

# 1. W5100\_Dhcp.c 파일의 칩 제조사 제공소스와 오픈소스 간 비교

| 구분 | 경전투 W5100 칩 제공 소스                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 오픈소스                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      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|    | <pre> 1. // This function sends DHCP DISCOVER message to DHCP server.  2. static void send_DHCP_DISCOVER(   SOCKET s )   /*&lt; a socket number. */ 3. { 4.     uint8 ip[4], event_data; 5.     u_int i=0; 6.     u_int iTemp; 7.     u_long lTemp; 8. 9.     pRIPMSG = (RIP_MSG*)lanTransBuf; 10. 11.     *((u_long*)&lt;DHCP_SIP) = 0; 12.     *((u_long*)&lt;DHCP_REAL_SIP) = 0; 13. 14.     memset((void*)&lt;pRIPMSG, 0, sizeof(RIP_MSG)); 15. 16.     pRIPMSG-&gt;op = DHCP_BOOTREQUEST; 17.     pRIPMSG-&gt;htype = DHCP_HTYPE10MB; 18.     pRIPMSG-&gt;hlen = DHCP_HLENETHERNET; 19.     pRIPMSG-&gt;hops = DHCP_HOPS; 20.     lTemp = htonl(DHCP_XID); 21.     pRIPMSG-&gt;xid[3] = lTemp &gt;&gt; 24 &amp; 0xFF; 22.     pRIPMSG-&gt;xid[2] = lTemp &gt;&gt; 16 &amp; 0xFF; 23.     pRIPMSG-&gt;xid[1] = lTemp &gt;&gt; 8 &amp; 0xFF; 24.     pRIPMSG-&gt;xid[0] = lTemp; 25.     iTemp = htons(DHCP_SECS); 26.     pRIPMSG-&gt;secs[1] = iTemp &gt;&gt; 8 &amp; 0xFF; 27.     pRIPMSG-&gt;secs[0] = iTemp &amp; 0xFF; 28.     pRIPMSG-&gt;flags[1] = htons(DHCP_FLAGSBROADCAST) &gt;&gt; 8 &amp; 0xFF; 29.     pRIPMSG-&gt;flags[0] = htons(DHCP_FLAGSBROADCAST) &amp; 0xFF; 30.     pRIPMSG-&gt;chaddr[0] = SRC_MAC_ADDR[0]; 31.     pRIPMSG-&gt;chaddr[1] = SRC_MAC_ADDR[1]; 32.     pRIPMSG-&gt;chaddr[2] = SRC_MAC_ADDR[2]; 33.     pRIPMSG-&gt;chaddr[3] = SRC_MAC_ADDR[3]; 34.     pRIPMSG-&gt;chaddr[4] = SRC_MAC_ADDR[4]; 35.     pRIPMSG-&gt;chaddr[5] = SRC_MAC_ADDR[5]; 36. 37.     /* MAGIC_COOKIE */ 38.     pRIPMSG-&gt;OPT[i++] = (int)((MAGIC_COOKIE &gt;&gt; 24) &amp; 0xFF); 39.     pRIPMSG-&gt;OPT[i++] = (int)((MAGIC_COOKIE &gt;&gt; 16) &amp; 0xFF); 40.     pRIPMSG-&gt;OPT[i++] = (int)((MAGIC_COOKIE &gt;&gt; 8) &amp; 0xFF); 41.     pRIPMSG-&gt;OPT[i++] = (int)(MAGIC_COOKIE &amp; 0xFF); 42. 43.     /* Option Request Param. */ 44.     pRIPMSG-&gt;OPT[i++] = dhcpMessageType; 45.     pRIPMSG-&gt;OPT[i++] = 0x01; 46.     pRIPMSG-&gt;OPT[i++] = DHCP_DISCOVER; 47. 48.     // Client identifier 49.     pRIPMSG-&gt;OPT[i++] = dhcpClientIdentifier; 50.     pRIPMSG-&gt;OPT[i++] = 0x07; 51.     pRIPMSG-&gt;OPT[i++] = 0x01; 52.     pRIPMSG-&gt;OPT[i++] = SRC_MAC_ADDR[0]; 53.     pRIPMSG-&gt;OPT[i++] = SRC_MAC_ADDR[1]; 54.     pRIPMSG-&gt;OPT[i++] = SRC_MAC_ADDR[2]; 55.     pRIPMSG-&gt;OPT[i++] = SRC_MAC_ADDR[3]; 56.     pRIPMSG-&gt;OPT[i++] = SRC_MAC_ADDR[4]; 57.     pRIPMSG-&gt;OPT[i++] = SRC_MAC_ADDR[5]; 58. 59.     // host name 60.     pRIPMSG-&gt;OPT[i++] = hostName; 61.     pRIPMSG-&gt;OPT[i++] = strlen(HOST_NAME)+3; // length of hostname + 3 62.     strcpy((char*)&amp;(pRIPMSG-&gt;OPT[i]), HOST_NAME); 63. 64.     i+=strlen(HOST_NAME); 65. 66.     pRIPMSG-&gt;OPT[i++] = SRC_MAC_ADDR[3]; 67.     pRIPMSG-&gt;OPT[i++] = SRC_MAC_ADDR[4]; 68.     pRIPMSG-&gt;OPT[i++] = SRC_MAC_ADDR[5]; 69. 70. 71.     pRIPMSG-&gt;OPT[i++] = dhcpParamRequest; 72.     pRIPMSG-&gt;OPT[i++] = 0x06; 73.     pRIPMSG-&gt;OPT[i++] = subnetMask; 74.     pRIPMSG-&gt;OPT[i++] = routersOnSubnet; 75.     pRIPMSG-&gt;OPT[i++] = dns; 76.     pRIPMSG-&gt;OPT[i++] = domainName; 77.     pRIPMSG-&gt;OPT[i++] = dhcpT1value; 78.     pRIPMSG-&gt;OPT[i++] = dhcpT2value; 79.     pRIPMSG-&gt;OPT[i++] = endOption; 80. 81.     /* send broadcasting packet */ 82.     ip[0] = 255; </pre> | <pre> 1. //dhcp.c 2. /* 3.  * Copyright (c) 2010 koress project, cigarcook 4.  * Twitter: @koress_project, @cigarcook 5.  * contact@koress.jp or visit to http://koress.jp/ 6.  * 7.  * This program is free software: you can redistribute it and/or modify 8.  * it under the terms of the GNU General Public License as published by 9.  * the Free Software Foundation, either version 3 of the License, or 10.  * (at your option) any later version. 11.  * 12.  * This program is distributed in the hope that it will be useful, 13.  * but WITHOUT ANY WARRANTY; without even the implied warranty of 14.  * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the 15.  * GNU General Public License for more details. 16.  * 17.  * You should have received a copy of the GNU General Public License 18.  * along with this program. If not, see &lt;http://www.gnu.org/licenses/&gt;. 19.  */ 20. // DHCP DISCOVERパケットを送信する 21. static void send_DHCP_DISCOVER(SOCKET s) 22. { 23.     uint8_t ip[4]; // temporary area 24.     uint16_t i=0; 25.     RIP_MSG MSG_BUFFER; // MessageBuffer (large size) 26.     pRIPMSG = (RIP_MSG*)&lt;MSG_BUFFER; 27. 28.     *((uint32*)&lt;DHCP_SIP)=0; 29.     *((uint32*)&lt;DHCP_REAL_SIP)=0; 30. 31.     memset((void*)&lt;pRIPMSG,0,sizeof(RIP_MSG)); 32. 33.     pRIPMSG-&gt;op = DHCP_BOOTREQUEST; 34.     pRIPMSG-&gt;htype = DHCP_HTYPE10MB; 35.     pRIPMSG-&gt;hlen = DHCP_HLENETHERNET; 36.     pRIPMSG-&gt;hops = DHCP_HOPS; 37.     pRIPMSG-&gt;xid[0] = (DHCP_XID&amp;0xFF000000)&gt;&gt;24; 38.     pRIPMSG-&gt;xid[1] = (DHCP_XID&amp;0x00FF0000)&gt;&gt;16; 39.     pRIPMSG-&gt;xid[2] = (DHCP_XID&amp;0x0000FF00)&gt;&gt;8; 40.     pRIPMSG-&gt;xid[3] = (DHCP_XID&amp;0x000000FF); 41.     pRIPMSG-&gt;secs[0] = (DHCP_SECS&amp;0xFF00)&gt;&gt;8; 42.     pRIPMSG-&gt;secs[1] = (DHCP_SECS&amp;0x00FF); 43.     pRIPMSG-&gt;flags[0] = (DHCP_FLAGSBROADCAST&amp;0xFF00)&gt;&gt;8; 44.     pRIPMSG-&gt;flags[1] = (DHCP_FLAGSBROADCAST&amp;0x00FF); 45. 46.     pRIPMSG-&gt;chaddr[0] = SRC_MAC_ADDR[0]; 47.     pRIPMSG-&gt;chaddr[1] = SRC_MAC_ADDR[1]; 48.     pRIPMSG-&gt;chaddr[2] = SRC_MAC_ADDR[2]; 49.     pRIPMSG-&gt;chaddr[3] = SRC_MAC_ADDR[3]; 50.     pRIPMSG-&gt;chaddr[4] = SRC_MAC_ADDR[4]; 51.     pRIPMSG-&gt;chaddr[5] = SRC_MAC_ADDR[5]; 52. 53.     /* MAGIC_COOKIE */ 54.     pRIPMSG-&gt;OPT[i++] = 0x63; 55.     pRIPMSG-&gt;OPT[i++] = 0x82; 56.     pRIPMSG-&gt;OPT[i++] = 0x53; 57.     pRIPMSG-&gt;OPT[i++] = 0x63; 58. 59.     /* Option Request Param. */ 60.     pRIPMSG-&gt;OPT[i++] = dhcpMessageType; 61.     pRIPMSG-&gt;OPT[i++] = 0x01; 62.     pRIPMSG-&gt;OPT[i++] = DHCP_DISCOVER; 63. 64.     // Client identifier 65.     pRIPMSG-&gt;OPT[i++] = dhcpClientIdentifier; 66.     pRIPMSG-&gt;OPT[i++] = 0x07; 67.     pRIPMSG-&gt;OPT[i++] = 0x01; 68.     pRIPMSG-&gt;OPT[i++] = SRC_MAC_ADDR[0]; 69.     pRIPMSG-&gt;OPT[i++] = SRC_MAC_ADDR[1]; 70.     pRIPMSG-&gt;OPT[i++] = SRC_MAC_ADDR[2]; 71.     pRIPMSG-&gt;OPT[i++] = SRC_MAC_ADDR[3]; 72.     pRIPMSG-&gt;OPT[i++] = SRC_MAC_ADDR[4]; 73.     pRIPMSG-&gt;OPT[i++] = SRC_MAC_ADDR[5]; 74. 75.     // host name 76.     pRIPMSG-&gt;OPT[i++] = hostName; 77.     pRIPMSG-&gt;OPT[i++] = (uint8_t)strlen(HOST_NAME); 78.     strcpy((char*)&amp;(pRIPMSG-&gt;OPT[i]), HOST_NAME); 79. 80.     i+=strlen(HOST_NAME); 81. 82.     pRIPMSG-&gt;OPT[i++] = dhcpParamRequest; 83.     pRIPMSG-&gt;OPT[i++] = 0x06; 84.     pRIPMSG-&gt;OPT[i++] = subnetMask; 85.     pRIPMSG-&gt;OPT[i++] = routersOnSubnet; 86.     pRIPMSG-&gt;OPT[i++] = dns; 87.     pRIPMSG-&gt;OPT[i++] = domainName; 88.     pRIPMSG-&gt;OPT[i++] = dhcpT1value; 89.     pRIPMSG-&gt;OPT[i++] = dhcpT2value; 90.     pRIPMSG-&gt;OPT[i++] = endOption; 91. 92.     // send broadcasting packet </pre> |

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83. ip[1] = 255;
84. ip[2] = 255;
85. ip[3] = 255;
86. if(0 == sendto(s, (u_char *)pRIPMSG, sizeof(RIP_MSG), ip, DHCP_SERVER_PORT)) {
87.     //DHCP : Fatal Error(0).
