Curing the longevity of supply blues

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POWER ARCHITECTURE TODAY Blog: Longevity of supply is a concern that can keep embedded military program managers up at night for a long, long time. That's because the time scale for deployed military systems is impressively lengthy. It's not unusual for RFPs received today to require single board computers (SBC) that need to be supplied in production volumes into 2025-2030. That support period actually starts at the back-end of production, after an SBC has already been designed in and deployed. The time that it takes toget a selected SBC designed, and the software application written, for anew program can be as long as three to four years.

After the board is selected, the system integrator has to design their chassis, select or design the other components, and then, as a final step, qualify the system both in the lab and in the airframe or vehicle in which it will deployed. The entire pre-deployment process can take as long as three to five years, and it's only after this that the program's lifecycle truly begins.

Today, in fact, we have some projects that are just now beginning

volume production and deployment, seven to eight years after the design process began. Factor in the obsolescence cycles defined by Moore's Law and you can understand why longevity issues can cause a program manager to stare long and hard at the ceiling in the middle of the night. If one of the system components, such as the SBC,needs to be upgraded with its next generation after just a few years of deployment, this consequence can be a costly adventure requiring application tweaks at least, and potentially a lengthy re-qualification process.

One seemingly obvious solution would be to buy all the parts your application will require over its lifetime based on a worst-case forecast, but that requires a costly investment to bank the required devices. An alternative remedy, that can lower costs and risk, is to select components/ processors with a guaranteed longevity that matches or comes close to matching thefull length the typical military system lifecycle. A good example of long-life support for processors is provided by NXP's Power Architecture devices.

It may surprise some to know that NXP (formerly Freescale) has historically offered a guaranteed 10 years of supply. What's more, their new QorIQ T-series are offered with 15 years of supply. For example, NXP has been making MPC7410s for 15 years with no planned EOL date in sight. More often than not, when the committed lifetime is less than 15 years, the devices continue to be supported far longer. A case in point is NXP's MPC7447 and 7448 processors, which were originally offered with 10 years support. They've now surpassed the 10 year mark, but continue to be offered with no lifetime buy date yet announced.

By guaranteeing 15 years of support, NXP frees program managers from having to obtain and/or invest funds to purchase components to continue with the same build standard for the full program lifecycle. Of course, not every program demands an extremely lengthy support strategy. If, forexample, the most important design requirement is raw performance, and the prospect of upgrading the SBC every seven

years isn't daunting, logistically or budgetarily, the benefits of 15 year support are reduced. But it is not uncommon for derivatives of a program to continue past the initial lifecycle requiring continued production. If new cards need to be introduced, the cost of a system re-qualification must be taken into account. Depending on the program, re-qualification can mean additional program costs ranging from $400K to $1M.

Taking a chip vendor's lifetime support commitment into consideration is just one part of a successful life-cycle management program. For aerospace and defense commercial-off-the-shelf (COTS) based systems, system designers also need to consider a board vendor's history and track record when it comes to long term supply and manufacturability. Do they combine long life component supply services with long term repair? You also need to evaluate their industry control services, such as frequency of BOM analysis, and ECO management offerings. Another important consideration is what options exist for component storage and handling that will enable a product's lifetime to extend beyond 15 years.

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