



SHAPING THE NEXT GENERATION OF ELECTRONICS

JUNE 23-27, 2024

MOSCONE WEST CENTER
SAN FRANCISCO, CA, USA

Veriest

NoC NoC – Who's There?

Moshe Zalcberg



Nice to meet you!

Veriest



Moshe Zalcberg
CEO

Veriest



Frank Schirrmeister
Executive Director, Strategic Programs

SYNOPSYS®



Dusica Glisic
VP Front End

Veriest

Veriest at a glance

150+

Engineers



Semiconductor Engineering Services company, founded in 2007



Headquartered in Israel, 5 additional sites in Europe: UK, Hungary, Serbia (3)



Customers in Israel, Europe, US

15+ years

Experience



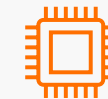
Full-flow ASIC solutions



Software



Front-end
(Design & Verification)



Back-end
(DFT & Physical Design)

We have a unique vantage point!



DAC Special sessions

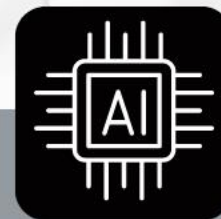
June 24th, 2024



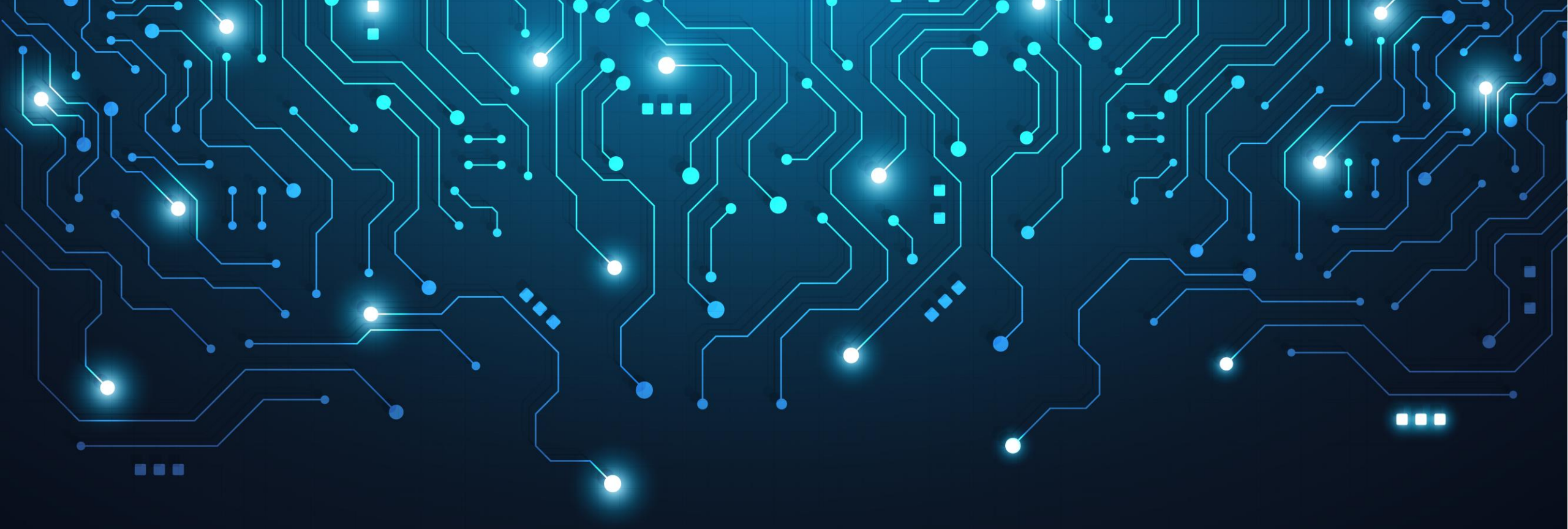
Network on a Chip



Innovative Memory
Architectures



AI in Chip-design



NoC NoC!

Traffic sometimes can be messy....