88.     event_data = 0;
89.     RecordEvent(EV_DHCP_FATAL_ERROR, 1, &event_data);
90.     if (dhcp_ip_conflict != 0) (*dhcp_ip_conflict)();
91. }
92.
93. //sent DHCP_DISCOVER
94. RecordEvent(EV_SENT_DHCP_DISCOVER, 0, &event_data);
95. }
96.
97. // This function sends DHCP REQUEST message to DHCP server.
98. static void send_DHCP_REQUEST( SOCKET s )    /**< socket number */
99. {
100.     uint8 ip[4], event_data;
101.     u_int i = 0;
102.     u_int iTemp;
103.     u_long lTemp;
104.
105.     pRIPMSG = (RIP_MSG*)LanTransBuf;
106.
107.     memset((void*)pRIPMSG, 0, sizeof(RIP_MSG));
108.
109.     pRIPMSG->op = DHCP_BOOTREQUEST;
110.     pRIPMSG->htype = DHCP_HTYPE10MB;
111.     pRIPMSG->hlen = DHCP_HLENETHERNET;
112.     pRIPMSG->hops = DHCP_HOPS;
113.     lTemp = htonl(DHCP_XID);
114.     pRIPMSG->xid[3] = lTemp >> 24 & 0xFF;
115.     pRIPMSG->xid[2] = lTemp >> 16 & 0xFF;
116.     pRIPMSG->xid[1] = lTemp >> 8 & 0xFF;
117.     pRIPMSG->xid[0] = lTemp;
118.     iTemp = htons(DHCP_SECS);
119.     pRIPMSG->secs[1] = iTemp >> 8 & 0xFF;
120.     pRIPMSG->secs[0] = iTemp & 0xFF;
121.
122.     if(dhcp_state < STATE_DHCP_LEASED) {
123.         pRIPMSG->flags[0] = htons(DHCP_FLAGSBROADCAST) & 0xFF;
124.         pRIPMSG->flags[1] = htons(DHCP_FLAGSBROADCAST) >> 8 & 0xFF;
125.
126.     } else {
127.         pRIPMSG->flags[1] = 0;        // For Unicast
128.         pRIPMSG->flags[0] = 0;        // For Unicast
129.         pRIPMSG->ciaddr[0] = GET_SIP[0];
130.         pRIPMSG->ciaddr[1] = GET_SIP[1];
131.         pRIPMSG->ciaddr[2] = GET_SIP[2];
132.         pRIPMSG->ciaddr[3] = GET_SIP[3];
133.     }
134.
135.     pRIPMSG->chaddr[0] = SRC_MAC_ADDR[0];
136.     pRIPMSG->chaddr[1] = SRC_MAC_ADDR[1];
137.     pRIPMSG->chaddr[2] = SRC_MAC_ADDR[2];
138.     pRIPMSG->chaddr[3] = SRC_MAC_ADDR[3];
139.     pRIPMSG->chaddr[4] = SRC_MAC_ADDR[4];
140.     pRIPMSG->chaddr[5] = SRC_MAC_ADDR[5];
141.
142.     /* MAGIC_COOKIE */
143.     pRIPMSG->OPT[i++] = (u_char)((MAGIC_COOKIE >> 24) & 0xFF);
144.     pRIPMSG->OPT[i++] = (u_char)((MAGIC_COOKIE >> 16) & 0xFF);
145.     pRIPMSG->OPT[i++] = (u_char)((MAGIC_COOKIE >> 8) & 0xFF);
146.     pRIPMSG->OPT[i++] = (u_char)(MAGIC_COOKIE & 0xFF);
147.
148.     /* Option Request Param. */
149.     pRIPMSG->OPT[i++] = dhcpMessageType;
150.     pRIPMSG->OPT[i++] = 0x01;
151.     pRIPMSG->OPT[i++] = DHCP_REQUEST;
152.
153.     pRIPMSG->OPT[i++] = dhcpClientIdentifier;
154.     pRIPMSG->OPT[i++] = 0x07;
155.     pRIPMSG->OPT[i++] = 0x01;
156.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[0];
157.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[1];
158.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[2];
159.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[3];
160.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[4];
161.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[5];
162.
163.     if(dhcp_state < STATE_DHCP_LEASED) {
164.         pRIPMSG->OPT[i++] = dhcpRequestedIPAddr;
165.         pRIPMSG->OPT[i++] = 0x04;
166.         pRIPMSG->OPT[i++] = GET_SIP[0];
167.         pRIPMSG->OPT[i++] = GET_SIP[1];
168.         pRIPMSG->OPT[i++] = GET_SIP[2];
169.         pRIPMSG->OPT[i++] = GET_SIP[3];
170.
171.         pRIPMSG->OPT[i++] = dhcpServerIdentifier;
172.         pRIPMSG->OPT[i++] = 0x04;
173.         pRIPMSG->OPT[i++] = DHCP_SIP[0];
174.         pRIPMSG->OPT[i++] = DHCP_SIP[1];
175.         pRIPMSG->OPT[i++] = DHCP_SIP[2];
176.         pRIPMSG->OPT[i++] = DHCP_SIP[3];
177.     }
178.
179.     // host name
180.     pRIPMSG->OPT[i++] = hostName;
181.     pRIPMSG->OPT[i++] = strlen(HOST_NAME)+3; // length of hostname + 3
182.     strcpy((char*)&(pRIPMSG->OPT[i]), HOST_NAME);
183.
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92. ip[0] = 255; ip[1] = 255; ip[2] = 255; ip[3] = 255;
93.
94. // 패킷送信
95. wiznet_udp_send(s, (uint8_t *)pRIPMSG, sizeof(RIP_MSG), ip, DHCP_SERVER_PORT);
96.
97. return;
98. }
99.
100. // This function sends DHCP REQUEST message to DHCP server.
