LXI Reference Design: A Fine Step Forward

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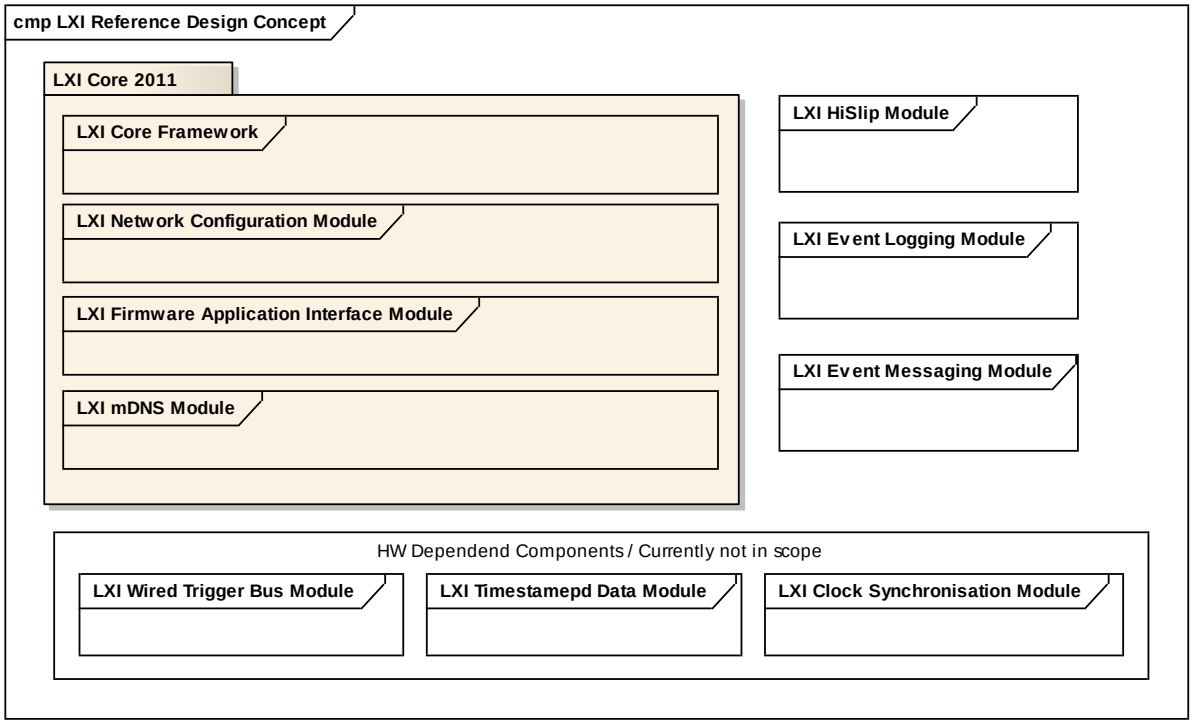
After five months of work between the LXI Consortium and TSEP, the LXI Reference Design is ready for an official review. The design document includes almost 400 pages at the moment and contains more than 100 classes, over a 100 sequence diagrams, and is based on more than 200 requirements.

The concept of the LXI Reference Design is based on a modular break-up of the LXI specification. As the specification, the design is split up into the corresponding modules, so the instrument vendor has the option to select and use those components which are relevant to his or her project. The following picture shows the modular structure of the Reference Design.



For the LXI Core 2011, the following mandatory modules are available:

- LXI Core Framework
- LXI Network Configuration Module
- LXI Firmware Application Interface Module
- LXI mDNS Module

The following optional modules may also be used:

- LXI HiSLIP Module
- LXI Event Logging Module
- LXI Event Messaging Module

Some modules described in the LXI Device Specification depend on dedicated hardware; hence, these modules are currently out of scope:

- LXI Wired Trigger Bus,
- LXI Timestamped Data,

- LXI Clock Synchronization using IEEE 1588

No extra module was created for the IPv6 extension, since these requirements are strongly interwoven with the entire design. IPv6 is nonetheless an optional component for the vendor who decides at run-time whether IPv6 is used. In the case of systems where IPv6 is to be non-existent, it can be entirely removed at compile time.

For the mDNS (Bonjour) implementation, it was decided to use the Apple framework and adjust the design accordingly. The deciding factor was that the Apple framework is available on Microsoft Windows as well as Linux. The alternative implementations are specially fitted to one operating system.

During the last five months the necessary development platforms were evaluated and prepared. For the development under Windows and Linux(x86) virtual machines were prepared and provided with necessary tools (compiler, editor, debugger, Doxygen). For the development under Linux (Arm) an appropriate motherboard was evaluated, an appropriate Ubuntu system superimposed and provided with necessary tools.

Parallel to the design work, the first prototyping implementations have already been developed. Therefore, a prototype to evaluate the used web server (CivetWeb and NginX) was created which verifies the necessary functionality for the reference design. Based on this prototype, TSEP was able to give a brief demonstration on the Ubuntu system (Arm) at the last LXI Plug Fest in Singapore. The functionality of the LXI website was demonstrated on a TSEP low-end device (Step Attenuator).

As the design phase is now completed, TSEP will begin the implementation of the LXI reference design. During the last months, in addition to the prototyping, the first implementations were developed (base classes, container classes etc.). Therefore, in the coming weeks the first classes of the LXI Core Framework can be addressed.

The LXI reference implementation is right on schedule. TSEP is planning several demonstrations at the next LXI Plug Fest in Washington, D.C. (October 2014), where the first modules will be presented. Also, workshops on the usage of the LXI Reference Design are planned.