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## The CAPI Puzzle

***The German version of Windows 95 includes support for CAPI 2.0; other versions don't.***

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Is ISDN the ideal platform for voice, fax, and video telephony that will replace analog phone systems?

Or is it a medium for connecting computers and LANs? The answers likely depend on which side of the Atlantic you're on. Microsoft GmbH, the company's German subsidiary, added fuel to the debate when it included an ISDN/Common-ISDN API (CAPI) subsystem into the German version of Windows 95.

CAPI was developed by a group of German ISDN board vendors to access ISDN hardware in a straightforward manner. The latest version, 2.0, covers all ISDN services (data, voice, fax, and video telephony) and has interfaces for DOS, OS/2, Unix, and Windows 3.x, NT, and 95.

CAPI 2.0 was officially approved by the European Telecommunications Standards Institute (ETSI) last year; it now coexists with the French-led PCI ISDN API, which received ETSI approval earlier. Major telecommunications players, such as Siemens and Deutsche Telekom, have supported CAPI for several years, and such companies as Novell and Lotus have implemented the interface in their software products.

The German ISDN market, which has 50,000 B-channels coming on-stream every month, is seen as the most important in Europe. The German communications industry has several years of rock-solid experience with the early data-centric CAPI 1.1 standard. This is the reason why Microsoft GmbH

decided to implement a CAPI-compliant ISDN subsystem, which it jointly developed with Acotec (Berlin, Germany), into the localized version of Win 95.

German Win 95 users can now install and run ISDN hardware in two ways. Some ISDN board vendors ship their products with 32-bit CAPI drivers; provided there are no incompatibility issues between the hardware and communications software, it's a fine solution. The other way deploys the CAPI subsystem that contains Microsoft's Network Driver Interface Specification (NDIS) driver and the board maker's corresponding ISDN driver (see the sidebar "ISDN and Windows 95").

"The CAPI subsystem is one possible implementation of the CAPI 2.0 standard," says Hans-Jürgen Ortmann, ISDN software project manager at AVM (Berlin, Germany) and chairman of the CAPI Association. "But we recommend that users of our hardware deploy our 32-bit drivers and not the subsystem. Full and secure functionality can be guaranteed only if the drivers and controllers are produced by the same manufacturer," he explains.

Because it's based on a detailed technical specification--not a set of DLLs--CAPI is an open standard. Its specification includes low-level ISDN protocols (Layers 1 through 3), a set of message-handling prescriptions, and OS-specific kernels.

However, CAPI is open to manufacturer-specific features, and there's nothing to stop an ISDN board manufacturer from developing a bundled software and hardware solution to add more functionality. This means that the specification can be interpreted in different ways by different vendors and can cause incompatibilities between the communications software and ISDN hardware from different vendors.

The CAPI subsystem of Win 95 doesn't support any vendor-specific functions. This

may be one reason why some German vendors initially didn't like the Win 95 CAPI subset. They also may have feared Acotec, an ISDN system vendor and co-developer of the subsystem, would gain a competitive advantage.

### **CAPI Subsystem Uses NDIS**

The CAPI subsystem employs Microsoft's NDIS drivers and sets up the board as a LAN network card. Thus, the installation procedure of an ISDN board is the same as that for network boards. But users won't find any installation assistance for ISDN in the Win 95 on-line help. The subsystem lists the products of vendors who cooperated with Acotec and Microsoft in time for the release of Win 95. Boards that are not listed have to be installed with the manufacturer's driver disk.

Not all board vendors supply their own 32-bit CAPI 2.0 drivers, which means that users of non-German versions of Win 95 can't install these boards as a CAPI 2.0 device unless they buy the subsystem from Acotec. The only other choice these users have is to install 16-bit CAPI 1.1 drivers at the DOS level, which results in significantly lower functionality.

### **Networking Support**

In March, Microsoft launched a suite of ISDN drivers for Win 95. But the ISDN Accelerator Pack, which is not CAPI compatible, increased the confusion. Europeans tend to view ISDN as a replacement of the plain old telephone service (POTS), while in the U.S. ISDN is treated as an Internet solution.

These different views persist when it comes to integrating ISDN with Win 95. The Microsoft U.S. view on ISDN is clearly network-centric. "ISDN is [only] one more network-transport [medium], like X.25, Ethernet, Token Ring, or ATM," says Charles Fitzgerald, ISDN program manager at Microsoft U.S.

The confusion surrounding ISDN in the German market comes from the fact that

Microsoft's U.S. view prevails. Microsoft designed the ISDN Accelerator Pack for remote access via ISDN under Win 95. It's based on Microsoft's WAN-NDIS interface and therefore provides functionality for networking only; it does not support voice and multimedia capabilities, as CAPI does.

Currently Win 95 is missing the drivers that bind Microsoft's Telephony API (TAPI) and MAPI interfaces to ISDN. "Microsoft gives each application its own API, but what's needed is a general communications architecture for dial-up links," says Christian Lühns, marketing manager of Stollmann E + V (Hamburg, Germany), a founding member of the CAPI initiative. "CAPI has this flexibility, even if it lacks extended voice capabilities," he adds.

Some members of the CAPI initiative suggest that CAPI could be made an extension of NDIS for dial-up networks and that it could be accessed with different application interfaces. Microsoft GmbH agrees that the current situation can't be the final solution. Says Juergen Schwertl, Microsoft's ISDN coordinator: "We need to bind TAPI, MAPI, and NDIS to ISDN."

But he adds that making CAPI an extension to NDIS is not the way Microsoft will go. "This would add the burden of protocol implementation and maintenance to the NDIS driver. Software protocols should remain in the OS, because that's the only way to include changes or add functionality and stay compatible with existing hardware," he explains.

It's obvious that a lot of political positioning and posturing is going on. Microsoft and the German-led CAPI camp are coming from different directions, with different objectives and agenda. Currently neither party has all the answers, but Microsoft has gone where the money is and is supporting data-centric ISDN use for Internet access.

Multiple APIs for communications under Win 95 is surely not the long-term answer.

It only postpones the day when any application can communicate seamlessly over whatever medium is available: LAN, PSTN, ISDN, GSM, or satellite.