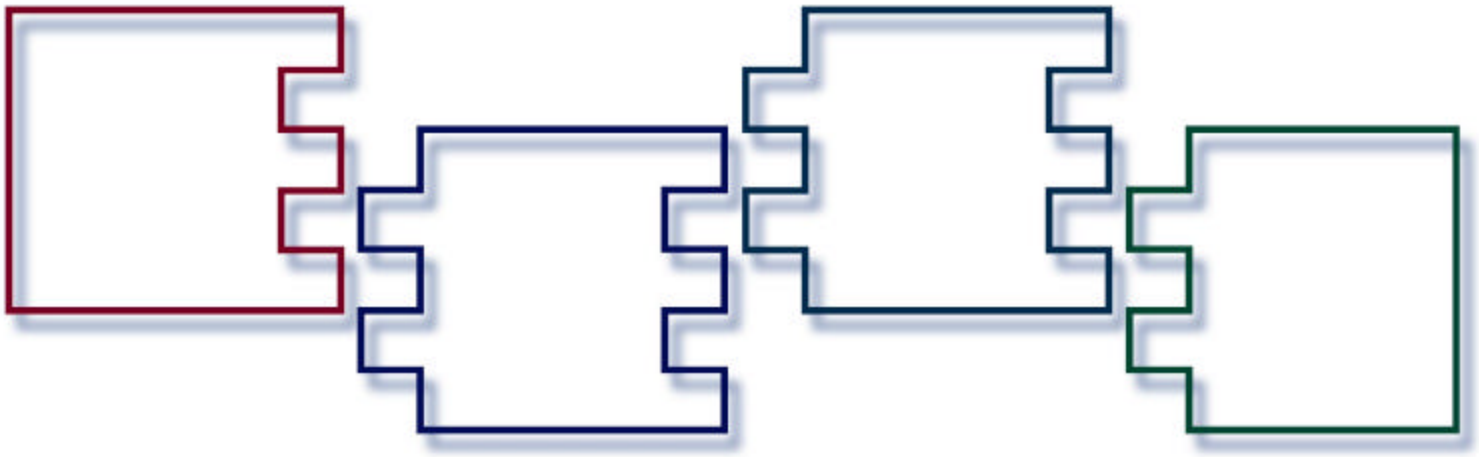
phoenix™ technologies

FIRSTBIOS™



Phoenix FirstBIOS:

The Right Choice for Client PCs

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Introduction

With its products designed into more than 1 billion devices worldwide, Phoenix Technologies Ltd. has been the undisputed source of Basic Input/Output System (BIOS) market leadership for nearly 20 years. Now Phoenix is again demonstrating its innovative leadership by paving the way to the industry's next generation of BIOS products through its introduction of Phoenix FirstBIOS™.

When evaluating a BIOS product for a client PC (desktop and notebook) design, one must consider not only the attributes of the product's features and functions, but also the merits of the BIOS provider itself. This paper offers client personal computer (PC) manufacturers, original equipment manufacturers (OEMs), and motherboard vendors a foundation upon which a BIOS purchase decision should be made. It demonstrates how Phoenix, with its latest BIOS product, Phoenix FirstBIOS, clearly represents the best solution for today and tomorrow's client PCs.

Choosing a BIOS Provider

The purchase of a BIOS solution should start with an evaluation of the BIOS providers themselves. Partnering with the right BIOS provider can help minimize risks when choosing a BIOS for a client PC design. A trusted partner will not only provide a superior product but also market leadership, technological direction, and an unparalleled track record for reliability with its customers.

Market Leadership

Hardware manufacturers must know that their BIOS provider is financially viable in the market and will be around for the long term. The BIOS provider must also demonstrate sufficient scale to support the silicon and chipset requirements of today's client PC manufacturers, OEMs, and motherboard vendors.

Phoenix has led the BIOS market for more than two decades—holding significant market share leads in the desktop, notebook, server, embedded, and internet device BIOS markets worldwide. As the market leader, Phoenix has proven its ability to keep pace with market demands—supporting the broadest range of silicon and chipsets available.

Phoenix BIOS products have been implemented on thousands of motherboard designs and can be found today on over 1 billion devices.

Phoenix can be counted on for continued leadership in the BIOS market.

Technology Leadership

Beyond market leadership, a BIOS provider must lead in technology—foreseeing upcoming trends, defining industry standards, and pioneering new technologies.

