

DAIMLER

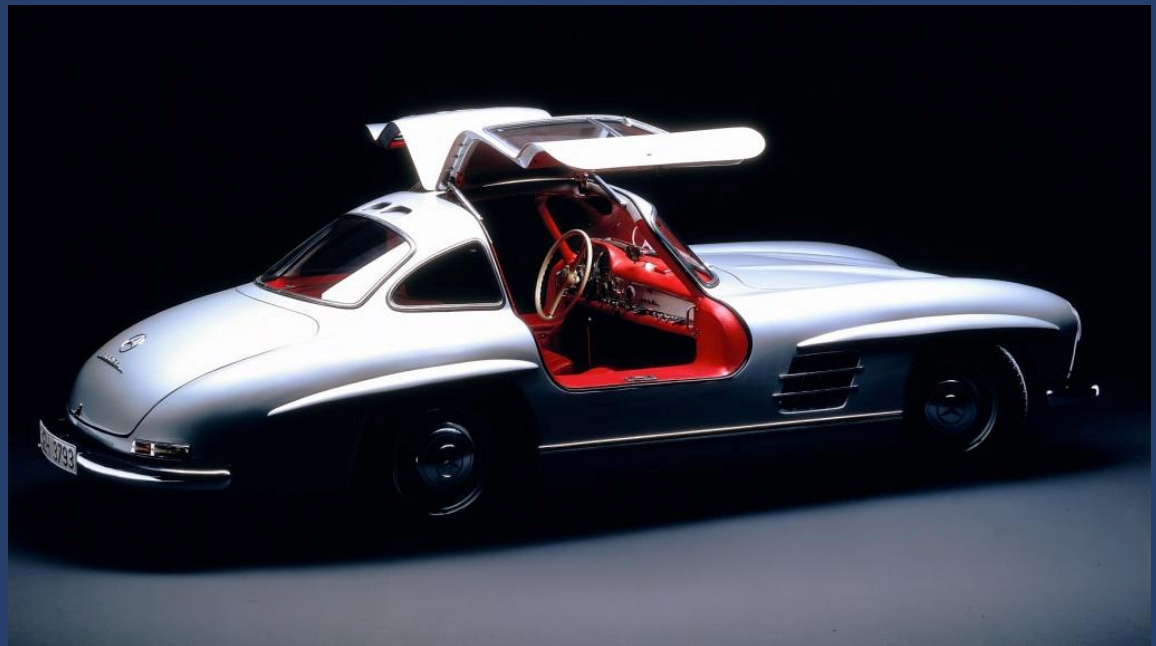
Challenges of MOST in the Second Decade

MOST Forum 2011

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MOST25 - Experiences



The Story of the MOST Cooperation

1998:

MOST Co founded by BMW, Daimler, Harman/Becker, SMSC; joined by Audi

2001:

