

IP-XACT for IP providers

Arteris IP example case



IPSoC Conference, December 2019

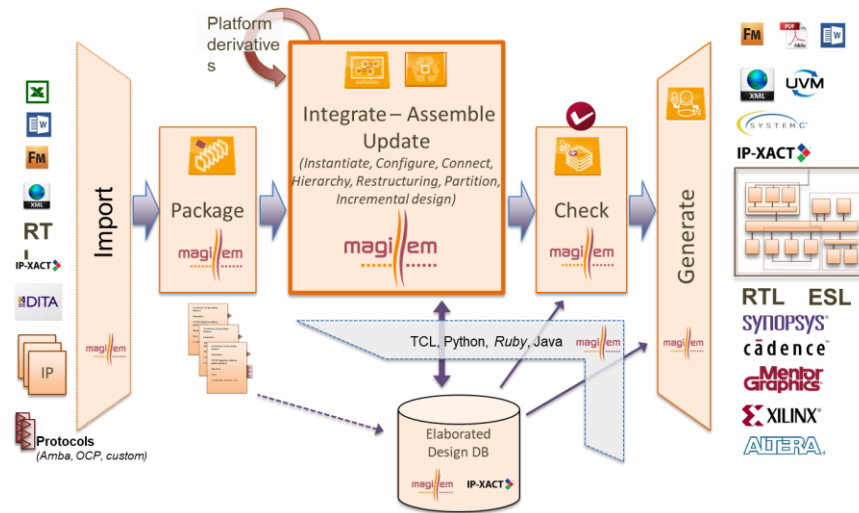
Agenda

- ❑ For all types of IPs:
 - Plug-and-play integration for your customers
 - Generation of collateral from IP-XACT
 - Deliverables management
 - Design Data Intelligence
- ❑ Advanced SoC integration with highly configurable NOC, Arteris IP case
 - Integrate multiple interconnects seamlessly
 - Leverage IP-XACT hierarchy for restructuring
 - Enhance configuration control and exchange
- ❑ Future of the collaboration:
 - Simplify NOC configuration by understanding the system
 - Attach physical information to IPXACT
 - True design traceability for ISO 26262

For all type of IPs

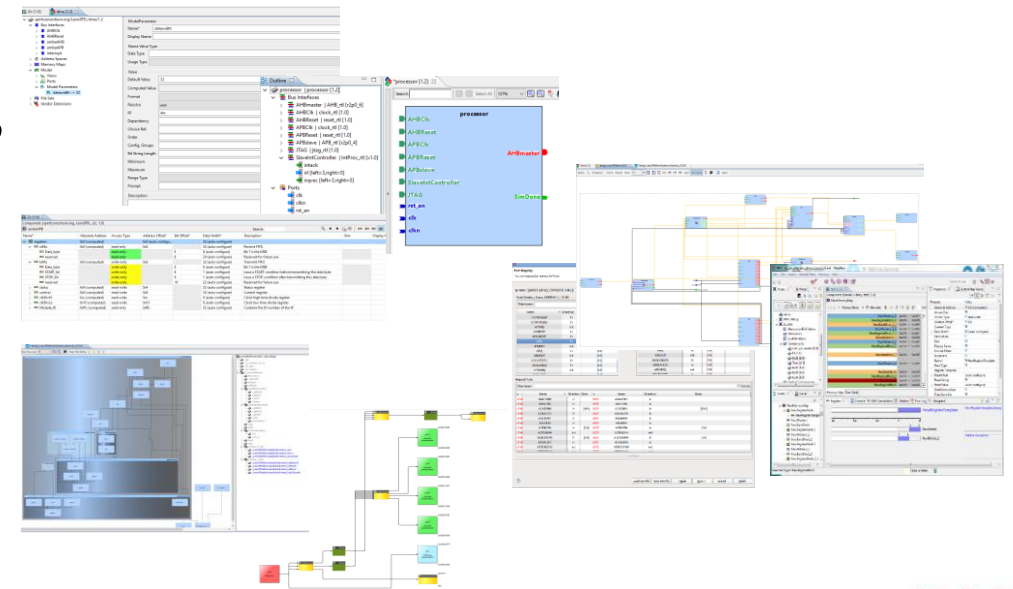
- Plug and play integration for your customers
- Generation of collateral from IP-XACT
- Deliverables management
- Data Intelligence