101. static void send_DHCP_REQUEST(SOCKET s)
102. {
103.     uint8_t ip[4];                // temporary area
104.     uint16_t i = 0;
105.     RIP_MSG MSG_BUFFER;           // MessageBuffer (large size)
106.     pRIPMSG = (RIP_MSG*)&MSG_BUFFER;
107.
108.     memset((void*)pRIPMSG, 0, sizeof(RIP_MSG));
109.
110.     pRIPMSG->op = DHCP_BOOTREQUEST;
111.     pRIPMSG->htype = DHCP_HTYPE10MB;
112.     pRIPMSG->hlen = DHCP_HLENETHERNET;
113.     pRIPMSG->hops = DHCP_HOPS;
114.
115.     pRIPMSG->xid[0] = (DHCP_XID&0xFF000000)>>24;
116.     pRIPMSG->xid[1] = (DHCP_XID&0x00FF0000)>>16;
117.     pRIPMSG->xid[2] = (DHCP_XID&0x0000FF00)>>8;
118.     pRIPMSG->xid[3] = (DHCP_XID&0x000000FF);
119.
120.     pRIPMSG->secs[0] = (DHCP_SECS&0xFF00)>>8;
121.     pRIPMSG->secs[1] = (DHCP_SECS&0x00FF);
122.
123.     if(dhcp_state < STATE_DHCP_LEASED) {
124.         pRIPMSG->flags[0] = (DHCP_FLAGSBROADCAST&0xFF00)>>8;
125.         pRIPMSG->flags[1] = (DHCP_FLAGSBROADCAST&0x00FF);
126.     } else {
127.         pRIPMSG->flags[0] = 0;        // For Unicast
128.         pRIPMSG->flags[1] = 0;        // For Unicast
129.         pRIPMSG->ciaddr[0] = GET_SIP[0];
130.         pRIPMSG->ciaddr[1] = GET_SIP[1];
131.         pRIPMSG->ciaddr[2] = GET_SIP[2];
132.         pRIPMSG->ciaddr[3] = GET_SIP[3];
133.     }
134.
135.     pRIPMSG->chaddr[0] = SRC_MAC_ADDR[0];
136.     pRIPMSG->chaddr[1] = SRC_MAC_ADDR[1];
137.     pRIPMSG->chaddr[2] = SRC_MAC_ADDR[2];
138.     pRIPMSG->chaddr[3] = SRC_MAC_ADDR[3];
139.     pRIPMSG->chaddr[4] = SRC_MAC_ADDR[4];
140.     pRIPMSG->chaddr[5] = SRC_MAC_ADDR[5];
141.
142.     pRIPMSG->OPT[i++] = 0x63;
143.     pRIPMSG->OPT[i++] = 0x82;
144.     pRIPMSG->OPT[i++] = 0x53;
145.     pRIPMSG->OPT[i++] = 0x63;
146.
147.     /* Option Request Param. */
148.     pRIPMSG->OPT[i++] = dhcpMessageType;
149.     pRIPMSG->OPT[i++] = 0x01;
150.     pRIPMSG->OPT[i++] = DHCP_REQUEST;
151.
152.     pRIPMSG->OPT[i++] = dhcpClientIdentifier;
153.     pRIPMSG->OPT[i++] = 0x07;
154.     pRIPMSG->OPT[i++] = 0x01;
155.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[0];
156.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[1];
157.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[2];
158.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[3];
159.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[4];
160.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[5];
161.
162.     if(dhcp_state < STATE_DHCP_LEASED)
163.     {
164.         pRIPMSG->OPT[i++] = dhcpRequestedIPAddr;
165.         pRIPMSG->OPT[i++] = 0x04;
166.         pRIPMSG->OPT[i++] = GET_SIP[0];
167.         pRIPMSG->OPT[i++] = GET_SIP[1];
168.         pRIPMSG->OPT[i++] = GET_SIP[2];
169.         pRIPMSG->OPT[i++] = GET_SIP[3];
170.
171.         pRIPMSG->OPT[i++] = dhcpServerIdentifier;
172.         pRIPMSG->OPT[i++] = 0x04;
173.         pRIPMSG->OPT[i++] = DHCP_SIP[0];
174.         pRIPMSG->OPT[i++] = DHCP_SIP[1];
175.         pRIPMSG->OPT[i++] = DHCP_SIP[2];
176.         pRIPMSG->OPT[i++] = DHCP_SIP[3];
177.     }
178.
179.     // host name
180.     pRIPMSG->OPT[i++] = hostName;
181.     pRIPMSG->OPT[i++] = (uint8_t)strlen(HOST_NAME);
182.     strcpy((char*)&(pRIPMSG->OPT[i]), HOST_NAME);
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184.     i+=strlen(HOST_NAME);
185.
186.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[3];
187.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[4];
188.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[5];
189.
190.     pRIPMSG->OPT[i++] = dhcpParamRequest;
191.     pRIPMSG->OPT[i++] = 0x08;
192.     pRIPMSG->OPT[i++] = subnetMask;
193.     pRIPMSG->OPT[i++] = routersOnSubnet;
194.     pRIPMSG->OPT[i++] = dns;
195.     pRIPMSG->OPT[i++] = domainName;
196.     pRIPMSG->OPT[i++] = dhcpTlvalue;
197.     pRIPMSG->OPT[i++] = dhcpT2value;
198.     pRIPMSG->OPT[i++] = performRouterDiscovery;
199.     pRIPMSG->OPT[i++] = staticRoute;
200.     pRIPMSG->OPT[i++] = endOption;
201.
202.     /* send broadcasting packet */
203.     if(dhcp_state < STATE_DHCP_LEASED) {
204.         ip[0] = 255;
205.         ip[1] = 255;
206.         ip[2] = 255;
207.         ip[3] = 255;
208.     } else {
209.         ip[0] = DHCP_SIP[0];
210.         ip[1] = DHCP_SIP[1];
211.         ip[2] = DHCP_SIP[2];
212.         ip[3] = DHCP_SIP[3];
213.     }
214.
215.     if(0 == sendto(s, (UInt8*)pRIPMSG, sizeof(RIP_MSG), ip, DHCP_SERVER_PORT)) {
216.         //DHCP : Fatal Error(1).
