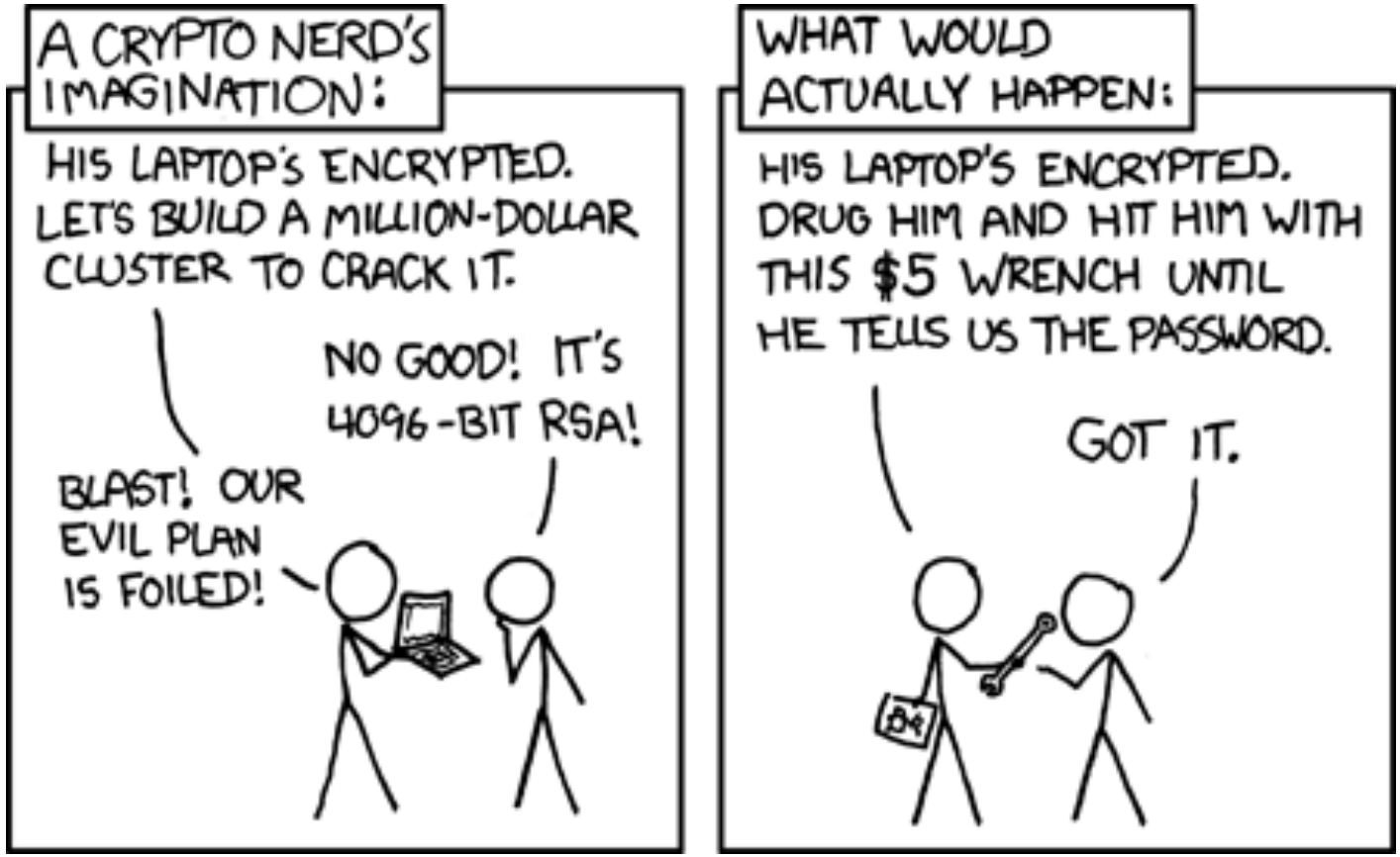
VPN on Nexys2



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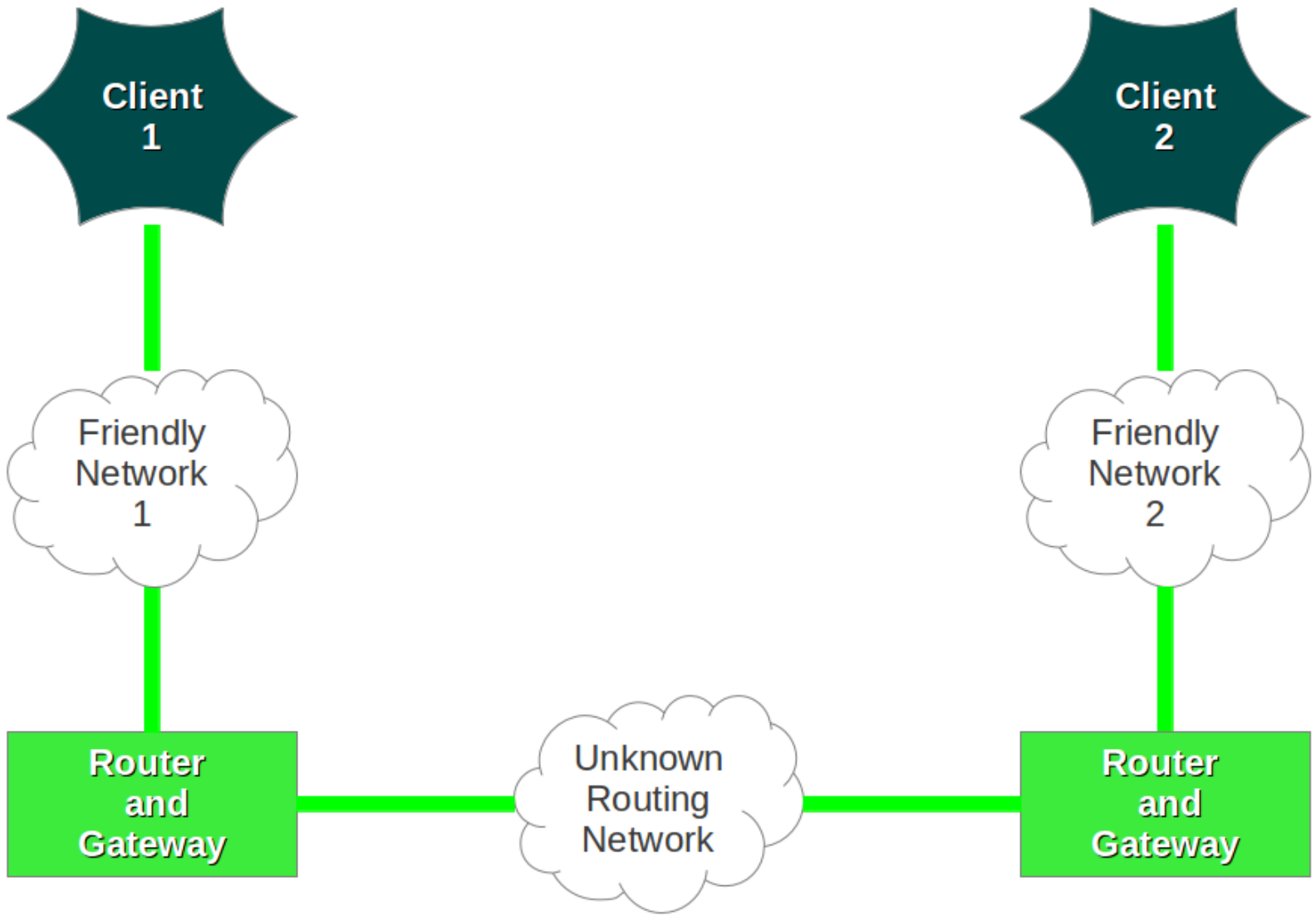
