

# **Standard Bus vs. Bus Wrapper: What is the Best Solution for Future SoC Integration?**

C. Yeung, VSI Alliance, USA  
G. Matthews, ST Microelectronics, France  
J. Morris, ARM, UK  
A Haverinen, Nokia, Finland  
J. Zaidi, Palmchip Corp.

## **Abstract**

A number of companies have promoted their on-chip busses as potential standards for the SoC industry. VSIA's On-Chip Bus Development Working Group chooses to develop a Standard Bus Wrapper (VCI) as opposed to endorsing a single bus as the standard. Standard Bus advocates claim Wrappers incur performance and area overhead. Bus Wrapper advocates claim no single On-Chip Bus will meet the needs of all SoCs. Will a single bus emerge, and if not where should a standard wrapper be used? Which is the correct approach for future SoC Integration? This panel will include experts from both of these perspectives, to discuss the pros and cons of their positions.

## **Graham Matthews, ST Microelectronics:**

ST Microelectronics has been developing a System on Chip integration platform over the past 10 years. ST embeds a wide range of processors, and so the platform is processor-independent and also spans a wide range of cost/performance combinations.

Given the dynamic nature of communication requirements in many application areas, it is important that ST retains some level of strategic independence in this key area. There are many other companies which have a similar strategic goal. However, it is also important that standardisation emerges in the industry as a whole to enable the import and export of key IP modules.

ST has contributed significantly to the Open Microprocessor Initiative and the VSI standardisation activities. The aim of this has been to ensure the emergence of an independently controlled and supported on-chip Virtual Component Interface. A standard VCI and the use of Interface-Based Design abstraction methods is key for SoC to support the critical separation of IP producer from product integrator.

## **Jonathan Morris, ARM**

While the structure and complexity of SoC design today requires use of IP from many different sources, it is necessary for efficient design to tightly couple the processor and critical peripherals together with an On Chip Bus tailored to communicate between them. A standard such as VSIA's Virtual Component Interface has its usefulness in allowing easy integration of non-critical third party IP. ARM has a tightly coupled Processor, bus and critical peripherals, which allow the designer to efficiently implement their SoC architectures. Furthermore many non-critical third party IP, which already have ARM's Amba bus interfaces, would be less efficiently integrated into an ARM based architecture if a standard such as VCI was the only available interface.

## **Anssi Haverinen, Nokia**

Even though most today's SoCs utilize PCB style bus architectures, the SoC technology allows for many different interconnect styles. Virtual Components designed today have to be portable from an architecture to another to protect the investment of making them reusable. VSIA's Virtual Component Interface standard is independent of interconnect architectures, and provides system integrators with a way to use the same component with on-chip buses, point-to-point connections, or other architectures.

## **Jauher Zaidi, Palmchip Corp.**

Today, SOC designers rely on internal and external IP for creating sophisticated designs quickly and reliably. Yet, they also find they need to spend significant time integrating and verifying IP at the system level. Jauher Zaidi, CEO of Palmchip Corporation, will discuss an alternative approach of integrating various IPs. This alternative approach -integration architecture - utilizes a channel and point-to-point interconnect rather than a wrapper or bus-based method for SOC integration. In addition, the presentation will cover specific architectural features that help facilitate IP integration and system-level verification in SOC.