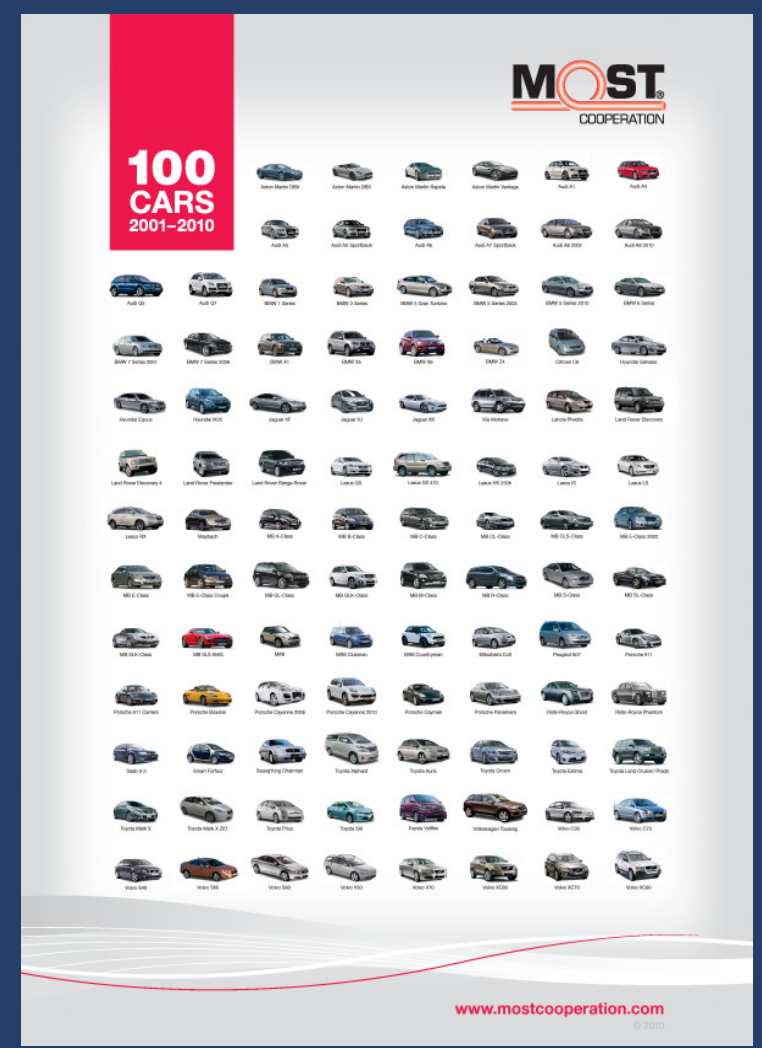
MOST is introduced in the first car

2011:

MOST Technology is used in more than 100 models of 16 car manufacturers

MOST Co has 81 members

Consortium active in Europe, Asia and America



Implementation Challenges at the Beginning

When starting with the implementation of MOST25 we encountered some difficulties, e.g.

- FOT Maturity
- Unlocks and “No Audio”
- Secondary node implementation
- First attempts to implement IP over MAMAC
- Parallel development of test tools
- ...



⇒ While implementing the first generation of MOST25 devices some fundamental standardization issues had to be solved in parallel.

Essential Conclusions

- A robust system starts with a robust physical layer
- A network controller has to provide easy to use and efficient interfaces
- The network stacks need to be bug free for an efficient development of distributed systems
- Development and test tools have to be available on time
- All external partners involved must have a sufficient know-how of a new technology

⇒ The MOST technology involves many domains requiring the system integrators to have comprehensive solutions.

Major Achievements with MOST25



More than 250 people from over 100 companies contributed



Detailed specification of the complete MOST network stack and corresponding test requirements with more than 4000 pages



Well proven hardware and software components



Comprehensive set of development tools

MOST150 – Status



Requirements for next Infotainment Systems

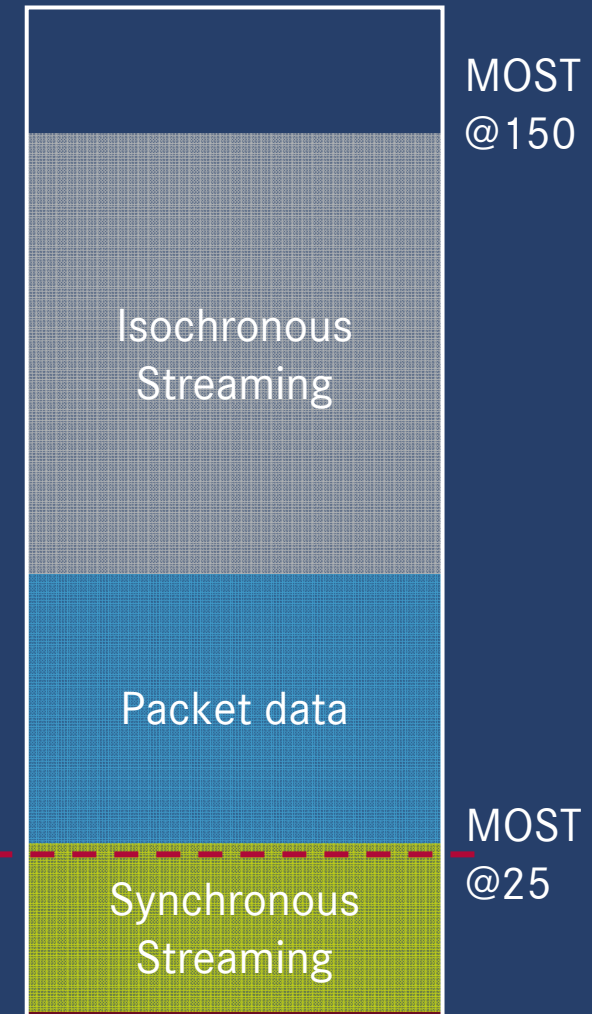


Bandwidth Forecast

Determining factors:

- High definition audio for several audio domains
- Video transmission from player or broadcast sources to several displays
- Huge amount of bulk data caused by CE device integration and internet applications

⇒ The next infotainment generations will exceed the capacity of MOST25 to a great extent.



