

Prepared (also subject responsible if other) ETH/XZX Endre Kulcsár +36 1 437 7469		No. 155 17-CNL 113 461 Uen		
Approved ETH/XZXC (Tibor Csöndes)	Checked	Date 2012-06-14	Rev C	Reference GASK2

**DHCP Protocol Modules for TTCN-3 Toolset with TITAN,
Function Specification**

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1 Introduction

1.1 Revision history

Date	Rev	Characteristics	Prepared
2005-07-15	PA1	First draft version	ETHJGI
2006-12-01	PB1	RFC 3046 and 3442 addition	ETHGBH
2012-05-09	PC1	Implemented CR_TR00019274	ETHEKR

1.2 How to Read this Document

This is the Function Specification for the set of DHCP protocol modules. DHCP protocol modules are developed for the TTCN-3 Toolset with TITAN. This document should be read together with Product Revision Information [4].

1.3 Scope

The purpose of this document is to specify the content of the DHCP protocol modules.

1.4 References

- [1] RFC 2131
Dynamic Host Configuration Protocol
- [2] RFC 2132
DHCP Options and BOOTP Vendor Extensions
- [3] ETSI ES 201 873-1 v.2.2.1 (02/2003)
The Testing and Test Control Notation version 3. Part 1: Core Language
- [4] 109 21-CNL 113 461-2
DHCP Protocol Modules for TTCN-3 Toolset with TITAN, Product Revision Information
- [5] 2/198 17-CRL 113 200 Uen
Programmer's Technical Reference for the TITAN TTCN-3 Test Executor
- [6] RFC 3046
DHCP Relay Agent Information Option
- [7] RFC 3442
The Classless Static Route Option for Dynamic Host Configuration Protocol (DHCP) version 4
- [8] RFC 3011 The IPv4 Subnet Selection Option
for DHCP

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1.5 Abbreviations

DHCP	Dynamic Host Configuration Protocol
TLV	Type, Length, Value
TTCN-3	Testing and Test Control Notation version 3

1.6 Terminology

No specific terminology is used.

2 General

Protocol modules implement the message structures of the related protocol in a formalized way, using the standard specification language TTCN-3. This allows defining of test data (templates) in the TTCN-3 language [3] and correctly encoding/decoding messages when executing test suites using the TITAN TTCN-3 test environment.

Protocol modules are using TITAN's RAW encoding attributes [5] and hence are usable with the TITAN test toolset only.

3 Functional specification

3.1 Protocol version implemented

This set of protocol modules implements protocol messages and constants of the DHCP protocol, (see [1], [2], [6], [7] and [8]) with the modifications specified in 3.2.

3.2 Modifications/deviations related to the protocol specification

3.2.1 Implemented Messages

The following messages are implemented from [1]:

- BOOT REQUEST
- BOOT REPLY

The following options are implemented from [2]:

- DHCP_PADDING_OPTION
- DHCP_END_OPTION
- DHCP_Message_Type_OPTION
- DHCP_Client_Identifier_OPTION
- DHCP_Requested_IP_Address_OPTION
- DHCP_Host_Name_OPTION
- DHCP_Vendor_class_identifier_OPTION
- DHCP_Parameter_request_list_OPTION
- DHCP_User_Class_Information_OPTION