217.         event_data = 1;
218.         RecordEvent(EV_SENT_DHCP_DISCOVER, 1, &event_data);
219.         if (dhcp_ip_conflict != 0) (*dhcp_ip_conflict)();
220.     }
221.
222.     //sent DHCP_REQUEST
223.     RecordEvent(EV_SENT_DHCP_REQUEST, 0, &event_data);
224. }
225.
226. // This function sends DHCP RELEASE message to DHCP server.
227. static void send_DHCP_RELEASE_DECLINE( SOCKET s, UInt16 msgtype )
228. // socket number, 0 : RELEASE, Not Zero : DECLINE
229. {
230.     u_int i =0;
231.     uint8 ip[4], event_data;
232.     u_int iTemp;
233.     u_long lTemp;
234.
235.     pRIPMSG = (RIP_MSG*)LanTransBuf;
236.     memset((void*)pRIPMSG, 0, sizeof(RIP_MSG));
237.
238.     pRIPMSG->op = DHCP_BOOTREQUEST;
239.     pRIPMSG->htype = DHCP_HTYPE10MB;
240.     pRIPMSG->hlen = DHCP_HLENETHERNET;
241.     pRIPMSG->hops = DHCP_HOPS;
242.     lTemp = htonl(DHCP_XID);
243.     pRIPMSG->xid[3] = lTemp >> 24 & 0xFF;
244.     pRIPMSG->xid[2] = lTemp >> 16 & 0xFF;
245.     pRIPMSG->xid[1] = lTemp >> 8 & 0xFF;
246.     pRIPMSG->xid[0] = lTemp;
247.     iTemp = htons(DHCP_SECS);
248.     pRIPMSG->secs[1] = iTemp >> 8 & 0xFF;
249.     pRIPMSG->secs[0] = iTemp & 0xFF;
250.     pRIPMSG->flags[0] = 0; //DHCP_FLAGSBROADCAST;
251.     pRIPMSG->flags[1] = 0; //DHCP_FLAGSBROADCAST;
252.
253.     pRIPMSG->chaddr[0] = SRC_MAC_ADDR[0];
254.     pRIPMSG->chaddr[1] = SRC_MAC_ADDR[1];
255.     pRIPMSG->chaddr[2] = SRC_MAC_ADDR[2];
256.     pRIPMSG->chaddr[3] = SRC_MAC_ADDR[3];
257.     pRIPMSG->chaddr[4] = SRC_MAC_ADDR[4];
258.     pRIPMSG->chaddr[5] = SRC_MAC_ADDR[5];
259.
260.
261.     /* MAGIC_COOKIE */
262.     pRIPMSG->OPT[i++] = (u_char)((MAGIC_COOKIE >> 24) & 0xFF);
263.     pRIPMSG->OPT[i++] = (u_char)((MAGIC_COOKIE >> 16) & 0xFF);
264.     pRIPMSG->OPT[i++] = (u_char)((MAGIC_COOKIE >> 8) & 0xFF);
265.     pRIPMSG->OPT[i++] = (u_char)(MAGIC_COOKIE & 0xFF);
266.
267.     /* Option Request Param. */
268.     pRIPMSG->OPT[i++] = dhcpMessageType;
269.     pRIPMSG->OPT[i++] = 0x01;
270.     pRIPMSG->OPT[i++] = ((!msgtype) ? DHCP_RELEASE : DHCP_DECLINE);
271.
272.     pRIPMSG->OPT[i++] = dhcpClientIdentifier;
273.     pRIPMSG->OPT[i++] = 0x07;
274.     pRIPMSG->OPT[i++] = 0x01;
275.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[0];
276.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[1];
277.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[2];
278.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[3];
279.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[4];
280.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[5];
281.

```

```

183.     i+=strlen(HOST_NAME);
184.
185.     pRIPMSG->OPT[i++] = dhcpParamRequest;
186.     pRIPMSG->OPT[i++] = 0x08;
187.     pRIPMSG->OPT[i++] = subnetMask;
188.     pRIPMSG->OPT[i++] = routersOnSubnet;
189.     pRIPMSG->OPT[i++] = dns;
190.     pRIPMSG->OPT[i++] = domainName;
191.     pRIPMSG->OPT[i++] = dhcpTlvalue;
192.     pRIPMSG->OPT[i++] = dhcpT2value;
193.     pRIPMSG->OPT[i++] = performRouterDiscovery;
194.     pRIPMSG->OPT[i++] = staticRoute;
195.     pRIPMSG->OPT[i++] = endOption;
196.
197.     /* send broadcasting packet */
198.     if(dhcp_state < STATE_DHCP_LEASED) {
199.         ip[0] = 255; ip[1] = 255; ip[2] = 255; ip[3] = 255;
200.     } else {
201.         ip[0] = DHCP_SIP[0];
202.         ip[1] = DHCP_SIP[1];
203.         ip[2] = DHCP_SIP[2];
204.         ip[3] = DHCP_SIP[3];
205.     }
206.
207.     wiznet_udp_send(s, (uint8_t*)pRIPMSG, sizeof(RIP_MSG), ip, DHCP_SERVER_PORT);
208. }
209.
210. /*
211. // This function sends DHCP RELEASE message to DHCP server.
212. static void send_DHCP_RELEASE_DECLINE(
213.     SOCKET s, // socket number
214.     char msgtype // 0 : RELEASE, Not Zero : DECLINE
215. )
216. {
217.     uint16_t i=0;
218.
219.     pRIPMSG = (RIP_MSG*)&MSG_BUFFER;
220.     memset((void*)pRIPMSG, 0, sizeof(RIP_MSG));
221.
222.     pRIPMSG->op = DHCP_BOOTREQUEST;
223.     pRIPMSG->htype = DHCP_HTYPE10MB;
224.     pRIPMSG->hlen = DHCP_HLENETHERNET;
225.     pRIPMSG->hops = DHCP_HOPS;
226.
