

# LPX(Lean Packet eXchange) Protocol Specification.

0000 field Big-endian(Network byte order)

## 1. Ethernet Header

0	8	16	24	31		
Destination Address(1~4 byte)						
Destination Address(5~6 byte)			Source Address(1~2 byte)			
Source Address(3~6 byte)						
Type						

Type = 0x88ad

## 2. LPX Header structure.

### 2.1. LPX Header.

0	2	8	16	24	31
Type	Packet Size		Destination Port		
Source Port			LPX_TYPE_DATAGRAM or LPX_TYPE_STREAM Header		

Type = LPX\_TYPE\_RAW 0x0 // 000 0

LPX\_TYPE\_DATAGRAM 0x2

LPX\_TYPE\_STREAM 0x3

Packet Size = Header size 01 0000 00000000 (bytes).

Destination Port = 00 00 Port

Source Port = 00 00 Port

LPX 0 0 Type 00 0 01 0 000 0 0  
0000 0000 (3 )

10Bytes

### 2.2. DATAGRAM Type Header.

0	8	16	24	3
Message ID		Total Length		
Fragment ID		Fragment Length		
reserved				

Message ID = Message 00

Total Length = Datagram 0 00

Fragment ID = Message 000000000000 00

Fragment Length = 00 0000

### 2.3. STREAM Type Header.

0	8	16	24	31
LSCTL		Sequence		
ACK Sequence		Window Size		
reserved				

LSCTL(Lpx Stream Control Bits) =

LSCTL_CONNREQ	0x0001
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```
LSCTL_DATA      0x0002
```

LSCTL\_DISCONNREQ 0x0004

LSCTL_ACKREQ	0x0008
--------------	--------

000 0 000 00 0ag 0000 2 setting

~~ACKREQ~~   ~~A P M~~   ~~E D M~~   Sequence /   ~~ACKREQ~~



```
LSCTL ACK                                0x1000
```

0000 00 ACK

Sequence = ~~1~~ packet sequence.

ACK Sequence = ACK0 sequence.

ACK Sequence   Sequence

Window Size = 20

### 3. Ethernet + LPX(Stream Type)

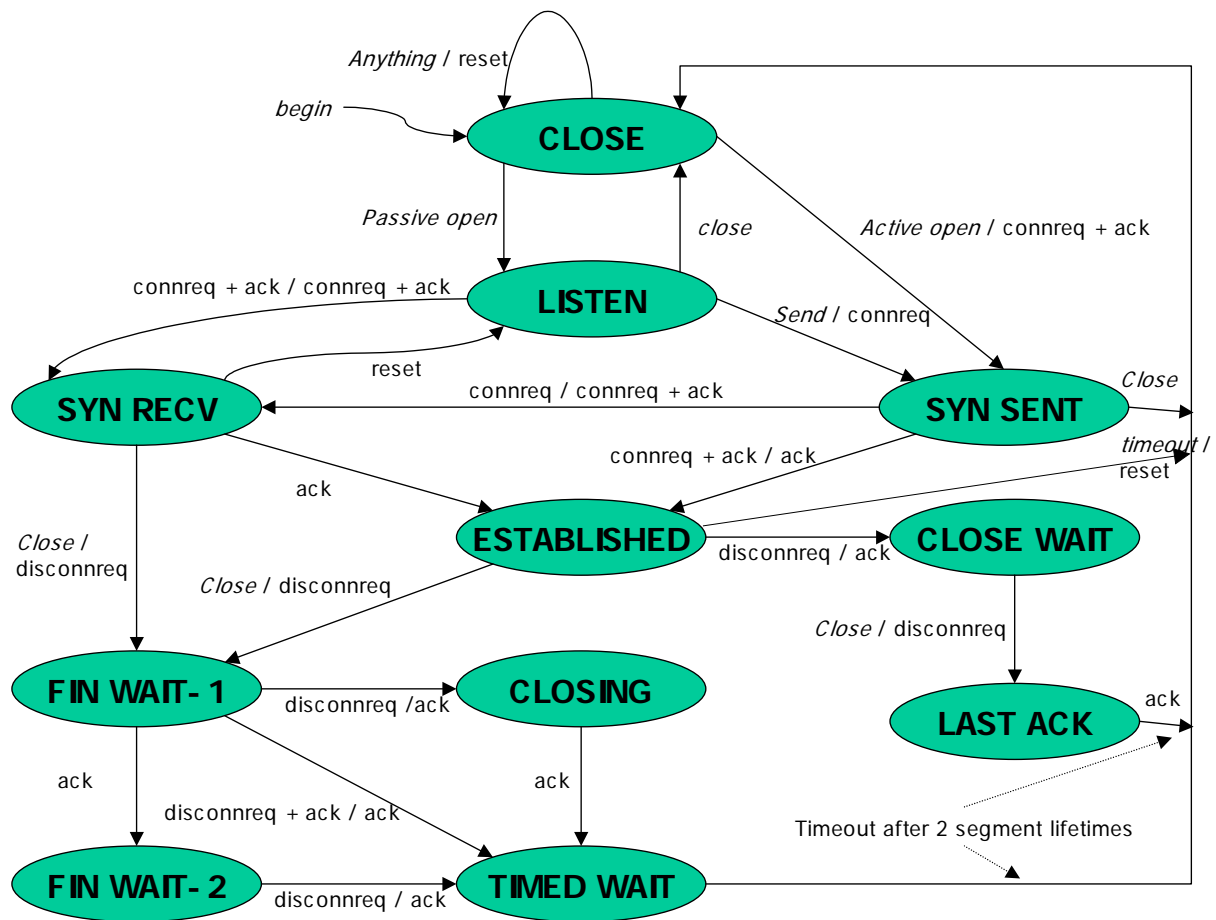
### 3.1. Datagram Type

0	8	16	24	31
Destination Address(1~4 byte)				
Destination Address(5~6 byte)		Source Address(1~2 byte)		
Source Address(3~6 byte)				
Type(Ethernet)		Type	Packet Size	
Destination Port		Source Port		
Message ID		Total Length		
Fragment ID		Fragment Length		
reserved				

### 3.2. Stream Type

0	8	16	24	31
Destination Address(1~4 byte)				
Destination Address(5~6 byte)		Source Address(1~2 byte)		
Source Address(3~6 byte)				
Type(Ethernet)		Type	Packet Size	
Destination Port		Source Port		
LSCTL		Sequence		
ACK Sequence		Window Size		
reserved				

#### 4. LPX Stream finite state machine



