FOREWORD

Pranav Mehta
Sr. Principal Engineer & CTO
Embedded & Communications Group
Intel Corporation

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"So, what do you mean by an embedded device?" is a question I get asked frequently. Many in academia and industry alike have offered and debated versions of its definition. While many achieve varying degrees of admirable brevity, insight, and accuracy, often these definitions leave an impression that embedded devices are somewhat less capable, outdated technology. Having been associated with Intel's embedded products group for almost two decades, I find such characterizations lacking. Yes, embedded devices have their special requirements, from technical as well as business perspectives, but less capable technology is certainly not one of them. At the risk of inflaming the definition debate, here is my version as an Intel technologist: An embedded device is a differentiated compute platform that is either invisible, being part of a larger infrastructure, or predetermined to expose limited capabilities in deference to a dominant usage. Implicit in this definition are the notion of an embedded device having its unique requirements, its inconspicuous pervasiveness throughout infrastructures supporting modern lifestyle, as well as an allusion to the underlying platform capable of much more than what is exposed in service of a primary set of use functions.

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This edition of Intel Technology Journal marks the intersection of several major trends and events in the embedded world. As eloquently articulated in the ITU paper Internet of Things, embedded devices appear poised to lead the next wave of evolution of the Internet as they add Internet connectivity as a key platform attribute. Against this backdrop, two groundbreaking technology innovations from Intel—Power efficient Intel® Core™ microarchitecture with an increasing number of cores and the introduction of the Intel® Atom™ processor, both benefitting immensely from the breakthrough High-K/Metal gate process technology—create a unique opportunity to accelerate this embedded transformation with Intel® architecture. The Intel multi-core processor architecture and related technologies ensure continuation of the performance treadmill famously articulated by Moore's Law, which is critical for the majority of embedded platforms that constitute the Internet infrastructure as new usage models involving video, voice, and data create an insatiable demand for network throughput and cost efficiency. On the other hand, the Intel Atom processor opens up possibilities for a completely new class of ultra low power and highly integrated System-on-a-Chip (SoC) devices with Intel architecture performance that were unimaginable before.

Over the last several years, Intel's Embedded and Communications Group has introduced several products that achieve the best-in-class "power efficient performance" and push the boundaries of integration for SoC devices. We have done that while preserving the fundamental premise of Intel architecture—software scalability. Now, equipped with these new technologies and product capabilities, we are delighted to have the opportunity to accelerate the phenomenon of the embedded Internet.

While I am proud to offer technical articles from members of Intel ECG's technical team, I am equally proud to offer articles from developers who have embraced our embedded systems platforms and put them to use. Finally, I look forward to revisiting embedded systems technology in a few years' time. I believe that we will witness enormous progress over the years to come.

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