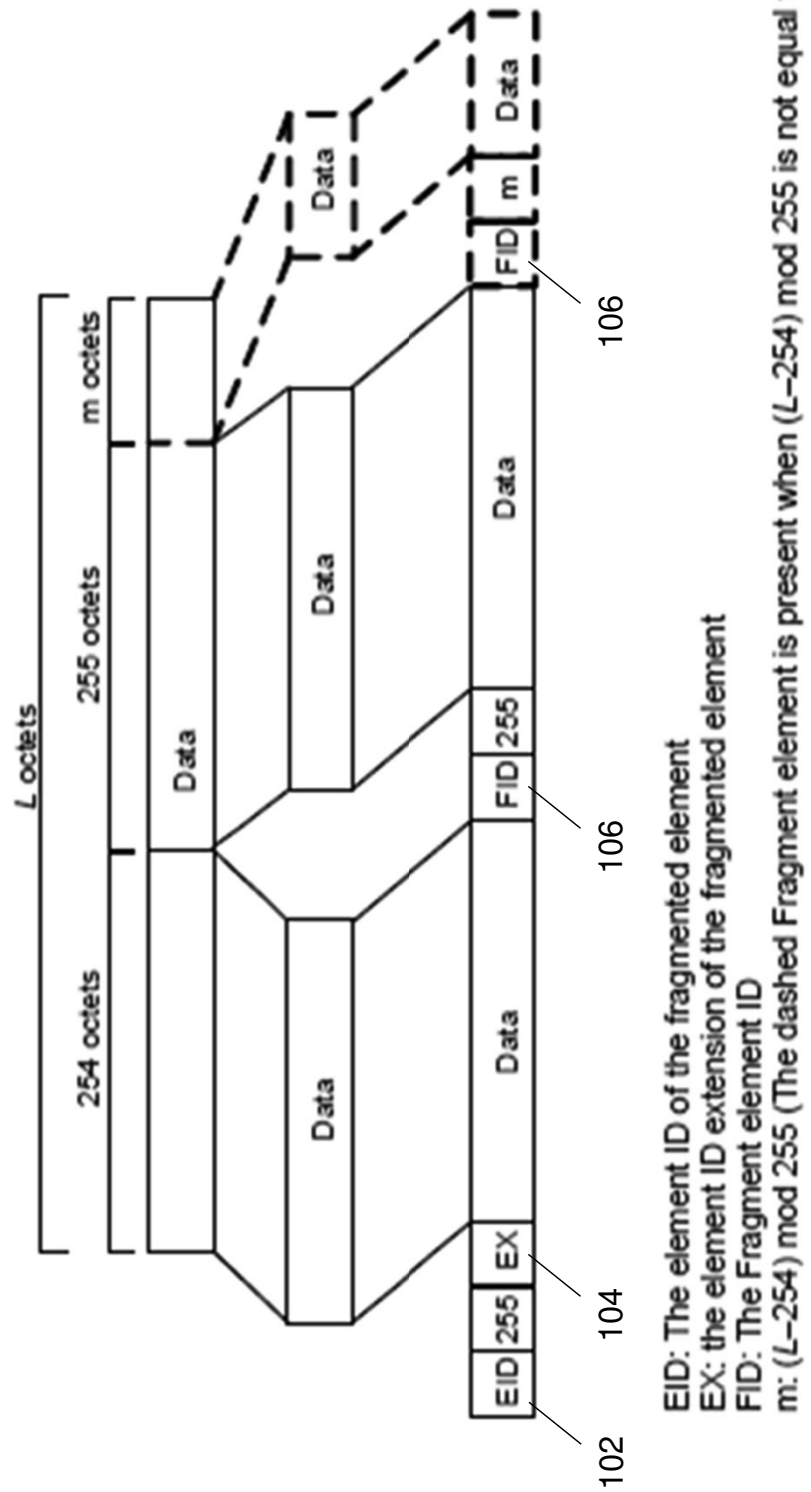

L octets
254 octets
255 octets
m octets
Data
Data
Data
Data
Data
Data
EID
255
EX
FID
255
FID
m
102
104
106
106
EID: The element ID of the fragmented element
EX: the element ID extension of the fragmented element
FID: The Fragment element ID
m: (L–254) mod 255 (The dashed Fragment element is present when (L–254) mod 255 is not equal to 0)

100

Figure 1

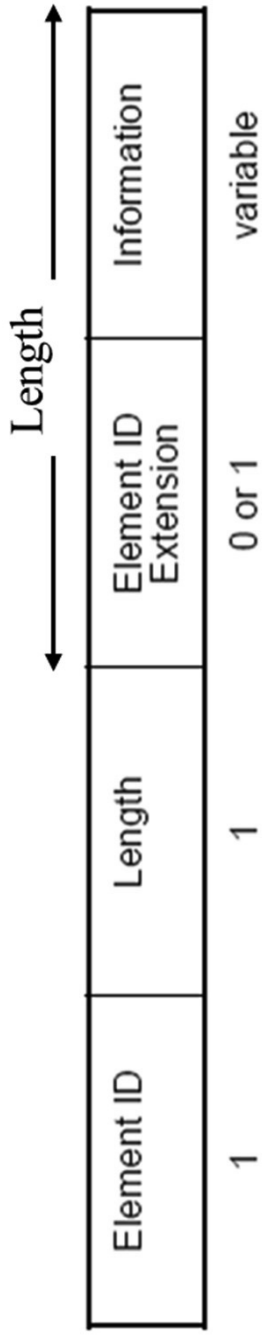


Figure 2A

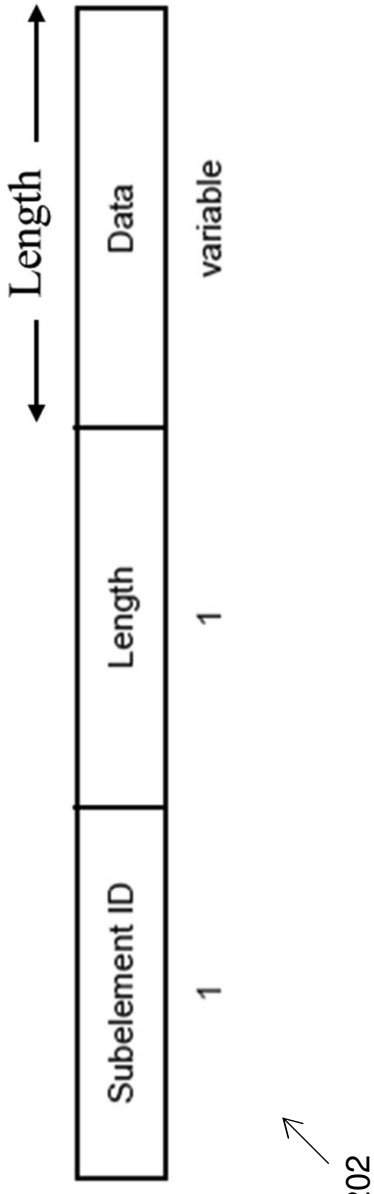


Figure 2B

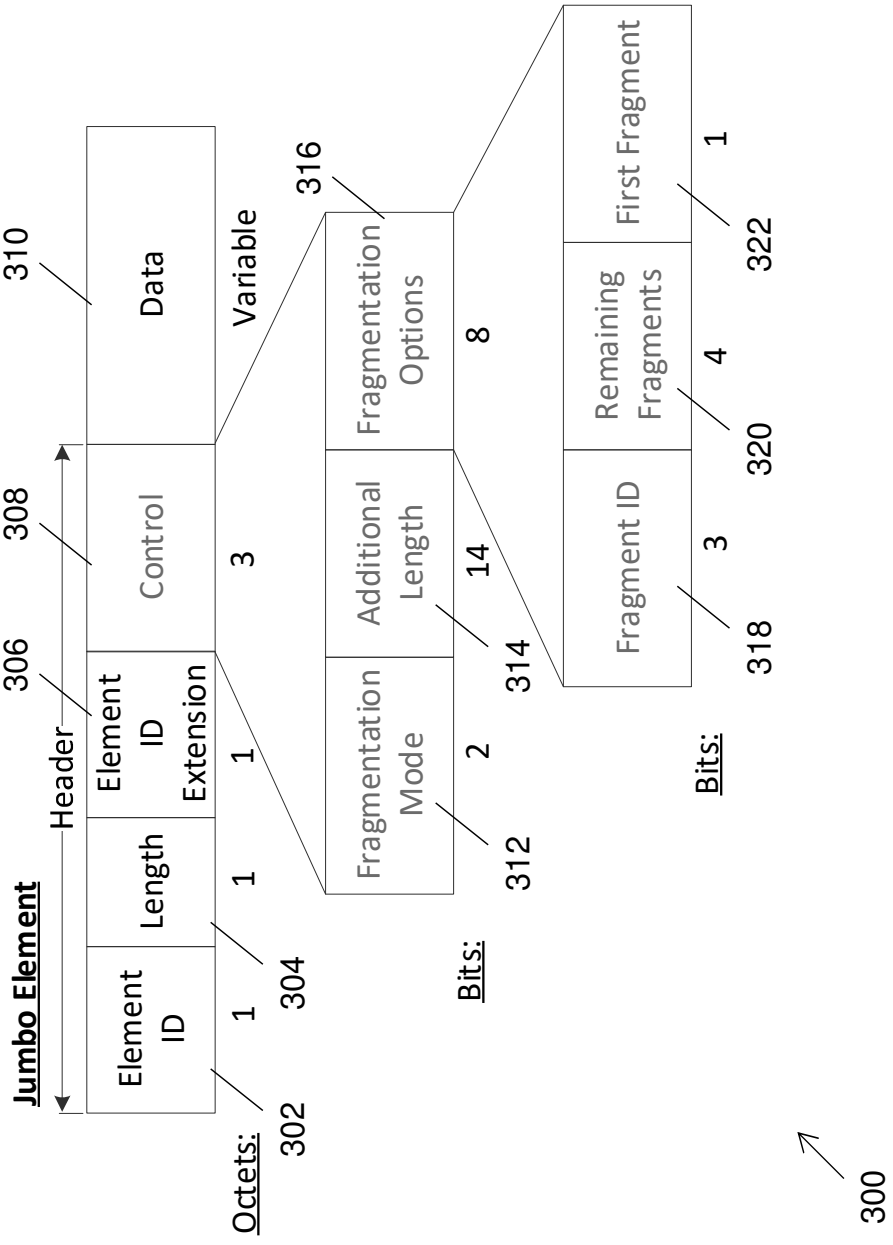

Jumbo Element
Header
Element ID
Length
Element ID Extension
Control
Data
Octets:
1
1
1
3
Variable
302
304
306
308
310
Fragmentation Mode
Additional Length
Fragmentation Options
Bits:
2
14
8
312
314
316
Fragment ID
Remaining Fragments
First Fragment
Bits:
3
4
1
318
320
322
300

