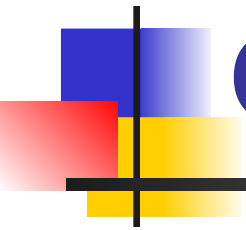
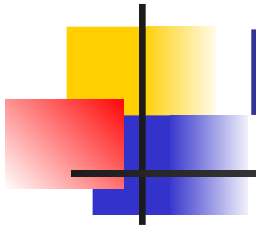


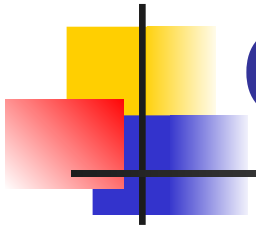
CSBridge – Net 6

Prof. Katz



BOOTP

- The bootstrap protocol was designed in 1985 to overcome the limitations of RARP
- It is a protocol to assign an IP address to a workstation but also has a “boot filename” parameter to inform the client of the program to execute for further information

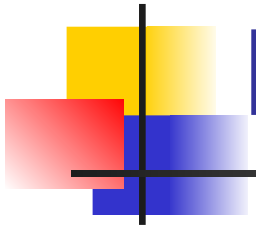


Operation of BOOTP

- Upon startup, the workstation will send a BOOTP_Request to the broadcast address. This request will have an IP header and a UDP header as well as the BOOTP packet.
- BOOTP operates on UDP Port 67 for the server port and 68 for the client.

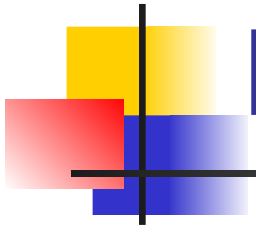
BOOTP Header

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
OPCODE								HARDWARE TYPE								HLEN								HOP COUNT							
TRANSACTION ID																															
NUMBER OF SECONDS																FLAGS															
CLIENT IP																															
YOUR IP																															
SERVER IP																															
GATEWAY IP																															
CLIENT HARDWARE ADDRESS …																															
SERVER HOST NAME …																															
BOOT FILENAME																															
VENDOR OPTIONS																															



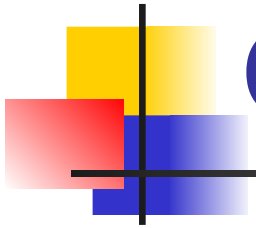
BOOTP benefits/costs

- The BOOTP datagram can be sent through a router
- IP Assignment is forever



DHCP

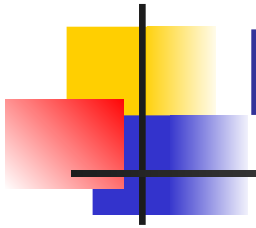
- Introduced in 1993
- DHCP was introduced to overcome the limitations of BOOTP
- The headers are the same so compatibility is guaranteed; port numbers are the same.



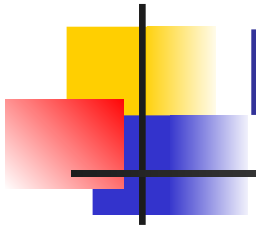
Overcoming BOOTP

- Three level of address assignment were designed
  - Manual
  - Automatic
  - Lease

Procedure for DHCP

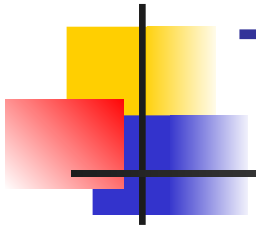


- DHCP_DISCOVER
- DHCP_OFFER
- DHCP_REQUEST
- DHCP_ACK
- (DHCP_NACK)
- (DHCP_DECLINE)
- (DHCP_RELEASE)



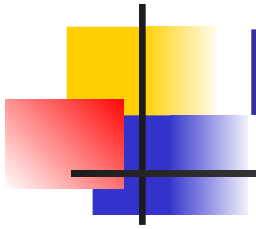
DHCP Client States

- Initialized
- Select – After DISCOVER
- Request – After Request
- Bound – Normal State
- Renewal
- Rebind



Timers

- Lease Expire Timer – usually 100% of Expire Time
- Rebind Time – usually 87.5% of Expire Time
- Renewal Time – usually 50% of Expire Time



Renewal Procedures

- At the expiration of the renewal timer, client attempts to renew the lease
  - If renewal occurs, rebind will never expire
  - Else, when continue until rebind expires
- When Rebind expires
  - Broadcast DHCP_DISCOVER to find other useable servers
- When lease expires, STOP USING THE IP!!!
  - Continue trying DHCP_DISCOVER at a reasonable rate.