Plug and Play integration



- ❑ IP-XACT is designed for IP-Reuse
- ❑ Speed up integration time
- ❑ Reduce number of respins
- ❑ Improve quality

- ❑ Most of the larger SoC integrators use IP-XACT
- ❑ Benefits are important and proven
- ❑ IP-XACT is an IEEE standard = Long-term investment.



Collateral generation

Capture the information once, generate multiple formats.

□ Documentation

- Internal documentation
- Customer Datasheets

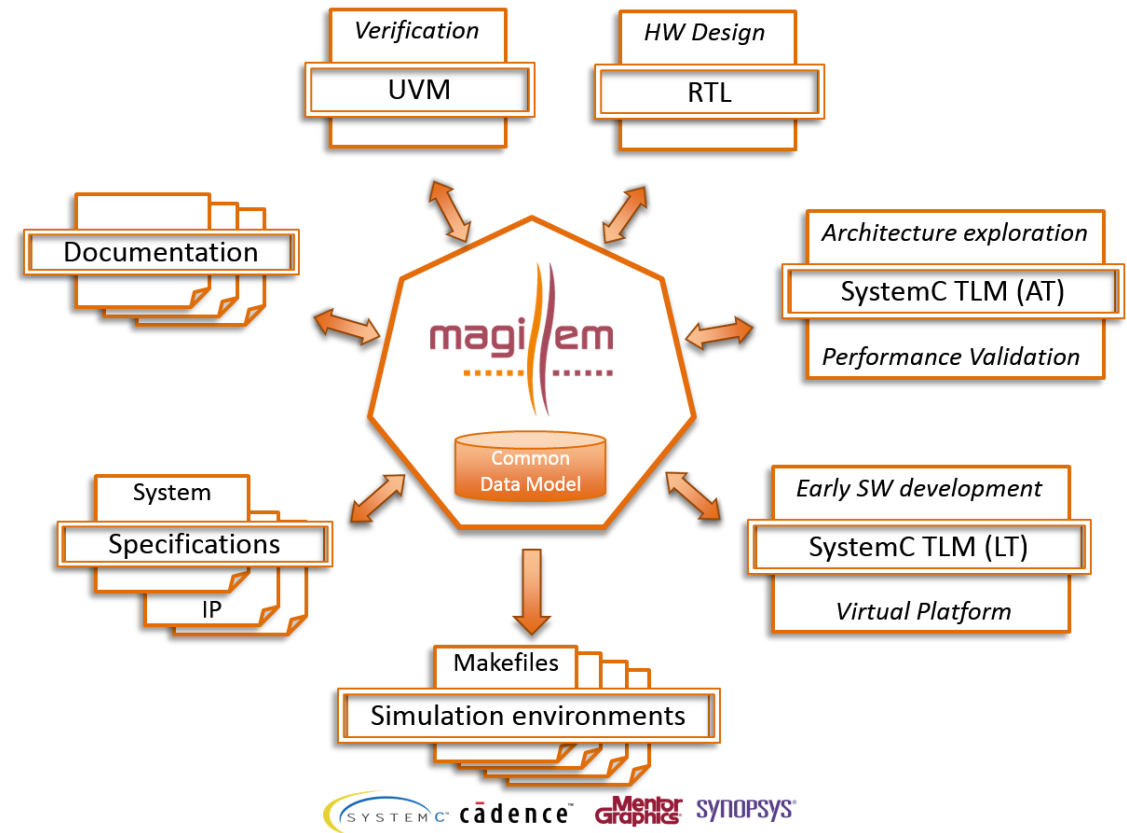
□ RTL / SystemC skeletons

- IOs
- Parameters
- Registers

□ Verification

□ Software

□ ...