Figure 3

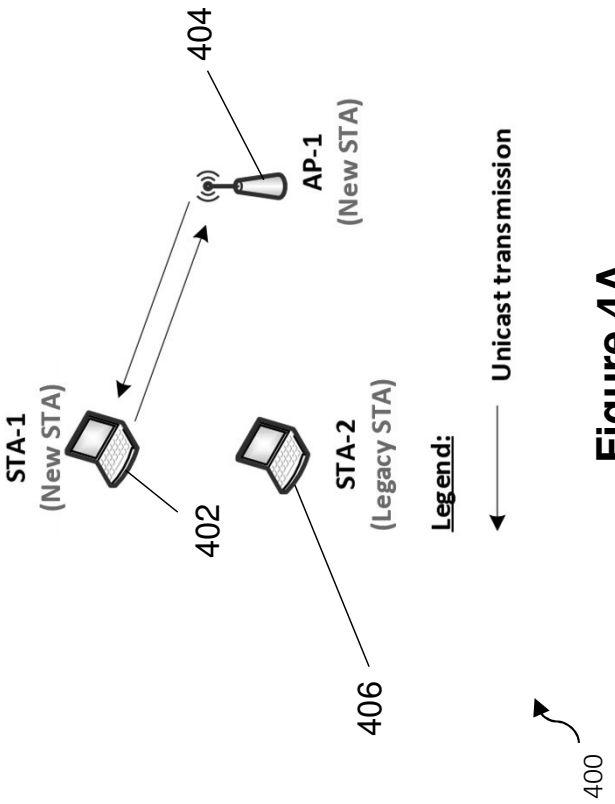


Figure 4A

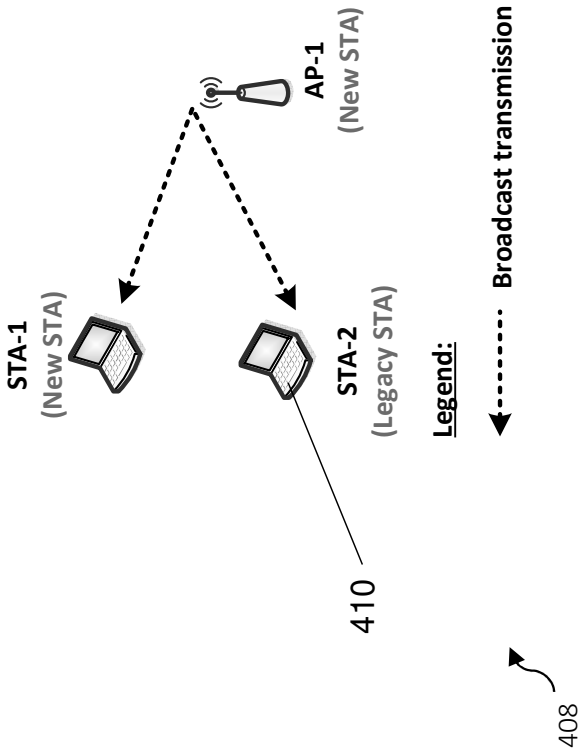


Figure 4B

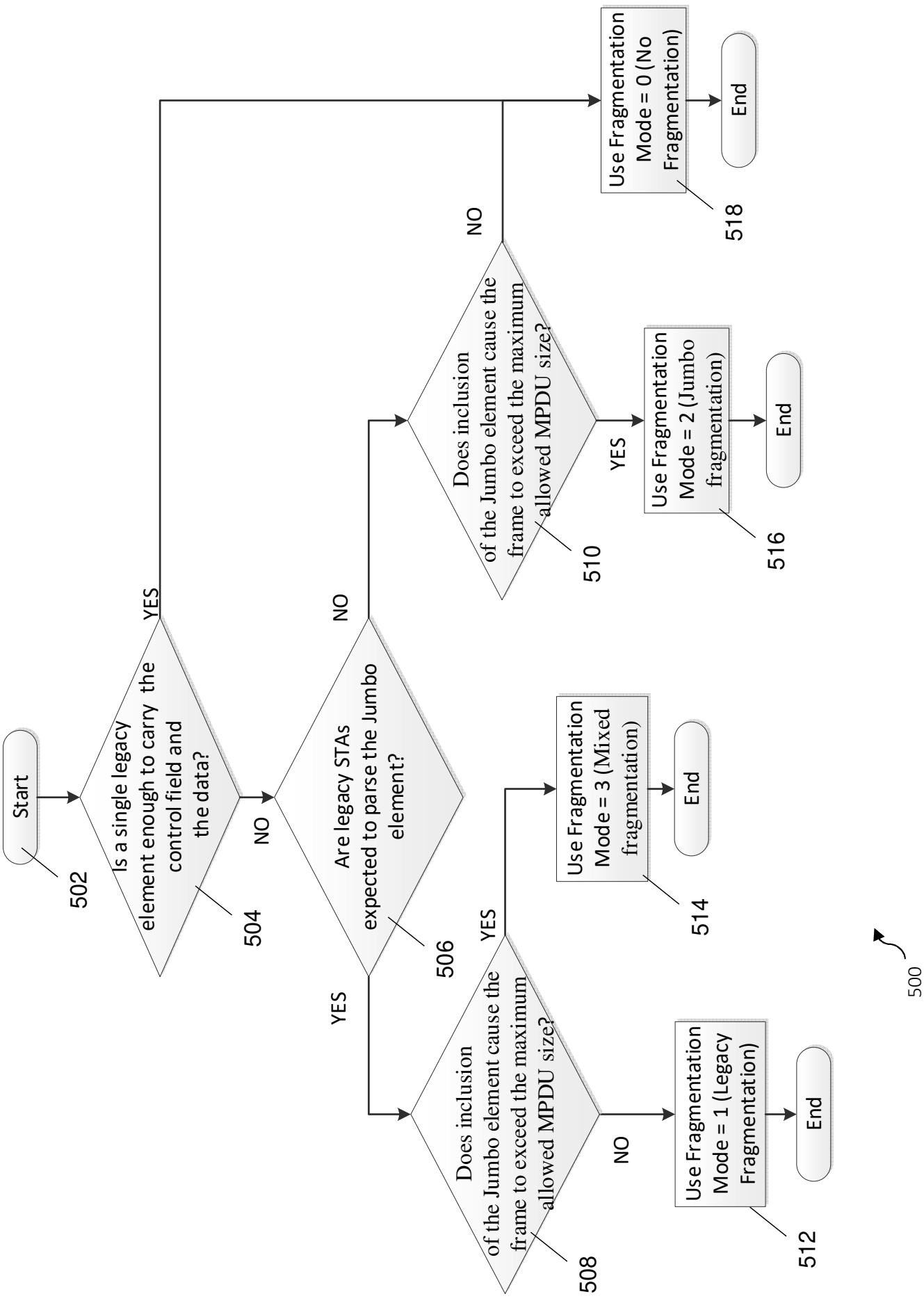

Start
502
Is a single legacy element enough to carry the control field and the data?
504
YES
NO
Are legacy STAs expected to parse the Jumbo element?
506
YES
NO
Does inclusion of the Jumbo element cause the frame to exceed the maximum allowed MPDU size?
508
YES
NO
Use Fragmentation Mode = 3 (Mixed fragmentation)
514
End
Use Fragmentation Mode = 1 (Legacy Fragmentation)
512
End
Does inclusion of the Jumbo element cause the frame to exceed the maximum allowed MPDU size?
510
YES
NO
Use Fragmentation Mode = 2 (Jumbo fragmentation)
516
End
Use Fragmentation Mode = 0 (No Fragmentation)
518
End
500

Figure 5

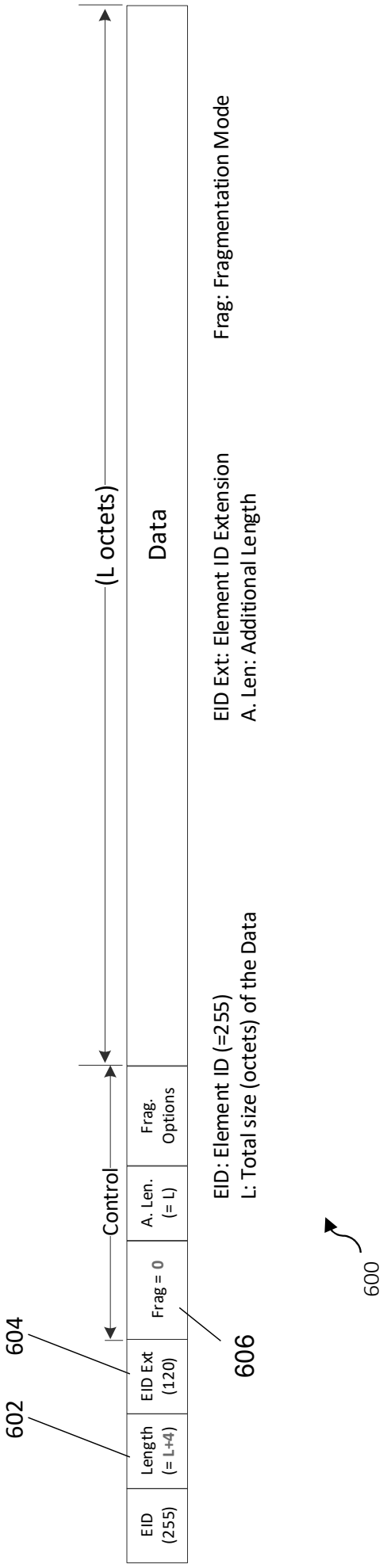

EID (255)
Length (= L+4)
EID Ext (120)
Frag = 0
A. Len. (= L)
Frag. Options
Data
Control
(L octets)
602
604
606
600
EID: Element ID (=255)
L: Total size (octets) of the Data
EID Ext: Element ID Extension
A. Len: Additional Length
Frag: Fragmentation Mode

