# Verification Architecture for Ibex Core

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# Agenda

- Introduction to Verification Architecture
- Interface Details
- Sanity Checks Implemented
- Test Cases Covered
- Summary and Q&A

# Introduction to Verification Architecture

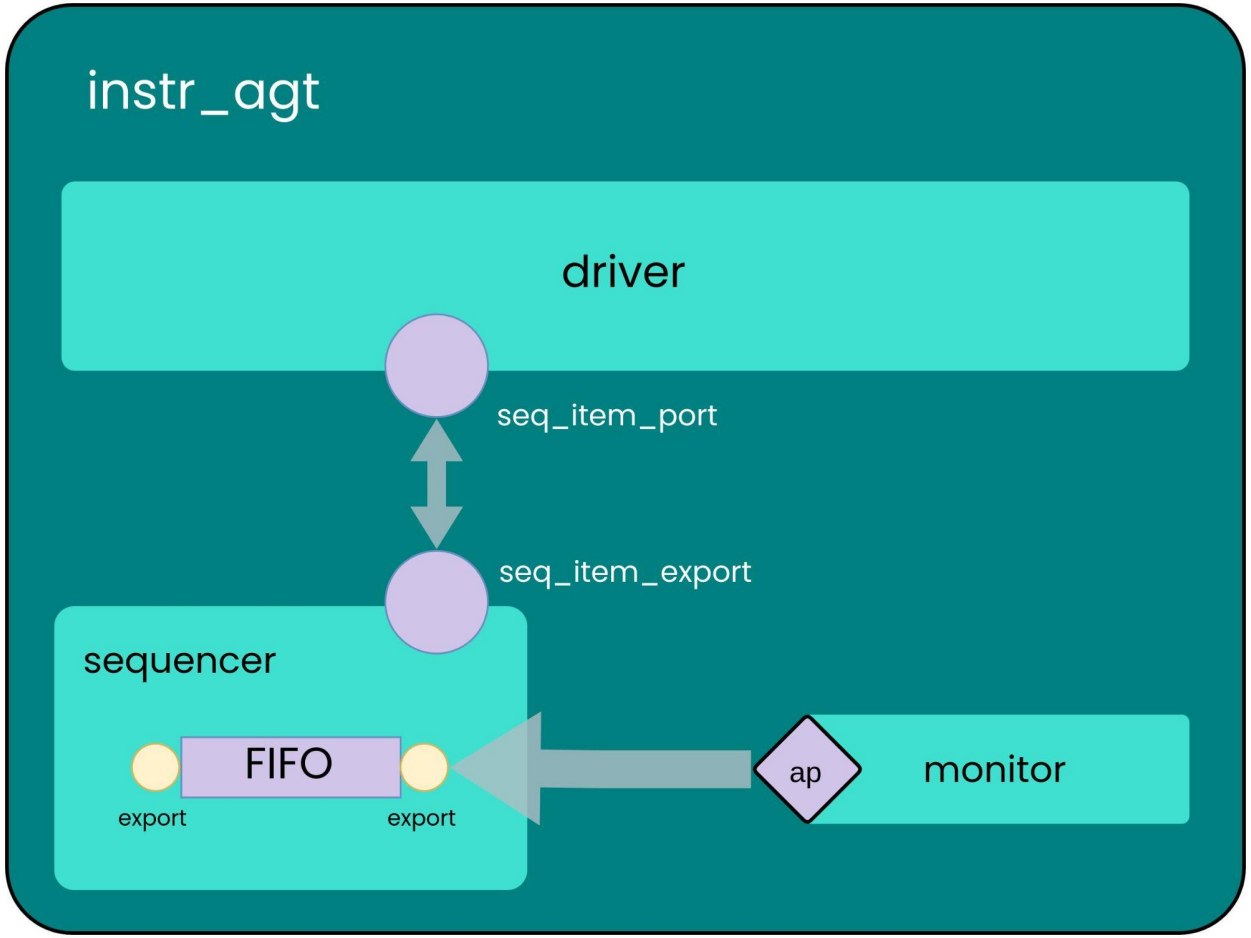
# Key Interfaces

- **dut_probe_intf:** Monitors core status and controls fetch enable signals.
- **instr_mem_intf:** Manages fetch unit signals for instruction requests.
- **data_mem_intf:** Handles Load Store Unit (LSU) signals for data operations.

