Lab 14
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1) Commands:

7za a tensorflow-master
　　7za – File archiver with highest compression ratio

tar -zcf tensor.tar.gz tensorflow-master
　　tar – GNU version of the tar archiving
　　z – gunzip
　　c – create
　　use an archive file

tar -jcf tensor.tar.bz2 tensorflow-master
　　j – bzip2
　　tar – GNU version of the tar archiving

tar -Zcf tensor.tar.Z tensorflow-master
　　Z – compress
　　tar – GNU version of the tar archiving

7za x tensorflow-master.7z
　　7za – File archiver with highest compression ratio

tar -Zxf tensor.tar.Z
　　x – extract
　　tar – GNU version of the tar archiving

tar -jxf tensor.tar.bz2
　　j – bzip2
　　tar – GNU version of the tar archiving

tar -zxf tensor.tar.gz
　　tar – GNU version of the tar archiving

2) Compression:

Let A = {a/20, b/15, c/5, d/15, e/45}

Huffman Encoding:

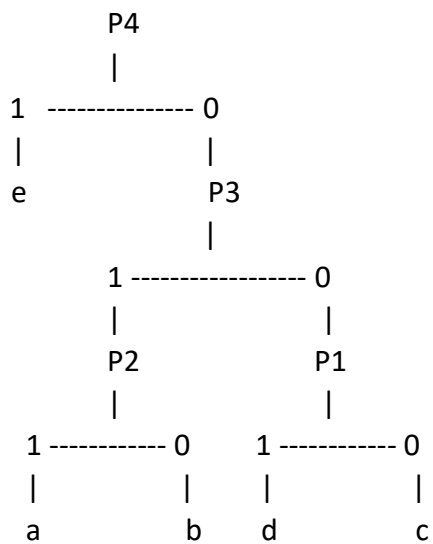1st Pass:

      e – 5, a – 20, b – 15, P1 - 20

2nd Pass:

      e – 45, P2 – 35, P1 - 20

3rd Pass:

      e- 45, P3 - 55

4th Pass:

      P4 - 100

```
          P4
          |
  1 -------------- 0
  |               |
  e              P3
                  |
        1 ----------------- 0
        |                 |
        P2                P1
        |                 |
   1 ----------- 0    1 ----------- 0
   |           |      |           |
   a           b      d           c
```
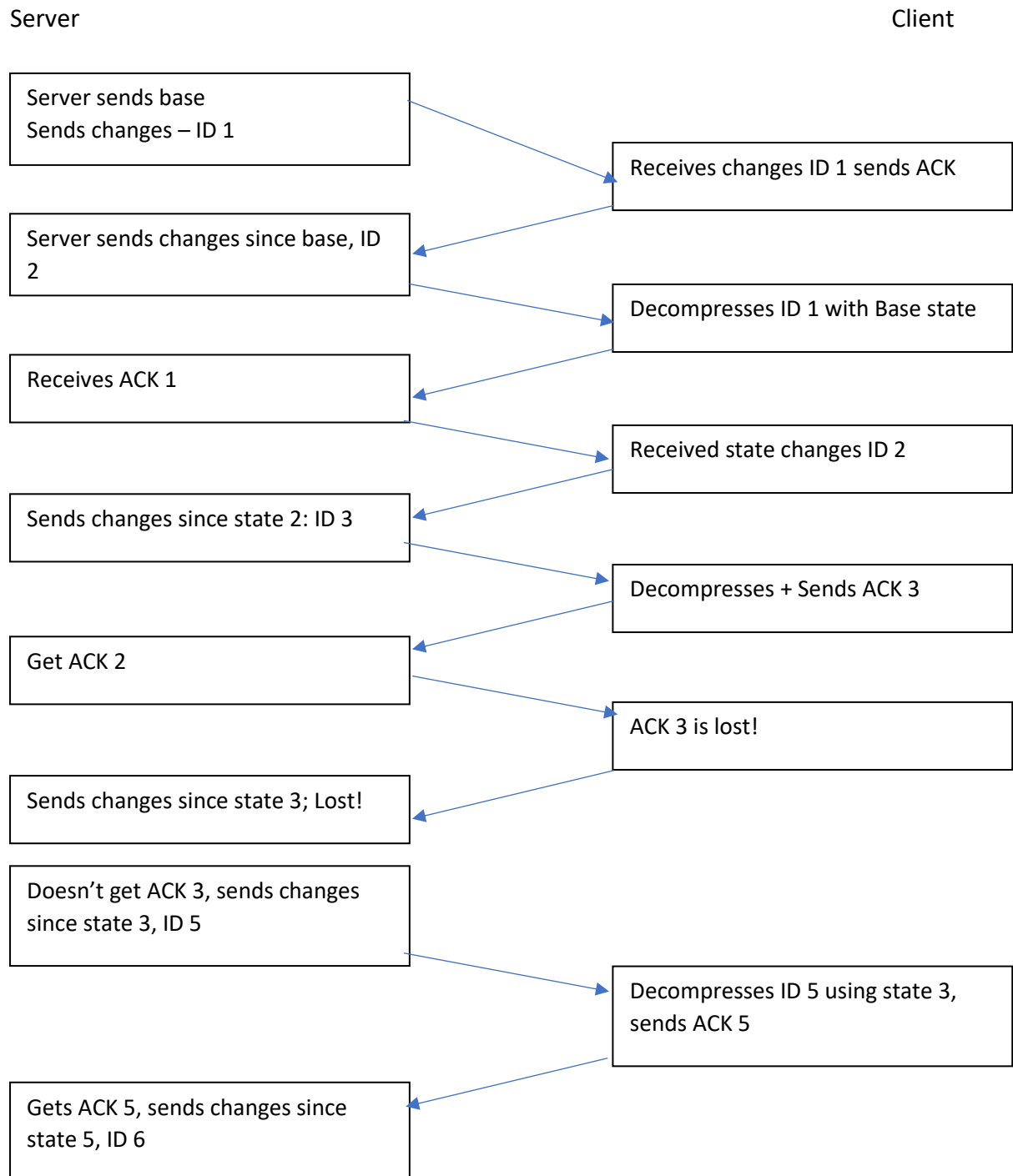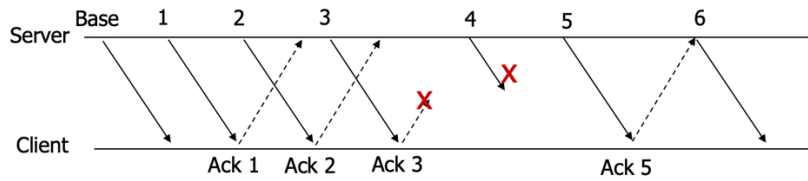
a = 011, b = 010, c = 000, d = 001, e = 1

3) Delta Compression: Info Exchange chart

Server   **Client**

Server sends base Sends changes – ID 1

Receives changes ID 1 sends ACK

Server sends changes since base, ID 2

Decompresses ID 1 with Base state

Receives ACK 1

Received state changes ID 2

Sends changes since state 2: ID 3

Decompresses + Sends ACK 3

Get ACK 2

ACK 3 is lost!

Sends changes since state 3; Lost!

Doesn't get ACK 3, sends changes since state 3, ID 5

Decompresses ID 5 using state 3, sends ACK 5

Gets ACK 5, sends changes since state 5, ID 6

4) LZW Compression:

String:
BABAABAAA
A = 0, B = 1

BABAABAA
B – in dictionary
BA not, BA = 2

BABAABAAA
A – in dictionary
AB not, AB = 3

BABAABAAA
B – in dictionary
BA – in dictionary
BAA not, BAA = 4

BABAABAAA
A – in dictionary
AA not, AA = 5

BABAABAAA
A – in dictionary
AB – in dictionary
ABA not, ABA = 6

BABAABAAA
B – in dictionary
BA – in dictionary
BAA not, BAA = 7

BABAABAAA
A – in dictionary
AA – in dictionary
AAA not, AAA = 8