http://groups.google.com/d/topic/comp.dcom.modems/8ovkVeNkGHc/discussion

comp.dcom.modems >

Telebits "PEP" protocol

25 posts by 16 authors

Mark Montgomery

12/7/90

I have been somewhat daunted by the recently explosive growth of info
on high(er) speed modems in this group. One question that comes to
mind is why isn't some modem manufacturer that already has a handle
on V.32, V.42, bis, etc putting PEP into their products? Seems like
that would not only be a good marketing boost but also give some
competition to Telebit who seems to own the Unix connectivity market.
                    Just a thought, Mark

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Marc Unangst

12/10/90

ncp...@brahms.amd.com (Mark Montgomery) writes:
> mind is why isn't some modem manufacturer that already has a handle
> on V.32, V.42, bis, etc putting PEP into their products? Seems like
> that would not only be a good marketing boost but also give some
> competition to Telebit who seems to own the Unix connectivity market.

Mostly because Telebit also owns the PEP protocol. They invented it,
and they can decided who gets to use it. I believe Telebit is
behaving like Microcom, who refused to license the MNP protocols above
5 to other manufacturers, preferring to have all of a small pie than a
smaller piece of a big pie.

Also, there are superior protocols. Even though PEP holds a noisy
line very well, it is mostly half-duplex, and other protocols such as
V.32bis will beat it out for raw throughput most of the time. PEP is
also not so good for interactive use (see HDX note above). When PEP
was invented, it was great -- and it still is great for some
applications. But I don't think the sales would be large enough for
another company to justify licensing the protocol from Telebit, even
if Telebit was willing.

--
Marc Unangst |
m...@mudos.ann-arbor.mi.us | "Bus error: passengers dumped"
...!umich!leebai!mudos!mju |

dcau...@cdp.uucp

12/11/90

Telebit's PEP protocol is both proprietary and patented.
It is possible that Telebit might license other manufacturers, but
I suspect they would not do so unless they saw this as increasing
their net revenues.

Telebit people read comp.dcom.modems - maybe they will comment.

Dave C

Geoff Steckel - Sun BOS Hardware

12/11/90

In article <8sHZT...@mudos.ann-arbor.mi.us> m...@mudos.ann-arbor.mi.us (Marc Unangst)
writes:
>ncp...@brahms.amd.com (Mark Montgomery) writes:
>> mind is why isn't some modem manufacturer that already has a handle
>> on V.32, V.42, bis, etc putting PEP into their products? Seems like
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>> competition to Telebit who seems to own the Unix connectivity market.

>and they can decided who gets to use it.

Does anybody remember Vadic (now Racal-Vadic) 1200 bps modems?
They were the first (and still technically superior to Bell 212)
full duplex 1200 bps modems. Vadic refused to license any of the
protocols. Bell announced 212, and after a couple of years, released
it for general use. Result: Vadic was incompatible with all the other
1200 bps units, and that protocol died as a result. It was a pity
at the time, since Bell picked 2 carrier frequencies which were
harmonically related and interfered with each other if line distortion
was high.

Open letter to Telebit: if you think PEP is worth anything, licence
it (with or without fee). Otherwise it will be bypassed by a (possibly
inferior) but widely available standard. V.32 is coming up fast.

Anecdote: until the patents run (ran?) out, Phillips N.V. collects a
very small (apocryphally $.05) royalty on all audio cassettes. They also
refuse to allow any modification to cassette designs which will cause
incompatibility. They will licence to anybody, anywhere, cheaply.
Result: Phillips survives immense losses on practically
all its other products. Cassettes are the largest selling recorded
music medium.
        geoff steckel (gw...@wjh12.harvard.EDU)
                        (...!husc6!wjh12!omnivore!gws)
Disclaimer: I am not affiliated with Sun Microsystems, despite the From: line.
This posting is entirely the author's responsibility.

Casey Leedom

12/11/90

| From: gste...@vergil.East.Sun.COM (Geoff Steckel - Sun BOS Hardware)
|
| >From: m...@mudos.ann-arbor.mi.us (Marc Unangst)
| >
| >>From: ncp...@brahms.amd.com (Mark Montgomery)
| >>
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| >> on V.32, V.42, bis, etc putting PEP into their products?
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| inferior) but widely available standard. V.32 is coming up fast.

   Telebit's DAMQAM (Dynamic Adaptive Multicarrier Quadrature Amplitude
Modulation) has a couple of definite features over V.32 and possibly even
the upcoming V.32bis standard:

    o   Ability to handle line noise and changing line conditions.

    o   Higher raw bandwidth -- in one direction at a time.

From what I understand, PEP (Packetized Ensemble Protocol) is simply a
special packetizing and error detection/correction protocol designed to
live on top of DAMQAM and provide a simulated full duplex interface. The
spoofing of various higher level protocols to increase overall throughput
rates are a completely separate issue and could be layered on top of any
``error free'' channel.