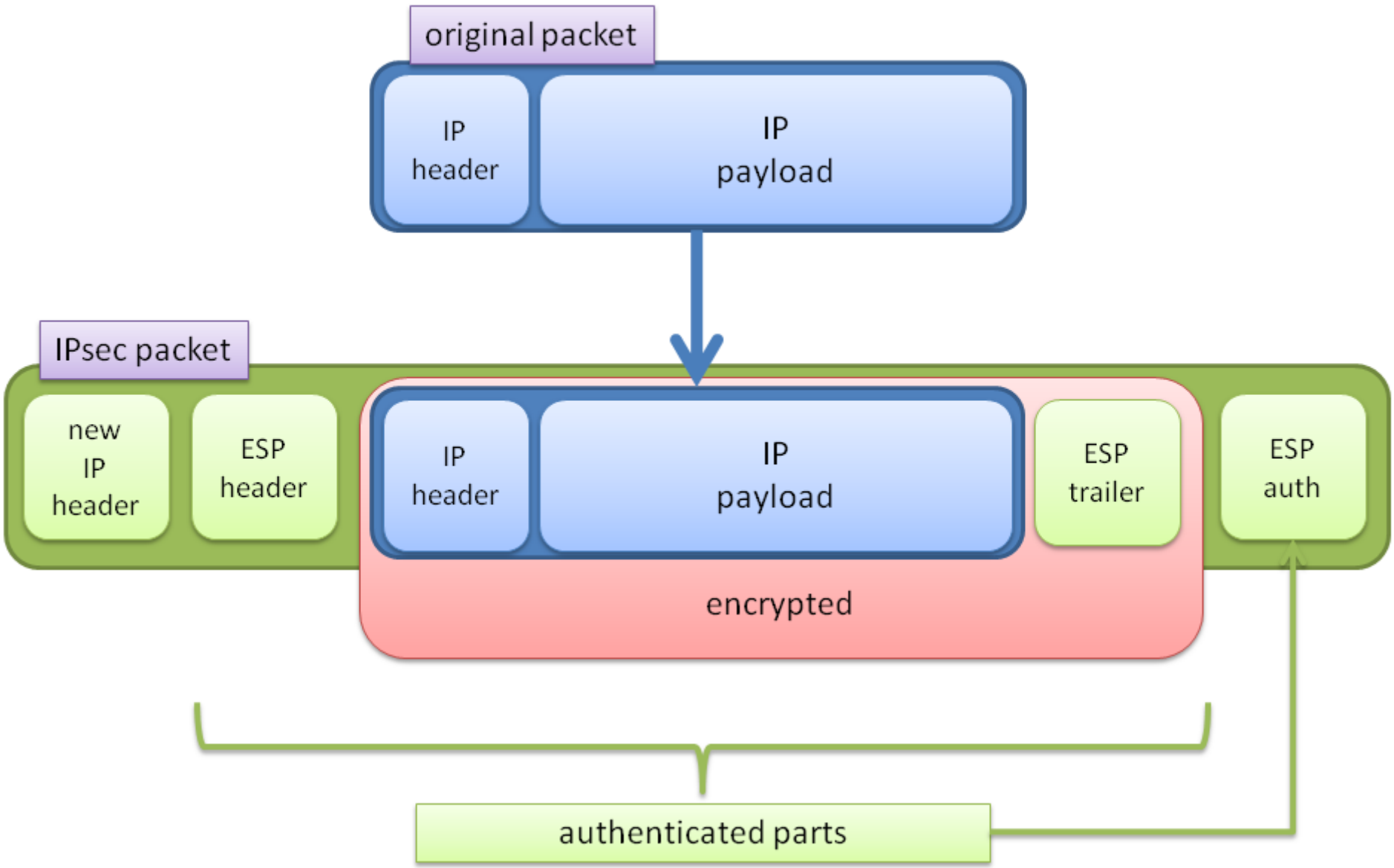
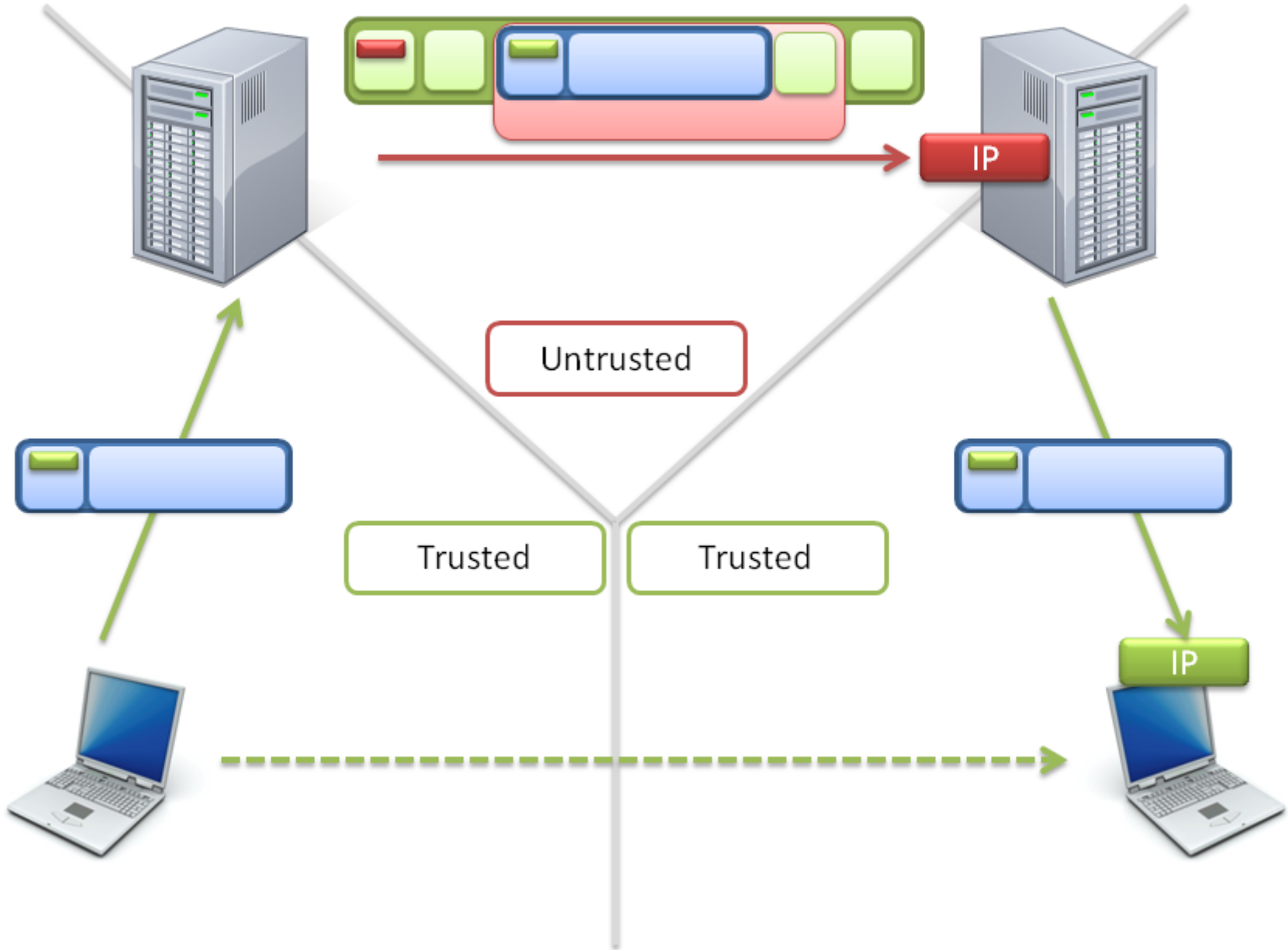
In a World of Rainbows and Unicorns



