The F6FBB PBBS paclen [port.sys]: a never solved/cleared dilemma

1. Foregrounds

a. **Paclen**: the paclen value limits the size of the '**data**' field in a AX.25 I-frame.
This value *__does not__* include the AX.25 protocol header (source, destination, digipeater addresses, control and PID bytes).
The AX.25 protocol specify a maximum of 256 bytes for the **paclen**.

b. **MTU**: the MTU (Maximum Transmission Unit) is an '**interface parameter**' that limits the size of the largest IP datagram that it may handle.
The MTU is ***the sum**** of the size of the '**data inside the IP header**' (TCP or UDP most likely) and the size of the '**IP header itself**'.
IP datagrams, routed to an interface, that are larger than its MTU are each split into two or more IP fragments.

2. On deep explanation

As stated before, the AX.25 v. 2.0 protocol limits the paclen to the 256 bytes. Now, the paclen parameter controls '**only**' the size of the '**data field**' in a I-frame, i.e. it specify the maximum length of the '**data**' portion of a packet and **not** the total size of a frame as it appears on the air.
In fact, since the AX.25 spec. allows up to 8 digipeaters, the largest possible I-frame is 256 + 72 = 328 bytes [maximum].
One of the drawbacks of AX.25 is that there is no way for one station to tell another how large a packet it is willing to accept. This requires the stations sharing a channel to agree beforehand on a maximum packet size [paclen].

3. NetRom packet

On the NetRom environment (network) a NetRom '**transport header**' is 5 bytes long and a NetRom '**network header**' 15 bytes, so the 5 + 15 = 20 bytes size '**must**' be added (as a **charge**) to the size to an IP datagram when figuring the size of the AX.25 I-frame '**data field**'.
Then, if the maximum paclen is 256 bytes (in size) this leaves 256 – 20 = 236 bytes for the IP datagram [data field]. Now, this last, represents also the '**default**' MTU of the NetRom 'pseudo-interface', so as long as paclen is at least 256 bytes, AX.25 segmentation cannot happen.
It appears clear, now, that if smaller values of paclen are used, the NetRom MTU must also be reduced!

4. ROSE packet

On the ROSE environment the 'headers' and 'network routing' needs 3 to 5 bytes, so that the maximum 'paclen' is 256 – 5 = 251 bytes.

5. The F6FBB PBBS paclen

The '*historical*' reason, since Jean-Paul, F6FBB, was also the original developer of FPAC, which is based on the ROSE packet, was to take into account this amount of charge into its PBBS interface, being: 256 - 5 = 251 bytes which he *rounded* to 250 bytes.
In this situation no fragmentation may happen on ROSE environment since the 'standard' FBB interface own a paclen size which is fully compatible with the ROSE paclen.

6. The linux environment

The linux is able to transport frames greater than the 256 bytes, so the paclen could be changed and perhaps (hopefully) FBB should be able to get the paclen from the AX.25 layer :) … but this does non happen :(

7. The 'actual' FBB “port.sys” and the NetRom setup

In this last period I was engaged, amongst the other things, to review and update 'as is', the FBB manual (as found on the internet) an then with the aim (about) to write a new section/new manual concerning the xfbb 7.04j/l and the new 7.05x developments.
So, about the first work I sent, among the others, a copy of my work to my friend OM Paul G4APL and he sent to me several comments/proposals to be implemented on my work, and one of them concerns the NetRom paclen.

8. Final results and investigations

Since there is no way to setup a paclen size '**greater than**' the **250 bytes** (see para 5. above) on the FBB port.sys, become clear, after the above definitions, that the '**default MTU**' for the FBB interfaces, is also its '*de facto*' standard; so following our theoretical explanation, having learned (see para 3. above) about the **20 bytes** charge concerned in the NetRom environment, the paclen 250 – 20 = **230 bytes** 'value' represents the '**default MTU**' for the FBB NetRom pseudo-interface!
So, the **230 bytes** size is the right paclen value to be entered on the FBB port.sys for the NetRom environment to prevent any fragmentation.

Hope that the above explanation can add at least my Euro cent on this puzzled matter.

73, Gustavo / I0OJJ
June 02, 2011