Design Guidelines for MOST150

Maintain existing and proven features of MOST25 as a solid basis

Consistent advancement according to the increased demands of applications

Cost per node comparable with MOST25

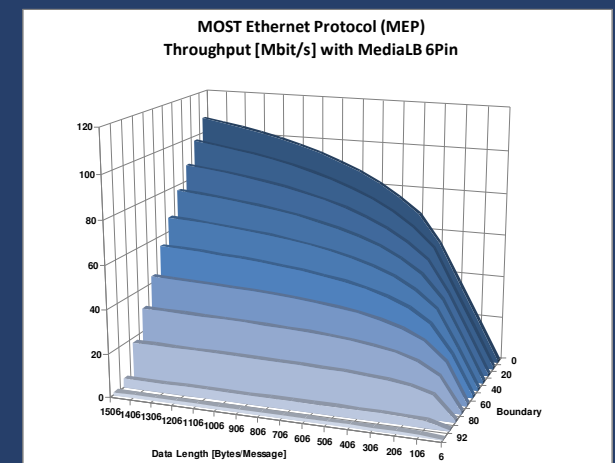


⇒ MOST150 allows reusing proven system architectures and focusing on developing new functions.

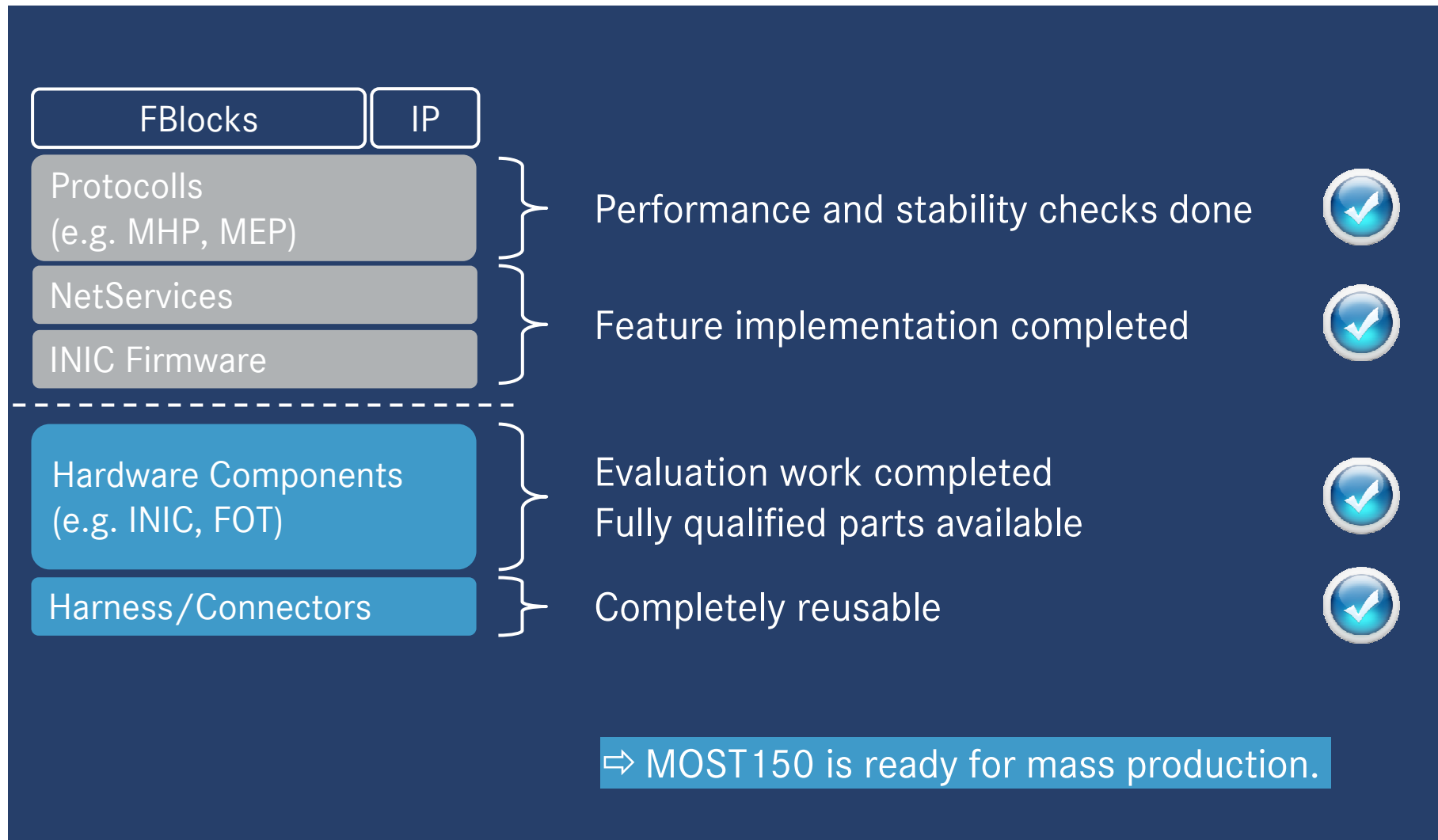
Validation of MOST150 at Daimler

- MOST150 pre-projects with tier1 suppliers
- Mechanical integration tests with tier1 suppliers (soldering, environmental tests)
- Setup of evaluation platform with external partner
- Independent validation of INIC firmware, NetServices and INIC interfaces (e.g. MLB)
- Bandwidth analysis of MOST Ethernet channel
- Early involvement of tool manufacturers

⇒ All necessary measures have been taken for validating MOST150.



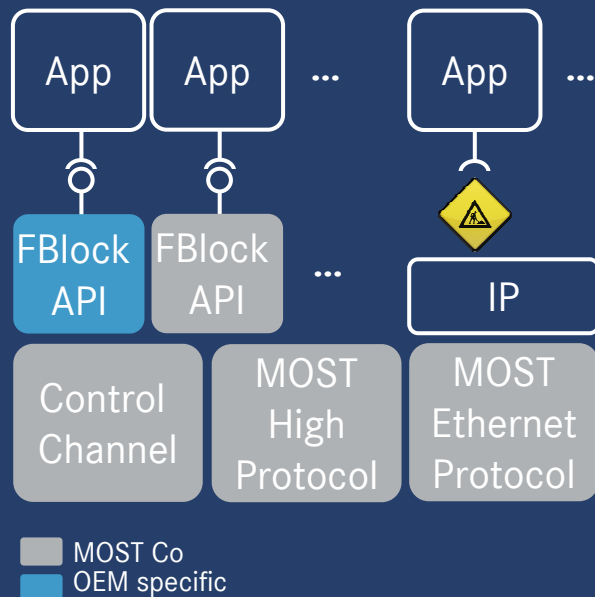
Evaluation Status MOST150



MOST – Challenges



Challenge: IP-based Technologies



Requirements:

- Efficient integration of MOST Ethernet channel into devices
- Seamless integration of IP based consumer standards into MOST, e.g. UPnP
- Definition and standardization of an IP-based communication middleware for the MOST Ethernet channel

⇒ MOST has to utilize the benefits of IP-based consumer technologies.

Challenge: Video Transmission

Requirements:

- Efficient and cost effective encoding and decoding of broadcast videos, e.g. TV signal
- Full featured multiseat system with Video/Audio synchronisation
- Efficient compression with low latency, e.g. for TV data services
- Support of automotive specific display resolutions and frame rates



⇒ MOST has to provide for easy integration of consumer state-of-the-art technologies, e.g. High Definition Video, 3D and HDMI user interfaces.

Challenge: Hardware and Network Stacks

Requirements:

- Cost down by continuous improvements
- Easy to use interfaces to host controllers, e.g. USB, PCIe, MII
- Support of modern operating systems
- Increase of speed grade for further use cases

⇒ MOST has to be successful in an extremely fast-paced infotainment world.

Summary

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- MOST25 is a success story
- MOST150 is on its way to mass production
- There are further challenges in the second decade

⇒ Daimler is committed to the MOST Technology

⇒ But all involved parties have to contribute

⇒ There is no reason to relax



Thank You