's **eRM** documentation.