Figure 6

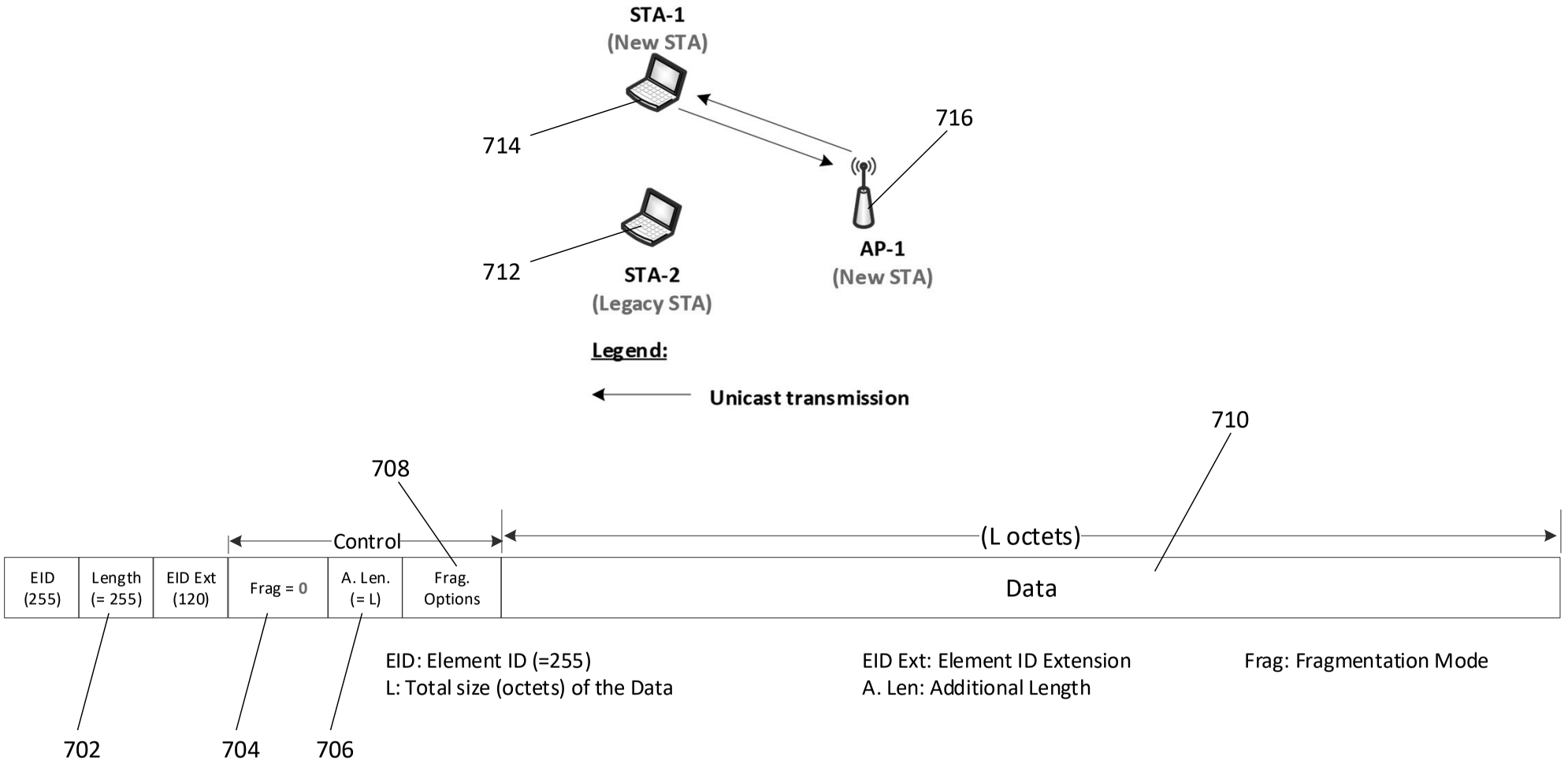

STA-1
(New STA)
714
716
712
AP-1
(New STA)
STA-2
(Legacy STA)
Legend:
Unicast transmission
710
708
Control
(L octets)
EID (255)
Length (= 255)
EID Ext (120)
Frag = 0
A. Len. (= L)
Frag. Options
Data
EID: Element ID (=255)
L: Total size (octets) of the Data
EID Ext: Element ID Extension
A. Len: Additional Length
Frag: Fragmentation Mode
702
704
706
700

Figure 7

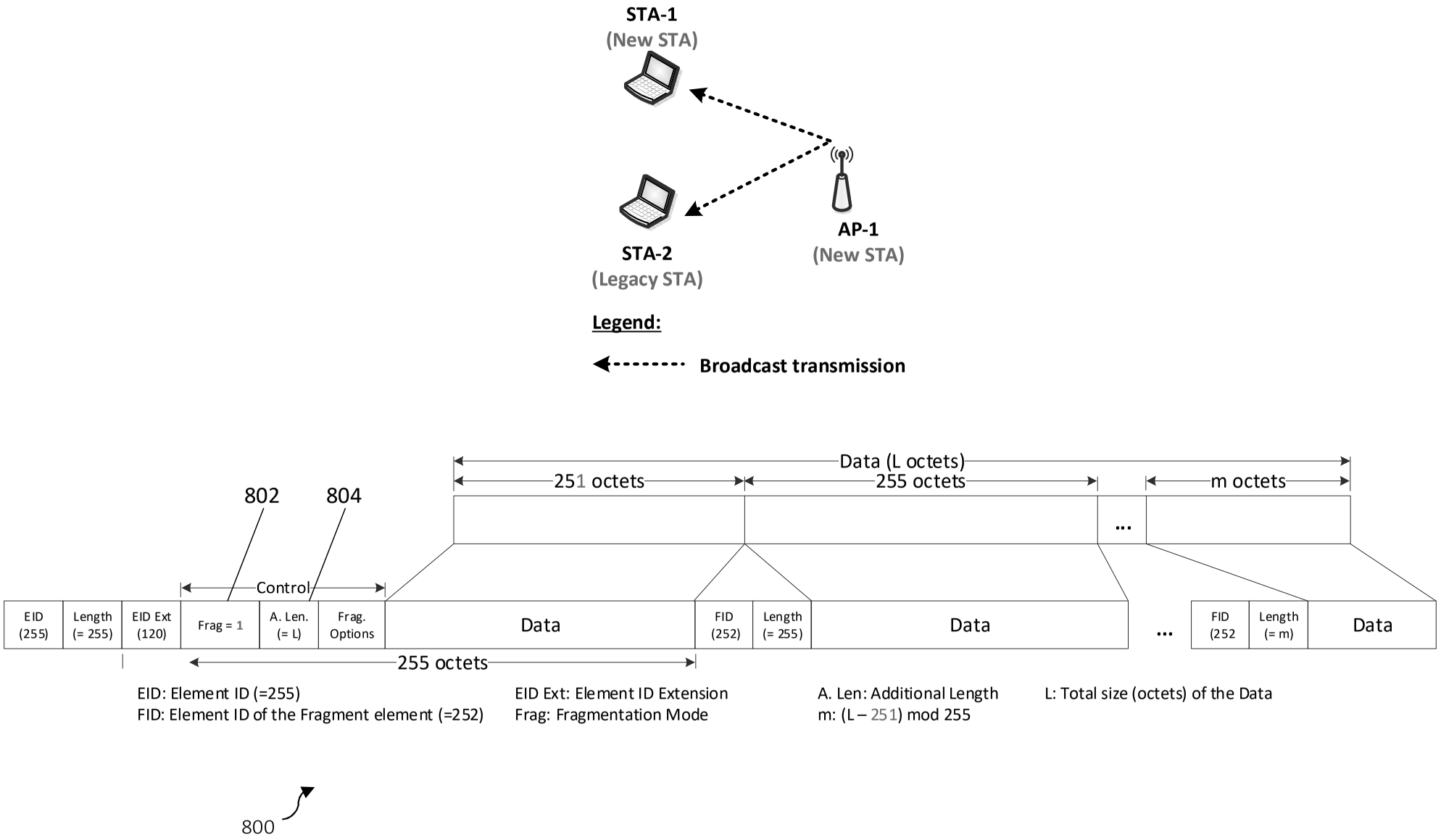

STA-1
(New STA)
AP-1
(New STA)
STA-2
(Legacy STA)
Legend:
Broadcast transmission
Data (L octets)
251 octets
255 octets
m octets
802
804
Control
EID (255)
Length (= 255)
EID Ext (120)
Frag = 1
A. Len. (= L)
Frag. Options
Data
FID (252)
Length (= 255)
Data
FID (252
Length (= m)
Data
255 octets
EID: Element ID (=255)
FID: Element ID of the Fragment element (=252)
EID Ext: Element ID Extension
Frag: Fragmentation Mode
A. Len: Additional Length
m: (L – 251) mod 255
L: Total size (octets) of the Data
800

