Why Dell’s ThinOS Runs on FreeBSD

Dell Technologies is a global leader in information technology, offering a wide range of products and services, including personal computers, servers, networking, and storage solutions. Known for its innovative approach to technology, Dell’s mission is:

“to be the most successful computer company in the world at delivering the best customer experience in markets we serve.”

The company’s ThinOS 9, inherited by its acquisition of Wyse Technology, is an embedded operating system for thin client devices in virtual workspace solutions.

### CHALLENGE

Prior to its acquisition by Dell, Wyse Technology faced the challenge of creating a reliable, secure, and high-performing operating system for its thin client solutions. This operating system had to support a wide range of virtual desktop infrastructure (VDI) applications, guarantee data security, and provide a seamless user experience on different hardware platforms while still being flexible enough to allow for customization and scalability.

### SOLUTION

Wyse Technology developed a highly secure thin client operating system based on the FreeBSD platform, responding to the need for a customized and optimized OS for enterprise virtual desktop environments. ThinOS utilizes FreeBSD’s stability, performance, and security features to provide a locked-down yet flexible client software solution that seamlessly integrates with diverse virtual workspace solutions.

### IMPACT

By utilizing the power of FreeBSD, Dell has improved the performance, security, and manageability of its thin client offerings. This strategic integration has enabled Dell to manage complex and high-traffic virtual environments efficiently, consolidating its position as a leader in the virtual workspace market. The effectiveness of leveraging open-source platforms in enterprise-grade solutions is exemplified by this successful collaboration.
Several Dell products use ThinOS 9, such as the OptiPlex 3000 Thin Client, the OptiPlex All-In-One, and the Latitude series laptops, such as the Latitude 3440 and 5440. ThinOS is a ready-to-deploy solution that aims to improve virtual desktops while offering a secure platform for applications and services. It provides users with a seamless and integrated experience, whether remotely or from the office. It’s a software environment that optimizes virtual workspaces.

The latest version, ThinOS 9, is built on FreeBSD 12 with other 3rd-party open source components and is well-known for its robust security and stability. This aligns with the requirements of modern enterprises that demand high performance and protection in their computing solutions.

**The significance of security and stability in the design of ThinOS**

ThinOS's architecture follows a “secure by design” philosophy. This approach minimizes potential attack surfaces by providing a locked-down desktop experience that ensures sensitive data and personal information remain inaccessible on local devices.

This security-first approach aligns with the core principles of FreeBSD, which provides a reliable and controlled kernel environment, further enhancing ThinOS’s secure nature.

The stability of FreeBSD is another critical factor in its selection as the backbone of ThinOS. Unlike other operating systems, frequent updates do not introduce instability, as FreeBSD's kernel offers reliability and predictability critical for enterprise environments. This stability reduces administrative overhead and ensures consistent performance, making it an ideal choice for ThinOS.

**Why FreeBSD?**

Choosing FreeBSD as the base of ThinOS was a strategic decision driven by several key factors:

- **License Advantages:** FreeBSD's BSD license offers customization flexibility without the obligation to disclose proprietary enhancements. This aspect is crucial for Dell, allowing the company to tailor the OS to its specific security and performance needs while maintaining proprietary control over its software.

- **Engineering Efficiency:** Dell's engineering team benefits from FreeBSD's stable kernel source code. It simplifies integrating and maintaining customized code, reducing the effort and resources required to keep ThinOS up to date.
Security Enhancements: The stability of the FreeBSD kernel, coupled with the permissive BSD license, which allows vendors to keep proprietary modifications under wraps, significantly bolsters ThinOS's security posture and creates a robust platform less susceptible to attacks than a CopyLeft-based system with GPL components.

Future plans and expectations

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- Dell's commitment to FreeBSD is about leveraging its capabilities and collaborating to shape the future. The roadmap for ThinOS includes:
- Upgrade base OS to FreeBSD 14: The next version of ThinOS, version 10, will use the current release version of FreeBSD, version 14.
- Enhanced Hardware Support: Upgrading the FreeBSD kernel to support an ever-widening array of hardware platforms, ensuring ThinOS remains compatible with the latest technological advancements.
- Linux Application Compatibility: Improving FreeBSD's Linux application binary interface (ABI) will allow a broader base of Linux applications to run seamlessly on ThinOS, enhancing its versatility and appeal.
- Driver Portability: Making it easier to port Linux device drivers to FreeBSD, which will streamline the integration process and the adoption of new hardware technologies.
- Advanced Security Features: This feature builds upon the MAC (Mandatory Access Control) framework to introduce more sophisticated security capabilities, fortifying ThinOS against emerging threats.

Dell's commitment to open source and innovation with FreeBSD

Dell's acquisition of WYSE and its decision to continue using FreeBSD as the basis for ThinOS demonstrates its ongoing dedication to open source principles and combines the robustness of enterprise solutions with the adaptability and innovation inherent in open source projects. The partnership between Dell and FreeBSD is not merely a technical choice but a reflection of a broader strategy that values security, stability, and collaborative development.
Through ThinOS, Dell demonstrates how commercial ventures can harness the power of open source software to create technologically advanced, secure, and reliable products. The future of ThinOS, powered by FreeBSD, looks promising, with continuous enhancements and a growing ecosystem that benefits both the open source community and enterprise users.

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