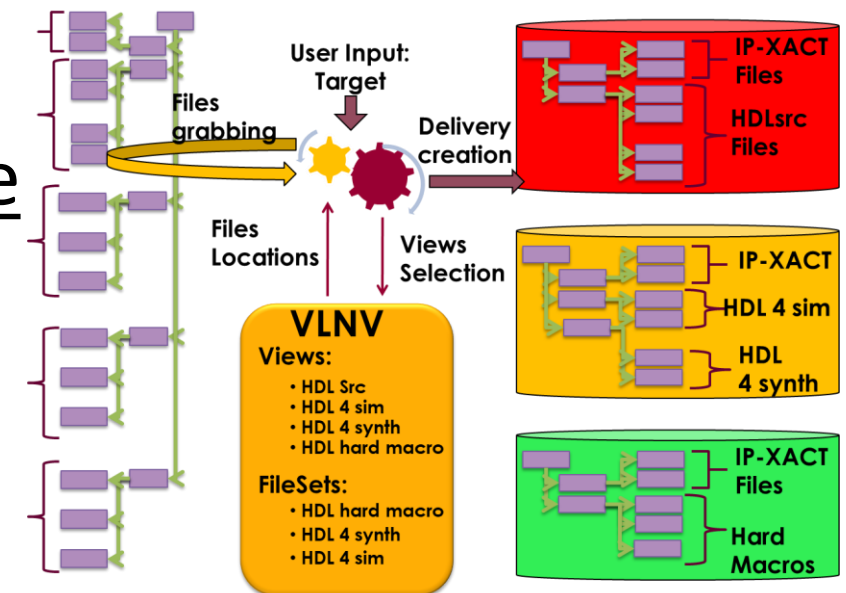


Deliverables management

Thanks to the views/fileSets mechanism of the standard, managing deliverables becomes a simple and fully automated action.

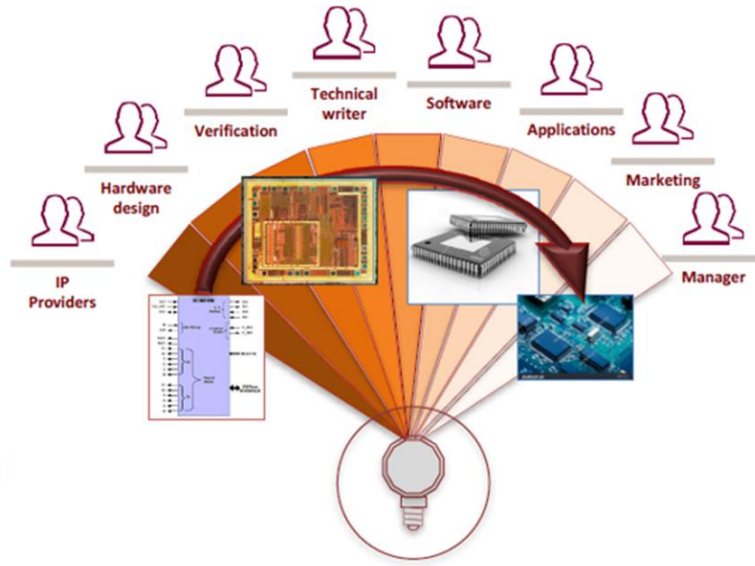
Views and FileSets offer a very flexible approach

- ❑ Components can contain multiple views
- ❑ Views can point to multiple FileSets
- ❑ FileSets can be referenced by multiple views