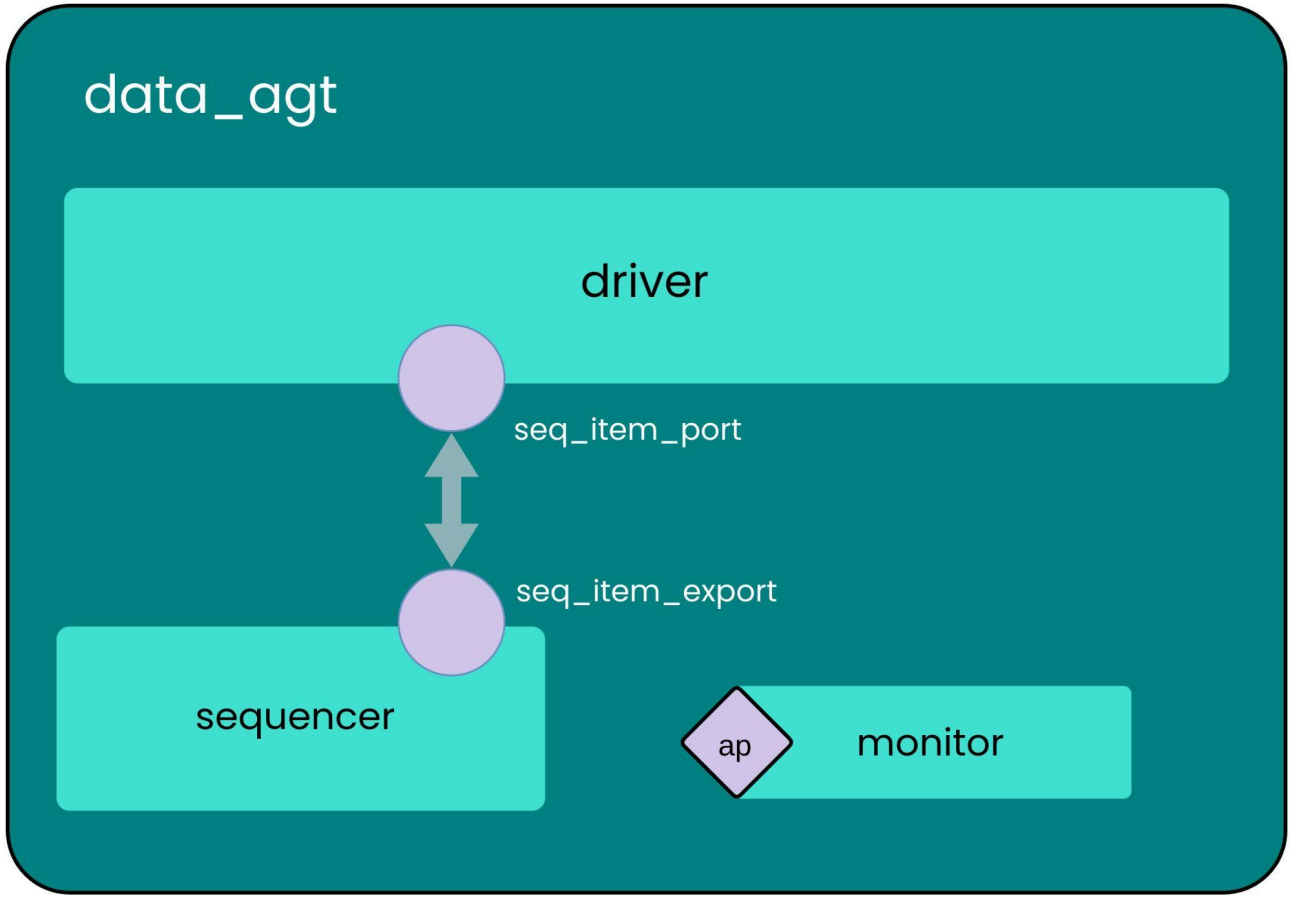
# Memory Model

- Serves instruction and data requests.
- Fetch unit and LSU collaborate for instruction execution and load/store operations.

