



RTC Interviews Mads Lillelund, CEO, Carlo Gavazzi

RTC: Now that we've turned the calendar page over to 2006, and you've been in the saddle as president of Carlo Gavazzi Computing Solutions for coming close on a year now, what is your overall impression of the market and where do you see the embedded computer business going?

Lillelund: I am encouraged about the market and the growth prospects for our businesses. Within the embedded computer business we see growth opportunities across our four targeted segments, which are: Military, Telecom, Industrial and Medical. Within the military segment we see continued growth with VME-based products as well as a keen interest in learning about new technologies. We have also seen this segment be an early adopter of innovative cooling technologies. Within our Telecom segment, the key driver is the move to ATCA and now an early interest in MicroTCA.

Clearly with new technologies coming into the market and more innovation and value required within the chassis, customers are increasingly requiring companies like us to provide increased design and engineering talent, quality and to help them fast track products to market. These requirements play to our strengths, so we are very excited about our prospects.

RTC: Carlo Gavazzi Computing Solutions comprises several different groups that have been consolidated under the Computing Solutions banner. Can you briefly tell our readers how the divisions evolved and what areas of the technology and expertise they cover?

Lillelund: Carlo Gavazzi Computing Solutions has grown through a combination of organic growth as well as acquisitions. We will continue this strategy as we bring new technologies to the market. I am a big believer in a strategy that combines technology alliances, partnerships and key acquisitions. By executing well on this strategy we can fast track products to the market and bring new technologies to our customers in an effective and cost-efficient manner.

Today we have three key groups that are uniquely positioned in the market, but that also allow the ability to leverage each of the groups' strengths with each other. The three groups are: Electronic Packaging & Embedded Computing (formerly known as Mupac), Fabric & Connectivity (formerly known as Aurora Technologies) and Channel Access.

Electronic Packaging & Embedded Computing is focused on the continuous participation

in the development and application of the PICMG, VITA and PIC SIG Open Architectures. Basically we apply this open architecture knowledge in designing system-level packaging solutions for our customer applications in the Telecom, Military, Industrial and Medical segments.

Fabric & Connectivity is focused on off-the-shelf solutions based upon StarFabric and PCI Express to address the needs of PCI and PCIe system expansion. The traditional Aurora brand serial products are still being maintained along with our ControlTower console management system. The rapid adoption of PCIe on motherboards and the reduced number of full height and/or length PCI slots have expanded the need and available market for reliable, well-designed, scalable system expansion. Our solutions allow people to maintain their existing investment in PCI cards, drivers and software and control their migration path to PCIx and PCIe. I have also chartered this group to stay abreast of the emerging and maturing fabrics outside of StarFabric and PCIe including InfiniBand and RapidIO, while continuing their committee activities with the PCI SIG groups.

Channel Access is a technical sales channel targeted toward the enterprise space. Our skill sets center around our technical sales ability and best-in-class product offerings, which feature NMS Communications, PIKA Technologies and our Aurora Technologies (Fabric & Connectivity) products. We are aiming to grow this business by extending the product lines and offering integrated systems for the enterprise space.

Our key driver in everything we do is to constantly innovate for our customers. Fortune 1000 companies as well as start-ups and medium-sized companies look to us to provide key capabilities to them. Chief among them are design and engineering, quality products, speed to market and in many cases they also take advantage of our integration capabilities.

RTC: ATCA has been very much on the front burner for a number of companies yet it still eludes the kind of market penetration that many analysts have forecast. Will 2006 be the year that ATCA achieves momentum and starts to reach the volumes that will make it a leading bus architecture? Why or why not?

Lillelund: As I prefer to spend my time with customers, I have closely followed their increased interest to the point that we now see ATCA starting to build momentum. We are now seeing traction in the market and orders from our customers in the telecom/datacom segment. We have therefore positioned the company to provide our customers with the best-in-class ATCA portfolio on the market. To further drive innovation, we just announced a partnership with Comtel, where we will combine our technical experience to provide further innovation for our customers.

RTC: In a similar vein, the military is becoming increasingly network-centric and as such, is requiring more network-oriented hardware. We've heard of at least a handful of ATCA systems and subsystems already going to military prime contractors and for development of military systems. As a supplier of hardware to the military, have you witnessed an increase in activity of ATCA in the military? If so, for what applications

and what kind of equipment?

Lillelund: Yes, the military seems very keen on understanding the impact of ATCA on their current and future applications. We have in many instances arranged for informational sessions on ATCA with our military customers. In fact, one of the first custom backplanes that we did was for a contractor that serves the military segment. Clearly there is an attraction to ATCA due to the high bandwidth that ATCA provides. High bandwidth is critical to future applications within the military such as live field simulations in 3D. The processing of unencrypted data within a single ATCA chassis is another application that is being explored in the military space.

RTC: MicroTCA—the system platform based on AMC mezzanine cards—has been criticized from a number of sources for a number of reasons such as connector cost and robustness, inject and eject mechanism, limitations to board thickness and overall fragile construction. Reports now, however, indicate that it has passed shock and vibration testing. Do you think MicroTCA will emerge as a winning solution for a variety of systems (Lucent already envisions systems with hundreds of AMC cards) or will it default to some other standard? Which one(s) do you see in the running?

