Overcoming Ethernet SoC Verification Challenges

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Agenda

- Ethernet IP/SoC and its challenges
- What is Verification IP?
- How VIP helps 25G Verification
- What an ideal VIP offers?
- Summary
Challenges for making IP/SoC

To design is straightforward

To verify is time-consuming
Challenges of Ethernet Verification

- Ethernet is a Complex Protocol
  - Software: different packets; routing
  - Hardware: Ethernet interfaces
  - Specification

- Time and effort
  - Time to Market is crucial to consumer electronics
  - Return of Invest. Do you want the model maintained by engineers?

It’s very hard to ensure the correctness and completeness simultaneously
What is VIP – Verification IP

- A **smart** verification component that is used to verify a certain protocol
Ethernet VIP: Leading Methodology

VIP Provides:

- Bus Function Model for various interfaces
- Random-constraint Stimulus Generation including different packet generation and error injection
- Protocol checking
- Functional Coverage
- Test compliance system
- Verification methodology support
- Easy to use and integrate
How VIP helps 25G verification

- 25G MAC VIP
  - Stimulus injection
  - Driving the interface

- 25G PHY Serial VIP
  - Stimulus collection
  - Driving the interface

- 25G DUT
  - XMI
  - KR

- MON
  - Protocol checking
  - Coverage collecting
25G Verification: System Solution
Compliance Solution: 3 basic Questions

- What are you going to test?
- Does your test actually cover what you wish to test?
- Is your test compliant to the Spec?
Triple Check: Verification Philosophy

Third-generation interface compliance analysis

Triple Check

TestSuite
- Link Layer
- Configuration
- Transaction Layer
- PHY Layer
- Link Layer

Functional Coverage

Test Suite

TripleCheck

Verification Plan

SOMA File

Cadence VIP
- Multi-Language Testbench I/F
- Optimized Cores

Design Under Test

Available for 40G/100G MAC and PHY verification

Native SV, e Coverage
What should an VIP package provides?

A proven solution, the S.M.A.R.T. choice

Proven
500+ customers
Thousands of verified designs

Support for Leading protocols
- 25G/50G

Ready-made for your environment
- Multi-language
- Multi-simulator

Technically advanced
- PureView
- TripleCheck
- Assertion-based VIP
Even more …
Thank You!
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