SDRF Change Proposals and Comments on JTRS SCA 3.0 Specialized Hardware Supplement

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The SDR Forum membership has reviewed the SCA 3.0 Specialized Hardware Supplement (SHS). Individual companies and organizations prepared detailed recommendations, which were then discussed and voted on at the Forum general meeting in Austin, TX, January 18–20 2005. This document reports the consensus view of the System Interface Working Group and Space Requirements Special Interest Group of the SDRF about what should be modified in SCA SHS 3.1.

Specific change proposals are numbered sequentially throughout the document. Paragraphs without numbers are comments for consideration by the JTRS JPO.

After SHS 3.1 has been developed, the SDRF recommends the JPO initiate a focused near-term effort to further mature and validate the SHS, along the lines of JTRS Step 2B for the SCA, to minimize risk for upcoming acquisition contracts that will mandate SCA 3.x compliance.

Overall comments

1. The SHS document should be restructured to allow graceful maturation toward a more complete HAL specification, which would cover such topics as operating environment, languages, new and different processor types, etc.

The SDRF offers to make a presentation to the JPO recommending a set of principles and a particular document structure that supports graceful maturation of the SHS.

2. Sections 1.1 and 2.2 should be clarified to state that special-purpose PEs that support CORBA are subject to the main SCA rather than the SHS.

HAL-C

3. The current section 2.4.2 ("Hal-C for FPGAs") is underspecified and should be substantially revised. It needs a set of additional specifications including real-time performance characteristics, a timing diagram, and many other extensions, which can be found in the CPs from various organizations.

4. The SHS should not define a new transport API for FPGAs unless no existing one already accepted in industry is usable. Candidates that should be analyzed include OCP/IP and Wishbone. Section 2.4.2 should be replaced if possible with a reference to an existing standard, just as the SCA refers to the CORBA standard.

5. A new section 2.5 should be added to describe how HAL-C components and HAL-C communication mechanisms interact with components and communication mechanisms specified in the rest of the SCA. Specific areas of concern are: interaction with CORBA based SCA components, interaction with SCA adapters of non-CORBA components (e.g., security subsystem), use of the SAD to control layout, and connection of HAL-C components.

6. A new section 2.6 should be added, or one of the introductory sections expanded, to describe whether ASICs are in the scope of the SHS and how HAL-C components should communicate with ASICs.

7. A new section 2.7 should be added, or one of the introductory sections expanded, to describe how the HAL-C specification and mechanisms will be extended to incorporate new processor technologies in the future.

DSP AEP

8. The AEP defined in section 3 should be renamed from the "DSP AEP" to the "Lightweight AEP." The SHS should specify that this AEP applies to any resource-constrained processor that cannot run a full POSIX AEP. DSPs are an example of such a processor. All other references to DSPs in section 3 should be removed.

Waveform Functional Blocks (WFBs)

9. The WFBs in the document are sufficiently underspecified as to be unimplementable. If the specifications cannot be made precise, the WFBs should not be required.

10. To avoid implying that WFBs must be implemented in specialized hardware rather than in a GPP, they should be specified in the API portal rather than the SHS.

11. If WFBs are required, it should not be mandatory that all platforms provide implementations of all WFBs. For example, space-based radios have radiation-hardening requirements that result in use of processors that are several generations behind the state of the art, so they are significantly more resource constrained than other JTRS platforms.

Issues related to WFBs that are outside the scope of the SHS document

If WFBs are required, there should be a library of reference WFB implementations that platform developers can port to their platforms.

If WFBs are required and it is not mandatory that all platforms support all WFBs, there should be a library of reference WFB implementations that waveform developers can use when porting to platforms that do not provide particular WFBs.

Before the WFBs become required, the business and organizational issues related to such a library need to be defined. These issues include: how it will be populated with reference implementations, what organization will maintain it, and what form of configuration management will be used.