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- DHCP_Server_Identifier_OPTION
- DHCP_IP_Address_Lease_Time_OPTION
- DHCP_Subnet_Mask_OPTION
- DHCP_Domain_Name_OPTION
- DHCP_Router_OPTION
- DHCP_Domain_Name_Server_OPTION
- DHCP_NetBIOS_over_TCP_IP_Name_Server_OPTION
- DHCP_NetBIOS_over_TCP_IP_Node_Type_OPTION
- DHCP_NetBIOS_over_TCP_IP_Scope_OPTION
- DHCP_Perform_Router_Discovery_OPTION
- DHCP_Static_Route_OPTION
- DHCP_Vendor_Specific_Information_OPTION
- DHCP_Maximum_DHCP_Message_Size_OPTION
- DHCP_Time_Offset_OPTION
- DHCP_Time_Server_OPTION
- DHCP_Name_Server_OPTION
- DHCP_Log_Server_OPTION
- DHCP_Cookie_Server_OPTION
- DHCP_LPR_Server_OPTION
- DHCP_Impress_Server_OPTION
- DHCP_Resource_Location_Server_OPTION
- DHCP_Boot_File_Size_OPTION
- DHCP_Merit_Dump_File_OPTION
- DHCP_Swap_Server_OPTION
- DHCP_Root_Path_OPTION
- DHCP_Extension_Path_OPTION
- DHCP_IP_Forwarding_Enable_Disable_OPTION
- DHCP_Non_Local_Source_Routing_Enable_Disable_OPTION
- DHCP_Policy_Filter_OPTION
- DHCP_Maximum_Datagram_Reassembly_Size_OPTION
- DHCP_Default_IP_Time_To_Live_OPTION
- DHCP_Path_MTU_Aging_Timeout_OPTION
- DHCP_Path_MTU_Plateau_Table_OPTION
- DHCP_Interface_MTU_OPTION
- DHCP_All_Subnets_Are_Local_OPTION
- DHCP_Broadcast_Address_OPTION
- DHCP_Perform_Mask_Discovery_OPTION
- DHCP_Mask_Supplier_OPTION
- DHCP_Router_Solicitation_Address_OPTION
- DHCP_Trailer_Encapsulation_OPTION
- DHCP_ARP_Cache_Timeout_OPTION
- DHCP_Ethernet_Encapsulation_OPTION
- DHCP_TCP_Default_TTL_OPTION
- DHCP_TCP_Keepalive_Interval_OPTION
- DHCP_TCP_Keepalive_Garbage_OPTION
- DHCP_Network_Information_Service_Domain_OPTION
- DHCP_Network_Information_Servers_OPTION
- DHCP_Network_Time_Protocol_Servers_OPTION
- DHCP_NetBIOS_Over_TCP_IP_Datagram_Distribution_OPTION

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- DHCP_X_Window_System_Font_Server_OPTION
- DHCP_X_Window_System_Display_Manager_OPTION
- DHCP_Network_Information_Service_and_Domain_OPTION
- DHCP_Network_Information_Service_and_Servers_OPTION
- DHCP_Mobile_IP_Home_Agent_OPTION
- DHCP_Simple_Mail_Transport_Protocol_OPTION
- DHCP_Post_Office_Protocol_OPTION
- DHCP_Network_News_Transport_Protocol_OPTION
- DHCP_Default_World_Wide_Web_OPTION
- DHCP_Default_Finger_Service_OPTION
- DHCP_Default_Internet_Relay_Chat_OPTION
- DHCP_Street_Talk_Server_OPTION
- DHCP_Street_Talk_Directory_Assistance_Server_OPTION
- DHCP_Option_Overload_OPTION
- DHCP_TFTP_Server_Name_OPTION
- DHCP_Bootfile_Name_OPTION
- DHCP_Message_OPTION
- DHCP_Renewal_Time_Value_OPTION
- DHCP_Rebinding_Time_Value_OPTION

The following option is implemented from [6]:

- DHCP_Relay_Agent_Information_OPTION

The following option is implemented from [7]:

- DHCP_Classless_Route_OPTION

The following option is implemented from [8]:

- DHCP_Subnet_Selection_OPTION

3.2.2 Protocol Modifications/Deviations

Protocol modules contain the following additions:

- DHCP_GENERAL_OPTION : This implements the general TLV format of the DHCP option
- The DHCP OPTION OVERLOAD option is not supported. Although this option is decoded correctly, the Enc/Dec functions do not interpret it, i.e. *sname* and *file* fields are decoded as charstrings.

3.3 Encoding/Decoding and Other Related Functions

This product also contains encoding/decoding functions that assure correct encoding of messages when sent from TITAN and correct decoding of messages when received by TITAN. Implemented encoding/decoding functions:

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<u>Name</u>	<u>Type of formal parameters</u>	<u>Type of return value</u>
enc_PDU_DHCP	PDU_DHCP	octetstring
dec_PDU_DHCP	octetstring	PDU_DHCP
dec_PDU_DHCP_Opt82	octetstring, DHCP_Option82_Format	PDU_DHCP