So there are ways to simplify things:



But often the “simple” turns into “complex”

Veriest



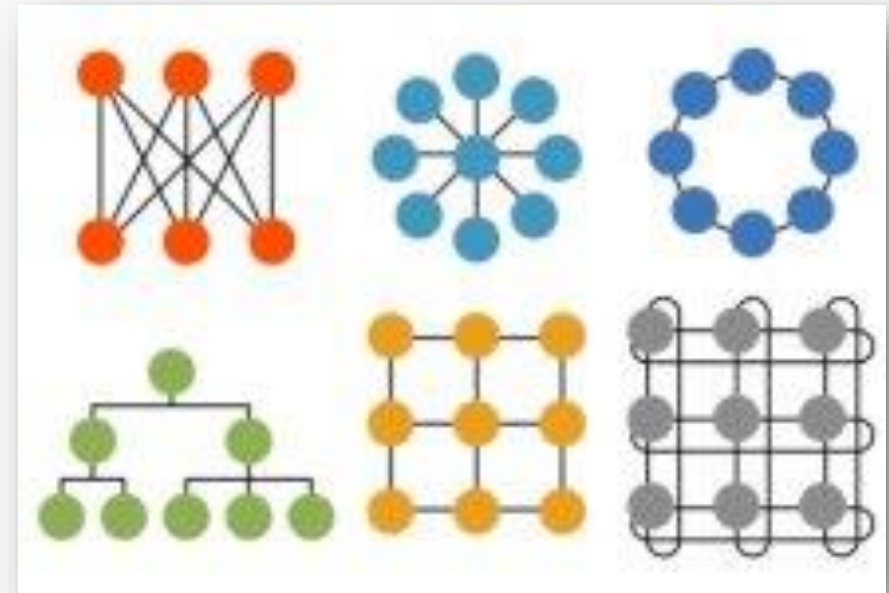
Or even very complex....

Veriest



What is NoC?

An advanced method for
on-chip communication
in System on Chip (SoC) designs.



NoC - Key benefits



Scalability



Modularity



Performance



Shorter
time to market



Power/performance

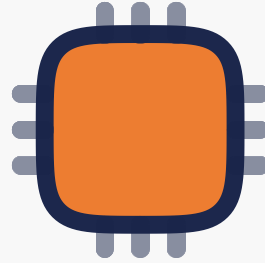


Reliability

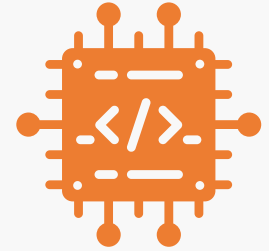
Main Applications that Use NoCs



Automotive



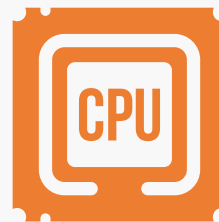
HPC



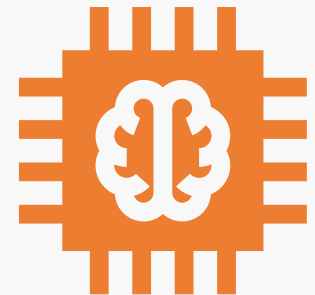
Embedded



GPUs



Multi-core CPUs



AI

Make vs Buy?



Home Made NoCs



IP-licensed NoCs



Customization



Development costs



Time to market



Expertise



Risk

Let's get started!