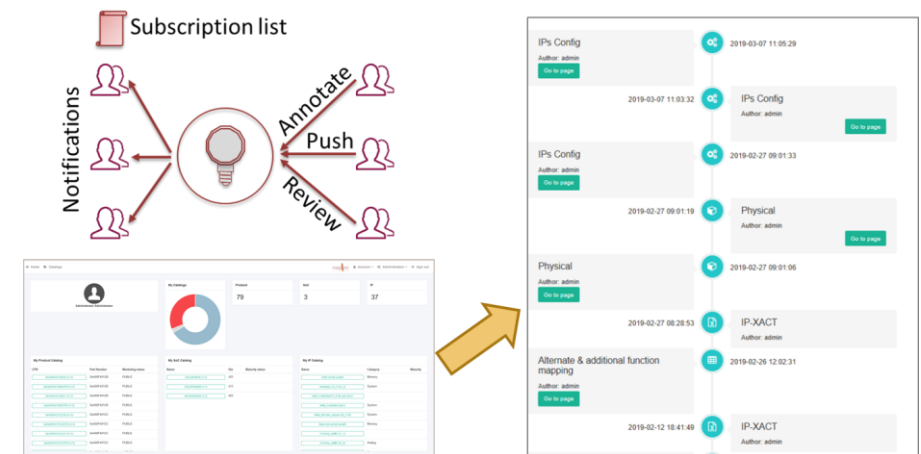
The Packaging step is the critical point to ensure a smooth management of deliverables.

Data Intelligence



- ❑ Products, SoC and IP referenced in a single environment
- ❑ Crystal Bulb is a lightweight client application (web browser)
- ❑ All teams access up-to-date information in a glimpse.

- ❑ Standard representation and curated data are critical for future AI applications.



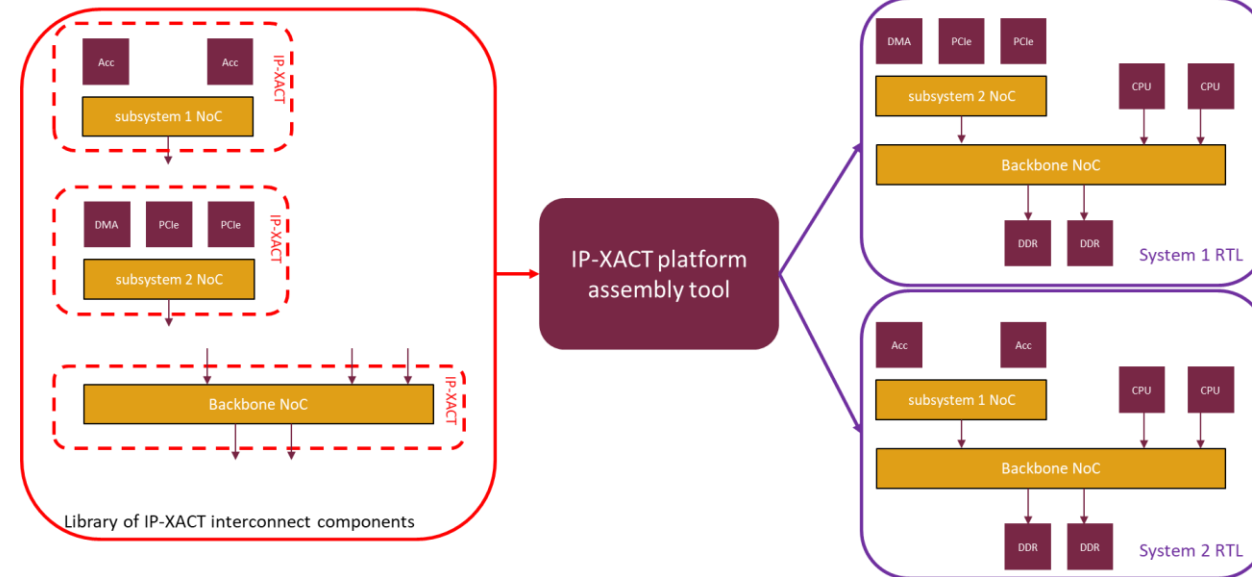
Advanced SoC integration with highly configurable NOC, Arteris IP case

- Integrate multiple interconnects seamlessly
- Leverage IP-XACT hierarchy for restructuring
- Enhance configuration control and exchange