227.     pRIPMSG->xid[0] = (DHCP_XID&0xFF000000)>>24;
228.     pRIPMSG->xid[1] = (DHCP_XID&0x00FF0000)>>16;
229.     pRIPMSG->xid[2] = (DHCP_XID&0x0000FF00)>>8;
230.     pRIPMSG->xid[3] = (DHCP_XID&0x000000FF);
231.     pRIPMSG->secs[0] = (DHCP_SECS&0x00FF00)>>8;
232.     pRIPMSG->secs[1] = (DHCP_SECS&0x00FF);
233.     pRIPMSG->flags[0] = 0;
234.     pRIPMSG->flags[1] = 0;
235.
236.     pRIPMSG->chaddr[0] = SRC_MAC_ADDR[0];
237.     pRIPMSG->chaddr[1] = SRC_MAC_ADDR[1];
238.     pRIPMSG->chaddr[2] = SRC_MAC_ADDR[2];
239.     pRIPMSG->chaddr[3] = SRC_MAC_ADDR[3];
240.     pRIPMSG->chaddr[4] = SRC_MAC_ADDR[4];
241.     pRIPMSG->chaddr[5] = SRC_MAC_ADDR[5];
242.
243.     // MAGIC_COOKIE
244.     pRIPMSG->OPT[i++] = 0x63;
245.     pRIPMSG->OPT[i++] = 0x82;
246.     pRIPMSG->OPT[i++] = 0x53;
247.     pRIPMSG->OPT[i++] = 0x63;
248.
249.     // Option Request Param
250.     pRIPMSG->OPT[i++] = dhcpMessageType;
251.     pRIPMSG->OPT[i++] = 0x01;
252.     pRIPMSG->OPT[i++] = ((!msgtype) ? DHCP_RELEASE : DHCP_DECLINE);
253.
254.     pRIPMSG->OPT[i++] = dhcpClientIdentifier;
255.     pRIPMSG->OPT[i++] = 0x07;
256.     pRIPMSG->OPT[i++] = 0x01;
257.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[0];
258.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[1];
259.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[2];
260.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[3];
261.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[4];
262.     pRIPMSG->OPT[i++] = SRC_MAC_ADDR[5];
263.
264.     pRIPMSG->OPT[i++] = dhcpServerIdentifier;
265.     pRIPMSG->OPT[i++] = 0x04;

```

|      |                                                                                |      |                                                                                        |
|------|--------------------------------------------------------------------------------|------|----------------------------------------------------------------------------------------|
| 282. | pRIPMSG->OPT[i++] = dhcpServerIdentifier;                                      | 266. | pRIPMSG->OPT[i++] = DHCP_SIP[0];                                                       |
| 283. | pRIPMSG->OPT[i++] = 0x04;                                                      | 267. | pRIPMSG->OPT[i++] = DHCP_SIP[1];                                                       |
| 284. | pRIPMSG->OPT[i++] = DHCP_SIP[0];                                               | 268. | pRIPMSG->OPT[i++] = DHCP_SIP[2];                                                       |
| 285. | pRIPMSG->OPT[i++] = DHCP_SIP[1];                                               | 269. | pRIPMSG->OPT[i++] = DHCP_SIP[3];                                                       |
| 286. | pRIPMSG->OPT[i++] = DHCP_SIP[2];                                               | 270. |                                                                                        |
| 287. | pRIPMSG->OPT[i++] = DHCP_SIP[3];                                               | 271. | if(msgtype)                                                                            |
| 288. |                                                                                | 272. | {                                                                                      |
| 289. | if (msgtype) {                                                                 | 273. | pRIPMSG->OPT[i++] = dhcpRequestedIPAddr;                                               |
| 290. | pRIPMSG->OPT[i++] = dhcpRequestedIPAddr;                                       | 274. | pRIPMSG->OPT[i++] = 0x04;                                                              |
| 291. | pRIPMSG->OPT[i++] = 0x04;                                                      | 275. | pRIPMSG->OPT[i++] = GET_SIP[0];                                                        |
| 292. | pRIPMSG->OPT[i++] = GET_SIP[0];                                                | 276. | pRIPMSG->OPT[i++] = GET_SIP[1];                                                        |
| 293. | pRIPMSG->OPT[i++] = GET_SIP[1];                                                | 277. | pRIPMSG->OPT[i++] = GET_SIP[2];                                                        |
| 294. | pRIPMSG->OPT[i++] = GET_SIP[2];                                                | 278. | pRIPMSG->OPT[i++] = GET_SIP[3];                                                        |
| 295. | pRIPMSG->OPT[i++] = GET_SIP[3];                                                | 279. | pRIPMSG->OPT[i++] = endOption;                                                         |
| 296. | pRIPMSG->OPT[i++] = endOption;                                                 | 280. | //DPRINTLN("sent DHCP_DECLINE");                                                       |
| 297. | //sent DHCP_DECLINE                                                            | 281. | }                                                                                      |
| 298. | RecordEvent(EV_SENT_DHCP_DECLINE, 0, &event_data);                             | 282. | else                                                                                   |
| 299. | } else {                                                                       | 283. | {                                                                                      |
| 300. | pRIPMSG->OPT[i++] = endOption;                                                 | 284. | pRIPMSG->OPT[i++] = endOption;                                                         |
| 301. | //sent DHCP_RELEASE                                                            | 285. | //DPRINTLN("sent DHCP_RELEASE");                                                       |
| 302. | RecordEvent(EV_SENT_DHCP_RELEASE, 0, &event_data);                             | 286. | }                                                                                      |
| 303. | }                                                                              | 287. |                                                                                        |
| 304. |                                                                                | 288. | if(!msgtype)                                                                           |
| 305. | if (!msgtype) {                                                                | 289. | {                                                                                      |
| 306. | ip[0] = DHCP_SIP[0];                                                           | 290. | ip[0] = DHCP_SIP[0];                                                                   |
| 307. | ip[1] = DHCP_SIP[1];                                                           | 291. | ip[1] = DHCP_SIP[1];                                                                   |
| 308. | ip[2] = DHCP_SIP[2];                                                           | 292. | ip[2] = DHCP_SIP[2];                                                                   |
| 309. | ip[3] = DHCP_SIP[3];                                                           | 293. | ip[3] = DHCP_SIP[3];                                                                   |
| 310. | } else {                                                                       | 294. | }                                                                                      |
| 311. | ip[0] = 255;                                                                   | 295. | else                                                                                   |
| 312. | ip[1] = 255;                                                                   | 296. | {                                                                                      |
| 313. | ip[2] = 255;                                                                   | 297. | ip[0] = 255;                                                                           |
| 314. | ip[3] = 255;                                                                   | 298. | ip[1] = 255;                                                                           |
