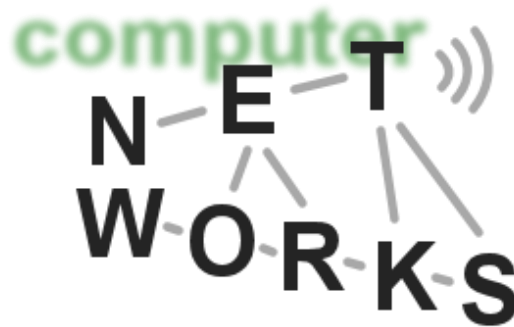# Network Layer – Part I (Addendum)
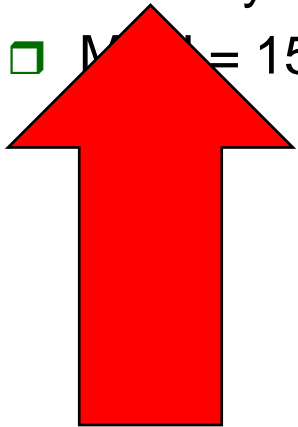
Telematics, Winter 2009/2010

IP Fragmentation and Reassembly

Example

- 4000 byte datagram
- MTU = 1500 bytes

Includes header!
⇒ **3980 byte of data**
⇒ **fragmented into**
1500 (1480+20)
1500 (1480+20)
1040 (1020+20)

	length =4000	ID =x	fragflag =0	offset =0	

One large datagram becomes
several smaller datagrams

	length =1500	ID =x	fragflag =1	offset =0	

	length =1500	ID =x	fragflag =1	offset =185	

	length =1040	ID =x	fragflag =0	offset =370	

How to fragment an already fragmented datagram

o Max. MTU = 820

o Incoming datagram:

...	Len = 1500	ID = X	MF = 1	Offset = 185	...

o Outgoing datagrams:

...	Len = 820	ID = X	MF = 1	Offset = 185	...

...	Len = 700	ID = X	MF = 1	Offset = 285	...

IPv4 vs IPv6

IPv6
2^{128} addresses
(RFC 2460, 1998)

IPv4
2^{32} addresses
(RFC 791, 1981)

RFC 675
2^8 host addresses
2^4 net addresses
(1974)

IMP
2^5 add.
(RFC 1, 1969)
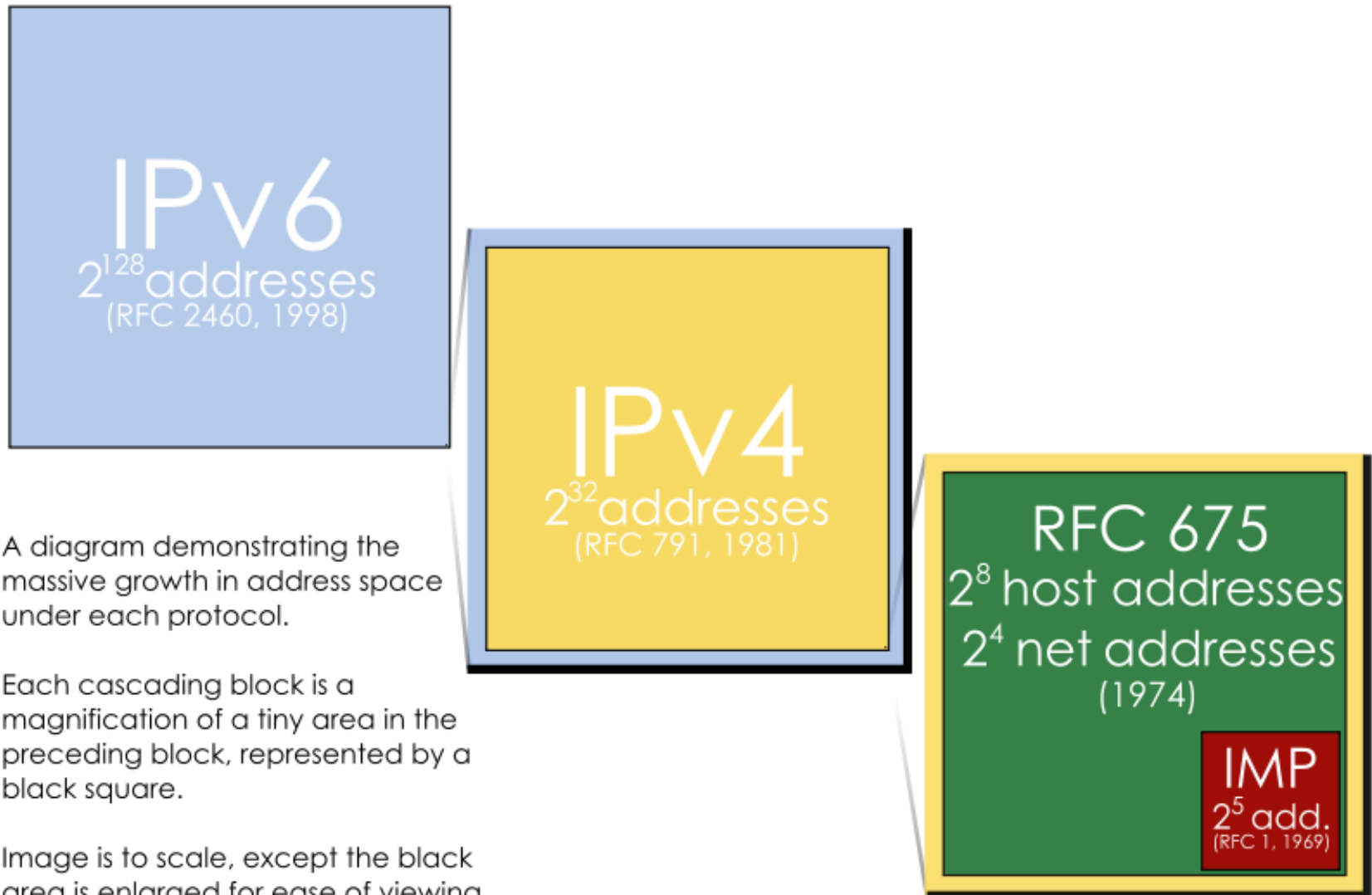
A diagram demonstrating the massive growth in address space under each protocol.

Each cascading block is a magnification of a tiny area in the preceding block, represented by a black square.

Image is to scale, except the black area is enlarged for ease of viewing

computer
NET
WORKS