Integrate multiple interconnects seamlessly

□ IP-XACT simplify multiple interconnect integration

- Each interconnect is configured and generated by different tools
- Systems are often composed of multiple interconnects

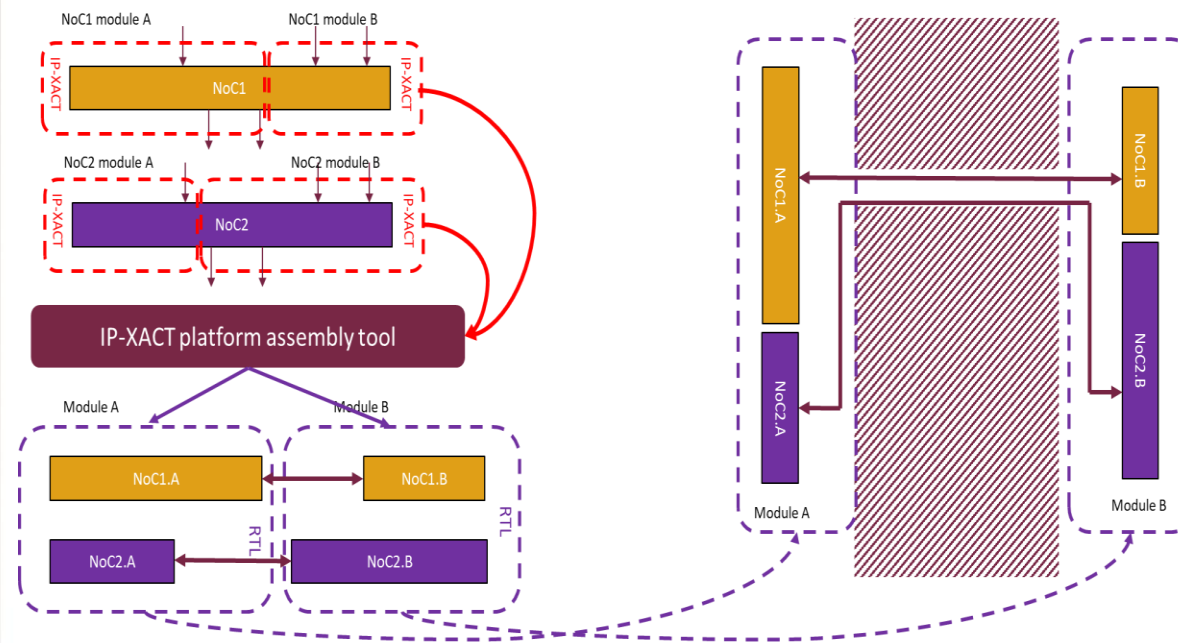
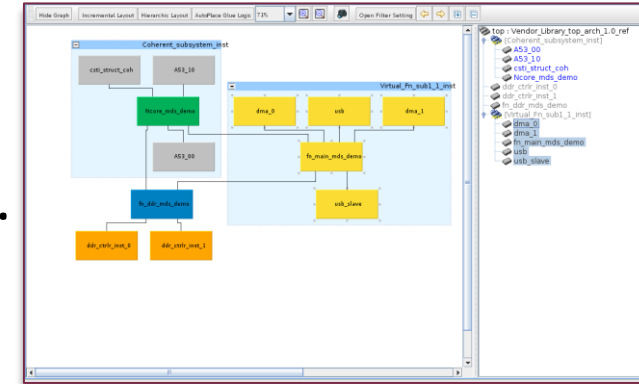


□ IP-XACT allow for a full system map computation through all interconnects

- Each interconnect contains its own address decoding
- Memory map computation is resolved through multiple Interconnect and the entire hierarchy

Leverage IP-XACT hierarchy for restructuring

- ❑ IP-XACT contains a detail description of the system's hierarchy
- ❑ Manipulating XML is faster and more reliable than directly manipulating RTL
- ❑ Checks and automation ensure an error-free restructuring.



