

COVERAGE

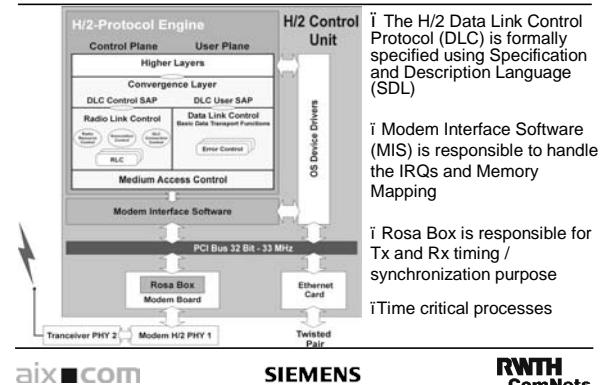
- Initiated by Siemens AG
- To observe and to develop Multi-Hop networks
- The testbed development is shared among TU Hamburg-Harburg, IAF and TU-Dresden, AixCom and RWTH Aachen (ComNets)
- To analyse and to optimise new algorithms e.g. for channel estimation, Radio Resource Management, Vertical and Horizontal Handover procedures
- To develop a Multi-Hop capability for H/2 using iForwarder concepts

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Testbed Architecture

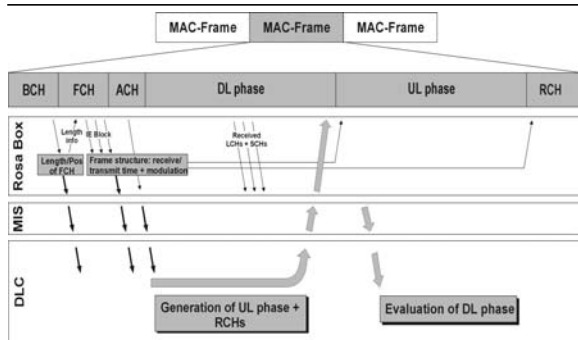


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Timing in Mobile Station MAC

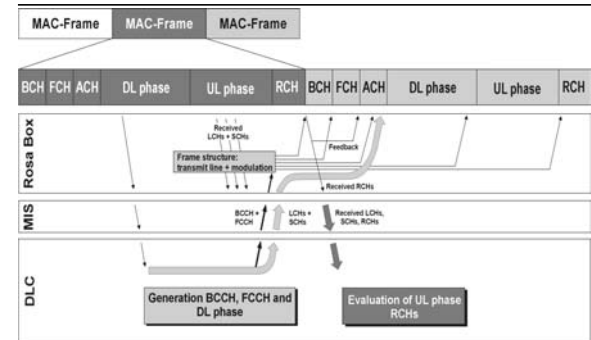


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Timing in Access Point MAC

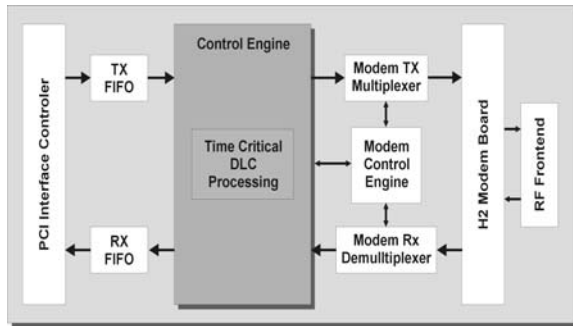


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Time Critical DLC Processing

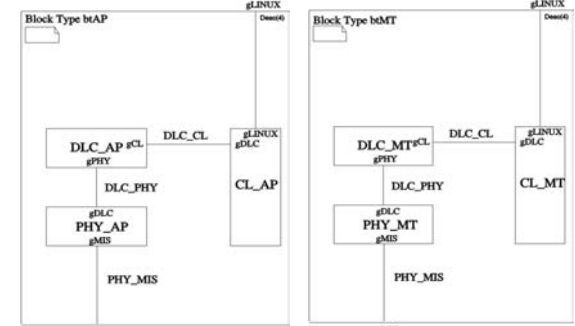


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H/2 DLC Specification in SDL



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Problems in DLC Development

SDL is easy and good to use for specifying communication protocols but ...