Figure 8

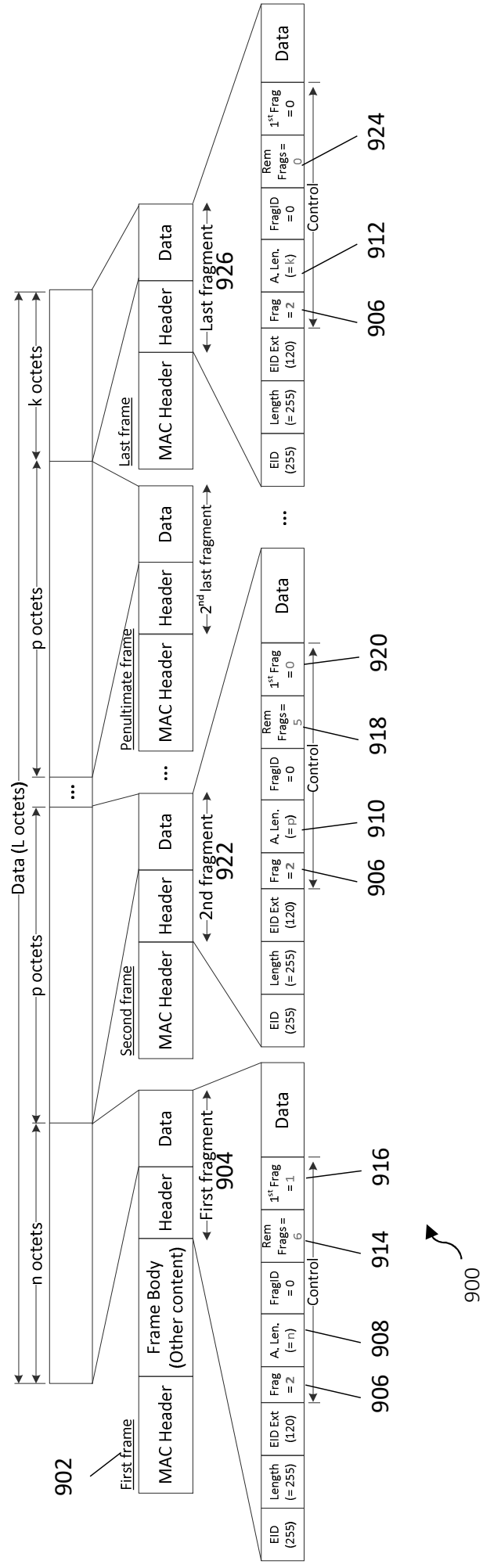
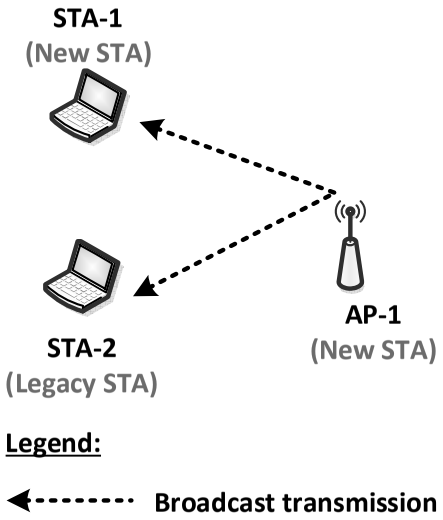
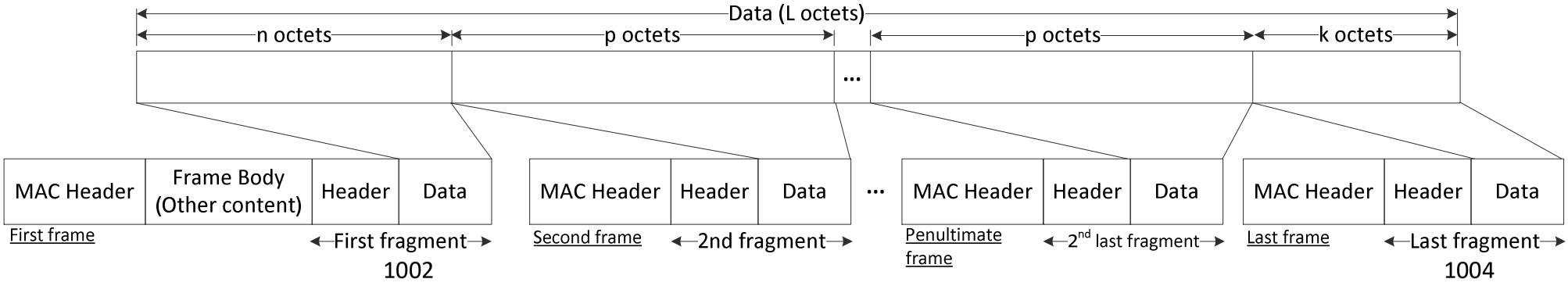

Data (L octets)
n octets
p octets
p octets
k octets
First frame
MAC Header
Frame Body (Other content)
Header
Data
Second frame
Penultimate frame
Last frame
First fragment
904
2nd fragment
922
2nd last fragment
Last fragment
926
902
900
EID (255)
Length (= 255)
EID Ext (120)
Frag = 2
A. Len. (= n)
FragID = 0
Rem Frags = 6
1st Frag = 1
Control
906
908
914
916
A. Len. (= p)
Rem Frags = 5
1st Frag = 0
910
918
920
A. Len. (= k)
Rem Frags = 0
912
924

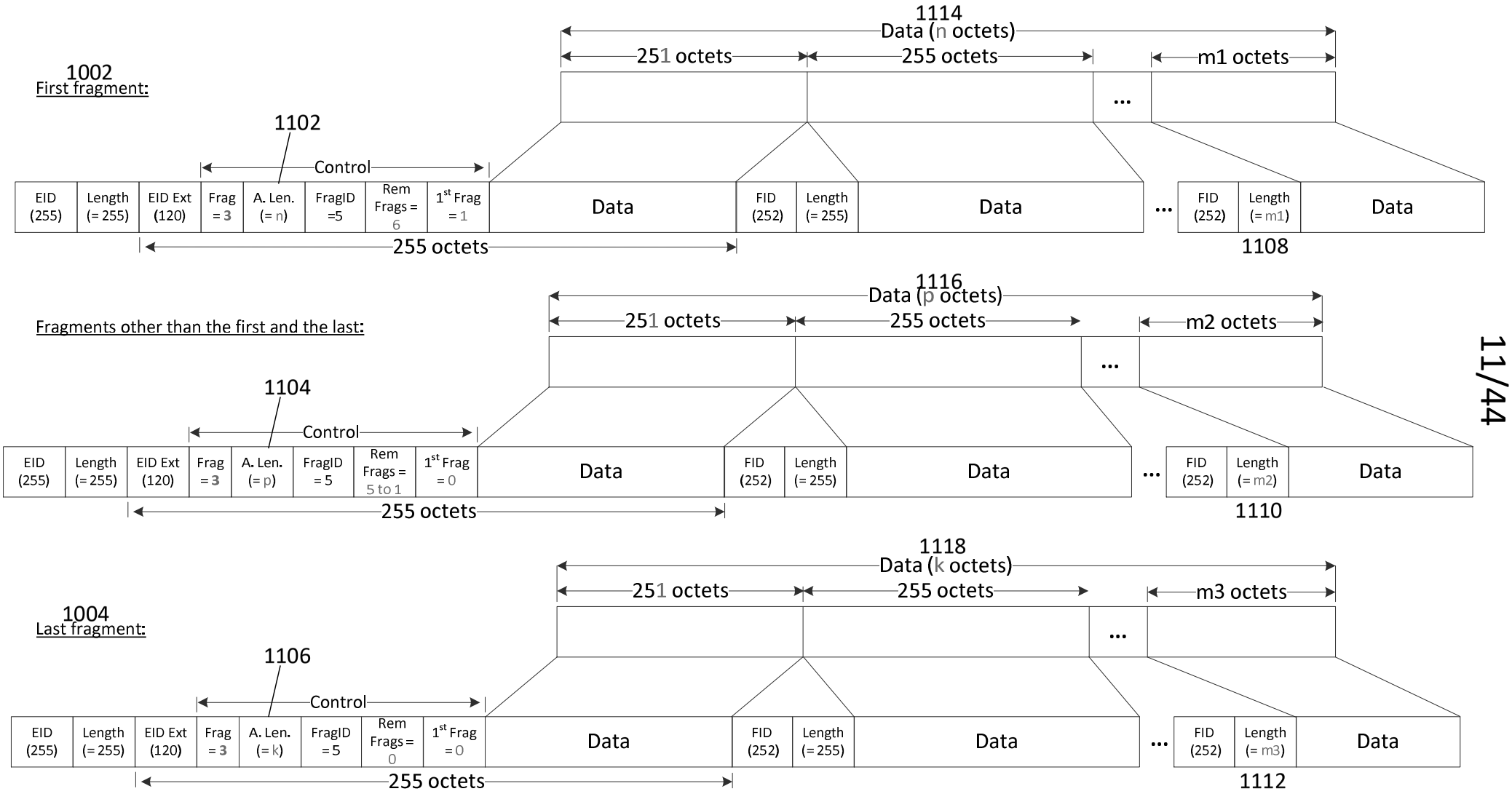
Figure 9





1000

Figure 10



EID: Element ID (=255)
L: Total size (octets) of the Data
n: Size of the first Jumbo fragment

EID Ext: Element ID Extension
FID: Element ID of the Fragment element (=252)
p: Size of the Jumbo fragments other than the first and the last

A. Len: Additional Length
Frag: Fragmentation Mode

1st Frag: First Fragment
Rem Frags: Remaining Fragments
k: Size of the last Jumbo fragment

FragID: Fragment ID

1100

Figure 11

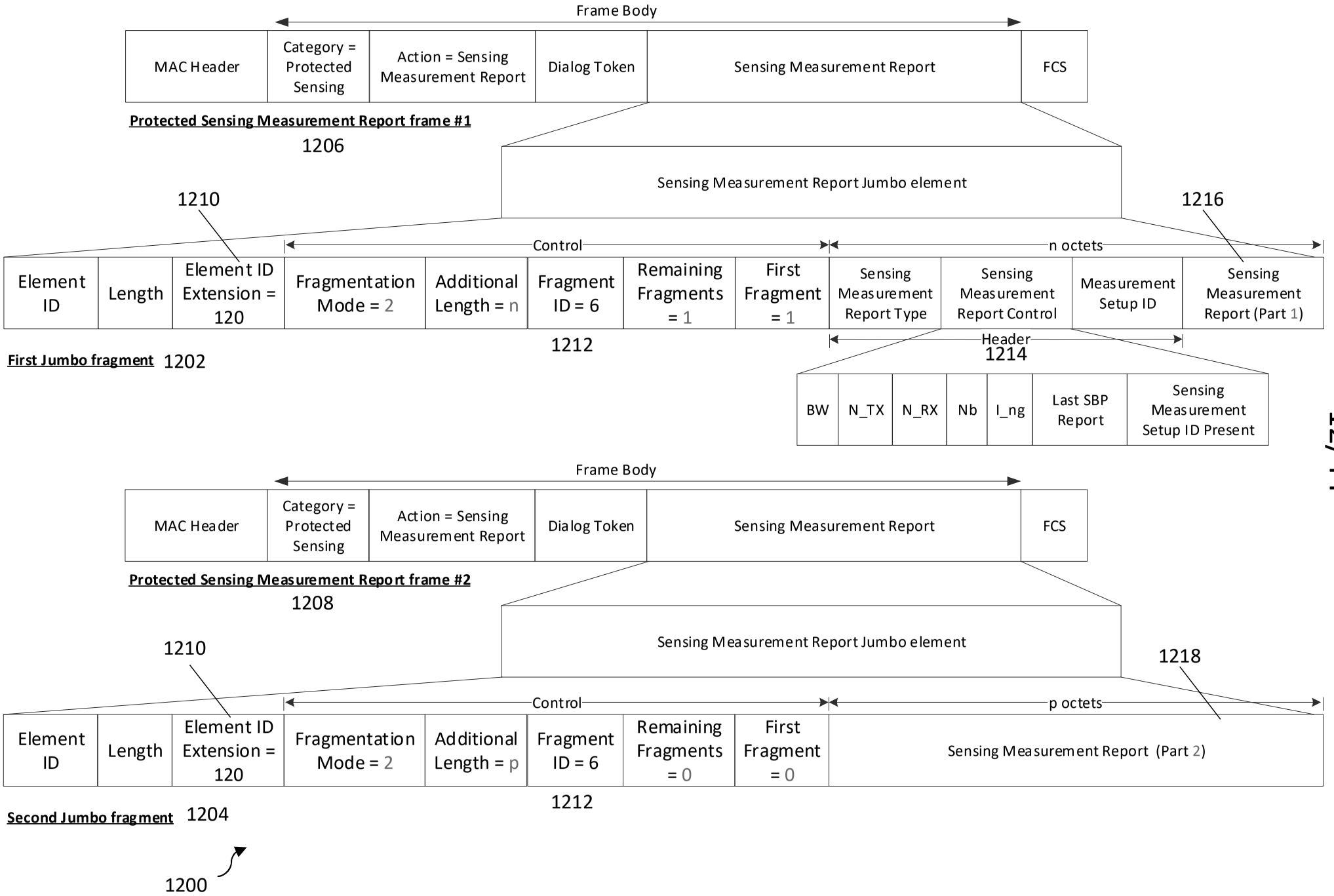
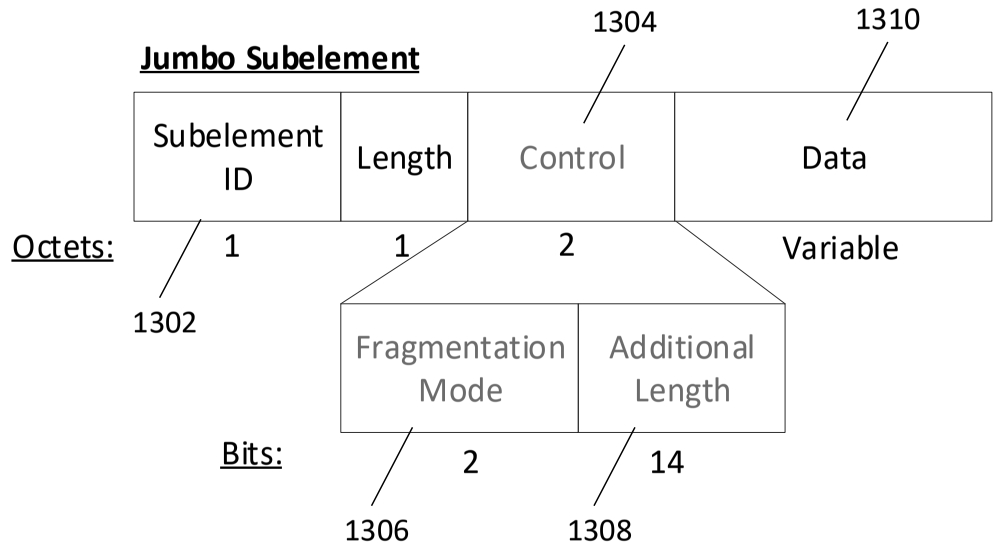