- ❑ Already in use in some of the most complex SoC
- ❑ Integrate with the over all information
 - System Map
 - Verification
 - Documentation

Enhance configuration control and exchange

A challenge for complex IP providers is to know how the IP is configured and used

□ Typical Issues

- Complex IP provider cannot verify every possible configuration
- Customers cannot share the final RTL for confidentiality reason
- Requires a lot of effort and local engineers to properly identify use case

□ IP-XACT can help

- Parameters constraints mechanisms enable the IP provider to guide the user in the proper configuration
- IP-XACT files can be used as a communication vector
- Generation from a common representation of the IP facilitate the verification.

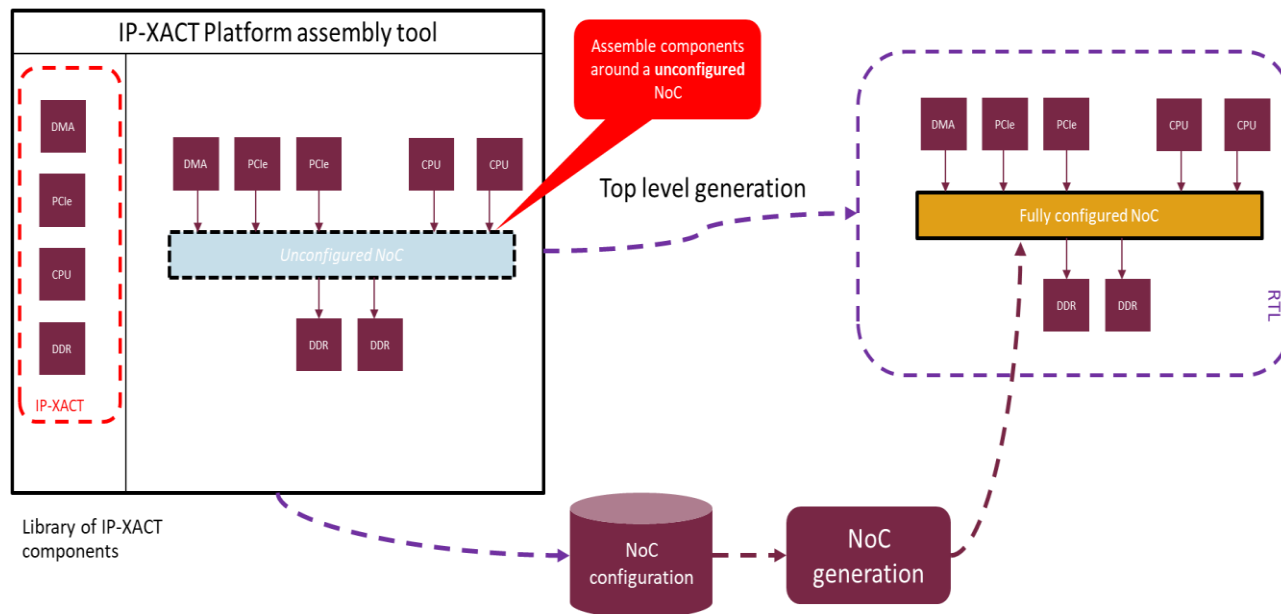
Future of the collaboration:

- Simplify NOC configuration by understanding the system
- Attach physical information to IPXACT
- True design traceability for ISO 26262

Simplify NOC configuration by understanding the system

A NOC configuration is highly dependent of the system

- ❑ A lot of information that the NOC configuration need is already captured in the system.



- ❑ IP-XACT allow to start with a non-configured instance
- ❑ Retrieving information throughout the entire system is easy in IP-XACT
- ❑ Replacing the unconfigured version by the fully configured one is as simple as pushing a button.

