

CHAPTER 5 NETWORK PROTOCOLS

5.1 CABLE COMMUNICATION PACKET

Each cable communication packet to the internet is shown below.

(1) Query from a gateway of the 'zone repeater station' to the 'management server'

- G/w will make a query to the 'management server', serving the callsign information from calling station as an index.

MAC header			IP header	UDP header	Query ID	Flag	Reserved	Query callsign
SA	DA	Type						
6	6	2	20+ α	8bytes	2bytes	2	4bytes	8bytes

α : Although the length of IP header for TCP/IP protocol is normally 20bytes, it will make a variable length when options are included, so it depends on the protocols and thus shown here with + α .

(2) Reply to the g/w from the 'management server'

- Searching the management table and retrieving the data, it will make a reply to the g/w that made a query.

MAC header			IP header	UDP header	Query ID	Flag	Reserved	Query callsign	Zone repeater callsign	Area repeater callsign	GW IP address
S A	D A	Typ e									
6	6	2	20+ α	8bytes	2bytes	2	4bytes	8bytes	8	8	4

(3) Request for table update from GW to the 'management server'

MAC header			IP header	UDP header	Update ID	Flag	Reserved	Mobile terminal callsign	Zone repeater callsign	Area repeater callsign
SA	DA	Type								
6	6	2	20+ α	8bytes	2bytes	2	4bytes	8bytes	8	8

(4) Reply indicating the completion of the update from the 'management server' to GW

MAC header	IP	UDP	Updat	Fla	Reserve	Mobile	Zone	Area	GW IP
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S A	D A	Typ e	heade r	heade r	e ID	g	d	termina l callsign	repeate r callsign	repeate r callsign	addres s
6	6	2	20+ α	8bytes	2bytes	2	4bytes	8bytes	8	8	4

(5) Communication between the GW for the zone repeater station of the calling station and the GW for the zone repeater station of the called station

• Data

MAC header			IP head er	TCP head er	DST R	Pack et lengt h	Main strea m head er	Wirele ss	Data				FC S
S A	D A	Typ e						Header	E_L en	MAC header		Data segme nt	CR C
6	6	2	20+ α	20+ α	4bytes	2	7bytes	Data stream without bit and frame synchronization signals					

← This signal can be iterated up to the maximum of 1500 bytes, and, if exceeded, should make a next new packet. →

• Voice Header

MAC header			IP header	UDP header	DSTR	Flag	Reserved	Main stream header	Wireless
SA	DA	Type							Header
6	6	2	20+a	8bytes	4bytes	2bytes	2bytes	7bytes	Wireless portion header without bit and frame synchronization signals

• Voice Data

MAC header			IP header	UDP header	DSTR	Flag	Reserved	Main stream header	Data	
SA	DA	Type							Voice segment	Data segment
6	6	2	20+ α	8bytes	4bytes	2bytes	2bytes	7bytes		

(6) An access to the internet through the GW of a zone repeater from terminal station

MAC header			IP header	Data
SA	DA	Type		
6	6	2		

(7) An access to a terminal station through its GW from a station on the internet

MAC header			IP header
SA	DA	Type	
6	6	2	

Currently undefined other than the frame construction

(8) Communication Between Zone Repeaters and Gateway

- A packet for the communication between z/r and g/w will be constructed as follows. A management segment for a packet contains following data.
 - M = the number of sequence (2 bytes)
 - ✧ This is a packet identification number assigned to the packet for communication between z/r and g/w. Normally it will be incremented by one.
 - S R = S, when sent from g/w; R, when received by g/w (1 byte)
 - C = a command which represent packet (1 byte)
 - L = length of the data following this segment (2 bytes)

● a. Data

DSTR	Management Segment				Header	Wireless	Data				FCS		
	M	SR	C	L			Header	E_Len	MAC Header			Data Segment	
									SA	DA			Type

4bytes 2 1 1 2 7bytes Data stream without bit and frame synchronization signals

01000000	Destination repeater ID	Source repeater ID	Source terminal ID	Dummy	Dummy	Management information
1byte	1byte	1byte	1byte	1byte	1byte	1byte

● b. Voice data

DSTR	Management Segment				Header	Wireless	Data				
	M	S	C	L			Header	Voice segm ent	Data segm ent	Voice segm ent	Data segm ent

4bytes 2 1 1 2 7bytes Voice data stream without bit and frame synchronization signals

0010000 0	Destination repeater ID	Source repeater ID	Source terminal ID	Conversation ID (upper)	Conversation ID (lower)	Management information
1byte	1byte	1byte	1byte	1byte	1byte	1byte

● c. Error data

DSTR	Management segment				Error data
	M	SR	C 01	L	
4bytes	2	1	1	2	

● d. Terminal location information data

DSTR	Management segment				Terminal Callsign	Area repeater callsign
	M	SR	C 21	L		
4bytes	2	1	1	2	8bytes	8bytes

(9) Transmission of log data from g/w to a 'management server'

MAC Header			IP header	TCP header	Log ID	The number of records in the log	Source callsign of the log	A log record	A log record	A log record
SA	DA	Type									
6	6	2	20+ α	20+ α	4bytes	4bytes	8bytes	64bytes	64		64

Record time (sec)	Record time (micro sec)	Source terminal callsign	Dest terminal callsign	Source IP address	Dest IP address	Source zone repeater callsign	Dest zone repeater callsign	Source area repeater callsign	Dest area repeater callsign
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4bytes 4bytes 8bytes 8 4 4 8 8 8 8