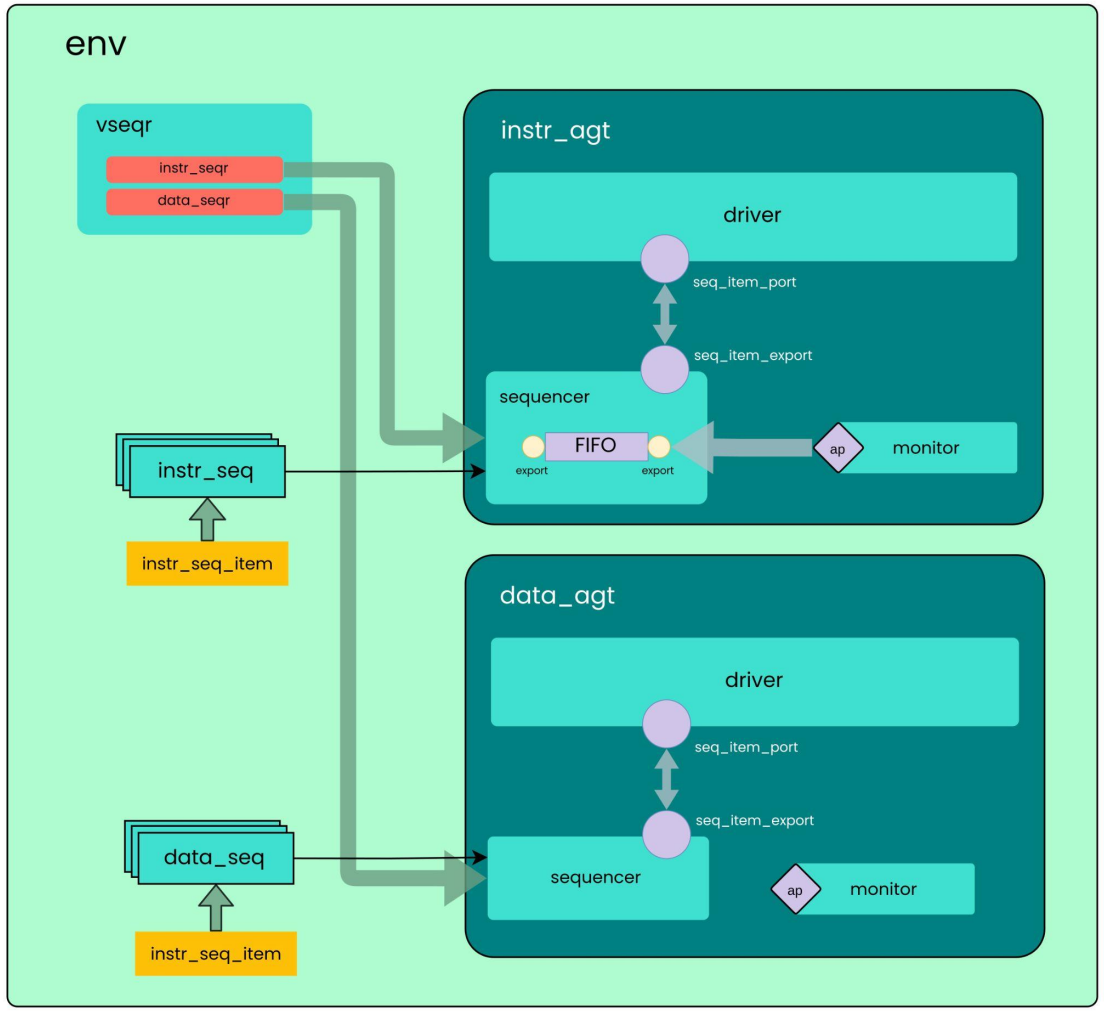
# Instruction Agent



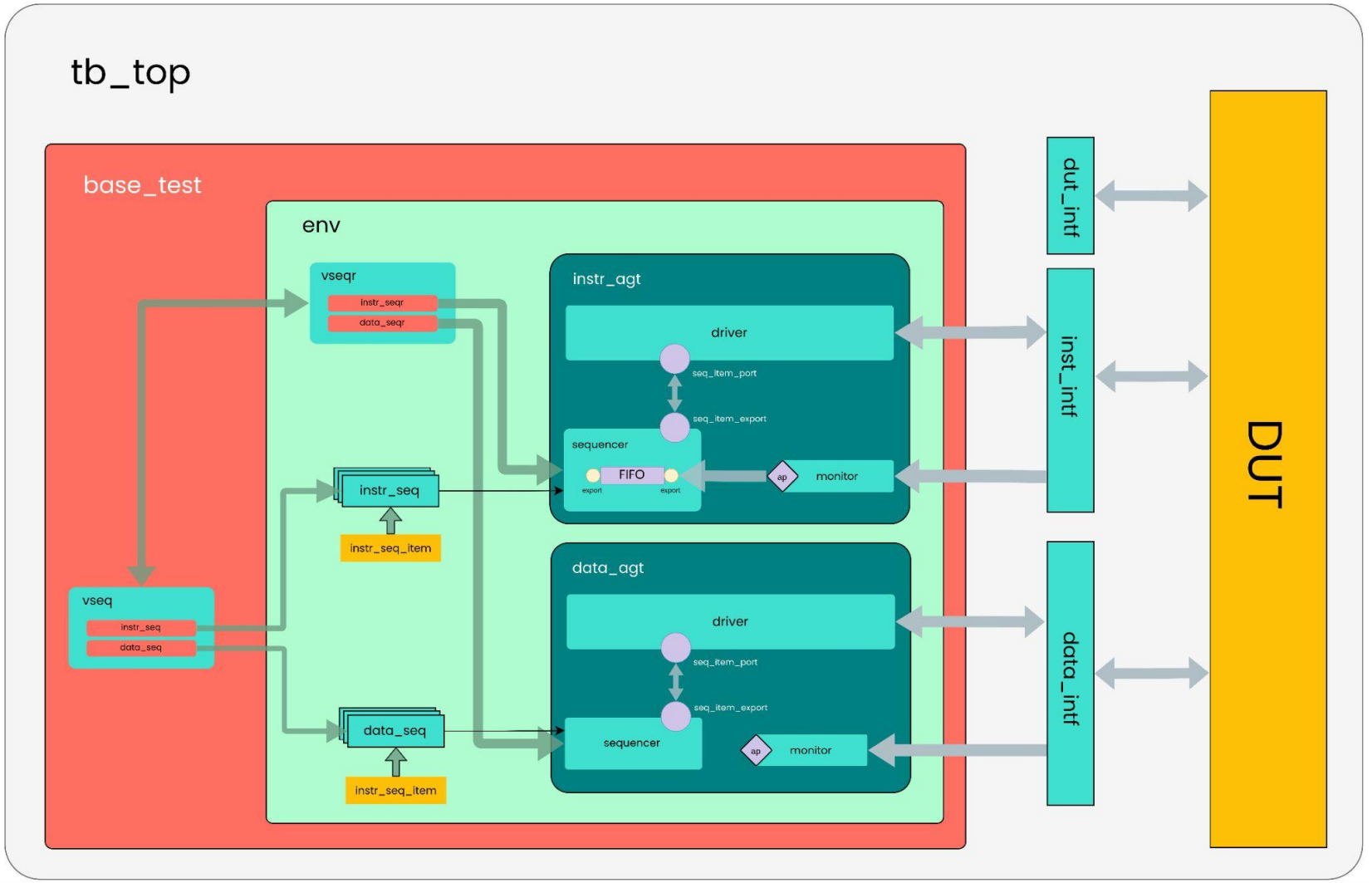
# Data Agent


data_agt
driver
seq_item_port
seq_item_export
sequencer
ap
monitor

# Environment



# Top Module:


tb_top
base_test
env
vseqr
instr_seqr
data_seqr
instr_agt
driver
seq_item_port
seq_item_export
sequencer
FIFO
export
export
ap
monitor
instr_seq
instr_seq_item
vseq
instr_seq
data_seq
data_agt
driver
seq_item_port
seq_item_export
sequencer
ap
monitor
data_seq
instr_seq_item
dut_intf
inst_intf
data_intf
DUT

# Interface Details

# Instruction Interface:

- **Driver:** Reads transactions from the sequencer FIFO and drives signals to the DUT.
- **Monitor:** Observes DUT’s instruction fetches and sends data to the analysis port.

# Data Interface:

- **Driver:** Drives LSU-related signals using slave-sequence method.
- **Monitor:** Monitors load/store requests and forwards data to analysis components.

# Sanity Checks

# Sanity Checks:

- Ensures **fetch_enable** is functional.
- Verified correct instruction data retrieval using core_trace.log.
- Waveform confirms proper load/store transactions are driven and monitored.

# Testcases Covered

# Testcases:

| Testcases (.bin) | |
|---|---|
| add | sb |
| sub | sh |
| xor | sw |
| or | beq |
| and | bne |
| sll | blt |
| srl | bge |
| sra | bltu |
| slt | jal |
| sltu | lui |
| addi | riscv_arithmetic_basic_test_0 |
| xori | riscv_arithmetic_basic_test_1 |
| ori | |
| lh | |
| lhu | |
| lw | |

# Thank you!