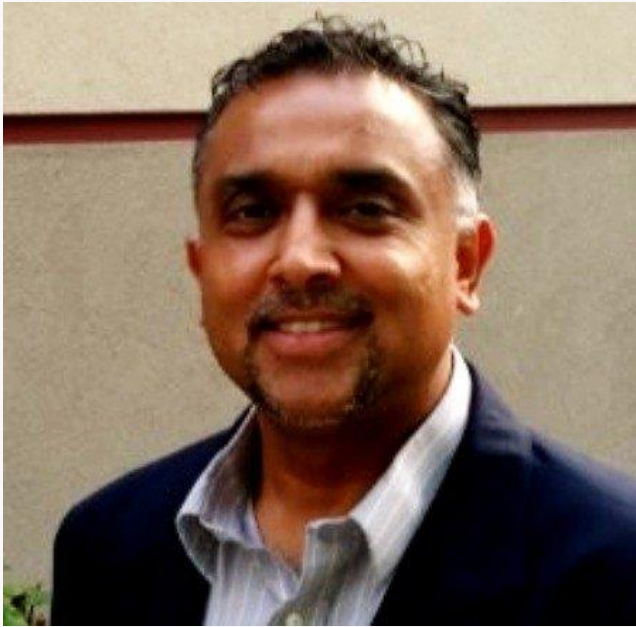
moshez@Veriests.com

<https://www.linkedin.com/in/moshezalcborg>



Advancing Multi-Core Systems: Networks-on-Chip Evolution

Guillaume Boillet
ARTERIS 



Dr. Kamal Desai
SYNOPSYS®

Modeling Networks-on-Chip for Architecture Analysis and Optimization



Designing multi-NoCs automotive devices

Jonathan Ezroni

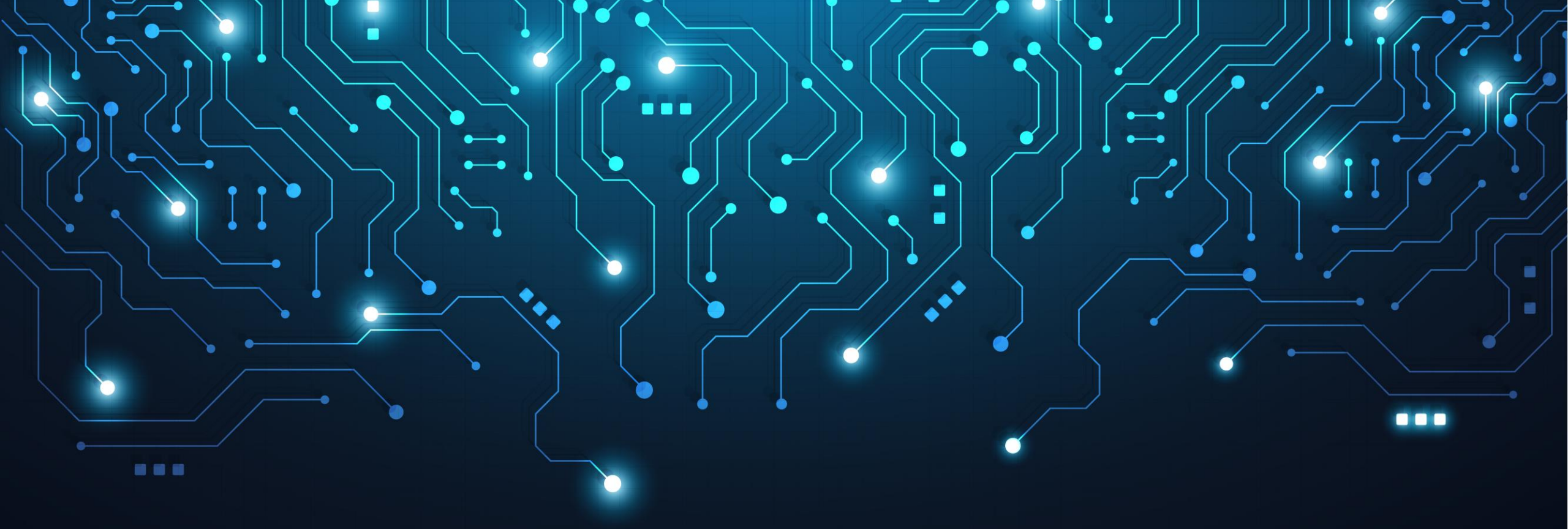




Andrea Majstorovic

Veriest

Verification Challenges of NoCs in complex SoCs



Backup

Make vs Buy?

Home Made NoCs:



- ✓ Full customization for specific needs.
- ✓ Potential cost savings on licensing fees.
- ✗ High development cost and time.
- ✗ Requires in-depth expertise.

IP-licensed NoCs:



- ✓ Reduced development time.
- ✓ Access to proven and tested designs.
- ✓ Technical support from the vendor.
- ✗ Licensing costs.
- ✗ Potential limitations in customization.