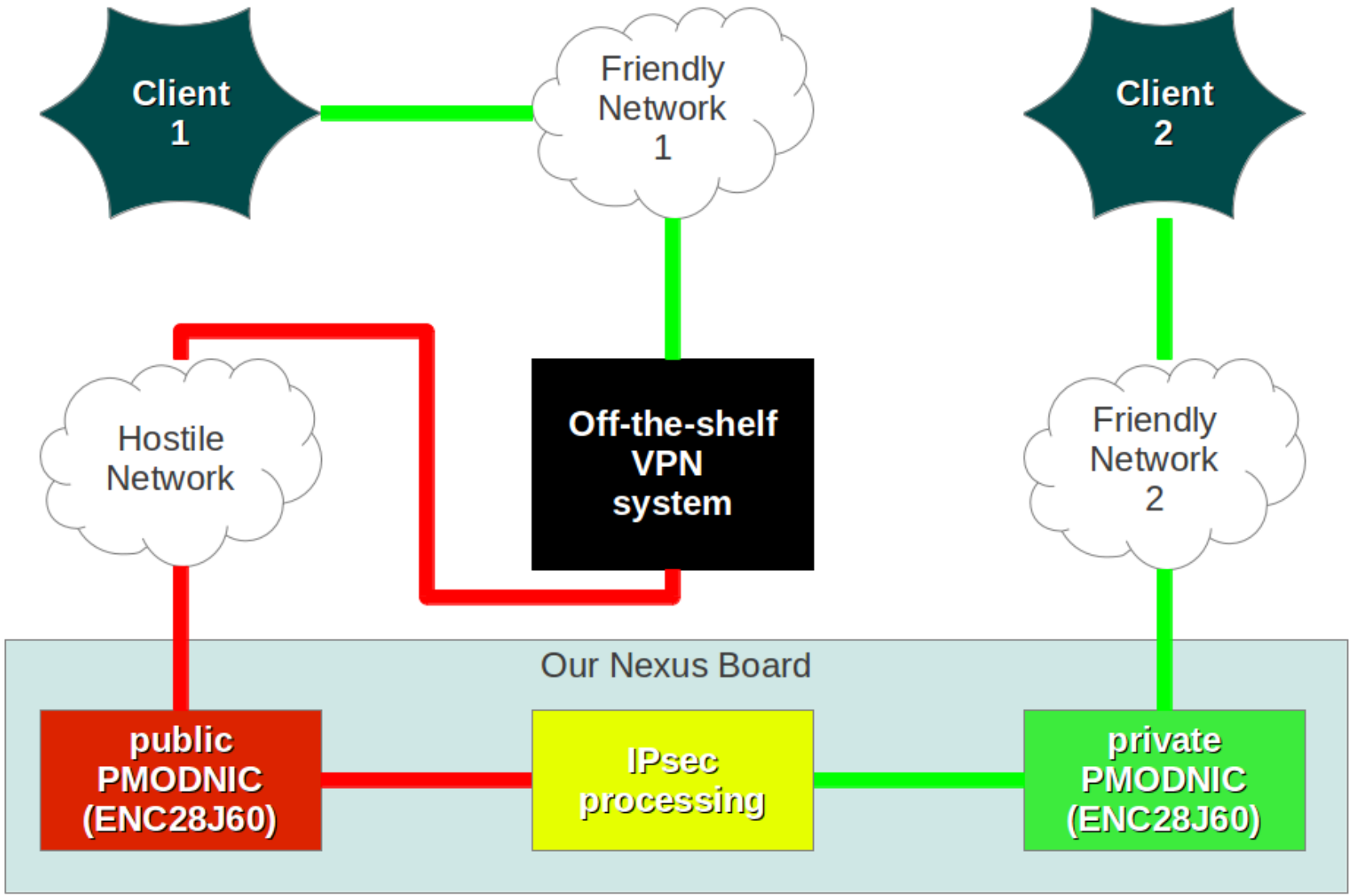
IPsec: Encapsulation of Packets



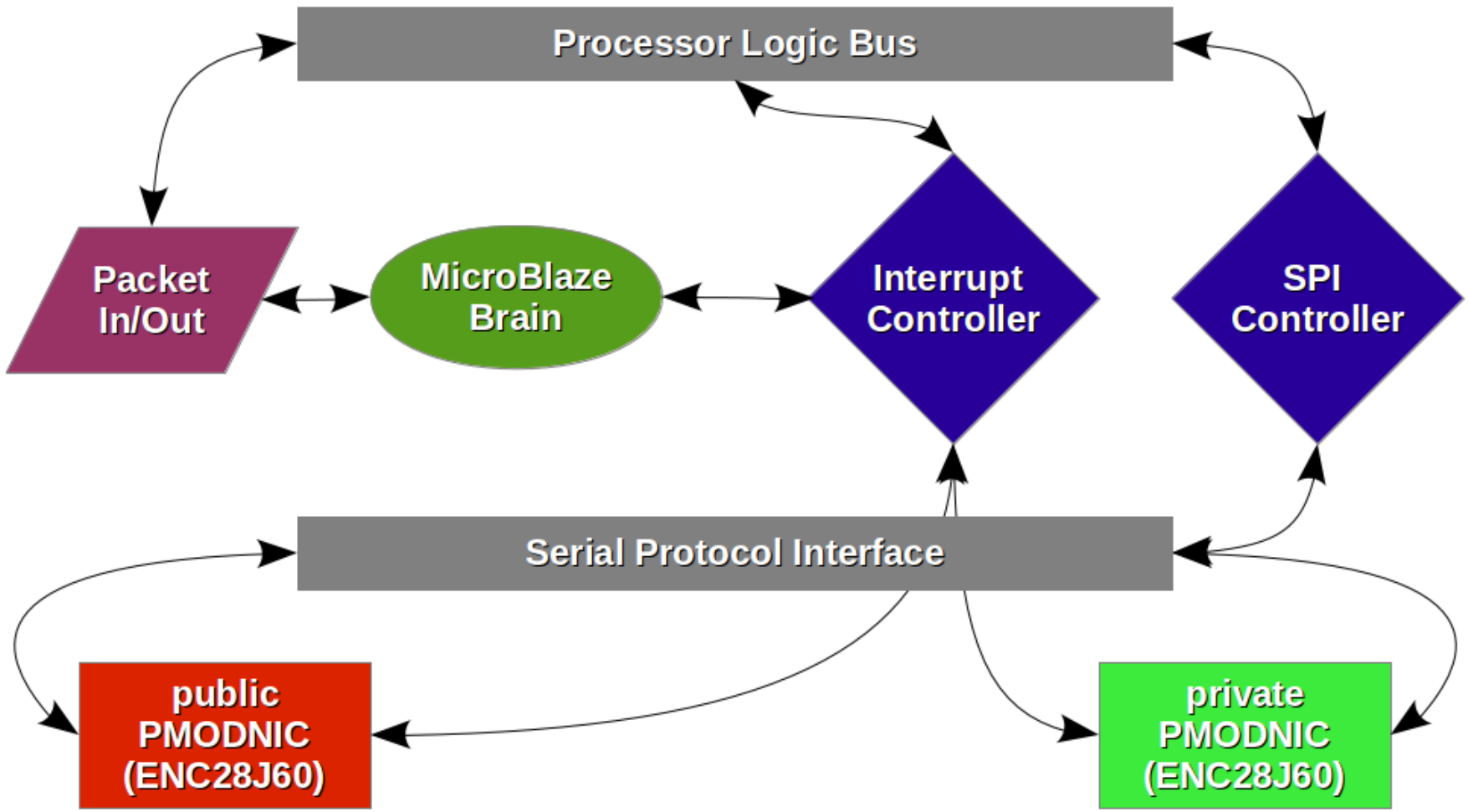
IPsec: The Big Picture with Packets



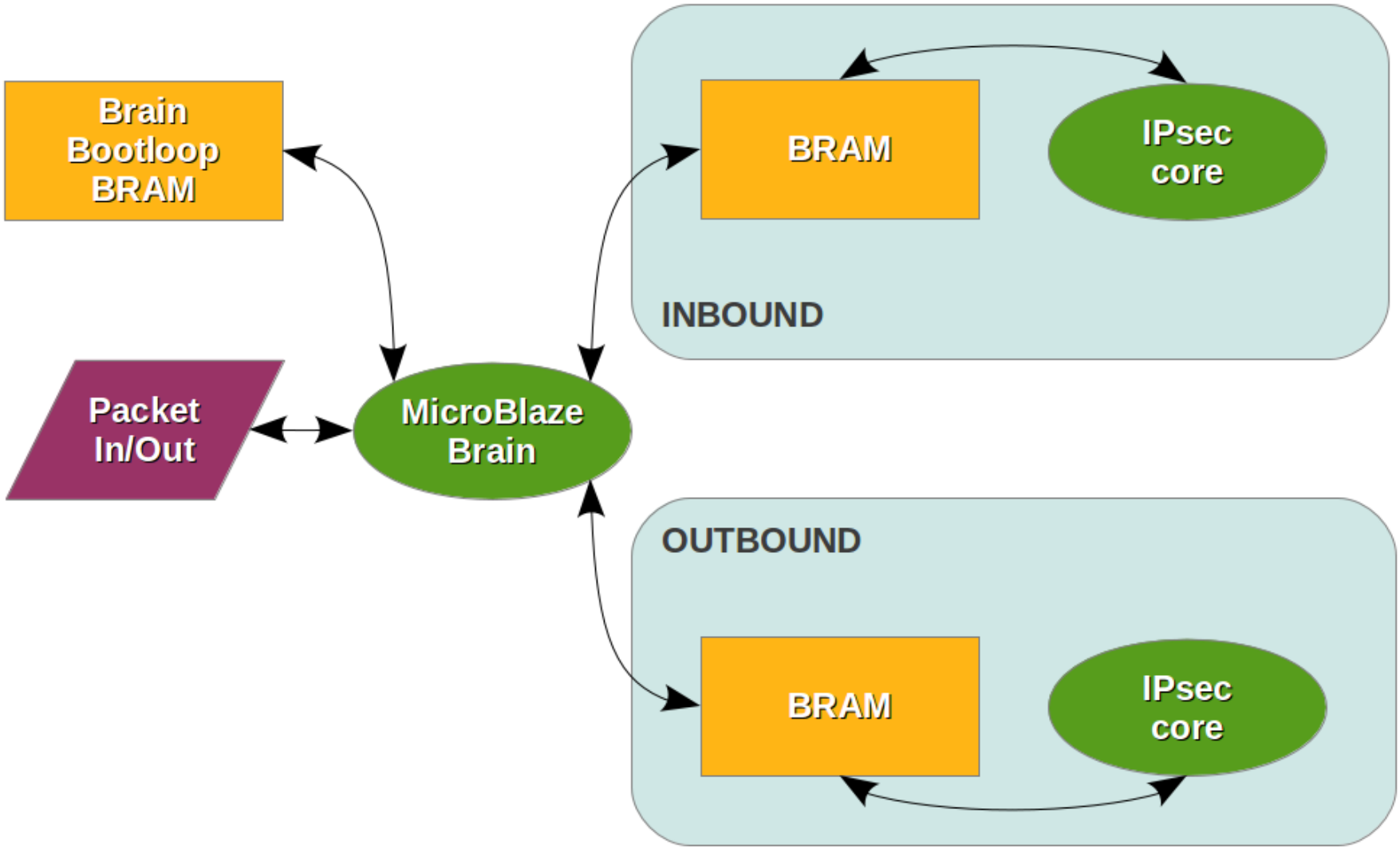
After the Smell of Coffee...



