

THE EDITORS' VIEW

Digital TV No Panacea for CPU Vendors

Volumes Will Take Time to Grow, Profits Even Longer

Interactive digital television. It's the wave of the future, and many processor vendors are trying to hang ten and take a long, profitable ride. Unfortunately, there are lots of wipeouts ahead, and in the end, these vendors may be all wet.

Just what is this hot new topic? Interactive digital TV, or IDTV, refers to the next generation of cable television. By switching from analog broadcast to a compressed digital format, the number of channels can be increased tenfold, from about 50 to more than 500. Instead of showing 500 simultaneous reruns of "Gilligan's Island," many proposals involve adding a low-bandwidth back-channel that carries information from the viewer to a central system, thus creating an interactive aspect.

According to Silicon Graphics (SGI) chairman Jim Clark, this technology could work something like today's telephone system; instead of passively viewing a channel, consumers could dial into a particular service through their TV set. These services could include movie rental, interactive shopping, multi-player video games, information retrieval, or even video conferencing, depending on the capabilities of the hardware.

Processor vendors are most interested in the set-top box that will perform these wondrous services at the customer site. Today's set-top box contains a simple analog tuner and descrambler, but the IDTV box must perform digital decompression and decoding while controlling the user interaction. This requires some fairly sophisticated (by current standards) processing power, either a high-speed RISC processor or a 486 with a separate decoder. Since every television must have one of these devices to connect to the digital network, the potential market is 100 million units in the US alone.

While companies such as SGI, Motorola, and Intel have already announced plans to participate in this market (see *0709MSB.PDF*), there are several drawbacks. The first is a long time frame; industry experts agree that it will probably take the rest of the '90s until 50% of all US households are connected to a digital TV system. By comparison, it took most of the '80s to get half of the country subscribing to current cable systems. Worldwide, the connection rate is likely to start lower and take longer to grow.

Let's say that by the end of the decade, IDTV set-top volume reaches 10 million per year. The next issue is that these are consumer items, not desktop PCs. Target prices (not manufacturing costs) for these boxes range from \$100-\$300, a tenth of the price of an average PC.

This works out to an annual hardware revenue of about \$2 billion; not a bad business, but a far cry from the \$100 billion PC market or the \$10 billion workstation market.

The processor revenue, of course, will be a small portion of the total hardware system revenue. Today, an IDTV-capable CPU sells for a few hundred bucks; that same processor will have to sell for about \$20 to fit into a \$200 set-top box. It will take a few generations and process shrinks to reach this point.

Still, many vendors are jumping at the chance to sell millions of processors later this decade. They may not realize that the profit margin on these chips is likely to be slim. After watching how Intel's PC monopoly has created enormous profit margins for Intel, no cable vendor (familiar as they are with monopoly pricing) will lock itself into a single-vendor design.

It is likely that set-top boxes will have most of their software in ROM and receive updates across the network; it will be easy to download the right software for a given processor type. Some high-end units may run programs from CD-ROMs, which have the capacity to include multiple binaries. The critical standards will be compression algorithms, data types, and communication protocols—not binary instruction encodings.

Since the hardware revenue will be relatively low, the number of box vendors probably will be small. The competition for the CPU sockets in these set-top boxes will be cut-throat as processor vendors eye potential million-unit volumes. With no tie to any one architecture, the box vendors will be able to cut CPU prices to the bone. The picture may be a mirror image of today's PC market: instead of PC vendors bailing out due to razor-thin margins, processor vendors may opt out.

The IDTV market will be most lucrative for vendors that provide the services enabled by this new technology. Movie rental is a \$10 billion market today; much of this business could shift to the digital network. Information services, video-game software, and similar ventures will grow rapidly.

The set-top box will be something everyone needs but no one really wants—the steering wheel that guides us along the digital highway. Service vendors may give away the boxes to enlist subscribers, making it difficult to put a value on the hardware. Ultimately, the IDTV market may not be attractive to most CPU vendors. ♦