```
LanDisk0 0 FD 0      0 .    0 connecting 0 0 disconnecting Host
0 connection 00 00 000 passive open .
```

## 5. Connecting

LPX Stream connection TCP 3-way handshaking

HOST A HOST B

(LSCTL\_CONNREQ | LSCTL\_ACK, 0, 0)

HOST A sequence 100

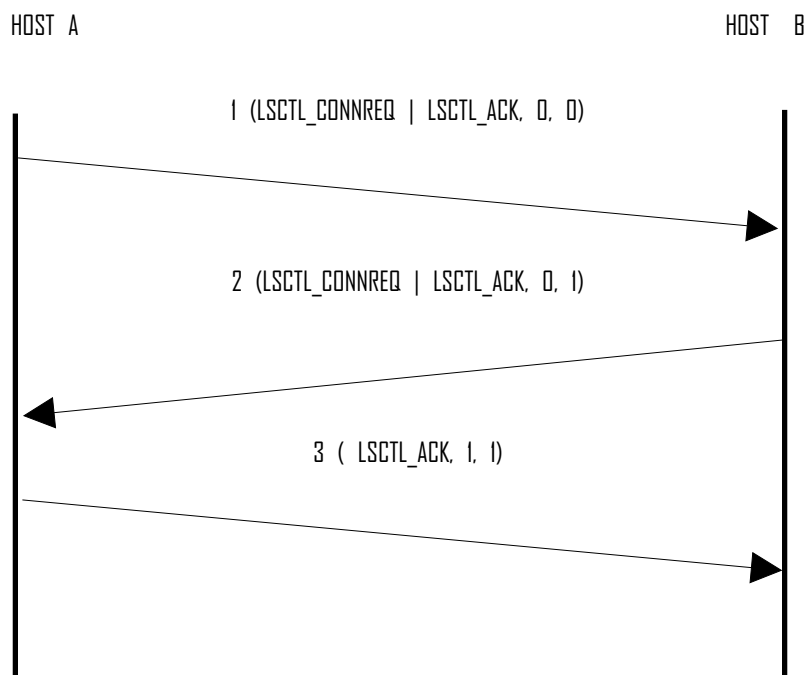
(LSCTL\_CONNREQ | LSCTL\_ACK, 100, 0), (LSCTL\_CONNREQ | LSCTL\_ACK, 0, 101), (LSCTL\_ACK, 101, 1)

LanDisk system

HOST B

LSCTL\_ACK) SYN\_RECV

connection (LSCTL\_CONNREQ | ESTABLISHED



## 6. Data Transferring