| 315. | }                                                                              | 299. | ip[2] = 255;                                                                           |
| 316. |                                                                                | 300. | ip[3] = 255;                                                                           |
| 317. | if (0 == sendto(s, (uint8 *)pRIPMSG, sizeof(RIP_MSG), ip, DHCP_SERVER_PORT)) { | 301. | }                                                                                      |
| 318. | //DHCP : Fatal Error(2).                                                       | 302. |                                                                                        |
| 319. | event_data = 2;                                                                | 303. | if(0 == wiznet_udp_send(s, (uint8_t *)pRIPMSG, sizeof(RIP_MSG), ip, DHCP_SERVER_PORT)) |
| 320. | RecordEvent(EV_DHCP_FATAL_ERROR, 0, &event_data);                              | 304. | {                                                                                      |
| 321. | if ( dhcp_ip_conflict != 0 ) (*dhcp_ip_conflict)();                            | 305. | //PRINTLN("DHCP : Fatal Error(2).");                                                   |
| 322. | }                                                                              | 306. | // if ( dhcp_ip_conflict != 0 ) (*dhcp_ip_conflict)();                                 |
|      |                                                                                | 307. | }                                                                                      |
|      |                                                                                | 308. | }                                                                                      |

## 2. W5100\_Dhcp.h 파일의 칩 제조사 제공소스와 오픈소스 간 비교

| 구분                                                          | 경전투 W5100 칩 제공 소스 | 오픈소스                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                             |                   | 1. /* master-brick<br>2. * Copyright (C) 2012 Olaf Luke <olaf@tinkerforge.com><br>3. *<br>4. * ethernet_dhcp.h: DHCP implementation for Ethernet Extension<br>5. *<br>6. * This library is free software; you can redistribute it and/or<br>7. * modify it under the terms of the <b>GNU Lesser General Public</b><br>8. * License as published by the Free Software Foundation; either<br>9. * version 2 of the License, or (at your option) any later version.<br>10. *<br>11. * This library is distributed in the hope that it will be useful,<br>12. * but WITHOUT ANY WARRANTY; without even the implied warranty of<br>13. * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU<br>14. * Lesser General Public License for more details.<br>15. *<br>16. * You should have received a copy of the GNU Lesser General Public<br>17. * License along with this library; if not, write to the<br>18. * Free Software Foundation, Inc., 59 Temple Place - Suite 330,<br>19. * Boston, MA 02111-1307, USA. |
| 1. // DHCP state machine.                                   |                   | 20. // DHCP state machine                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 2. #define STATE_DHCP_DISCOVER 1                            |                   | 21. #define STATE_DHCP_DISCOVER 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 3. #define STATE_DHCP_REQUEST 2                             |                   | 22. #define STATE_DHCP_REQUEST 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 4. #define STATE_DHCP_LEASED 3                              |                   | 23. #define STATE_DHCP_LEASED 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 5. #define STATE_DHCP_REREQUEST 4                           |                   | 24. #define STATE_DHCP_REREQUEST 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 6. #define STATE_DHCP_RELEASE 5                             |                   | 25. #define STATE_DHCP_RELEASE 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 7.                                                          |                   | 26.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 8. #define MAX_DHCP_RETRY 3                                 |                   | 27. #define DHCP_MAX_RETRY 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 9. #define DHCP_WAIT_TIME 5                                 |                   | 28. #define DHCP_WAIT_TIME 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 10.                                                         |                   | 29.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 11. #define DHCP_FLAGSBROADCAST 0x8000                      |                   | 30. #define DHCP_FLAGSBROADCAST 0x8000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 12.                                                         |                   | 31.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 13. // UDP port numbers for DHCP                            |                   | 32. // UDP port numbers for DHCP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 14. #define DHCP_SERVER_PORT 67 /* from server to client */ |                   | 33. #define DHCP_SERVER_PORT 67 // from server to client                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 15. #define DHCP_CLIENT_PORT 68 /* from client to server */ |                   | 34. #define DHCP_CLIENT_PORT 68 // from client to server                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 16.                                                         |                   | 35.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 17. // DHCP message OP code                                 |                   | 36. // DHCP message OP code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 18. #define DHCP_BOOTREQUEST 1                              |                   | 37. #define DHCP_BOOTREQUEST 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 19. #define DHCP_BOOTREPLY 2                                |                   | 38. #define DHCP_BOOTREPLY 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 20.                                                         |                   | 39.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 21. // DHCP message type                                    |                   | 40. // DHCP message type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 22. #define DHCP_DISCOVER 1                                 |                   | 41. #define DHCP_DISCOVER 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 23. #define DHCP_OFFER 2                                    |                   | 42. #define DHCP_OFFER 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 24. #define DHCP_REQUEST 3                                  |                   | 43. #define DHCP_REQUEST 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 25. #define DHCP_DECLINE 4                                  |                   | 44. #define DHCP_DECLINE 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 26. #define DHCP_ACK 5                                      |                   | 45. #define DHCP_ACK 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 27. #define DHCP_NAK 6                                      |                   | 46. #define DHCP_NAK 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 28. #define DHCP_RELEASE 7                                  |                   | 47. #define DHCP_RELEASE 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 29. #define DHCP_INFORM 8                                   |                   | 48. #define DHCP_INFORM 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 30.                                                         |                   | 49.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

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31. // DHCP RETRANSMISSION TIMEOUT (microseconds)
32. #define DHCP_INITIAL_RTO      ( 4*1000000)
33. #define DHCP_MAX_RTO          (64*1000000)
34.
35. #define DHCP_HTYPE10MB        1
36. #define DHCP_HTYPE100MB       2
37.