Frame Body
MAC Header
Category = Protected Sensing
Action = Sensing Measurement Report
Dialog Token
Sensing Measurement Report
FCS
Protected Sensing Measurement Report frame #1
1206
Sensing Measurement Report Jumbo element
1210
1216
Control
n octets
Element ID
Length
Element ID Extension = 120
Fragmentation Mode = 2
Additional Length = n
Fragment ID = 6
Remaining Fragments = 1
First Fragment = 1
Sensing Measurement Report Type
Sensing Measurement Report Control
Measurement Setup ID
Sensing Measurement Report (Part 1)
1212
First Jumbo fragment 1202
Header
1214
BW
N_TX
N_RX
Nb
I_ng
Last SBP Report
Sensing Measurement Setup ID Present
Frame Body
MAC Header
Category = Protected Sensing
Action = Sensing Measurement Report
Dialog Token
Sensing Measurement Report
FCS
Protected Sensing Measurement Report frame #2
1208
Sensing Measurement Report Jumbo element
1210
1218
Control
p octets
Element ID
Length
Element ID Extension = 120
Fragmentation Mode = 2
Additional Length = p
Fragment ID = 6
Remaining Fragments = 0
First Fragment = 0
Sensing Measurement Report (Part 2)
1212
Second Jumbo fragment 1204
1200

Figure 12



1300

Figure 13

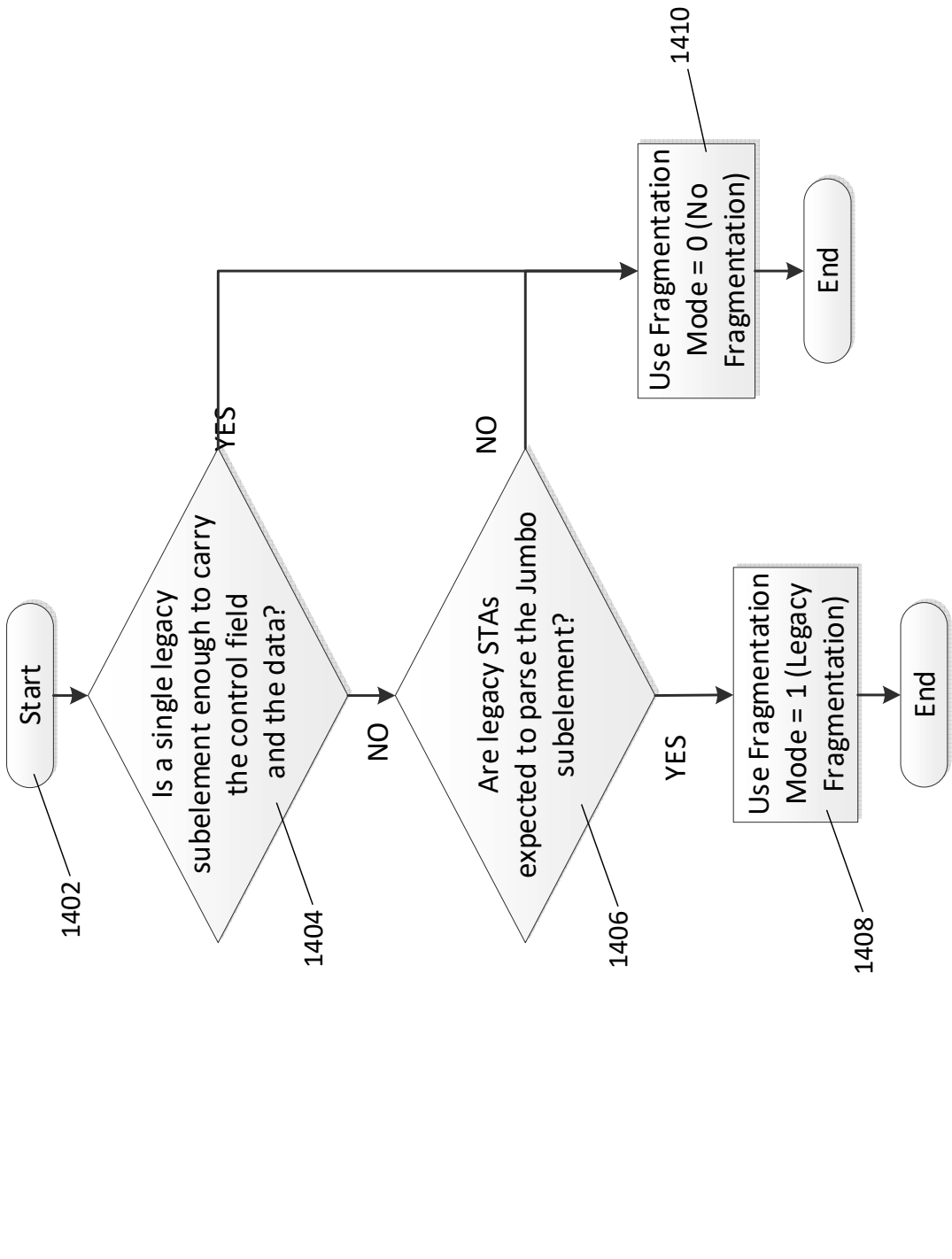

Start
1402
Is a single legacy subelement enough to carry the control field and the data?
1404
YES
NO
Are legacy STAs expected to parse the Jumbo subelement?
1406
YES
NO
Use Fragmentation Mode = 1 (Legacy Fragmentation)
1408
Use Fragmentation Mode = 0 (No Fragmentation)
1410
End
End
1400

Figure 14

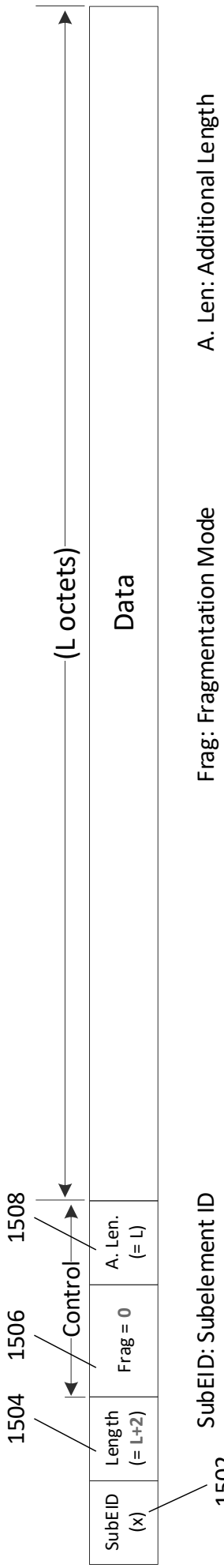
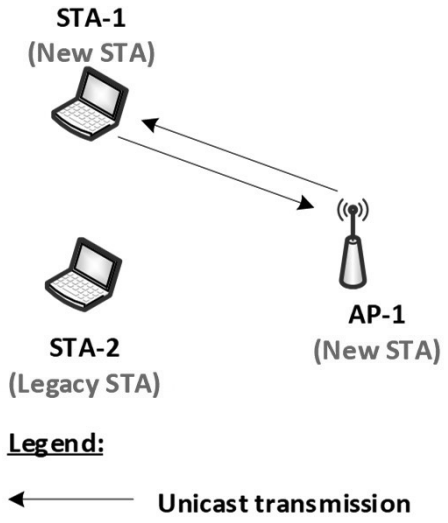
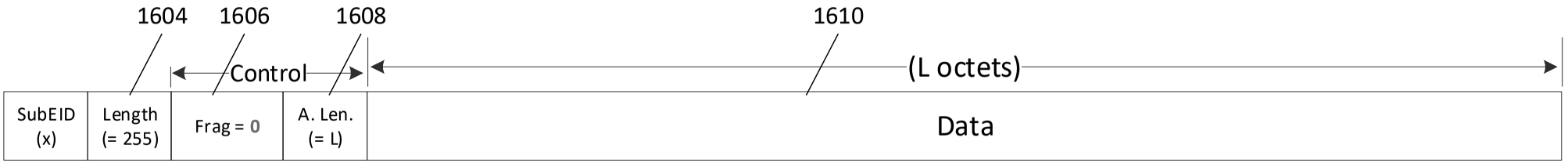

