TITLE

V.90 Protocol: Connectivity Discussion

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TOPIC

My iMac comes with a 56 kbps capable modem, why should I use a modem script that limits my speed to 33.6 kbps?

DISCUSSION

The iMac modem is the first modem Apple has shipped that supports the new V.90 protocol. Although derived from the competing x2 and K56flex protocols, the V.90 specification is in its infancy and will be undergoing changes over the next several months.

When a modem is attempting to establish a connection with another modem it will attempt to connect at the highest speed possible. The speed of the connection is determined by two factors:

1. The capabilities of the other modem:
The remote modem must support the same protocols. The iMac modem supports both V.90 and K56flex protocols so it can connect to other modems that support these protocols at speeds between 33.6 kbps and 53 kbps (although the modem technology is capable of 56 kbps, FCC regulations limit the top speed to 53 kbps). If the remote modem does not support either of these protocols, the iMac modem will then try using the V.34 protocol which has a top speed of 33.6 kbps. The modems will continue to try slower protocols until they find one that both modems are capable of supporting.

2. Quality of the connection:
Modem connections are being made over regular voice telephone lines. The quality of a connection between two points can be different each time the connections is made. Once the modems have negotiated a protocol to use, they test the ability of the connection to sustain the speed of the connection. The higher the speed of the connection, the more susceptible it is to noise on the phone lines. Therefore, even when making a V.90 connection between the same two points, one connection could be 44000 bps while the other could be 38000 bps.

If the quality of the connection is such that it can not support the slowest V.90 connection then the modems will step down to the next protocol.

What we are observing with the iMac modem is this V.90 implementation is overly aggressive. Instead of negotiating down to support a slower but more stable connection, the modem keeps trying to connect at a higher speed. This causes the remote modem to determine that a connection can't be established and it hangs up.

There are times when this aggressive behavior will manage to complete a connection, only to be dropped minutes later since the quality of the phone connection really can not support that connection speed.

The V.34 only modem script is a work around for customers that are unable to connect using the V.90 protocol. In many cases, even if the V.90 implementation negotiated downward properly, the resulting connection might end up being between 28.8 kbps and 33.6 kbps due to phone line quality. In these cases there is no performance difference between using the V.34 and V.90 protocols.

Apple is working with others in the modem industry to improve the behavior of the V.90 implementation. The iMac modem is capable of being upgraded via software.

Currently, modem firmware updates are available from the Apple Software Updates updates page at: **http://asu.info.apple.com**.

For additional information on 56 kbps connectivity, see:
Tech Info Library Article 24482: "**56Kbps Modems: Getting the Fastest Connection**"

EXTENDED Information - Apple Internal Use - Service Providers and Support Professional

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