With senior technologists serving on dozens of industry standards boards and technology consortia, Phoenix sees future technologies before they hit the industry. By sharing these technologies, Phoenix provides customers with a leg-up on the competition. Phoenix works closely with other industry leaders, such as Microsoft and Intel, to author numerous industry standards (e.g. ACPI, 3GIO, etc.). Finally, Phoenix holds many patents for pioneering its own technologies—thereby winning industry recognition for its technical leadership and innovation.

Phoenix clearly leads the way in technology—a key attribute in a valuable partner to any client PC manufacturer, OEM, or motherboard vendor.

Reliability

While market and technology leadership is important, a BIOS provider must also demonstrate its ability to offer proven reliability to support its customers worldwide throughout the manufacturing process—ensuring time-to-market.

Again, Phoenix leads the pack with a time-tested track record of reliability for its customers. Phoenix understands that time-to-market is critical and works hand-in-hand with its customers to optimize its products for a customer's given design. With its worldwide office locations, Phoenix provides its customers with development and field support in all major computer manufacturer markets: including Japan, Taiwan, China, Europe, and North America.

Phoenix Technologies: The Preferred BIOS Provider

Phoenix Technologies, having demonstrated its market leadership, technological prowess, and reliability for 20 years, stands above the rest as the preferred BIOS provider. The next step in licensing a BIOS solution is to evaluate the way the BIOS provider sees the market—now and in the future—and how its products address that vision.

Phoenix FirstBIOS: The Right BIOS for Client PCs

As client PCs evolve in response to today's market demands, the requirements of BIOS services extend far beyond traditional expectations. As digital devices converge, the initialization and configuration tasks are merely a starting point for next-generation BIOS services. With a keen understanding of this market evolution, Phoenix is leading the way to the technology industry's next generation of BIOS firmware through Phoenix FirstBIOS.

Selecting a BIOS by meticulously analyzing a laundry list of individual features and functions has become an outdated evaluation process—due to the maturity of today's BIOS products. A more efficient and effective process for choosing a next-generation BIOS product is to measure the direct benefits a BIOS provides to a client PC manufacturers.

A next-generation BIOS must provide manufacturers with a competitive advantage by providing a pre-operating system (OS) environment with improved performance, a modern graphical environment, and powerful security. A next-generation BIOS must also dramatically reduce manufacturing and support costs through an extensible architecture that offers a whole new class of BIOS services.

Phoenix provides both competitive advantage and cost reduction benefits to client PC manufacturers through FirstBIOS.

The Core Platform Environment

The core platform environment—consisting of the end-user experience from the time a device is first turned on until the OS loads—should be as brief as possible when the user does not need or want to perform any actions with the BIOS program, and as user friendly as possible when they do.

Performance

A quick boot time is beneficial both to manufacturers and to end-users of client PCs. For manufacturers, a quick boot time provides a competitive advantage in the market and assistance in exceeding WHQL requirements. For end-users, the benefit of a quick boot time is obvious—it gets the users' computers up and running quicker so they can be more productive sooner.

Phoenix has reached a new performance threshold with FirstBIOS—reducing boot time by up to 25 percent. This performance gain comes in the form of a standard, core feature, which does not require system-by-system integration.

Also, Phoenix is a leader in driving *Instant-On* technology, adding features such as improved resume times from S3.

Modern Graphical User Interface

A next-generation BIOS product today requires a next-generation user interface. While graphical user interfaces (GUI) have evolved significantly over the years in operating systems and applications, character-based user interfaces of BIOS products have remained stagnant and are increasingly challenging for users—adding to support costs.

FirstBIOS provides the BIOS market with its first modern GUI. The impacts of the new GUI are most prevalent in two areas.

- FirstBIOS allows client PC manufacturers and OEMs the ability to present their customers with a high-resolution, instant-on startup screen. While previously limited to 16 colors at 640x480, FirstBIOS permits the use of 256 colors at 640x480, 600x800, 1024x768, and 1280x1024 screen resolutions. Client PC manufacturers and OEMs will welcome the opportunity to provide richer startup screens in their branding efforts.