Considerations: Timeline, Budget, Expertise



System architecture &
partition



Software development &
modelling



System verification –
coverage & capacity



Design flows
& methodologies



Safety & Security
considerations



Die-to-die
connectivity



Signal integrity
& signoff



Test &
manufacturability



Scalability



**Reduced
development costs**



**Rapid
creation of variants**



**Shorter
time to market**



**More resilient
supply chain**



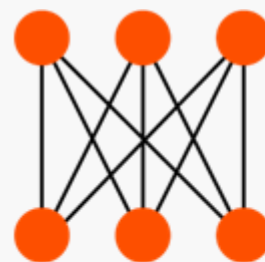
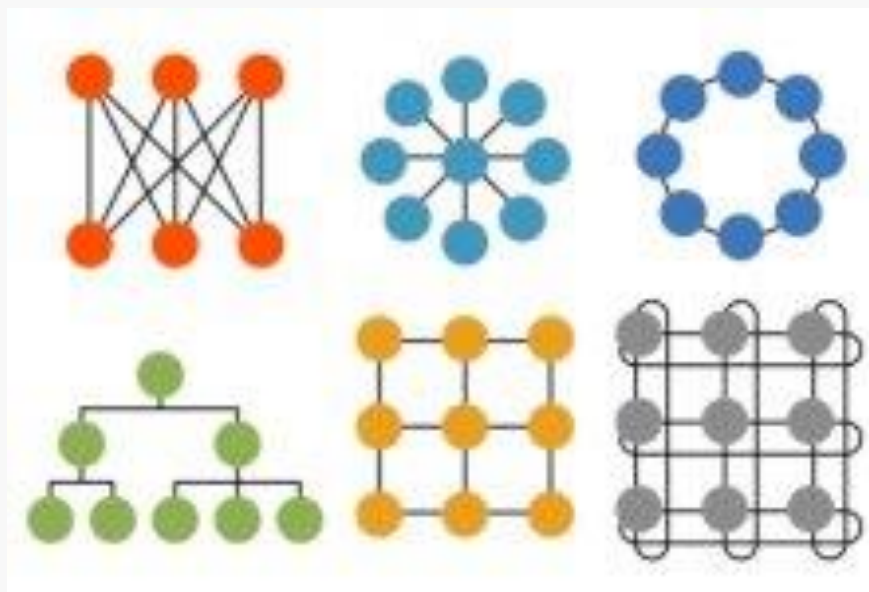
Lower risk



