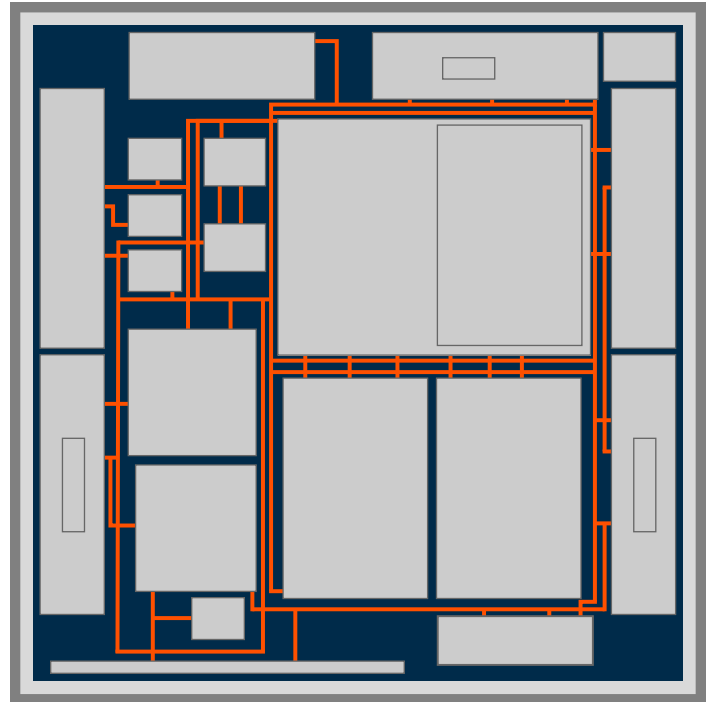


Network-on-Chip (NoC) Defined

A network-on-chip (NoC) is an on-chip communications network or interconnect fabric for semiconductors, specifically SoCs. The NoC connects IP blocks (i.e. CPUs, GPUs, NPUs) and components (i.e. memory, video processing, etc.) and routes data packets among them using switches. The concept was developed in the 1990s as a way to efficiently connect multicore designs and it has become essential technology, especially with the skyrocketing demands for better performing chips with AI functionality.

- The NoC is the physical infrastructure that carries data on the chip and guarantees quality of service.
- NoCs enables data to move between heterogeneous computing elements, while at the same time minimizing the resources required to connect them.
- The NoC or physical wires that transport the data can take up to 10% to 13% of the total area of the silicon chip with 5 to 20 NoCs per SoC.
- Tradeoffs can be made about the topology of a NoC, the resources consumed, and the latency associated with data traffic for a defined bandwidth.
- NoC topologies include mesh, torus, tree, or custom designs.
- NoCs come in two flavors, non-coherent and cache coherent NoCs, with cache coherent NoCs helping to keep the data coherent between distributed computing elements.



Arteris was founded in 2004 and pioneered the commercialization of NoC IP for complex SoCs. NoCs are used in SoCs across all markets including automotive, communications, consumer electronics, enterprise computing and industrial applications.

Commercial NoC IP enables semiconductor manufacturers, OEMs, hyperscale system houses, semiconductor design houses, and other electronic system producers to build differentiated products with optimized performance and efficient power consumption. Leveraging commercial NoC IP in the SoC design process ensures quicker iteration cycles for a faster overall time to market and improved SoC economics.

arteris-support@arteris.com +1 408 470 7300

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