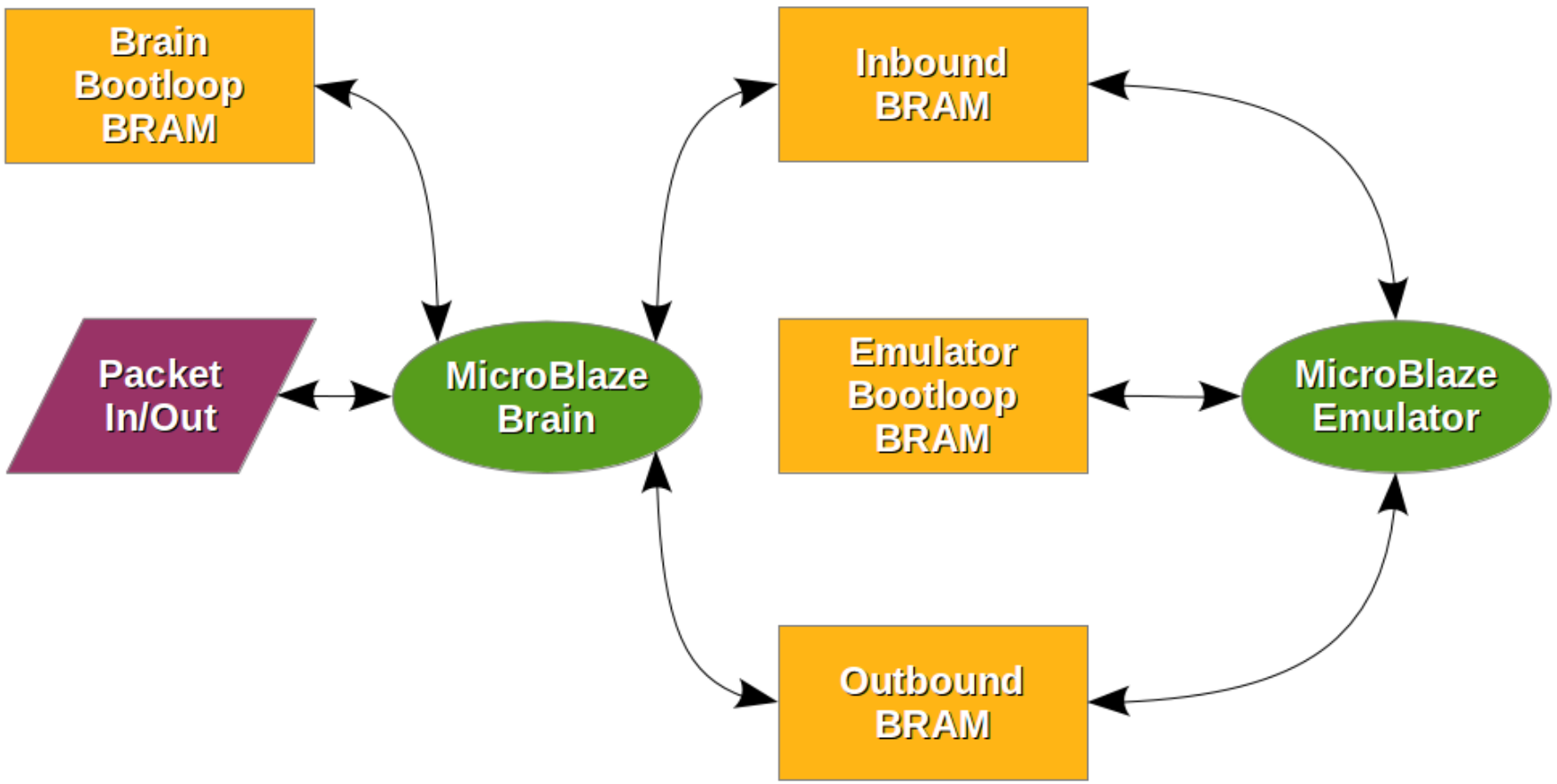
Networking, Nexys Style



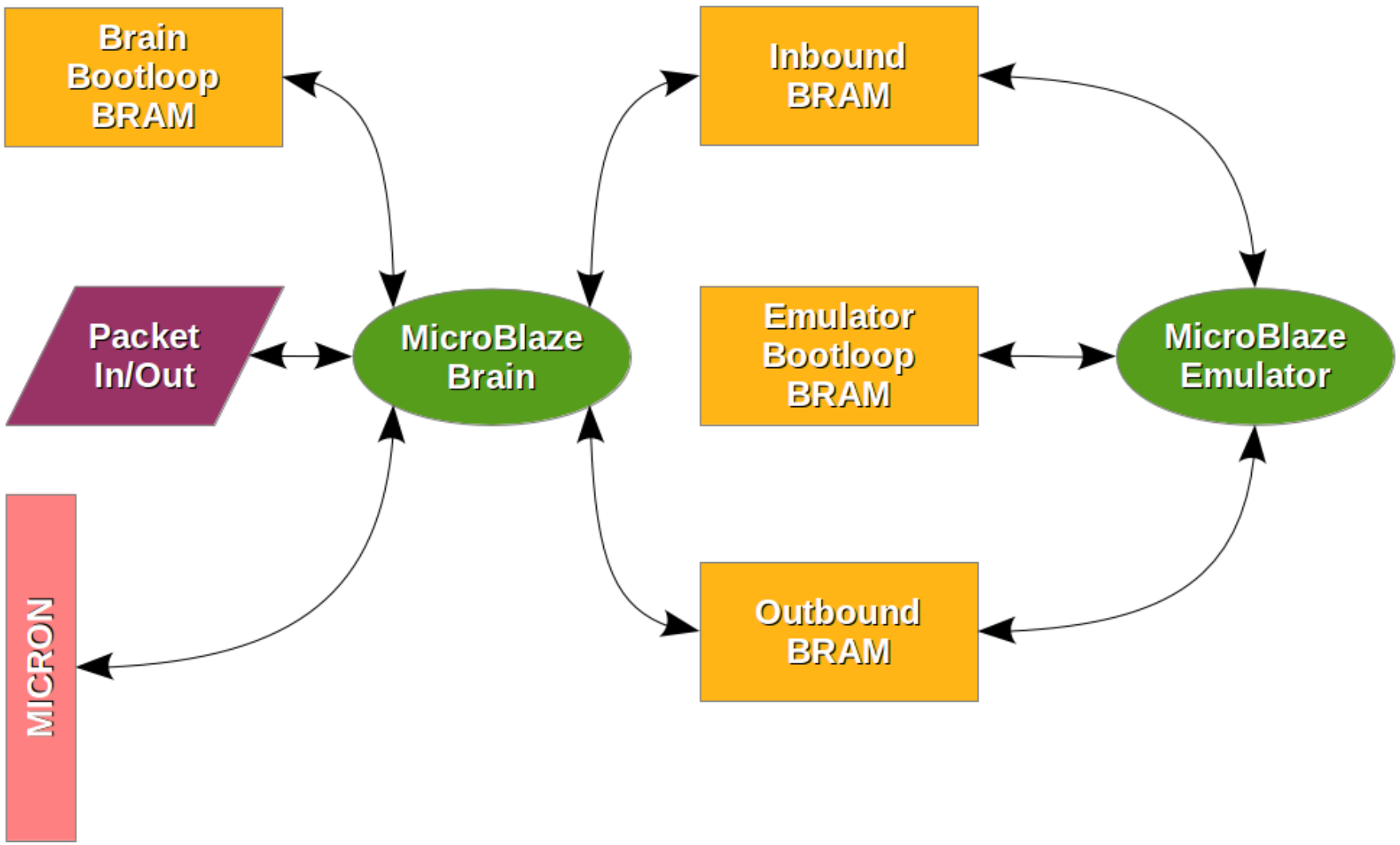
Original Target Idea



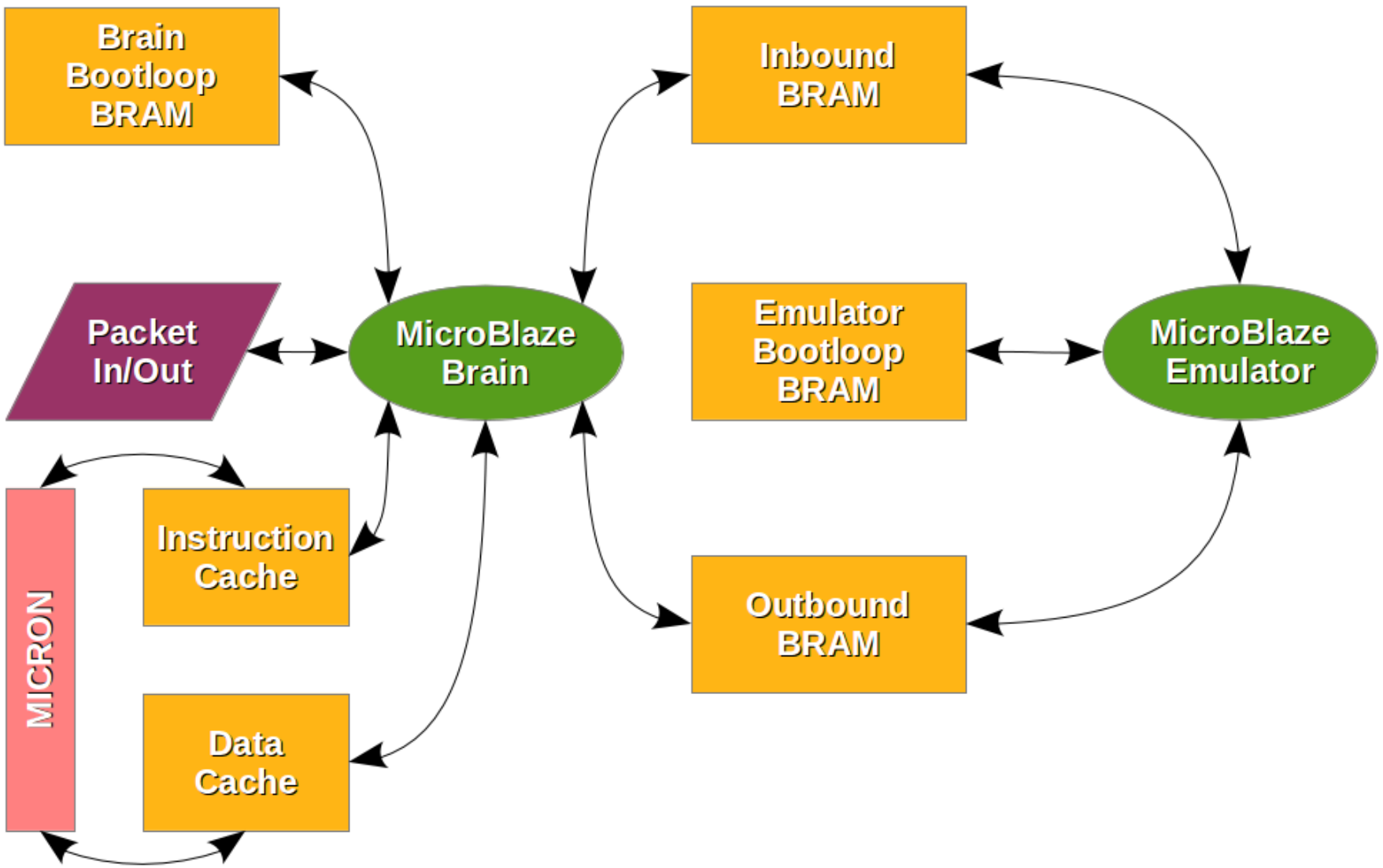
Emulate the Hardware Cores



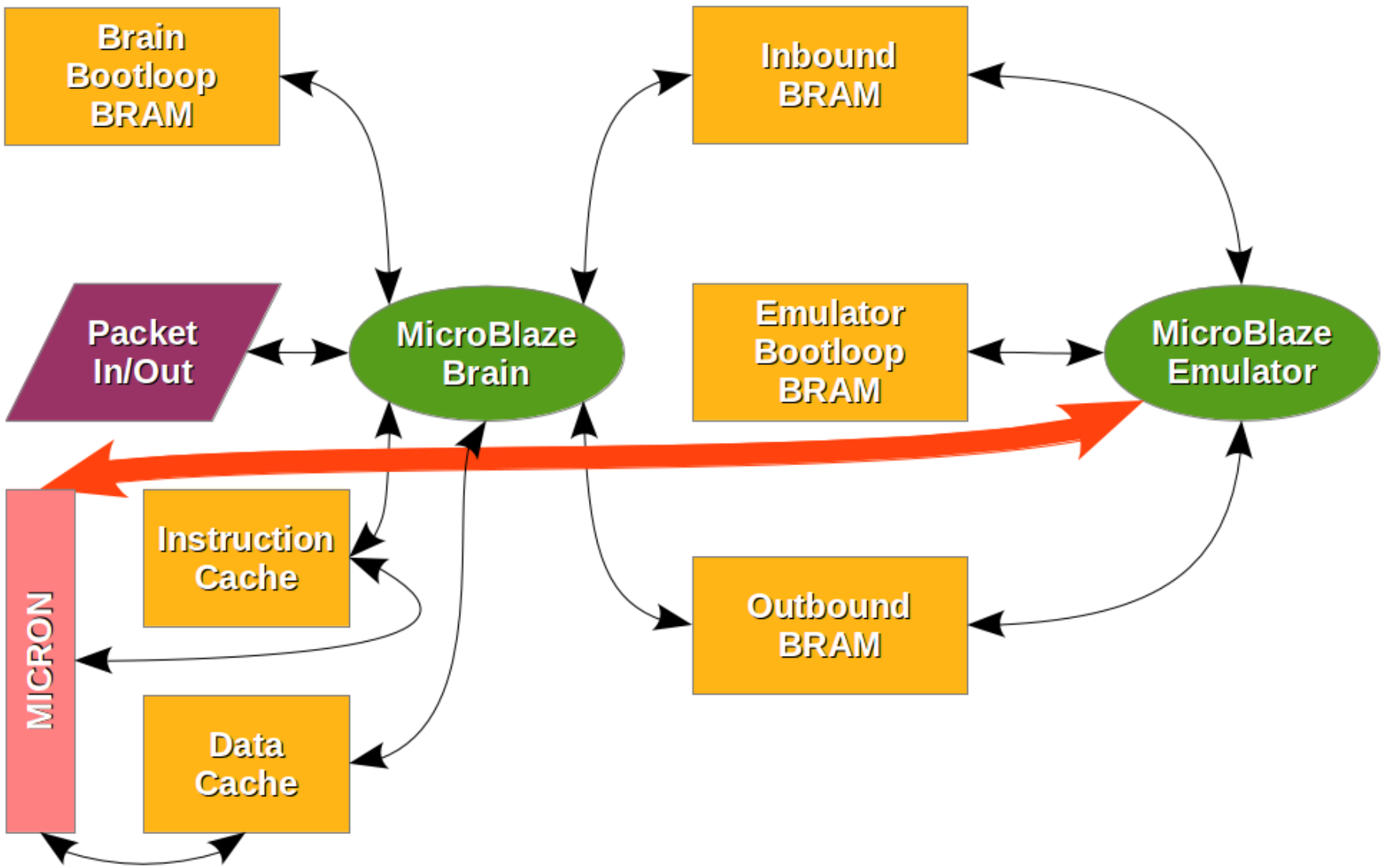
(re)Insert Micron SDRAM support