Lillelund: There is going to be great demand for AMCs because of the flexibility they provide to system designers. How these AMCs will be deployed (in MicroTCA or ATCA) comes down to where the common system cost break occurs between the two platforms.

Even though the MicroTCA standards are not finalized, we have several customers who want to move ahead with early MicroTCA developments. We therefore launched a MicroTCA Starter Kit at the Bus & Board show, which we will provide to early adopters.

RTC: VME has been a staple in Carlo Gavazzi's electronic packaging stable lineup for many years. However, the business is changing radically. What was the number one VME supplier has gone end-of-life on many of its designs and according to reports has backed off on most new development. What was the number two maker of VME hardware has abandoned the architecture and was acquired by what was the number one player—the combined company now focusing on ATCA and communications strategies. While the remaining VME market remains relatively strong, 1) can it continue to be a viable force in the embedded computer board and subsystem market in light of growing competition and 2) will a critical mass of suppliers continue to offer the variety of products required? 3) Is there a market for VME outside the military?

Lillelund: First, with the amount of VME design-ins, legacy products and VME design knowledge that is available in the market, VME will continue to be a viable force in the embedded computer board and subsystem market. Secondly, yes, for the reason stated in my previous answer. And finally, yes, we still see many VME solutions being used in Industrial applications.

RTC: Switched fabric technology appears to be something that's going to happen—it's just a matter of when. Several variants from ATCA and AMC, which we just discussed, above to other approaches such as VITA 36 and VITA 41 are beginning to emerge as is CompactPCI Express. Do you see any of these emerging as critical technologies over the next several years? Which one(s)? How will the emergence of hybrid and non-VME products impact the backplane and packaging business?

Lillelund: Let's face it. Switched fabric technologies have happened, although we are just at the beginning. We have several CompactPCI 2.16 solutions shipping at production levels and many ATCA systems moving from development to deployment. We have seen some interest in VITA 41 as well. The move from traditional bus-based architectures to fabric-based architectures has extended the life of the board and backplane, or should I say blade and backplane method of electronic packaging for at least a decade. The next technology challenge is cooling.

RTC: The Carlo Gavazzi Fabric & Connectivity division was an early supporter and developer of StarFabric. And while we believe StarFabric offers a lot of advantages compared with some of the other switched fabrics on the market, it never achieved a significant market presence, and as a standard does not have a critical mass of vendors. Does the StarFabric family of products you make continue to make sense in a world dominated by PCI Express at the low end? Does Carlo Gavazzi plan to continue its family of StarFabric boards or do you have plans for a new product family based on another fabric?

Lillelund: Our early adoption of StarFabric and fabric interconnects in general continues to reap benefits. The risk we took did not have the direct financial return we expected, but the experience has been invaluable. PCI Express is a derivative of StarFabric in many ways, and with the substantial adoption that PCIe has already achieved, we are well positioned to provide PCIe-based products. One key application of StarFabric that we continue to have success with and will continue to support is PCI expansion. We have a 1U PCI expansion system that uses StarFabric as the enabling technology. This product has generated more interest recently due to the rapid changes in available PCI slots at the motherboard and system levels. At the board level, we will continue support of both a PCI and PMC bridge and will introduce a low-profile version this quarter. These cards are used as host interfaces for the PCI expansion systems and have had limited success in general applications. We will not continue support of our StarFabric/2.17 centralized switch due to lack of demand and success of 2.17.

RTC: Back in 2000 and 2001, Carlo Gavazzi was on the acquisition trail buying such companies as Aurora and Channel Access among others. However, since then, it has slowed down. Do you believe the entire embedded computer industry has slowed its acquisition rate? Why? High valuations? Too few companies available?

Lillelund: Some of the slowdown in mergers and acquisitions within the industry was probably due to the burst of the bubble and most companies regrouping at the time. However, you have seen some consolidation in the market recently. I think this trend will continue in 2006 and 2007. The companies that have come through the downturn in

market, but have focused on strengthening their financials, will be the ones that are looking for acquisitions to aggressively grow their businesses. Carlo Gavazzi Computing Solutions has a strong balance sheet and cash position. We intend to be looking at assets that either bring in new technology platforms or increase our market share in key segments.

RTC: The general theme of this year's Bus & Board conference was applications. And one of the application areas where we've been seeing a great deal of activity is in the convergence of voice, data and video, both wireless and wireline (fiber optic) on the same network. And, on the cable side of the business, Time Warner, Comcast, Cox and others are pushing in the same direction. Joining the fray are wireless companies Sprint Nextel and Internet companies Google and Yahoo. Cisco has already begun deploying some hardware, but it would seem a natural for ATCA, MicroTCA and other standard form-factor systems. What application areas have you seen the most activity in recently? Have you noticed any increase in companies supplying equipment for converged communications services? From the ATCA packaging side? From the fulfillment division side?

Lillelund: The packaging business is definitely seeing increased traction in the areas of VoIP, Internet Media Servers and other network-intensive applications. These systems are being deployed on CompactPCI 2.16 and ATCA. uTCA will also play in the space when it gets finalized. Increasingly, bandwidth-intensive applications will strain the available technologies. We will continue our rich history of innovating to remove the roadblocks from our customers so that they can focus on their core competencies.