(L octets)
Data
1508
A. Len.
(= L)
Control
1506
Frag = 0
1504
Length
(= L+2)
1502
SubEID
(x)
SubEID: Subelement ID
L: Total size (octets) of the Data
Frag: Fragmentation Mode
A. Len: Additional Length
1500

Figure 15





SubEID: Subelement ID
L: Total size (octets) of the Data

Frag: Fragmentation Mode

A. Len: Additional Length

1600

Figure 16

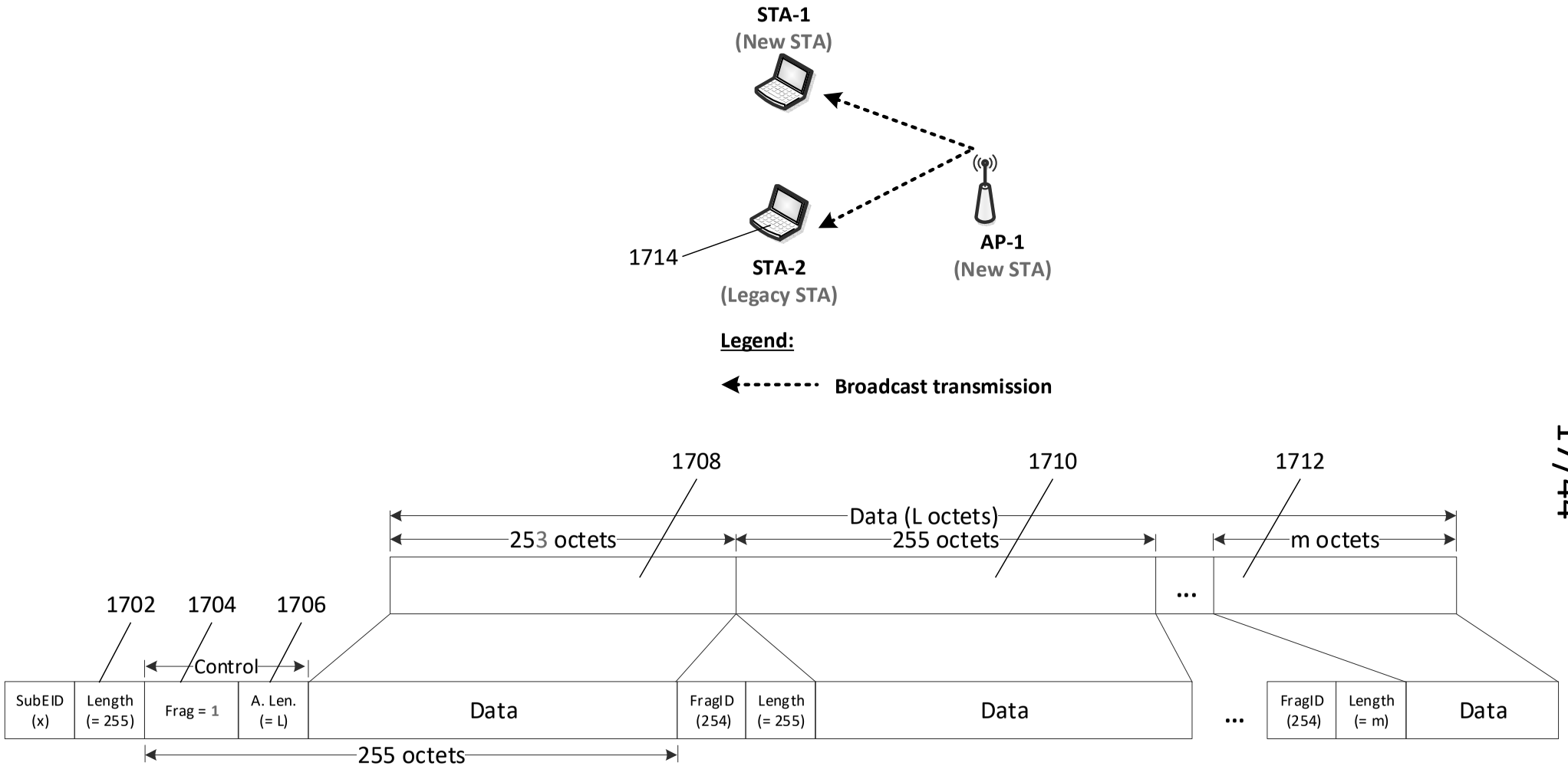

STA-1
(New STA)
AP-1
(New STA)
1714
STA-2
(Legacy STA)
Legend:
Broadcast transmission
1708
1710
1712
Data (L octets)
253 octets
255 octets
m octets
1702
1704
1706
Control
SubEID (x)
Length (= 255)
Frag = 1
A. Len. (= L)
Data
FragID (254)
Length (= 255)
Data
FragID (254)
Length (= m)
Data
255 octets
SubEID: Subelement ID
FragID: Subelement ID of the Fragment subelement
Frag: Fragmentation Mode
L: Total size (octets) of the Data
A. Len: Additional Length
m: (L – 253) mod 255
1700

Figure 17

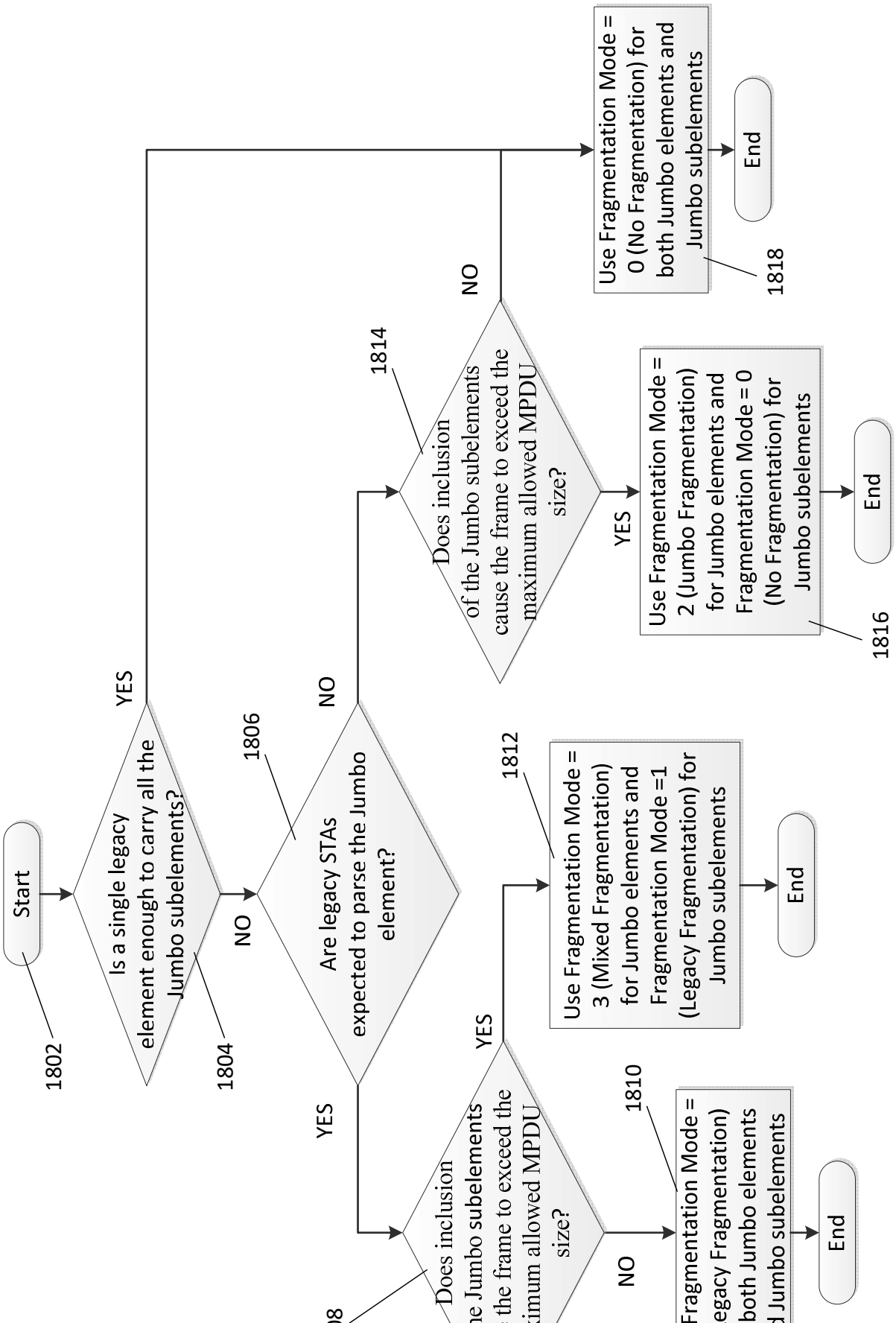
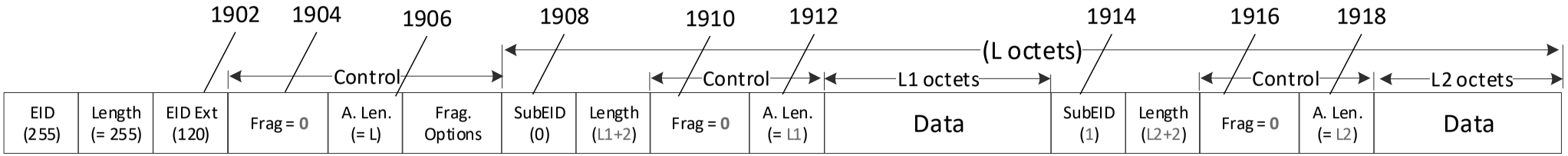

Start
1802
Is a single legacy element enough to carry all the Jumbo subelements?
1804
YES
NO
Are legacy STAs expected to parse the Jumbo element?
1806
YES
NO
Does inclusion of the Jumbo subelements cause the frame to exceed the maximum allowed MPDU size?
1808
YES
NO
Use Fragmentation Mode = 1 (Legacy Fragmentation) for both Jumbo elements and Jumbo subelements
1810
End
Use Fragmentation Mode = 3 (Mixed Fragmentation) for Jumbo elements and Fragmentation Mode =1 (Legacy Fragmentation) for Jumbo subelements
1812
End
Does inclusion of the Jumbo subelements cause the frame to exceed the maximum allowed MPDU size?
1814
YES
NO
Use Fragmentation Mode = 2 (Jumbo Fragmentation) for Jumbo elements and Fragmentation Mode = 0 (No Fragmentation) for Jumbo subelements
1816
End
Use Fragmentation Mode = 0 (No Fragmentation) for both Jumbo elements and Jumbo subelements
1818
End
1800