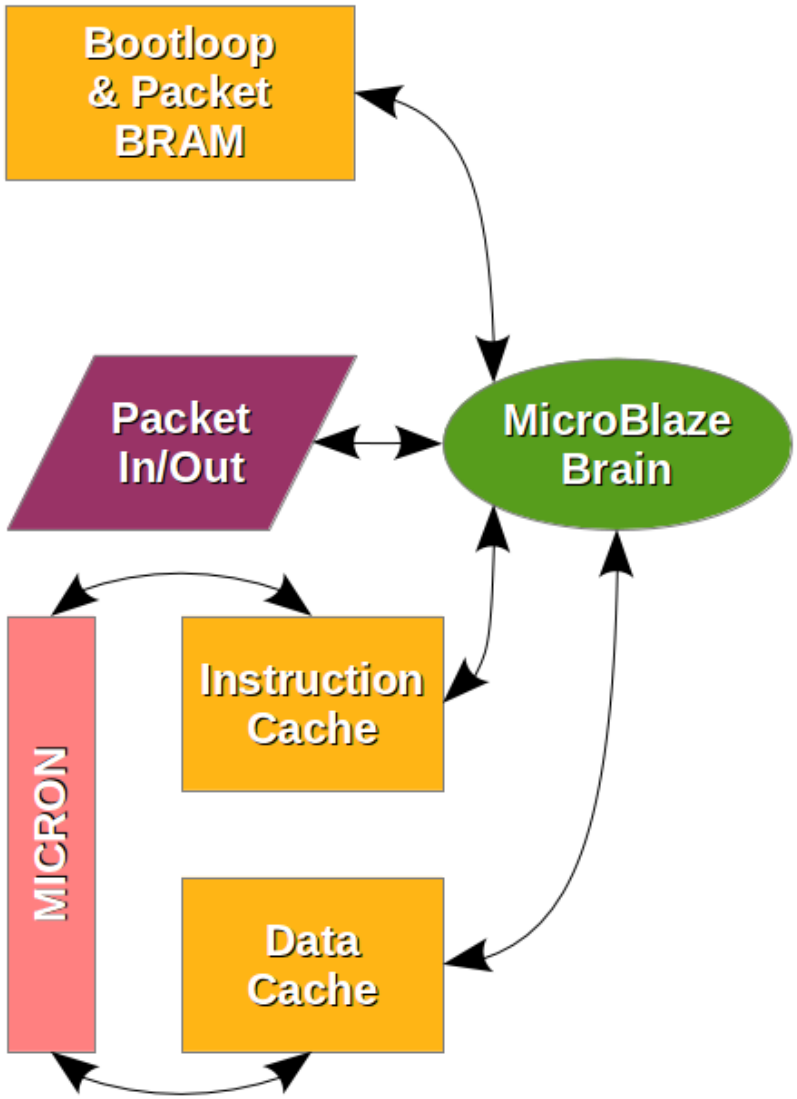
Insert Caches into Microblaze



Micron can only be controlled by one

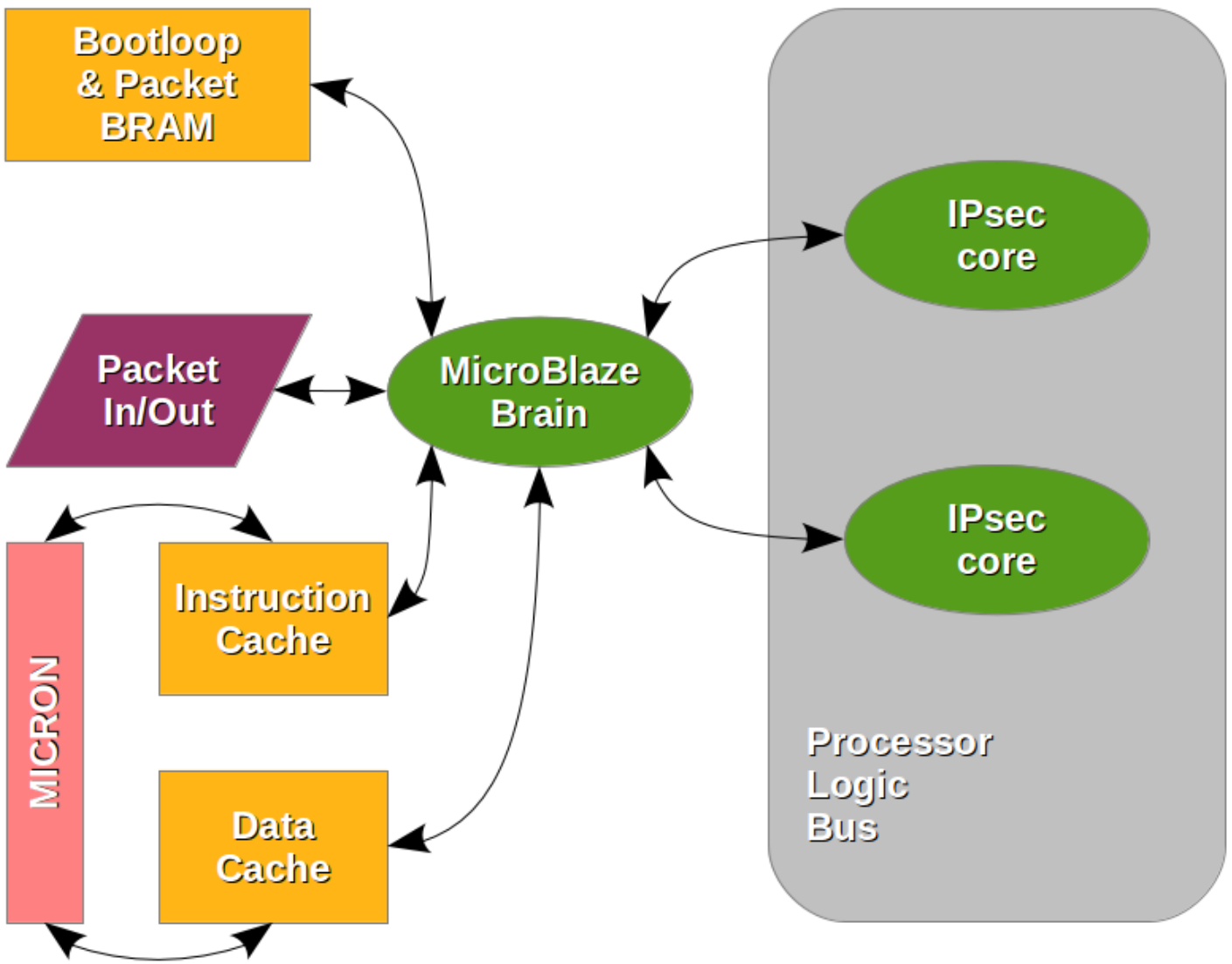


Merge Brain and Emulator



- This is the first iteration that works.
- All calculations are done in software on the Brain core.
- This means no hardware accelerators.

Appending Hardware Accelerators



Lessons Learned (Nexys)

Nexys has a very limited amount of RAMB16 / BRAM blocks.

pmodnic is really buggy, example from errata:

"The Receive Packet Pending Interrupt Flag (EIR. PKTIF) does not reliably/accurately report the status of pending packets."

