

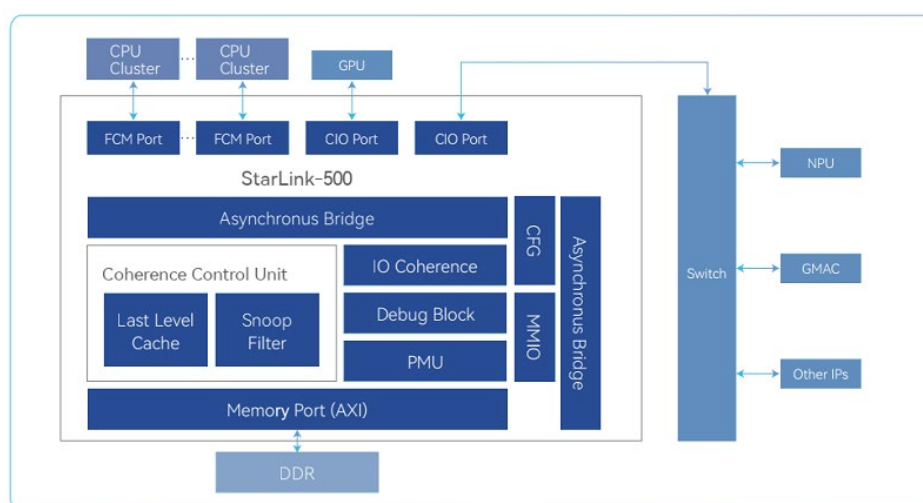
STARLINK-500 INTERCONNECT FABRIC IP

StarLink-500 is StarFive's first self-developed interconnect fabric IP with cache coherence support.

INTRODUCTION

StarLink-500 is StarFive's first self-developed interconnect fabric IP with cache coherence support, supporting the construction of multi-cores and SoC to provide cache coherence NoC, connecting multiple CPU clusters, IO devices, and DDR, and maintaining cache coherence within the SoC

- Providing NoC with cache coherence: connecting multiple CPU clusters, IO devices, and DDR, and maintaining cache coherence within the SoC.
- High performance: providing the last-level cache (LLC), snoop filter, and improving the efficiency of the coherence maintenance module, and memory hierarchy performance.
- Efficient data exchange: supporting CPU and IO devices to share the LLC, simplifying CPU and IO data exchange, and improving performance.
- Low power consumption: supporting low power consumption technologies such as LLC way shutdown and cache retention.
- High reliability: Snoop filter and cache support SEC-DED (Single Error Correction Double Error Detection).
- Control interface support (CFG & MMIO): CPU configuration of IO devices and reading of on-chip SRAM; IO device access and configuration of coherence on-chip interconnect.



DESIGN SPECIFICATIONS

- Support multiple Fully Coherent Master (FCM) ports
- Support multiple CPU core/cluster configuration
- Support Component Aggregation Layer (CAL)
- Support multiple Coherent IO (CIO) ports
- Frequency: 1.2 Ghz@12nm (Reference)
- Cache Size: Typical 4 MB (Configurable)
- Bus Width: 256 Bit (Configurable)
- High bandwidth, low power consumption, low latency

FUNCTION LIST

Coherence Unit

- Support multiple CPU core/cluster coherency
- Support cache coherent IO

LLC

- Cache Inclusion Policy: Exclusive
- Support multibank
- Support CMO
- Support atomic

Low Power Design

- Support low power consumption mode
- Clock Gating
- Cache Way Shutdown
- Cache Retention

RAS

Snoop Filter and LLC supports SEC-DED

CIO Port

- Support concurrency
- Support QoS LLC allocation

Error Reporting

Support error reporting

Debug

- Support bus monitor
- Support internal status monitor

Performance Monitor (PMU)

Support performance monitor

CONTACT US

Technical Documentation: <https://doc.rvspace.org/>
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