

# FlexNoC<sup>®</sup> Reliability Option for Enterprise Applications

## Overview

Choosing a suitable NoC IP is paramount to ensuring robust reliability in enterprise-level SoC designs. Arteris FlexNoC Reliability Option adds Error Correction Code (ECC) and Parity mechanisms, contributing to systemic data integrity. Its adaptability helps counteract wear environmental stresses and control signal issues, ensuring consistent, long-lasting performance.

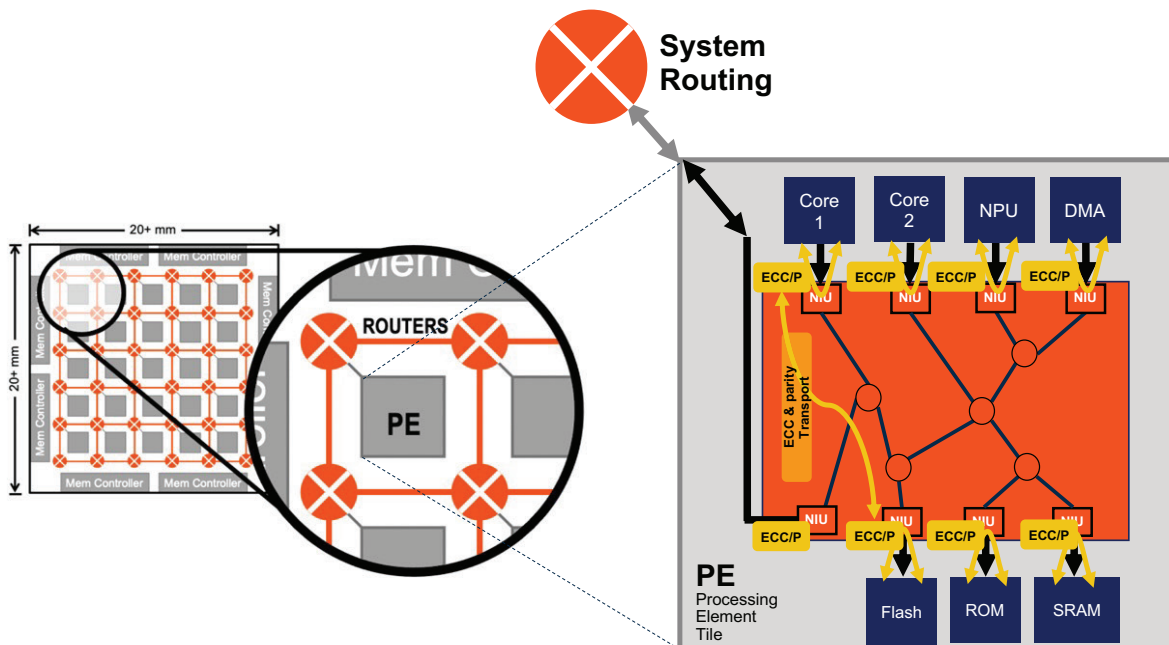
Enterprise SoCs operate in mission-critical environments. Packet Consistency checkers within FlexNoC's Reliability Option swiftly identify anomalies, such as erroneously routed and partial packet issues caused by environmental stressors. Moreover, the option's customizability extends to user-defined ECC/parity on data, allowing designers to tailor error correction measures to their specific enterprise applications.

By safeguarding communication and control signals through user-defined ECC/parity on interface data, the FlexNoC Reliability Option ensures seamless coordination even under challenging environmental conditions.

The FlexNoC Reliability Option also caters to the unique requirements of enterprise-level SoC designers, offering adaptability and robust error correction to ensure enduring dependability in the face of evolving operational demands and challenging environments.

## Highlights

- Simplify and optimize NoC design for long-term SoC performance and reliability.
- Streamline SoC fault detection and correction processes for smoother operations.
- Benefit from adaptability to diverse operational scenarios with versatile data handling.
- Achieve comprehensive fault coverage tailored to the specific requirements of industrial systems.
- Flexibility to tailor the NoC to specific needs with user-defined ECC/parity checking on socket data and control signals.



## Benefits

### Improved data integrity.

The data and control signal checkers ensure that data transfers and control operations occur without errors, enhancing the overall integrity of data within the system.

### Fault tolerance and recovery.

The configurable redundancy generator and checker provide fault tolerance, improving system reliability and minimizing downtime.

### Error detection and correction.

The transport packet protection (parity/DED/SECDED) techniques help detect and correct errors during data transmission, ensuring accurate and consistent data exchange.

### Enhanced system dependability.

By addressing wear and tear, environmental conditions, and other factors that could impact long-term performance, the FlexNoC Reliability Option improves the overall dependability of the system.

### Safety-critical system foundation.

The enhancement provides SoC designers with a robust foundation for building safety-critical systems, ensuring the safety and dependability of systems in industries like automotive and industrial applications.

### Trustworthiness and longevity.

The FlexNoC Reliability Option tries to ensure that the components of the system rarely fails, ensuring a trustworthy and long-lasting system.

### Optimal decision for design engineers.

Opting for the Reliability Option of FlexNoC is a judicious decision for design engineers seeking to improve system dependability and ensure the successful operation of safety-critical systems.

## Features

### Transport packet protection (Parity/DED/SECDED).

Transport packet protection is a critical aspect of ensuring data integrity during transmission within the system. The FlexNoC Reliability Option includes different methods of packet protection, such as Parity, Double Error Detection (DED), and Single Error Correction Double Error Detection (SECDED). Parity is a simple method that uses an extra bit to represent the parity of the data. DED allows the detection of up to two errors within a packet, while SECDED can both detect and correct a single error within a packet and detect up to two errors.

### Redundancy generator and checker (Configurable for each network interface unit).

This feature provides a mechanism to introduce protection within the NoC design's network interface units (NIUs), and is the first NoC module an external IP is connected to. By configuring the redundancy generator and checker for each NIU, the system can achieve real-time fault detection using DED or SECDED schema.

## Differentiation

FlexWay is a cost-efficient entry-level NoC product with an optimized feature subset of FlexNoC for smaller-scale SoC designs. Note that the Reliability Option is available to FlexWay and FlexNoC and includes all Reliability features mentioned above.

Both FlexNoC and FlexWay products can export IP-XACT files that can then be used in the Arteris Magillem import/export for enhanced productivity.

Other Arteris products with similar options are Ncore 3 cache-coherent NoC, and CodaCache last-level/dedicated cache.

## About Arteris

Arteris is a leading provider of system IP for the acceleration of system-on-chip (SoC) development across today's electronic systems. Arteris network-on-chip (NoC) interconnect IP and SoC integration technology enable higher product performance with lower power consumption and faster time to market, delivering better SoC economics so its customers can focus on dreaming up what comes next. [Learn more at arteris.com](https://www.arteris.com).