Networking on Nexys is sub-optimal.

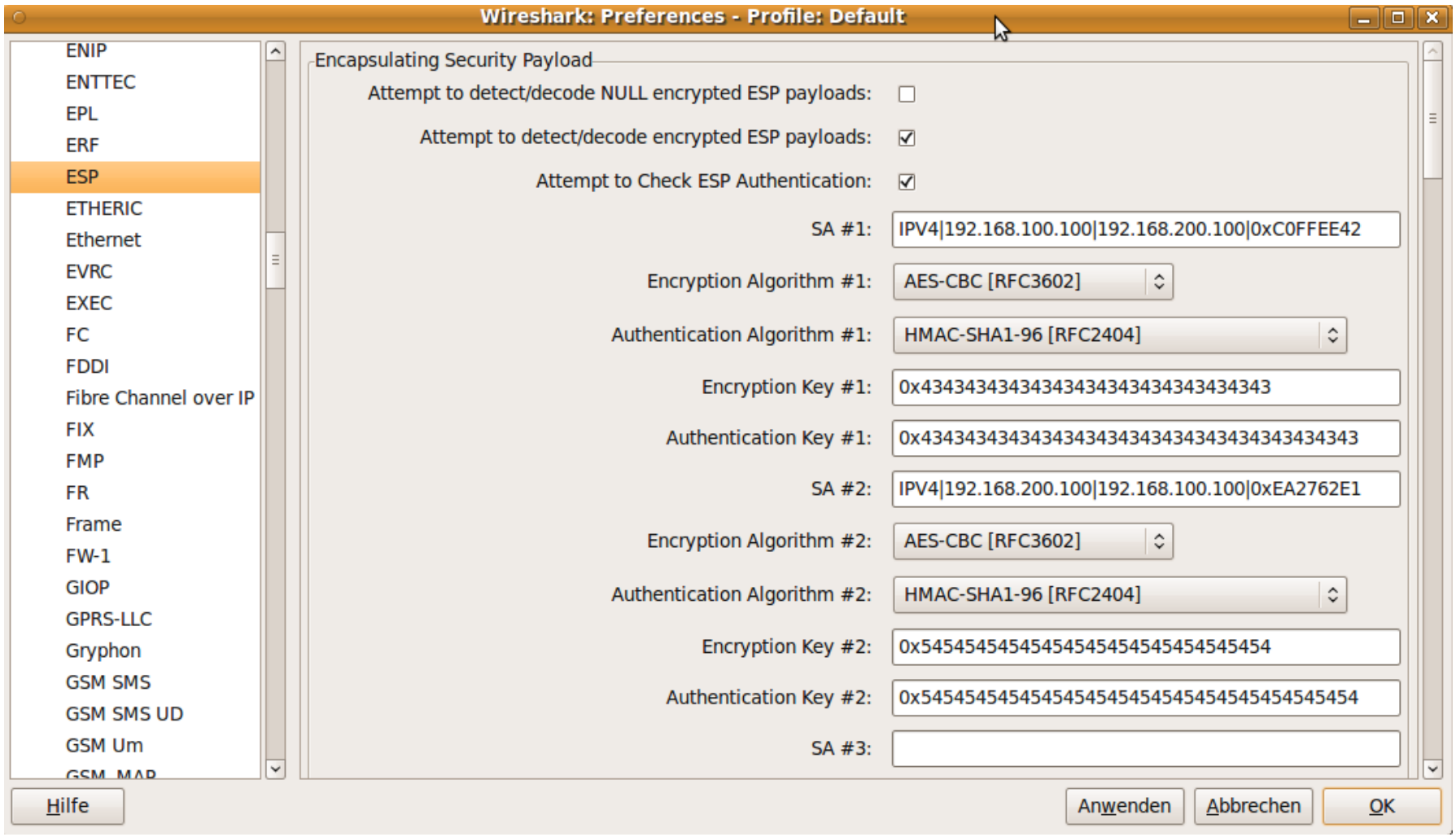
- Recieve Packet (NIC)
- Extract Packet via SPI
- Construct an Answer
- Insert Packet via SPI
- Send Packet (NIC)

Microblaze is too slow to do networking at reasonable speeds.

Lessons Learned (Supporting Systems)

Auxiliary systems needs time to be configured. The Linux VPN system took days.

Spend some time to learn your tools... Wireshark can decrypt packets!



Lessons Learned (Work Methods)

Time spent planning is time saved debugging.

BUT: No plan survives intial contact with the enemy.

Starting with a big prototype and then successively reduce it is inefficient if not impossible.

GUI tools are fine for one time operations. But repeated tasks are more effective when scripted.

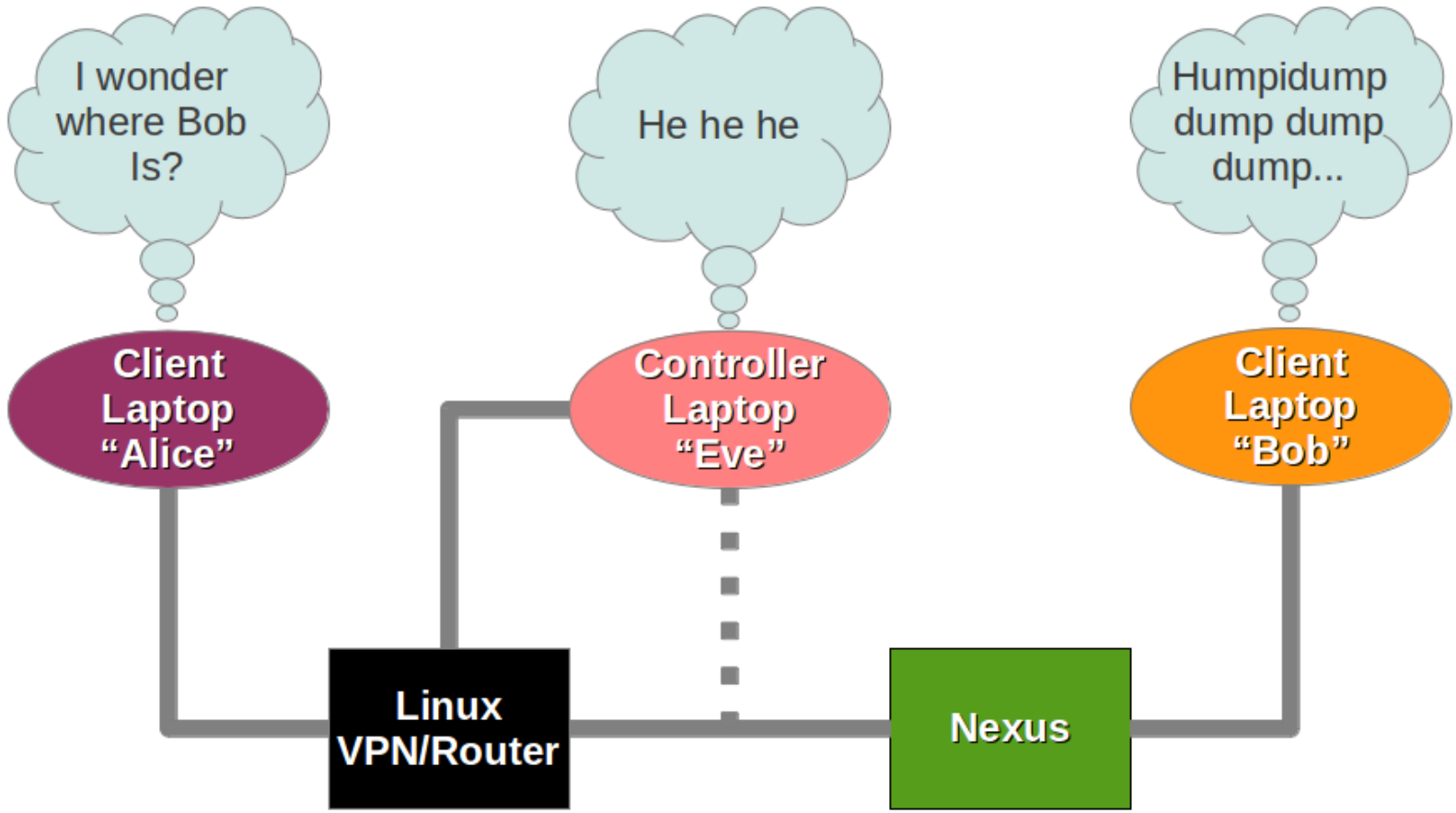
Splitting up the workload and working independent of each other is problematic.