   The protocol spoofing is nice, but mostly a because of stupidity in the
higher layer protocols -- notably a fixed window size of 1. (From what I
understand, SLIP spoofing, when it becomes available, will actually be
making up for the half duplex nature of DAMQAM.) Nevertheless, in this
world of stupid higher level protocols, the spoofing is a definite
advantage. My only complaint is that I should be able to do it over any
``error free'' channel, such as V.32/V.42/V.42bis.

   PEP is simply a packetization protocol. Who cares? Please feel free
to flame me if I'm misstating the extent of PEP's features.

connection for the last couple of weeks with the best length of connection
being ninety minutes I've changed my mind about telling people to forget
``PEP'' modems and just go with V.32.

   My only problem is I can't stand using PEP. The echo delays are
terrible to behold when I try to use my X terminal and it's just barely
passable with a normal terminal. Visual editors are gruesome.

   It would be really nice if Telebit could come up with a follow on to
DAMQAM that was ``TRUE'' full duplex ala the V.32/V.32bis echo
cancellation. Really nice. Incredible nice. Can you imagine it?
Roughly 18Kbps full duplex and reliable over the worst lines? Layer
V.42/V.42bis on top of that and you'd have one mean communications link
... such a modem would also, of course, have to support ``TRUE''
38.4Kbps ... :-)

   Oh course, in line with the note that I'm following up, it would have
to be licensed very cheaply for such a scheme to become widely used or
adopted as a new CCITT standard ...

Casey

Bob Sutterfield

12/12/90

In article <87...@lll-winken.LLNL.GOV> ca...@gauss.llnl.gov (Casey Leedom) writes:
    I should be able to do [protocol spoofing] over any ``error free''
    channel, such as V.32/V.42/V.42bis.
According to the T2500 firmware version GE7.00 release notes,

        Protocol Support in V.32 Mode
                All file transfer protocols defined by the S111
                register are now supported when a MNP connection is
                established in V.32 mode.

No mention (yet?) of spoofing support over a V.42/V.42bis connection.

Cerafin E Castillo

12/12/90

Casey quotes and writes:

| Open letter to Telebit: if you think PEP is worth anything, license it
| (with or without fee). Otherwise it will be bypassed by a (possibly
| inferior) but widely available standard. V.32 is coming up fast.

Telebit does license PEP/DAMQAM in an 18 kbps non-LZ compression (No S110)
form to Ventel (ie Ventel Pathfinder) and Racal-Milgo (1822S). Various
form factors have also been available in the DCA Fastlink, GTE TrailBlazer,
etc., mostly OEM-type deals.

>Telebit's DAMQAM (Dynamic Adaptive Multicarrier Quadrature Amplitude
>Modulation) has a couple of definite features over V.32 and possibly even
>the upcoming V.32bis standard:
>
>   o   Ability to handle line noise and changing line conditions.
>
>   o   Higher raw bandwidth -- in one direction at a time.

This is true. the one direction at a time (half-duplex / "adaptive duplex)
is a benefit, as well as a problem, especially in interactive work.

> The protocol spoofing is nice, but mostly a because of stupidity in the
>higher layer protocols -- notably a fixed window size of 1.

Correct. In UNIX UUCP ('g' protocol), the window size is usually a fixed size
of 3. SCO UNIX and other such O/S UUCPs have adjustable sizings up to 7 for
use with slower (<= V.32) modems. PEP forces a window size of 3, then performs
the spoof at each end in order to be able to do the PEP/DAMQAM (half-duplex)
modulation between the two modems without causing the full duplex 'g' protocol
to timeout. Both a necessity and a feature! This comes in handy with UUPC,
Waffle, or other such DOS programs with a window size of 1. The spoof will
automatically make this software do a 3 window size and effect performance
radically (if the serial I/O drivers can hack it! ;-).

SLIP spoofing, from what Telebit has told me, will never exist. the Telebit
NetBlazer is the current SLIP/CSLIP/PPP solution offered by Telebit.

As to protocol spoofing:

>My only complaint is that I should be able to do it (protocol spoofing)

>over any ``error free'' channel, such as V.32/V.42/V.42bis.

You can. The current GF7.00 firmware for T2500/T1500 allows protocol support
in V.32 (with or without V.42/V.42bis) between Telebit modems (ONLY!). The
New, T1600 modem is also capable of doing this. From my test of this firmware
feature, it is not very impressive. Maybe a 10% gain over raw V.32 throughput.

> PEP is simply a packetization protocol. Who cares? Please feel free
>to flame me if I'm misstating the extent of PEP's features.

No problem. PEP is a sales/marketing term for the layman. DAMQAM is the
correct modulation method. PEP is just an ECC layer.

> But, the real winner is DAMQAM.