- For systems that also have FirstWare™ applications installed, FirstBIOS offers a new GUI called FirstSight™. FirstSight offers a familiar, yet more simple, UI than today's PC interfaces and offers many benefits to both manufacturers and end-users including:

    - Mouse, keyboard control options
    - Localization options
    - Integrated Help system
    - Task-based interface – *leads* users to embedded solutions
    - Option for operation with non-PC systems
    - Read-only memory (ROM)-based to disk-based options

The modern GUI provided by FirstBIOS will produce direct benefits to its customers—elevating BIOS-based usability to a new level, and dramatically reducing services/support costs to OEMs, system integrators, and corporate information technology (IT) departments.

Security

Heightened sensitivities have made all industries more concerned about security and their security practices. With FirstBIOS, Phoenix is raising the security bar by embedding ROM-based security components in client PCs through its new security service—FirstAuthority™. The FirstAuthority service is based on Phoenix's patent-pending StrongROM technology. FirstAuthority provides a comprehensive foundation for today and tomorrow's security needs by:

- Making embedded security the required underpinning for all platform enabling software
- Providing authentication services for runtime, OS-present, applications
- Offering an extensible design to support evolving security standards (i.e. hardware TPMs, etc.)
- Securing a ROM-based runtime environment for Independent Software Vendors to leverage in their product development—resulting in secure software
- Providing a tamper-resistant, incorruptible storage area for public security keys

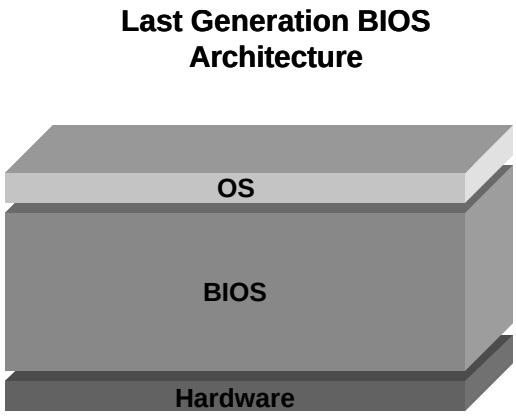
FirstAuthority can provide two-factor authentication, which provides the same sorts of benefits an automated teller machine (ATM) cash card provides users to access their money (users need both the physical cash card as well as a unique personal identification number (PIN) code in order to gain access). Similarly with device authentication, offered through FirstAuthority, the client PC takes the place of the hardware token (the ATM card).

But FirstAuthority does not stop there. FirstAuthority enables runtime applications to take advantage of Phoenix's chain of trust—allowing them to take advantage of a secure runtime environment to encrypt and decrypt data on client PCs. Further, it allows data to be securely fastened to a specific application on the particular device that the application is running on. Imagine a client PC that will only allow an authenticated user to launch and use any given application (i.e. Microsoft Word); or taken one step further, imagine a multi-user machine that allows one of its users to use Microsoft Word and another to use Adobe PageMaker—but not vice-versa.

The BIOS Architecture

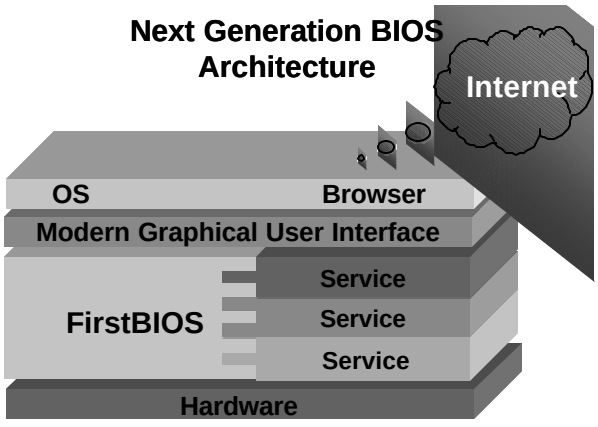
When BIOS was first conceived, its sole purpose was to connect the hardware to the OS though its initialization and configuration processes. Many of today's existing BIOS products remain the same (see Figure 1).

Figure 1



The architecture of FirstBIOS (see Figure 2) is radically different than the tired, last-generation architecture. It takes into account the new demands of the latest client PC designs. While still connecting the hardware to the OS, this new architecture was developed to be extensible—enabling the addition of revolutionary new services to the BIOS function. The architecture also sports a modern GUI, making it much easier to use.

Figure 2



The direct customer benefits of this new architecture include a level of extensibility never before seen in the BIOS market. It provides the foundation for a wealth of next-generation services offered through core platform applications and a user interface that will dramatically reduce manufacturing and support costs.

