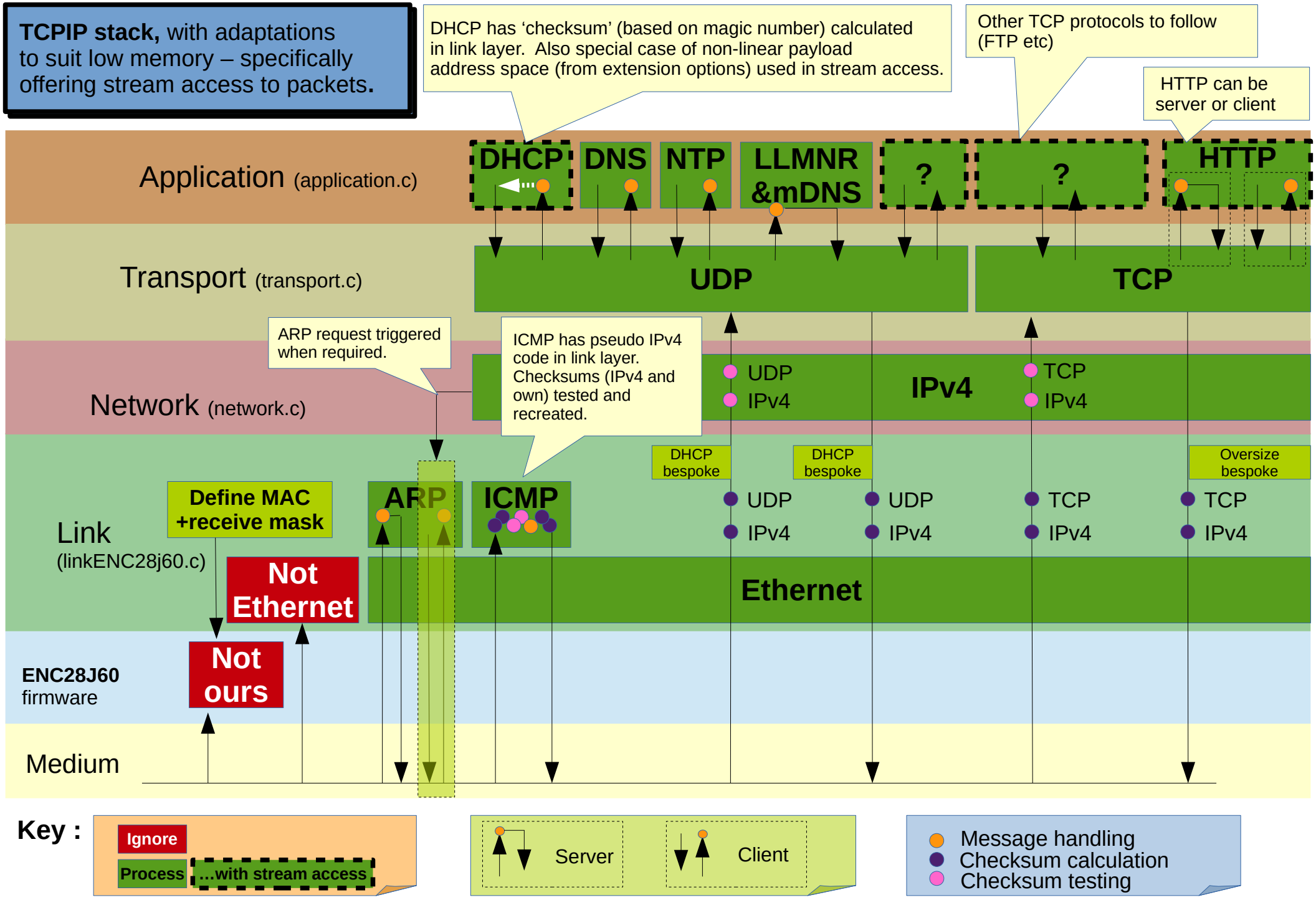
TCPIP stack, with adaptations to suit low memory – specifically offering stream access to packets.
DHCP has 'checksum' (based on magic number) calculated in link layer. Also special case of non-linear payload address space (from extension options) used in stream access.
Other TCP protocols to follow (FTP etc)
HTTP can be server or client
Application (application.c)
DHCP
DNS
NTP
LLMNR &mDNS
?
?
HTTP
Transport (transport.c)
UDP
TCP
ARP request triggered when required.
ICMP has pseudo IPv4 code in link layer. Checksums (IPv4 and own) tested and recreated.
Network (network.c)
UDP
IPv4
IPv4
TCP
IPv4
DHCP bespoke
DHCP bespoke
Oversize bespoke
Define MAC +receive mask
ARP
ICMP
Link (linkENC28j60.c)
UDP
IPv4
UDP
IPv4
TCP
IPv4
TCP
IPv4
Not Ethernet
Ethernet
Not ours
ENC28J60 firmware
Medium
Key :
Ignore
Process
...with stream access
Server
Client
Message handling
Checksum calculation
Checksum testing

Design Issue	Solution
Packets read can be larger than available memory.	Read packets as a stream from network card memory.
Checksum requires access to whole packet, yet packet is read as a stream.	Checksum determined first in link layer, and flag of result passed up the stack.
DHCP packets do not have a linear address space (can pack data into three different fields, indicated by options)	Code in application layer knows link layer stream addresses and calls the correct one, one after another, as indicated by application layer flags.
Packets to be written can be larger than available memory.	Write packet as a stream, or embed stock packets (e.g. constant icons) directly in the link layer.