Figure 18



EID: Element ID (=255)
L: Total size (octets) of the Data

EID Ext: Element ID Extension
A. Len: Additional Length

SubEID: Subelement ID
Frag: Fragmentation Mode

Ln: Total size (octets) of Data in the nth subelement

1900

Figure 19

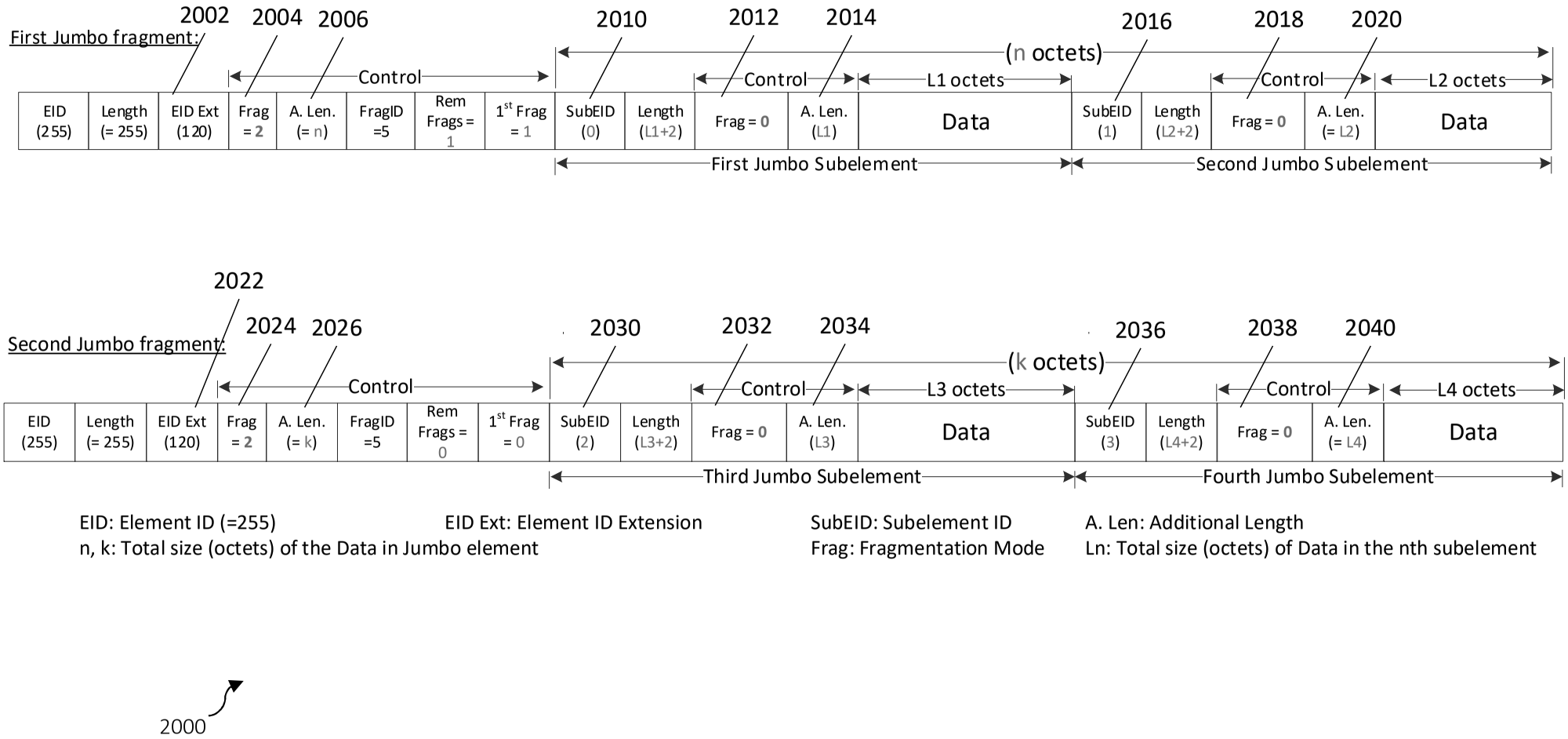
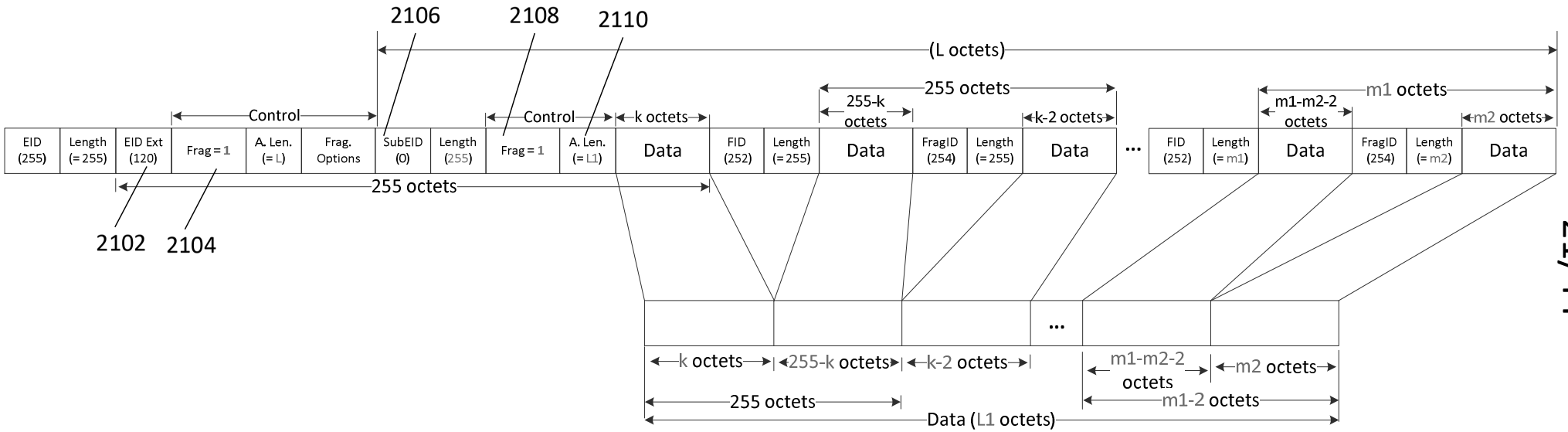

First Jumbo fragment:
2002
2004
2006
2010
2012
2014
2016
2018
2020
Control
(n octets)
Control
L1 octets
Control
L2 octets
EID (255)
Length (= 255)
EID Ext (120)
Frag = 2
A. Len. (= n)
FragID =5
Rem Frags = 1
1st Frag = 1
SubEID (0)
Length (L1+2)
Frag = 0
A. Len. (L1)
Data
SubEID (1)
Length (L2+2)
Frag = 0
A. Len. (= L2)
Data
First Jumbo Subelement
Second Jumbo Subelement
Second Jumbo fragment:
2022
2024
2026
2030
2032
2034
2036
2038
2040
Control
(k octets)
Control
L3 octets
Control
L4 octets
EID (255)
Length (= 255)
EID Ext (120)
Frag = 2
A. Len. (= k)
FragID =5
Rem Frags = 0
1st Frag = 0
SubEID (2)
Length (L3+2)
Frag = 0
A. Len. (L3)
Data
SubEID (3)
Length (L4+2)
Frag = 0
A. Len. (= L4)
Data
Third Jumbo Subelement
Fourth Jumbo Subelement
EID: Element ID (=255)
EID Ext: Element ID Extension
SubEID: Subelement ID
A. Len: Additional Length
n, k: Total size (octets) of the Data in Jumbo element
Frag: Fragmentation Mode
Ln: Total size (octets) of Data in the nth subelement
2000

Figure 20



EID: Element ID (=255) EID Ext: Element ID Extension
L: Total size (octets) of the Data in Jumbo element

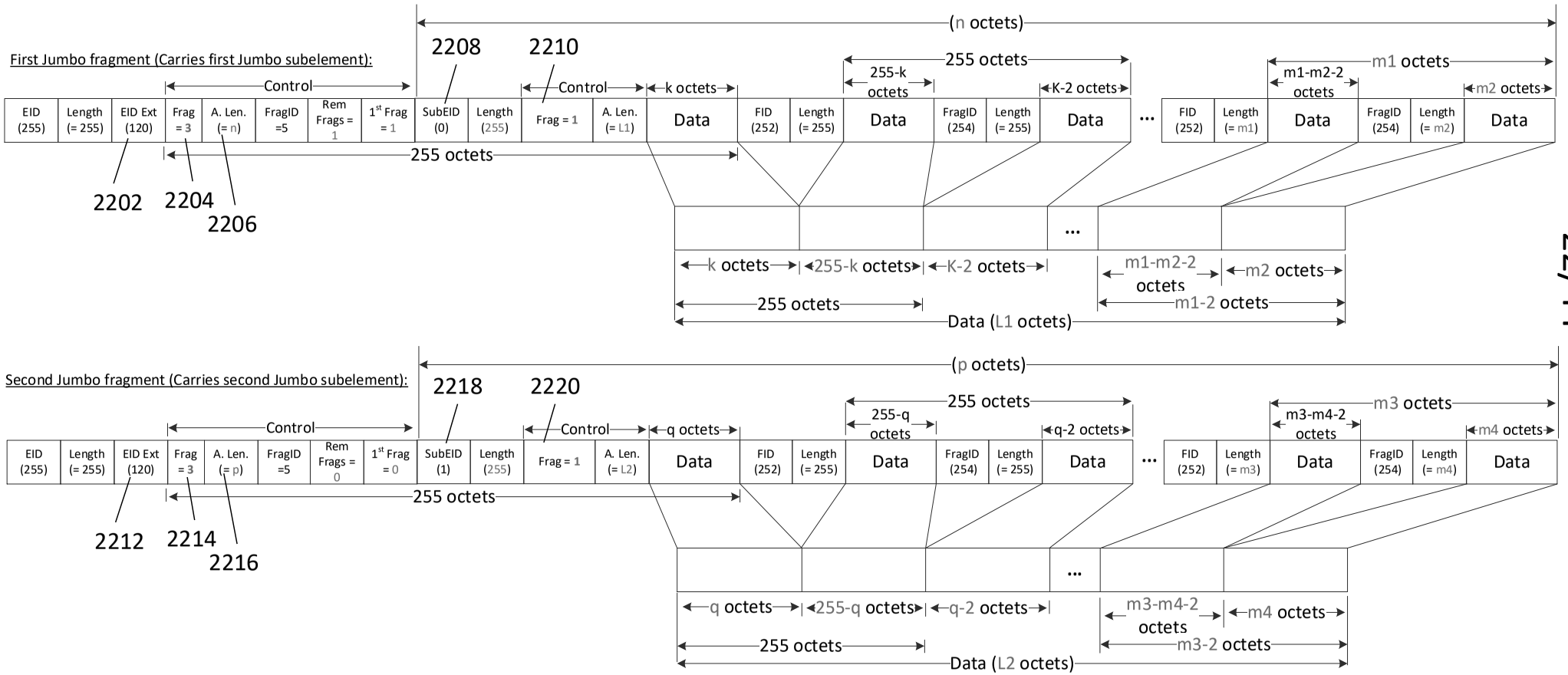
SubEID: Subelement ID
A. Len: Additional Length