```
LPX Stream Type | 0 v| 0 0 0 0 50 0 0 0 0 0 0 Sequence      0 0 )   0 0(Most Recently)    0 0 0 0 0 0 0 |
0 sequence=0 0 mmm mm 6d 00 0 mm
00 0 000  me          p 00j 00mACK                sequence     i
LPX Stream Type | 0 v| 0 DESTABLISHED 0 1 0 0 0 00 )0 0 i 0 0 VO 0 0 .0 0 =0 0 0 00 )0 LPX Stream
Type           0 LSCTL                               (LSCTL_DATA  j LSCTL_ACK)              LPX Stream Type Header
ACK sequence=0 0             (ACK piggy-back) , LPX Stream Type+HedeadMM
6d . ACK sequenBdd B dd 0 0 pm 00908 00
0 LPX Stream Type 0AKM 0 Ee 0            0 0 0 m 6d               acknowledge
OV 000 .
00         DATA 0 mmv00        HOST 00                                HOST       ACK
```

HOST A

HOST B

```
AI (LSCTL_DATA | LSCTL_ACK, 1200, 20)
```

A2 (LSCTL DATA | LSCTL ACK, 1201, 20)

A3 (LSCTL DATA | LSCTL ACK, 1202, 21)

RETRANSMIT\_TIME

A4 (LSCTL DATA | LSCTL ACK, 1202, 22)

*ALIVE INTERVAL*

A5 (LSCTL ACK, 1203, 23)

B1 (LSCTL ACK, 20, 1201)

B2 (LSCTL ACK, 21, 1202)

B3 (LSCTL ACK, 22, 1203)

B4 (LSCTL ACK, 22, 1203)

### ALIVE INTERVAL

B5 (LSCTL ACK, 23, 1203)

00 0 HOST A 00 00 00 00 00 00 . A4 B3  
00000a0V 00080)00 . AS DBS connecton 000v000A 0E0000)0a0i 00a0i  
00

[illegible]

20) 0 800 00 0 70 0 600 0 90 AOK 0 0

**0 0 0 0 0 0 0 0 0 0**

0i 0v0000050000000010)010y 000) 0-000 000000 0E00)

```
connection    alive count
```

```
0010010100 00 ACK
```

(10)

idle

- 5 -

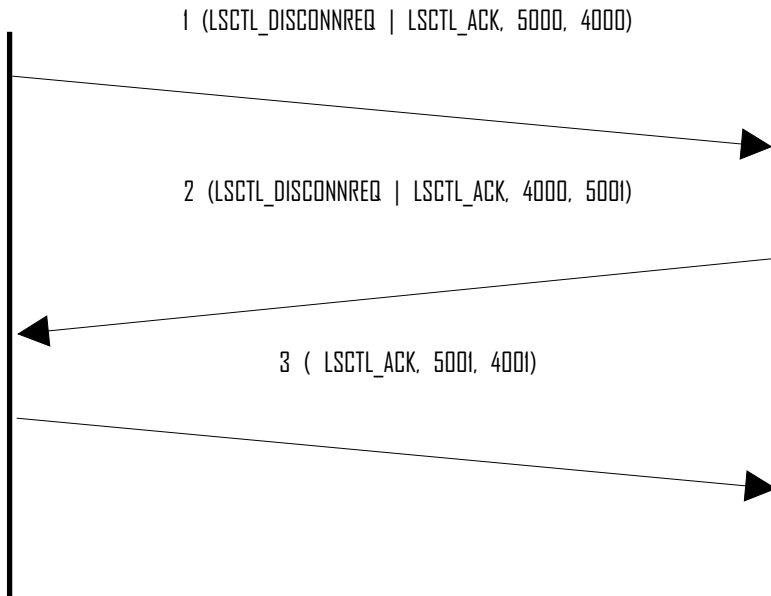
```
00 0 0000 8 0 0 0 0      0 0 0000)0      (Alive_interval * 10  
6000 70 0      ) 000 800      ) connection
```

## 7. Disconnecting

LPX Stream Disconnecting connecting C-wait WndBaking  
 HOST A HOST B Disconnecting HOST B  
 CLOSE\_WAIT CLOSE\_WAIT close call 2 LAST\_ACK  
 connection

HOST A

HOST B



Host A HOST B  
 connection  
 FIN\_WAIT-1, TIMED\_WAIT