

Major Networking Vendor Relies on Phoenix to Optimize Router Firmware Boot Time

Introduction

A major networking vendor was designing a new enterprise router and had selected an Arm-based networking SoC (System-on-Chip) from a prominent silicon vendor. As the development team built the first prototype, they quickly realized that the boot time was unacceptably



long. There were many factors which contributed to the lengthy boot time, but the first one the team identified and decided to solve was the time it took for the firmware to fully boot and begin to launch the operating system. After consultation with executive management, a target boot time reduction of 50% was set as the requirement. Phoenix Technologies was engaged to help and in the end firmware boot time was reduced by 60%.

Key Challenge

Once a target firmware boot time was decided, the next challenge was to figure out how to meet that target. The networking vendor's development team had—before talking to Phoenix—approached the

SUMMARY

Phoenix Technologies achieved a 60% reduction in firmware boot time, exceeding the 50% target set by the vendor.

KEY CHALLENGES

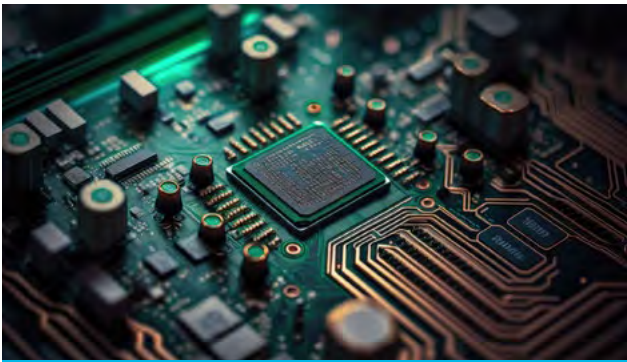
- + Unacceptably long firmware boot time for new enterprise router
- + Lack of router firmware expertise within company or by SoC vendor

WHY PHOENIX?

Phoenix was chosen by the networking vendor because of its 40+ year track record and expertise in firmware development, optimization, and security.

PRODUCT/FEATURE USED

- + PhoenixBoot
- + First cold boot, cold boot, and warm boot optimization



Phoenix and Arm Relationship

Phoenix Technologies has a long-standing relationship with Arm from both a technical and marketing perspective.

Phoenix actively participates in the Arm SystemReady program and is also an Arm Ecosystem Partner. Phoenix regularly engages with Arm personnel and works closely with many Arm customers.

NOTE: The Phoenix Technologies listing in the Arm Partner Ecosystem Catalog is [here](#).

SoC vendor that supplied the reference, open-source UDK (UEFI Development Kit) along with the SoC. However, they quickly realized that the SoC vendor had very little firmware expertise and could only provide the BSP (Board Support Package) “as is”, leaving the networking vendor to develop the final, production ready firmware.

After searching internally for some firmware expertise and not finding what they were looking for, the enterprise router development team reached out to Arm directly and asked for their assistance with the problem. Arm pointed out that they didn’t have any internal technical expertise to help with this problem, but that they have a partner ecosystem which could potentially be leveraged to aid the networking vendor.

The networking vendor approached a few potential ecosystem partners and ultimately decided that Phoenix Technologies was the best fit. After some exploratory discussions, a contractual agreement was reached and development work began

Phoenix firmware engineers were optimistic that they could achieve the 50% firmware boot time reduction target but could not be sure until they dissected the existing firmware. The Phoenix team utilized their significant, collective UEFI firmware expertise to optimize the firmware boot time using various techniques that are available in the PhoenixBoot offering.

“**Phoenix Technologies achieved a 60% reduction in firmware boot time, exceeding the 50% target set by the networking vendor.**”

The initial optimization steps fell short of the goal as they only reduced the boot time by about 25%. After further exploration and with some additional input from the networking vendor, the final result came in at approximately a 60% reduction in boot time. Boot time was improved for first cold boot, cold boot, and warm boot. All results exceeded the networking vendor’s target of 50%, so consequently, the networking vendor was pleased with the final result and will likely continue to work with Phoenix on future projects.



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