While the new architecture of FirstBIOS adds a wealth of new services, the implementation and the manufacturing processes are unchanged. Manufacturers and system builders will implement the BIOS using the same familiar processes without any additional implementation costs.

Next-Generation BIOS Services

Increased demand for lower cost, instant-on, and more appliance-like client PCs is requiring a new class of BIOS services. Leveraging its extensible architecture, FirstBIOS paves the way for next-generation BIOS services. These services benefit from a new foundation of security, and are offered through a firmware-controlled, core platform environment. The first of these services provided by Phoenix includes extended power-on self-test (POST), disaster recovery, software installation storage, and online support access. FirstBIOS's extensible architecture will allow for additional next-generation services to be easily added in the future.

Firmware-Controlled Environment

The firmware controlled core platform environment that is created using FirstBIOS allows for powerful new solutions for significantly lower support costs. With *self-contained* always-available tools, everything a user or technician needs to service a PC is built-in. Phoenix provides several breakthrough solutions using this environment through its FirstRescue™ services.

Extended Power-On Self-Test

With ever-increasing pressures on client PC manufacturing margins, support costs are under heightened scrutiny. Client PC support is both time and labor intensive. One particularly frustrating support cost to client PC manufacturers is the unneeded return of hardware by customers who have misdiagnosed a software problem for a hardware problem. Studies of client PC support processes have shown that on average, 80 percent of returned client PCs have *no trouble found* with the device.

FirstWare's Check service dramatically reduces manufacturer support costs by preventing misdiagnosis of client PC troubles. Check performs an extended POST, which tells users in seconds whether or not the trouble is related to the hardware. The test separates hardware from software problems and reports to users its results though a simple, easy to understand, pass/fail interface. Check provides users with confidence concerning the nature of the problem—helping them to avoid a knee-jerk reaction to automatically return the system back to the manufacturer for troubleshooting.

Disaster Recovery

Another expensive cost to manufacturers is the time and money spent helping customers rebuild the OS on their PC. One out of every six support calls requires a system recovery effort—many of these are complicated by customers having misplaced or lost their recovery CDs. FirstWare's Recover service can recover a client PC in minutes even if the OS cannot start. With Recover, there is no need for a boot CD or a recovery CD. Recover is self-contained and secure. Recover makes use of a protected area of the hard drive—which cannot be corrupted and is not susceptible to viruses. The original OS and all applications are restored using a single compressed recovery image, which automatically scales to the space available. Recover reduces the time (and costs) support representatives spend on support calls, and gets customers up and running more quickly—yielding greater customer satisfaction.

Installation Software Storage

FirstWare's Vault service eliminates the need for manufacturers to ship installation CDs with their systems. Vault uses a protected portion of the system hard drive to compress and store up to ten installation CDs. Vault uses a secure space totally separate from the partitions visible to the OS. Even viruses cannot access this space. Manufacturers can store OS driver CDs, pre-loaded applications CDs, system utilities, etc. reducing purchase and support costs to manage, maintain, and ship these CDs.

On-Line Support Access

The Internet has become an invaluable tool in providing world-class support across a wide range of industries. FirstBIOS is the only core platform to exploit the strength of the Internet and bring these advantages to client PC manufacturers and OEMs. FirstWare's Connect service provides manufacturers the ability to offer its customers core platform Internet access to their online support sites. Connect is not meant to replace the Internet browser of the OS,

but provides a *spare-tire* for Internet access when the OS environment is damaged.

Connect can be pre-configured to automatically bring up the client PC builder's support site / on-line service center, or local hypertext markup language (HTML)-based help materials such as *Frequently Asked Questions* pages, trouble-shooting guides, or reference manuals. Connect can also point to unique up-sell promotions and opportunities.

Conclusion

Within the maturing client PC market, manufacturers, OEMs, and motherboard vendors are being squeezed from efforts to manufacture PCs as commodities and through ever-shrinking margins. Providing added value—while at the same time cutting manufacturing and support costs—is vital to their survival and profitability. Phoenix Technologies, and its next next-generation BIOS product—FirstBIOS—can help on both these fronts.

Phoenix is the preeminent BIOS provider through its market leadership, technological vision, and proven reliability. Partnering with Phoenix minimizes project risk and helps manufacturers ensure an on-time shipment of a winning client-PC design. Phoenix FirstBIOS, with its extensible architecture, modern graphical core platform environment, and next-generation services, significantly enhances the overall value of a client PC system—while at the same time dramatically reducing manufacturing and support costs.