Attach physical information to IPXACT

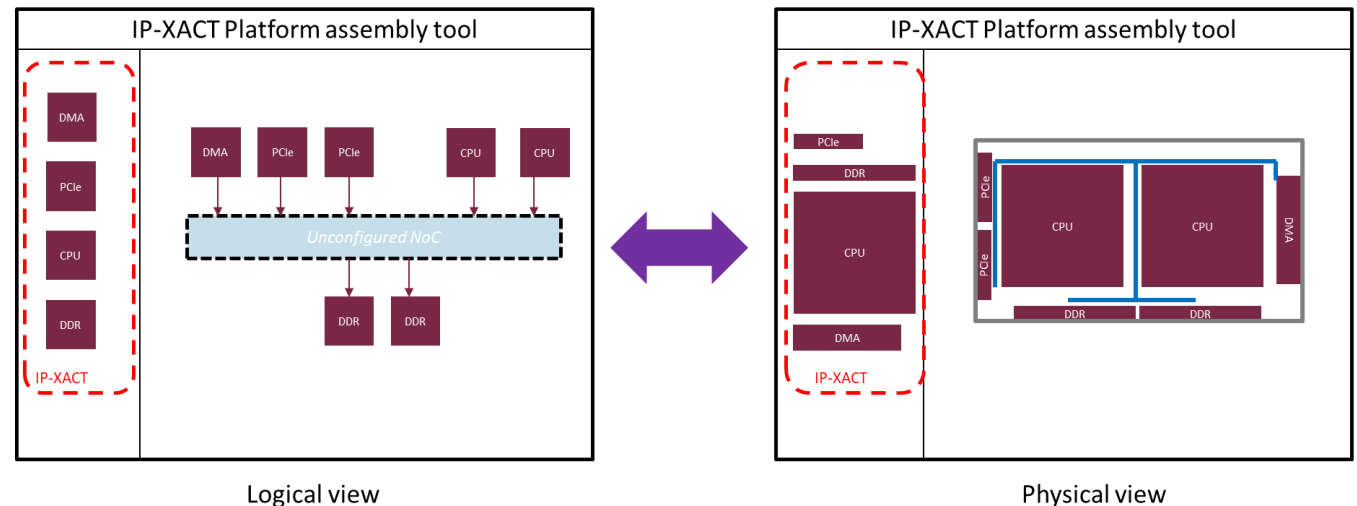
What if we could leverage physical information for an early floor planning assessment?

Physical floorplan can have a lot of effect on design choices.