Individual work can cause things to be lost in merging, even with tools like GIT.

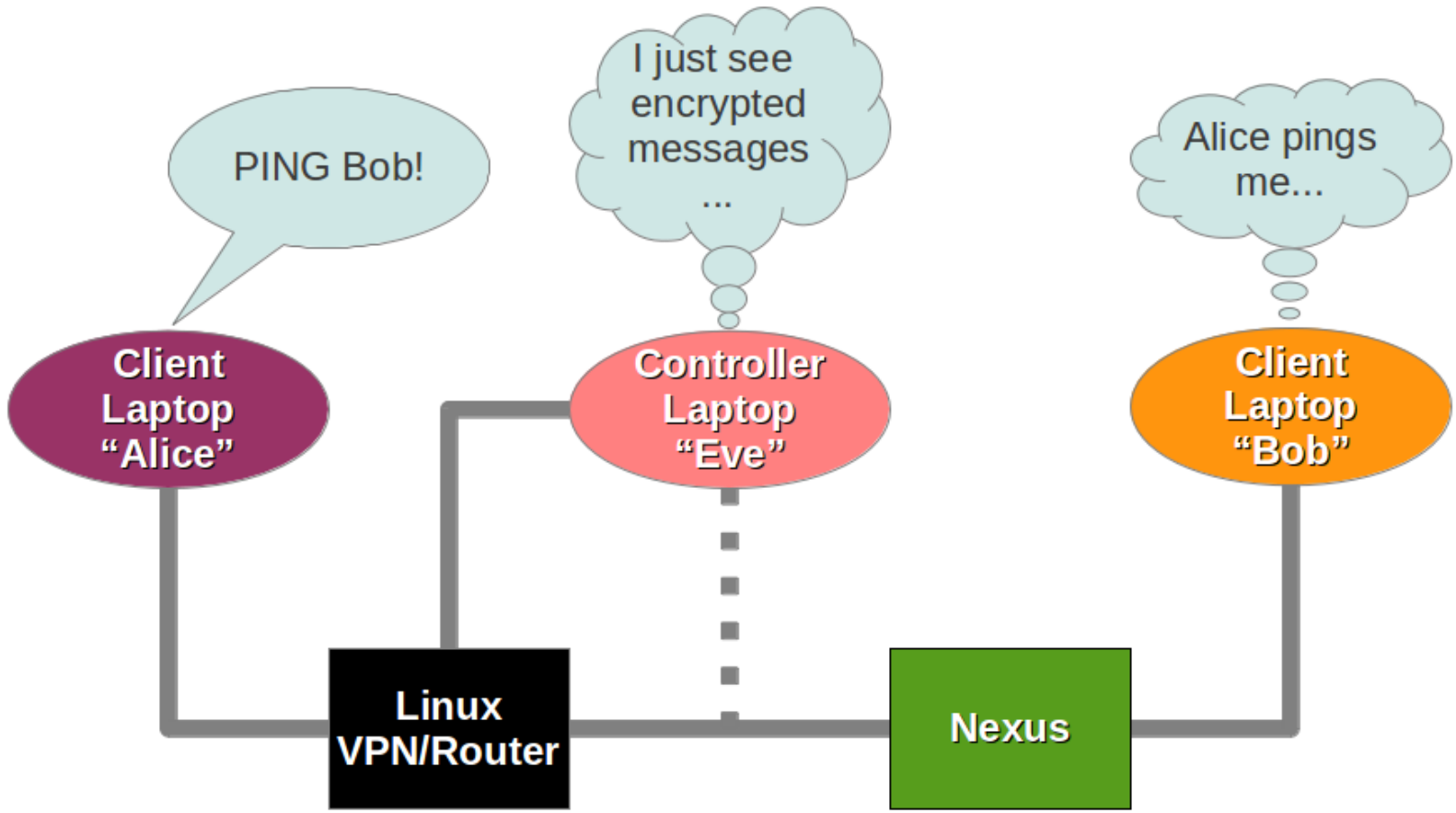
Exemple; this line was lost:
#define WORDS_BIGENDIAN

It cost around 25h to resolve.

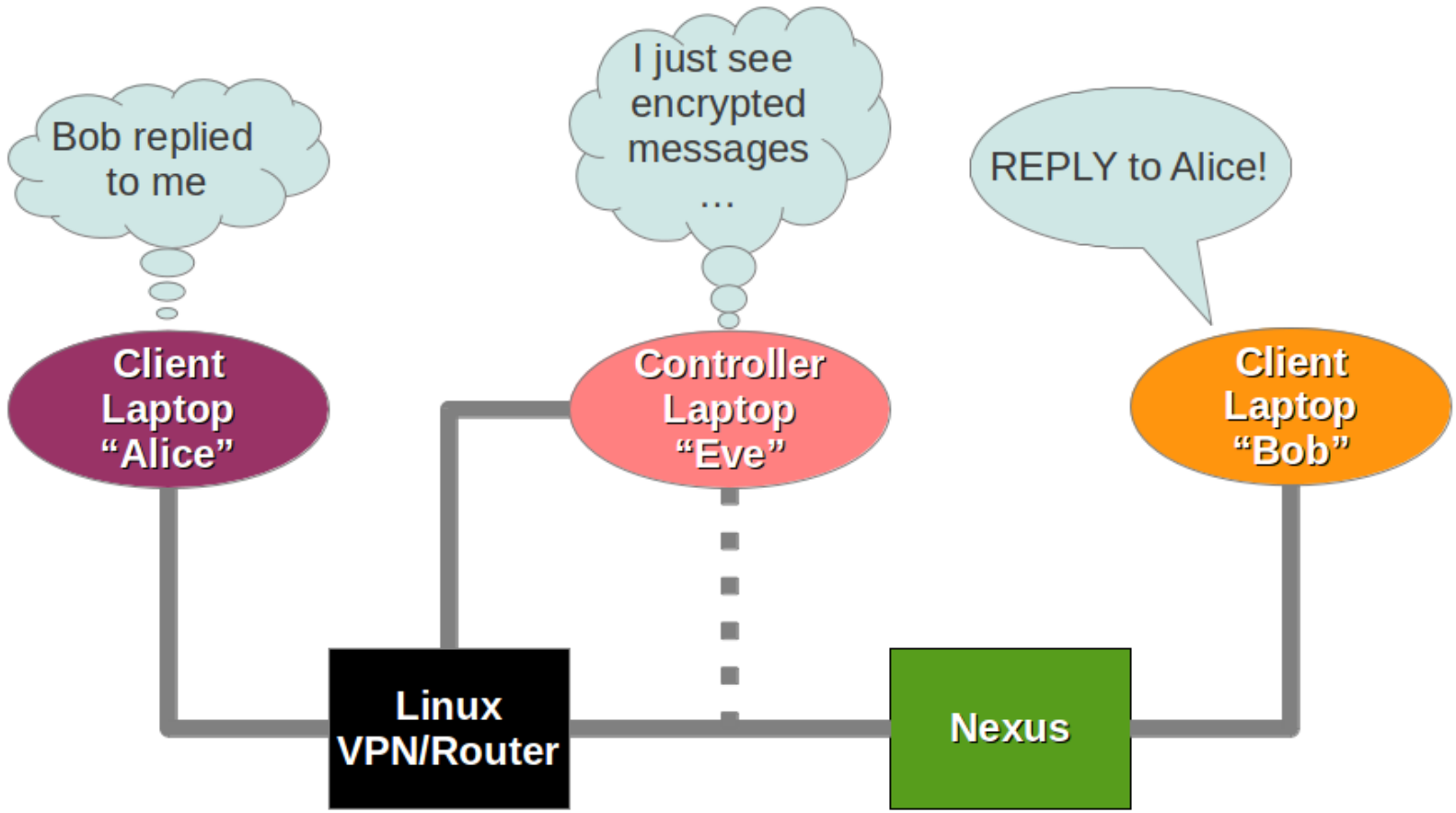
How will the Demonstration Look?



How will the Demonstration Look?



How will the Demonstration Look?



How will the Demonstration Look?