>After struggling with a V.32 connection for the last couple of weeks...

>I've changed my mind about telling people to forget ``PEP'' modems and
>just go with V.32.

I have to agree. V.32, and for that fact V.32bis or V.32turbo (Rockwell
option) all using single carrier technology and echo cancellation/trellis
techniques, are only as good as the line you are using them on. While
this is true for DAMQAM as well, the multicarrier technology assures that
you will find available carriers for your data on any phone line (except a
dead one...;-) amongst the 511 carriers it makes avaialble. Furthermore,
you will be able to move anywheres from 2,4, or 6 bits of data through
these carriers at speeds between 7.3 and 88.26 baud. Of course, those of
you who know about the hidden registers (See Telebit Tech Support for
documentation...) also know of how to squeeze even more throughput out
of a bad line using DAMQAM packetization modification methods. 38.4 kbps
is available on the T1600.

> My only problem is I can't stand using PEP. The echo delays are
>terrible to behold when I try to use my X terminal and it's just barely
>passable with a normal terminal. Visual editors are gruesome.

I agree. I use V.32 with V.42bis compression in the receive direction
when using a Graphon OptimaX 200 X-Windows solution. Since the mouse
and typing yielded small bits of data as opposed to the screen redraws
coming in from the system, this method worked well, but not always
reliably. This was due to the combination of V.32 line problems. PEP
was very frustrating to deal with and could not provide this level of
intelligence in handling data on a per carrier basis.

> It would be really nice if Telebit could come up with a follow on to

>DAMQAM that was ``TRUE'' full duplex...

>support ``TRUE'' 38.4Kbps ... :-)

V.34 Asym seemed to have died in CCITT. This was the proposal for a 28 Kbps
PEP with a reverse 300-600 channel. Maybe in light of multicarrier cellular,
satellite, microwave, or fax modulation methods, it might be given new life...

I hope these personal and technical insights help. As a Telebit modem user
I share the same problems and complaints, but have the added benefit of a
little more product education thanks to Telebit.

===
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                "...No hay mal que por bien no venga..."

Casey Leedom

12/13/90

| From: c...@cup.portal.com (Cerafin E Castillo)
|
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| form to Ventel (ie Ventel Pathfinder) and Racal-Milgo (1822S). Various
| form factors have also been available in the DCA Fastlink, GTE TrailBlazer,
| etc., mostly OEM-type deals.

   Since I expect that V.42bis is probably nearly as good or better than
PEP's LZ compression, the lack of compression isn't a problem except that
Telebit doesn't support V.42/V.42bis on top of DAMQAM (you'd actually
have to have a layer between performing the adaptive-(sic)-duplex, but
that's just an implementation issue.) By withholding their LZ compression
it sounds like Telebit was just trying to prevent its licensees from
being competitive with Telebit's products. This just emphasizes the
earlier poster's point.

   I also agree with another poster who mentions the Phillips Cassette as
an example. I'd bet that if Telebit were to cheaply license their
technology out for, say, $5 a modem to any and all comers, a CCITT
standard would be rapidly forthcoming and Telebit would be amazed at how
much money they made without even making product ...

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| This is true. The one direction at a time (half-duplex / adaptive-duplex)
| is a benefit, as well as a problem, especially in interactive work.

   Except that half-duplex/adaptive-duplex is not the reason for DAMQAM's
robustness with regard to line problems. Multi-carrier technology is.
You all but say this later on, but I think it's important to stress it
here.

   As for the half-duplex nature of DAMQAM ... I mostly count that as a
massive headache with higher single direction bandwidth offered as a
salve.

   I used to complain bitterly about the fixed receive/transmit channel
allocation (essentially half-duplex) and ask why Telebit hadn't used
dynamic channel allocation based on measured receive/transmit loads.
Recently I heard a rumor that Telebit was working on a new multi-carrier
technology that used echo cancellation on each of the sub-carriers to
produce ``TRUE'' full-duplex. I would really love to see this happen.

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| >higher layer protocols -- notably a fixed window size of 1.
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| In UNIX UUCP ('g' protocol), the window size is usually a fixed size of
| 3. SCO UNIX and other such O/S UUCPs have adjustable sizings up to 7 for
| use with slower (<= V.32) modems. PEP forces a window size of 3, then
| performs the spoof at each end in order to be able to do the PEP/DAMQAM
| (half-duplex) modulation between the two modems without causing the full
| duplex 'g' protocol to timeout.

   Actually UUCP (really uucico) is 100% half-duplex. It only transmits
files in one direction at a time. The big problem with the UUCP 'g'
protocol and PEP modems is that the ACK packets are big enough to cause
the line to turn around introducing huge delays for each packet. Since
the data packets are very small this drops your throughput a lot. The
other advantage of spoofing that I mentioned earlier is that it helps
keep the data pipeline loaded when protocols using small windows are used

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