Adding some physical information to IP-XACT like

- Area and shape estimation
- Physical location

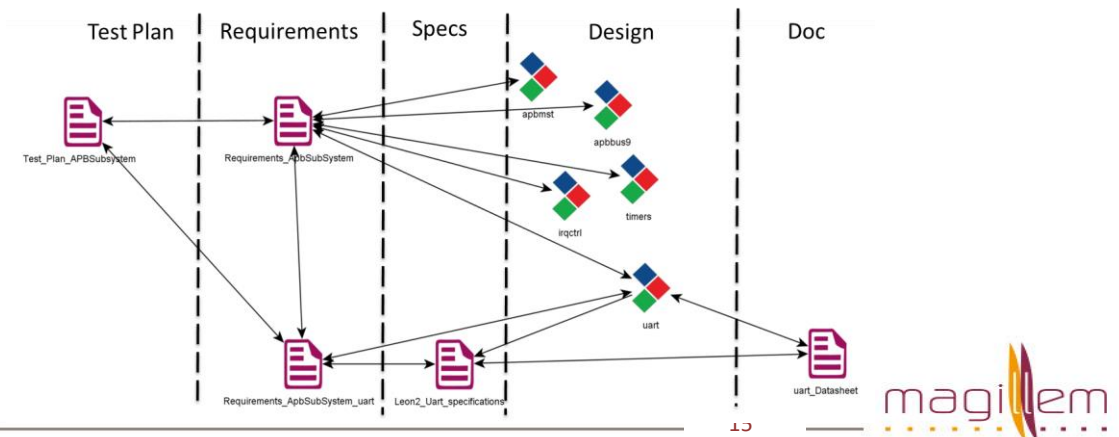
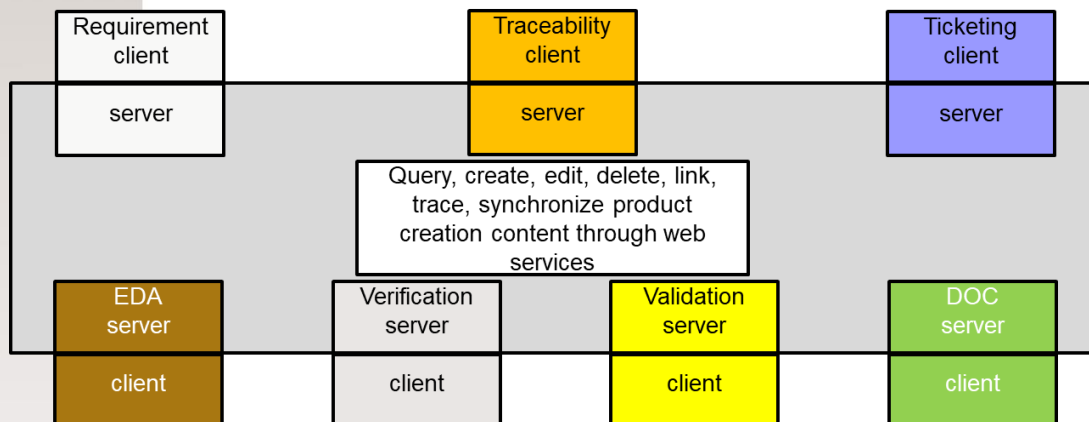
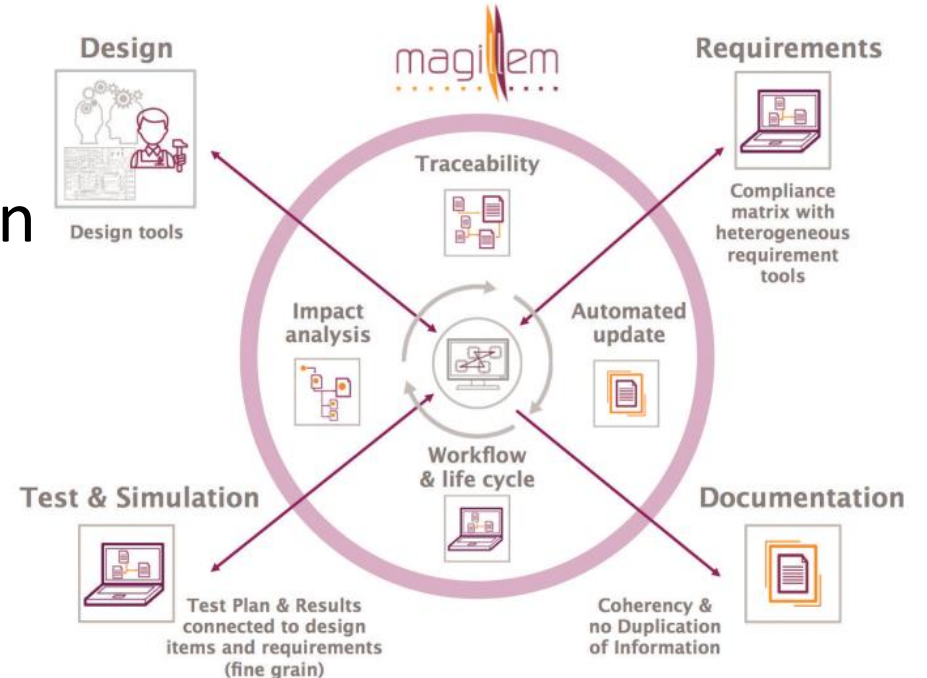
and a good graphical representation in a tool



Enable earlier assessment and better design choices in the very early architecture and design phases.

True design traceability for ISO 26262

- Traceability of information is a key requirement for ISO 26262 certification
- Leveraging the understanding of the design via IP-XACT is a cornerstone to true traceability.





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