- The execution time of ~~the~~ standard SDL specification is very slow
 - ⇒ SDL is not best suited for Hard Real Time system !!
- It is very difficult to program an interface that works well with both SDL data structures and hardware data structures (MIS)
 - ⇒ SDL cannot provide a good Software Abstraction Level for Modem Interface Software (MIS) !!
- The ~~the~~ standard SDL executable from SDT Telelogic Tau is a user application
 - ⇒ SDL introduces extremely high delay and the concept of device driver programming is violated !!

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DLC Development in RT System

Therefore

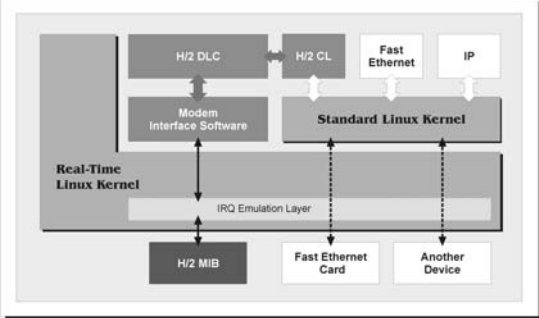
- Introduce C pointer into the SDL specification
- Introduce C data structures which work perfectly in both SDL and hardware interface environments (MIS)
- Linux supports only ~~the~~ Round Robin scheduling
 - ⇒ SDL protocol has the same priority as the mouse protocol
- Real Time Linux supports ~~the~~ Priority Scheduling
 - ⇒ Development of some new SDL Kernels which enable the SDL specification to run as Real Time Linux module
 - ⇒ Compile and link the SDL specification and the SDL Kernel together as RT Linux Module and assign a high priority to it

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H2 Device Driver

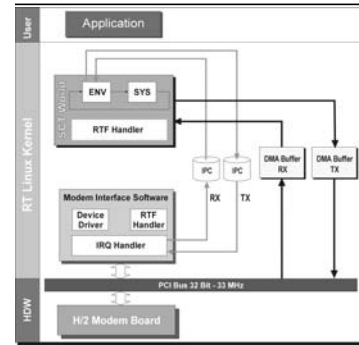


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SDL in Real Time Kernel (Soft Real Time approach)



• MIS intercepts IRQs from H/2 modem board and writes a message into the IPC queue

• The SDL Kernel (SCT World) wakes up periodically to poll the ENV

• The ENVironment (ENV) checks the IPC queue if there is a message

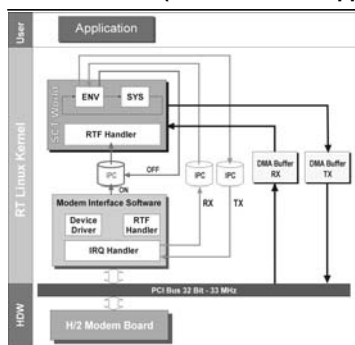
• Then the ENV will contact SDL (Sys) after processing the message from IPC queue

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SDL in Real Time Kernel (Hard Real Time approach)



• MIS intercepts IRQs and triggers the SDL Kernel on by sending **NDNi** signal through IPC and writes a message into the IPC queue

• The ENV checks the IPC queue if there is a message

• Then the ENV will contact SDL (Sys) after processing the message from IPC queue

• The ENV, triggers the SDT Kernel off by sending **NOFFi** signal through IPC

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Summary

- The objectives of COVERAGE project
- To observe and to develop Multi-Hop networks
- Multi-Hop for H/2 using *iForwarder* concepts
- Development of H/2 Data Link Control (DLC) in SDL
- Development of some new Soft and Hard Real Time SDL Kernels
- Development of Hard Real Time H/2 device driver

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