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WHO OWNS THE IP?

Patent disputes and management costs may stall growth in the Internet of Things

Complex semiconductor electronic systems – like the Internet of Things – are only possible by combining widely available hardware and software in innovative new ways. But proving who owns the intellectual property behind these technologies is becoming an increasingly difficult hurdle to clear.

• by John Blyler

If you had to pick one phrase that has captured the imagination of today's high-tech community, it would be the Internet of Things (IoT). Synonymous with connectivity, the IoT will connect everything to everybody with applications that few of us today can imagine.

The secret that few users appreciate about the IoT is that its greatest strength might also be its greatest weakness: namely, the innovative combination of intellectual property (IP) from multiple sources. The IoT phenomenon is flourishing today thanks to the

availability of inexpensive, low-power, yet feature-rich electronic hardware combined with relatively free software development tools.

All of this technology is based upon a foundation of IP that allows the sharing and reuse of hardware and software – from circuits on chips and boards to software firmware and application code. IP can also be part of the integration and manufacturing processes. But as companies scramble for competitive advantage, “sharing” of IP is giving way to lawsuits that could hamper the IoT's growth.

PAYING THE PRICE

“IP-related lawsuits are increasingly being used for competitive advantage,” noted Mark Davis, principal at Deloitte Consulting, based in New York City. “The growth of ‘patent troll’ activities requires firms to manage IP tightly and be able to defend against claims.” A patent troll uses patent rights to threaten other companies in an attempt to collect licensing fees, but does not use those patents to actually improve or create new products.

CHALLENGING THE ENTERPRISE

Managing IP from product development through manufacturing and distribution requires a company-wide focus involving both technical and business teams. The scope of this task mandates an enterprise-level approach to IP management that includes documenting everything from the discovery and creation of internal company IP to searching, acquisition and integration of external IP.

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The semiconductor electronics industry is well acquainted with the basic concepts of IP management. But the degree of management needed – especially to handle larger and more complex systems like the IoT – is not yet fully appreciated. Traditionally, IP was curated internally from discrete blocks of technology derived from a company's previous hardware and software projects, or it was purchased from external, third-party suppliers. But today's globally distributed and collaborative development teams and diverse IP offerings require a more robust management system.

“The concept of a ‘lifecycle’ is a good way to think about the range of activities, risks and costs associated with IP for a semiconductor company,” explained Warren Savage, president and CEO of IPExtreme, a US-based company licensing IP and methodologies for system-on-chip designers. “Today, we see amazing levels of IP reuse to create complex devices at lower and lower costs. But as time goes on, the attention will turn to some of the hidden costs associated with creating, buying, using and supporting IP. We see a lot of big companies struggling with these things today.” Those hidden costs will only increase as designers use more and more third-party IP to improve product performance, add new features and meet the ever-shrinking time-to-market windows.

Accomplishing these tasks requires a comprehensive way to catalog and grade the quality of all IP types across the organization and throughout the company's supply chain.

Defects and bugs found during development by multiple design teams must be tracked with versioning control. On the business side, third-party IP licensing and royalty payments must be made based upon the IP type involved and the product families in which it will be used.

The business and legal issues of product IP is just as daunting in scope as the technical ones. “Managing catalogs of licensed and proprietary IP across numerous product lines is becoming a challenge in the semiconductor industry,” said Eric Nguyen, director of Business Intelligence at Jama Software, a computer software company headquartered in Portland, Oregon (USA). Due diligence requires that firms conduct patent and technology checks to ensure they are not violating IP agreements. Additionally, firms must handle the payments of licensees.

Knowing what IP is legally safe to use will also affect the engineer's design choices. Generally, the hardware IP blocks – like microprocessor cores from ARM and Intel – are well established with IP protection. But the software side can be more difficult to manage.

“A main concern for using third-party software IP is to ensure that it does not open any volatility or backdoors to the product,” cautioned Patrick Sullivan, VP of Marketing, MCU Business Unit for Atmel, a US-based designer and manufacturer of semiconductors. “This is important for protecting the data of the device's end user, as well as protecting the IP of those that create the device.”

The optimal product design choice will depend upon the right mix of a company's internal IP and third-party offerings, said Richard Wawrzyniak, senior market analyst for ASIC & System-on-Chip (SoC) at Semico Research, a semiconductor marketing and consulting research company located in Phoenix. “Firms may be required to license specific IP to accomplish a product feature desired by customers,” Wawrzyniak said. “On the flip side, they may choose to invest more time in R&D/Engineering to invent something that goes beyond existing IP to ensure they are free and clear from patent claims.”

Enterprise IP management will help hardware and software teams make the right IP choices so that no hidden costs impact the evolution of the IoT or any other innovative technology. ♦

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