

## Address Resolution Protocol

The Address Resolution Protocol (ARP) maps IP network addresses to hardware addresses used by a data link protocol. The protocol operates below the network layer.

ARP finds the MAC hardware address of a host from its known IP address. ARP maintains a cache in which MAC addresses are mapped to IP addresses.

Note that ARP is used by IPv4; IPv6 uses Neighbor Discovery Protocol (NDP) instead of ARP.

## Test ARP with the Maxwell Pro TCP/IP Test Suite

IWL's TCP/IP Test Suite includes fifty tests for the Address Resolution Protocol (ARP).

The tests, based on RFCs 826, 1122, and 5227, test the quality, conformance, and robustness of ARP implementations.

A summary of the ARP tests is included below:

### New ARP Test Summary

- ▶ IPv4.ARP.001 IPv4 packet with source addresses not in DUT's ARP translation table.
- ▶ IPv4.ARP.002 ARP Request with Ethernet source different from ARP Hardware Sender.
- ▶ IPv4.ARP.003 ARP Request with Hardware type field set to unassigned type.
- ▶ IPv4.ARP.004 ARP Reply with Hardware type field set to unassigned type.
- ▶ IPv4.ARP.005 ARP Request with Protocol type field set to unassigned type.
- ▶ IPv4.ARP.006 ARP Reply with Protocol type field set to unassigned type.
- ▶ IPv4.ARP.007 ARP Request with Hardware length field set to 0.
- ▶ IPv4.ARP.008 ARP Reply with Hardware length field set to 0.
- ▶ IPv4.ARP.009 ARP Request with Hardware length field set to 4.
- ▶ IPv4.ARP.010 ARP Reply with Hardware length field set to 4.
- ▶ IPv4.ARP.011 ARP Request with Protocol length field set to 0.
- ▶ IPv4.ARP.012 ARP Reply with Protocol length field set to 0.
- ▶ IPv4.ARP.013 ARP Request with Protocol length field set to 6.
- ▶ IPv4.ARP.014 ARP Reply with Protocol length field set to 6.
- ▶ IPv4.ARP.015 ARP packet with Opcode field set to 0.
- ▶ IPv4.ARP.016 ARP packet with Opcode field set to 26.
- ▶ IPv4.ARP.017 ARP Request with Hardware Sender Address set to all bits broadcast.
- ▶ IPv4.ARP.018 ARP Request with Hardware Sender Address set to 1 bit broadcast.
- ▶ IPv4.ARP.019 ARP Request with Hardware and Protocol Sender Address set to broadcast.
- ▶ IPv4.ARP.020 ARP Request with Hardware and Protocol Sender Address set to multicast.
- ▶ IPv4.ARP.021 ARP Request with Protocol Sender Address set to all ones broadcast.
- ▶ IPv4.ARP.022 ARP Request with Protocol Sender Address set to 127.0.0.2 localhost.
- ▶ IPv4.ARP.023 Unrequested broadcast ARP Reply.
- ▶ IPv4.ARP.024 Unrequested unicast ARP Reply.
- ▶ IPv4.ARP.025 Unrequested ARP Reply with non-DUT Hardware Target Address.
- ▶ IPv4.ARP.026 Unrequested ARP Reply with new Protocol Sender Address and non-DUT Protocol Target Address.
- ▶ IPv4.ARP.027 Unrequested ARP Reply with existing Protocol Sender Address and non-DUT Protocol Target Address.
- ▶ IPv4.ARP.028 Request appears to come from DUT hardware but different protocol address.

- ▶ IPv4.ARP.029 Request appears to come from DUT hardware with same protocol address.
- ▶ IPv4.ARP.030 Reply appears to come from DUT hardware but different protocol address.
- ▶ IPv4.ARP.031 Reply appears to come from DUT hardware with same protocol address.
- ▶ IPv4.ARP.032 Opcode 26 ARP appears to come from DUT hardware but different protocol address.
- ▶ IPv4.ARP.033 Opcode 26 ARP appears to come from DUT hardware with same protocol address.
- ▶ IPv4.ARP.034 Request from other sender hardware has DUT's Protocol Address.
- ▶ IPv4.ARP.035 Reply from other sender hardware has DUT's Protocol Address.
- ▶ IPv4.ARP.036 Opcode 26 ARP from other sender hardware has DUT's Protocol Address.
- ▶ IPv4.ARP.037 Using TCP; Request from other sender hardware has DUT's Protocol Address.
- ▶ IPv4.ARP.038 Using TCP; Reply from other sender hardware has DUT's Protocol Address.
- ▶ IPv4.ARP.039 Using TCP; Opcode 26 ARP from other sender hardware has DUT's Protocol Address.
- ▶ IPv4.ARP.040 Using TCP; Slow Requests from other sender hardware has DUT's Protocol Address.
- ▶ IPv4.ARP.041 Using TCP; Slow Replies from other sender hardware has DUT's Protocol Address.
- ▶ IPv4.ARP.042 Using TCP; Slow Opcode 26 ARPs from other sender hardware has DUT's Protocol Address.
- ▶ IPv4.ARP.043 Using TCP; Fast Requests from other sender hardware has DUT's Protocol Address.
- ▶ IPv4.ARP.044 Using TCP; Fast Replies from other sender hardware has DUT's Protocol Address.
- ▶ IPv4.ARP.045 Using TCP; Fast Opcode 26 ARPs from other sender hardware has DUT's Protocol Address.
- ▶ IPv4.ARP.046 Fixed IPv4; Fast Requests from other sender hardware has DUT's Protocol Address.
- ▶ IPv4.ARP.047 Fixed IPv4; Fast Replies from other sender hardware has DUT's Protocol Address.
- ▶ IPv4.ARP.048 Fixed IPv4; Fast Opcode 26 ARPs from other sender hardware has DUT's Protocol Address.
- ▶ IPv4.ARP.049 Request is in a 1500 byte Ethernet frame.
- ▶ IPv4.ARP.050 Request contains non-null Ethernet frame padding.



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