■ THE PUBLISHER'S VIEW

# The Many Faces of Network Computers

*First Devices Ship, While NetPC Adds Another Layer of Confusion*

From the first of this year, it was clear that the network computer, in its many guises, would be a hot topic. In recent months, the first devices have begun shipping, many more have been announced, and even Intel and Microsoft are pitching a network-computer-like concept: the NetPC.

It remains a subject of much debate, however, whether the network computer is the beginning of the end of the Intel/Microsoft hegemony or a pipe dream promoted by the have-nots. The products and plans that have emerged this year reveal a complex landscape of differing devices and markets, defying any attempt to make simple statements about the new category's prospects for success.

The range of devices is broad, making it imperative to look separately at each device type. The common thread is the attempt to reach one or more of the following goals:

- Reducing the cost of entry-level computing devices
- Cutting administration cost
- Increasing ease of use

Note, however, that no single device addresses all three goals; commercial devices focus on the first and second goals, while consumer products target the first and third.

Early discussions of network computers focused on devices that run only Java applications and a built-in Web browser. This design makes them processor-independent, breaking the x86 architecture's hold.

By switching to a non-x86 architecture, network computer makers will cut their cost for a given level of performance. While today's high-volume PCs typically have microprocessors costing $75–$200, the processor for a $500 device needs to sell for well under $50. Chips based on MIPS, ARM, Hitachi SH, or PowerPC cores can meet this price point while delivering performance comparable to that of the pricier PC chips. They also consume less power.

The closest thing to a network computer shipping to consumers today is the WebTV box. Based on a MIPS processor, it is stripped down, even for a network computer. The design is focused on one goal, which it achieves remarkably well: making it easy for consumers to connect to the Internet using their television as a display device. The WebTV system isn't designed to be a platform for running Java applications, but it is here now, cheap, and easy to use. It's successful at what it does because it doesn't try to do too much.

Sun's JavaStation defines a spot at the other end of the network computer spectrum. The JavaStation is designed for businesses, not consumers, and uses conventional CRT monitors. The goal of the JavaStation is not just to make the system itself inexpensive but to cut administration costs.

Devices based on Oracle's NC design have been announced by half a dozen companies, with first shipments expected late this year or early next. These systems are between the JavaStation and WebTV extremes, using Java applications to provide a range of functions but able to use a TV to reduce display cost.

Intel and Microsoft recently added another level to the discussion with their NetPC campaign. This is not a network computer in the JavaStation or Oracle sense; it is simply the duopoly's attempt to provide the lower administration cost promised by network computers without leaving the PC paradigm. The NetPC is still a PC. That means an x86 processor, Microsoft software, and conventional PC applications. The key to the NetPC is a future version of Windows (presumably NT 5.0) that will offer a "zero administration" mode in which the master copies of all user data and programs are kept on a server and all configuration is done remotely.

The NetPC differs from a regular PC in that it has limited expansion options, has a built-in network interface, and is instrumented to be managed via the network. The press has tagged the NetPC as a thin client, but it is not especially thin; while a hard disk is technically optional, systems without one are unlikely to be interesting. A NetPC can run Java applications, like any other PC, but its value is not in any way connected to such software.

The NetPC may find a niche, but it is just another flavor of PC and doesn't change the microprocessor landscape. In the near term, any network computer dependent on Java applications is going to be limited by the tiny number of useful applications available, while consumer devices are further constrained by the bandwidth available at most homes. As a result, the near-term impact will be minimal.

The network-computer paradigm remains of high interest, however, because it is the only credible seed for a new platform that could grow to become a significant competitor to the Wintel standard. There is a big opportunity for new devices, and hundreds of companies are making significant investments to chase it.

In the end, the landscape will include a far broader range of devices than it does today. The most successful new devices could ship several million units per year within a few years. While this volume is tiny compared with that of PCs, it is a big opportunity compared with most others—and the long-term potential is great. Ⓜ