Power/performance



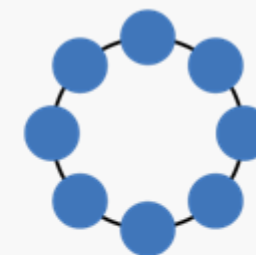
Reliability



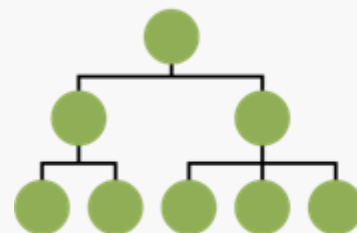
(a) Crossbar



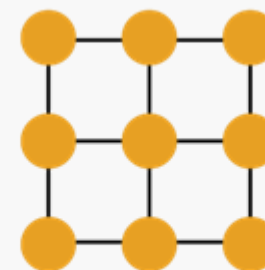
(b) Star



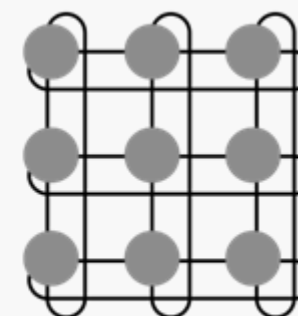
(c) Ring



(d) Tree

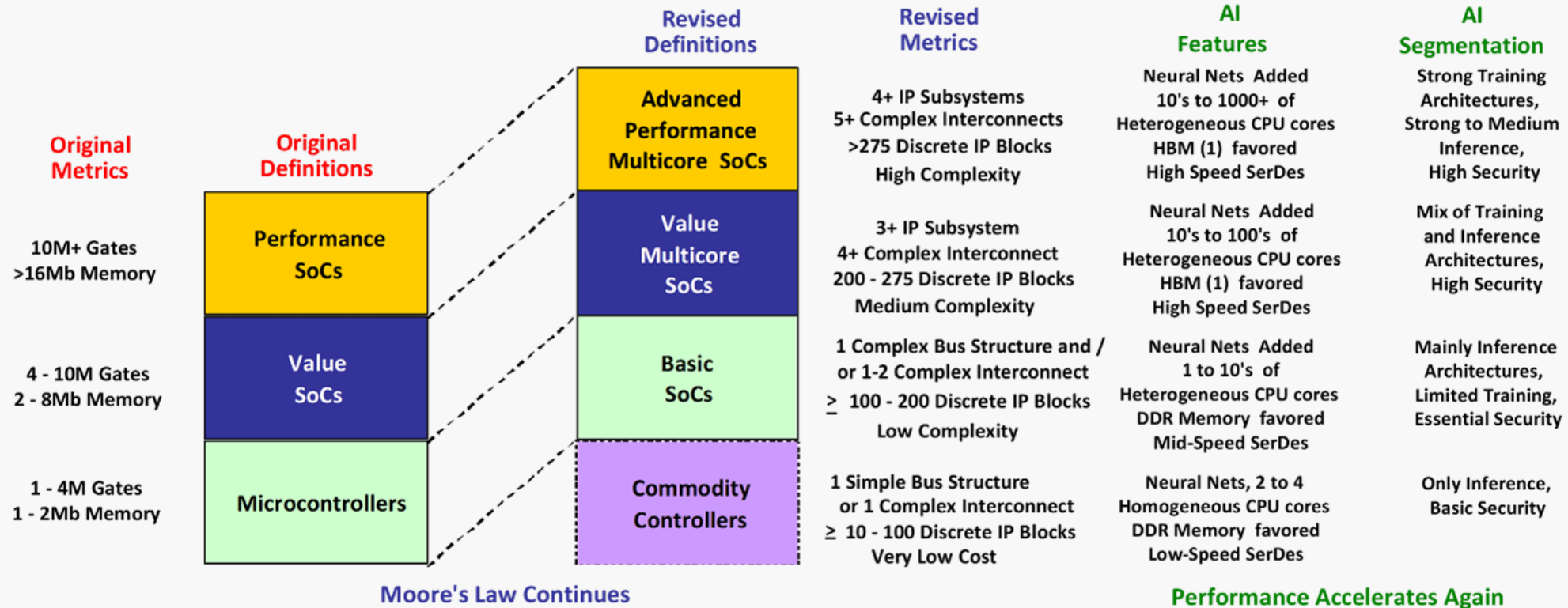


(e) 2D Mesh



(f) 2D Torus

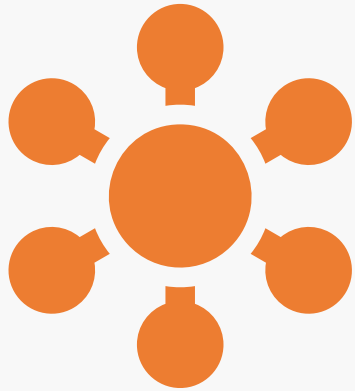
Who needs NoC



(1) High Bandwidth Memory

Source: Semico Research Corp.

Types of NoCs



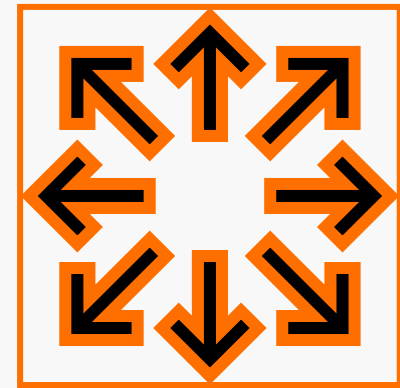
Topology

Mesh
Torus
Ring
Bus



Routing Algorithms

Deterministic
Adaptive



Routing Teciques

Circuit
Packet
Hybrid

Or even very complex....

Veriest