38. #define DHCP_HLENETHERNET      6
39. #define DHCP_HOPS              0
40. #define DHCP_SECS              0
41.
42. #define MAGIC_COOKIE           0x63825363
43.
44. #define DEFAULT_LEASETIME       0xffffffff /***< infinite lease time */
45.
46. // DHCP option and value (cf. RFC1533)
47. enum {
48.     padOption      =      0,
49.     subnetMask     =      1,
50.     timerOffset    =      2,
51.     routersOnSubnet =      3,
52.     timeServer      =      4,
53.     nameServer      =      5,
54.     dns             =      6,
55.     logServer       =      7,
56.     cookieServer    =      8,
57.     lprServer        =      9,
58.     impressServer   =     10,
59.     resourceLocationServer = 11,
60.     hostName        =     12,
61.     bootFileSize    =     13,
62.     meritDumpFile   =     14,
63.     domainName      =     15,
64.     swapServer       =     16,
65.     rootPath         =     17,
66.     extentionsPath   =     18,
67.     IPforwarding     =     19,
68.     nonLocalSourceRouting = 20,
69.     policyFilter     =     21,
70.     maxDgramReasmSize = 22,
71.     defaultIPTTL     =     23,
72.     pathMTUagingTimeout = 24,
73.     pathMTUplateauTable = 25,
74.     ifMTU            =     26,
75.     allSubnetsLocal =     27,
76.     broadcastAddr    =     28,
77.     performMaskDiscovery = 29,
78.     maskSupplier     =     30,
79.     performRouterDiscovery = 31,
80.     routerSolicitationAddr = 32,
81.     staticRoute       =     33,
82.     trailerEncapsulation = 34,
83.     arpCacheTimeout  =     35,
84.     ethernetEncapsulation = 36,
85.     tcpDefaultTTL     =     37,
86.     tcpKeepaliveInterval = 38,
87.     tcpKeepaliveGarbage = 39,
88.     nisDomainName     =     40,
89.     nisServers        =     41,
90.     ntpServers        =     42,
91.     vendorSpecificInfo = 43,
92.     netBIOSnameServer = 44,
93.     netBIOSdgramDistServer = 45,
94.     netBIOSnodeType   =     46,
95.     netBIOSscope      =     47,
96.     xFontServer       =     48,
97.     xDisplayManager   =     49,
98.     dhcpRequestedIPAddr = 50,
99.     dhcpIPAddrLeaseTime = 51,
100.    dhcpOptionOverload = 52,
101.    dhcpMessageType    = 53,
102.    dhcpServerIdentifier = 54,
103.    dhcpParamRequest    = 55,
104.    dhcpMsg             = 56,
105.    dhcpMaxMsgSize      = 57,
106.    dhcpTlvalue         = 58,
107.    dhcpT2value         = 59,
108.    dhcpClassIdentifier = 60,
109.    dhcpClientIdentifier = 61,
110.    endOption           = 255
111. };

```

```

50. // DHCP retransmission timeout (ms)
51. #define DHCP_INITIAL_RTO      ( 4*1000000)
52. #define DHCP_MAX_RTO          (64*1000000)
53.
54. #define DHCP_HTYPE10MB        1
55. #define DHCP_HTYPE100MB       2
56.
57. #define DHCP_HLENETHERNET      6
58. #define DHCP_HOPS              0
59. #define DHCP_SECS              0
60.
61. #define DHCP_MAGIC_COOKIE      0x63825363
62. #define DHCP_START_XID         0x12345678
63. #define DEFAULT_LEASETIME       0xFFFFFFFF // infinite lease time
64. // DHCP options and values (cf. RFC1533)
65. enum {
66.     padOption = 0,
67.     subnetMask = 1,
68.     timerOffset = 2,
69.     routersOnSubnet = 3,
70.     timeServer = 4,
71.     nameServer = 5,
72.     dns = 6,
73.     logServer = 7,
74.     cookieServer = 8,
75.     lprServer = 9,
76.     impressServer = 10,
77.     resourceLocationServer = 11,
78.     hostName = 12,
79.     bootFileSize = 13,
80.     meritDumpFile = 14,
81.     domainName = 15,
82.     swapServer = 16,
83.     rootPath = 17,
84.     extentionsPath = 18,
85.     IPforwarding = 19,
86.     nonLocalSourceRouting = 20,
87.     policyFilter = 21,
88.     maxDgramReasmSize = 22,
89.     defaultIPTTL = 23,
90.     pathMTUagingTimeout = 24,
91.     pathMTUplateauTable = 25,
92.     ifMTU = 26,
93.     allSubnetsLocal = 27,
94.     broadcastAddr = 28,
95.     performMaskDiscovery = 29,
96.     maskSupplier = 30,
97.     performRouterDiscovery = 31,
98.     routerSolicitationAddr = 32,
99.     staticRoute = 33,
100.    trailerEncapsulation = 34,
101.    arpCacheTimeout = 35,
102.    ethernetEncapsulation = 36,
103.    tcpDefaultTTL = 37,
104.    tcpKeepaliveInterval = 38,
105.    tcpKeepaliveGarbage = 39,
106.    nisDomainName = 40,
107.    nisServers = 41,
108.    ntpServers = 42,
109.    vendorSpecificInfo = 43,
110.    netBIOSnameServer = 44,
111.    netBIOSdgramDistServer = 45,
112.    netBIOSnodeType = 46,
113.    netBIOSscope = 47,
114.    xFontServer = 48,
115.    xDisplayManager = 49,
116.    dhcpRequestedIPAddr = 50,
117.    dhcpIPAddrLeaseTime = 51,
118.    dhcpOptionOverload = 52,
119.    dhcpMessageType = 53,
120.    dhcpServerIdentifier = 54,
121.    dhcpParamRequest = 55,
122.    dhcpMsg = 56,
123.    dhcpMaxMsgSize = 57,
124.    dhcpTlvalue = 58,
125.    dhcpT2value = 59,
126.    dhcpClassIdentifier = 60,
127.    dhcpClientIdentifier = 61,
128.    endOption = 255
129. };

```