

Avionics Based on Ethernet Networks

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- Ethernet is the most commonly used terrestrial protocol and has already seen limited use in space onboard the international space station.
- In response to terrestrial requirements for real-time and fault tolerance, new flavours of Ethernet are now commercially available
- Such developments are of potential interest to the space community and as we shall see are already finding their way into missions
- This session will overview the concepts behind TTEthernet and examine actual and potential use cases in space applications. Products and prototype implementations will be presented.
- *The session is intended to be informative so as to make the space community aware of developments and potential applications*

Agenda



Introduction to Deterministic Networks	Prof. Hermann KOPETZ (Technical University of Vienna)	14:00 - 14:40
TTEthernet presentation	Mr. Christian FIDI (TTTech Computertechnik AG)	14:40 - 15:10
Deterministic High Speed Communication in Space	Mr. Jens HARTMANN (<i>Astrium EADS</i>)	15:10 - 15:40
Coffee Break		15:40 - 16:00
MPCV CM Presentation-Webex	Mr. George W. EGER (Locheed Martin)	16:00 - 16:30
FLPP/AvionicX	Mr. Guillaume JAVELLAUD (ESA/HQ)	16:30 - 17:00
Implementation aspects of TTEthernet interfaces	Mr. Anders PETERSEN (RUAG Space AB)	17:00 - 17:30
Open Discussion	All	17:30 - 18:15

Hermann Kopetz is emeritus professor at the Technical University of Vienna. He is the chief architect of the *time-triggered technology* for dependable embedded Systems and a co-founder of the company TTTech. The time-triggered technology is deployed in leading aerospace, automotive and industrial applications. Kopetz is a Life Fellow of the IEEE and a full member of the Austrian Academy of Science. Kopetz served as the chairman of the *IEEE Computer Society Technical Committee on Dependable Computing and Fault Tolerance* and in program committees of many scientific conferences. He is a founding member and a former chairman of IFIPWG 10.4 and has been a member of the ISTAG advisory group at the European Commission in Brussels from 1998-1912. Kopetz has written a widely used textbook on Real-Time Systems and published more than 200 papers. In June 2007 he received the honorary degree of *Dr. honoris causa* from the University Paul Sabatier in Toulouse, France.



- TTEthernet is already finding its way into the flight avionics – MPCV
- What is the potential market?
 - Currently the use limited to Human spaceflight and potentially Launchers
- What building blocks are available (MPCV development is ITAR), commercial boards and test system from TTTech, but IP cores , ASIC?:
 - The overriding need is to have an open standard supported by more than one source
 - The approach taken for existing development such as the LEON should be followed (IP core licenced by ESA to European missions)
 - Supporting tools need to be developed and the IP core need to be focused on actual needs rather than general purpose