FID: Element ID of the Fragment element (=252)
Frag: Fragmentation Mode

FragID: Subelement ID of the Fragment subelement
Ln: Total size (octets) of Data in the nth subelement

2100

Figure 21



EID: Element ID (=255) EID Ext: Element ID Extension
n, k: Total size (octets) of the Data in Jumbo element

SubEID: Subelement ID
A. Len: Additional Length

FID: Element ID of the Fragment element (=252)
Frag: Fragmentation Mode

FragID: Subelement ID of the Fragment subelement
Ln: Total size (octets) of Data in the nth subelement

2200

Figure 22



Figure 23A

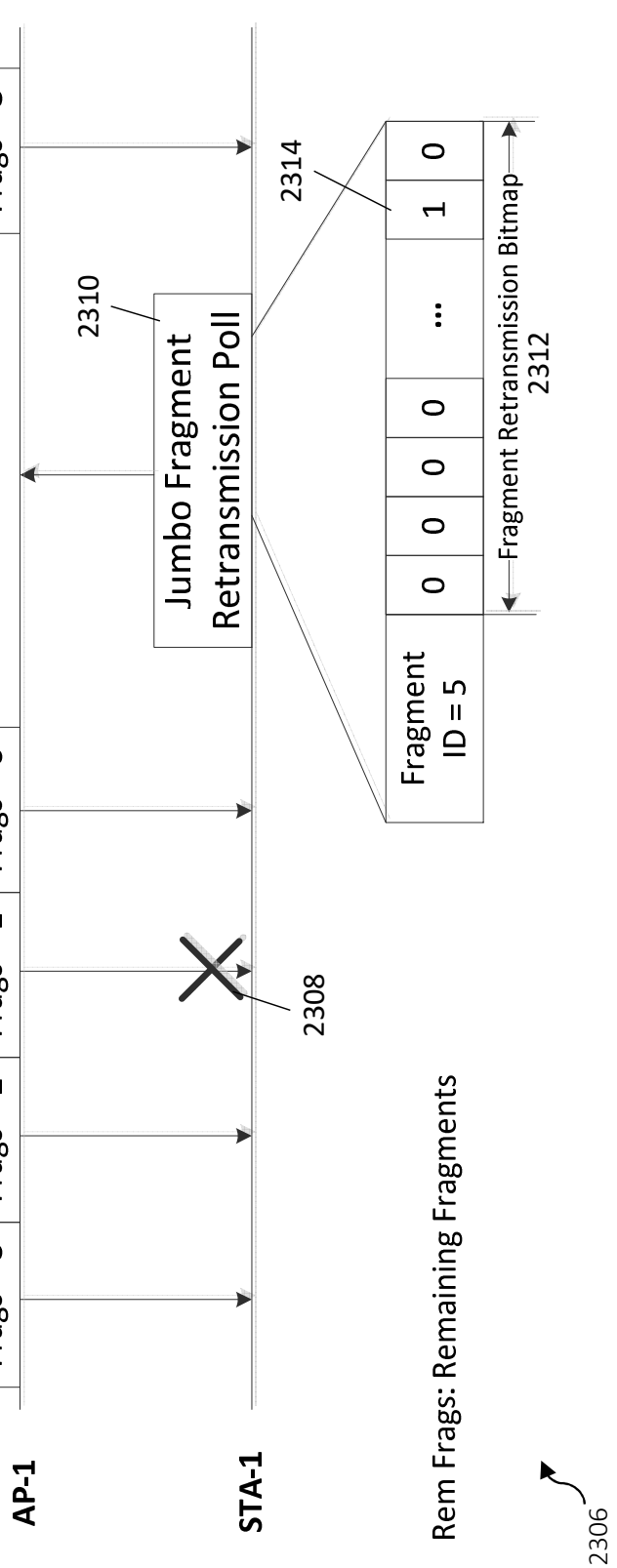


Figure 23B

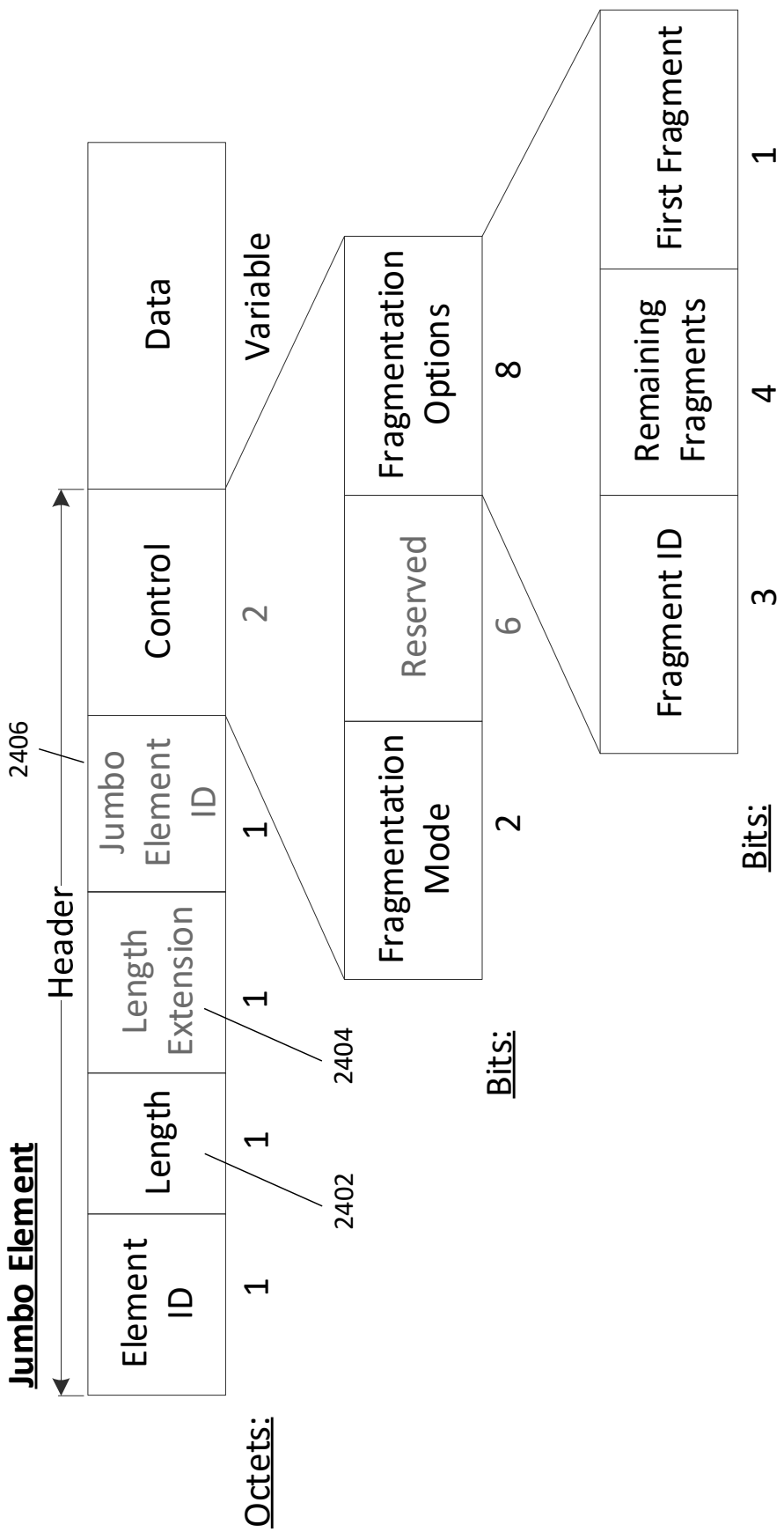
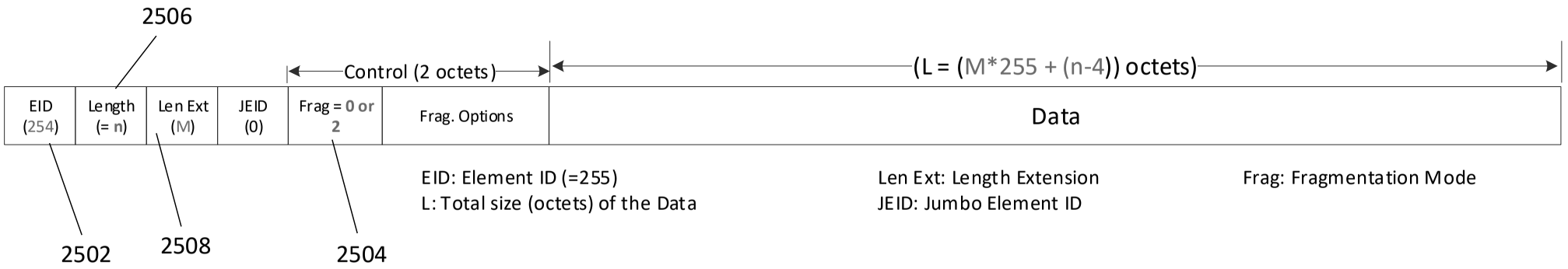

Jumbo Element
Element ID
Length
Length Extension
Jumbo Element ID
Control
Data
Octets:
1
1
1
1
2
Variable
Header
2406
2402
2404
Fragmentation Mode
Reserved
Fragmentation Options
Bits:
2
6
8
Fragment ID
Remaining Fragments
First Fragment
3
4
1
Bits:
2400

Figure 24



2500

Figure 25

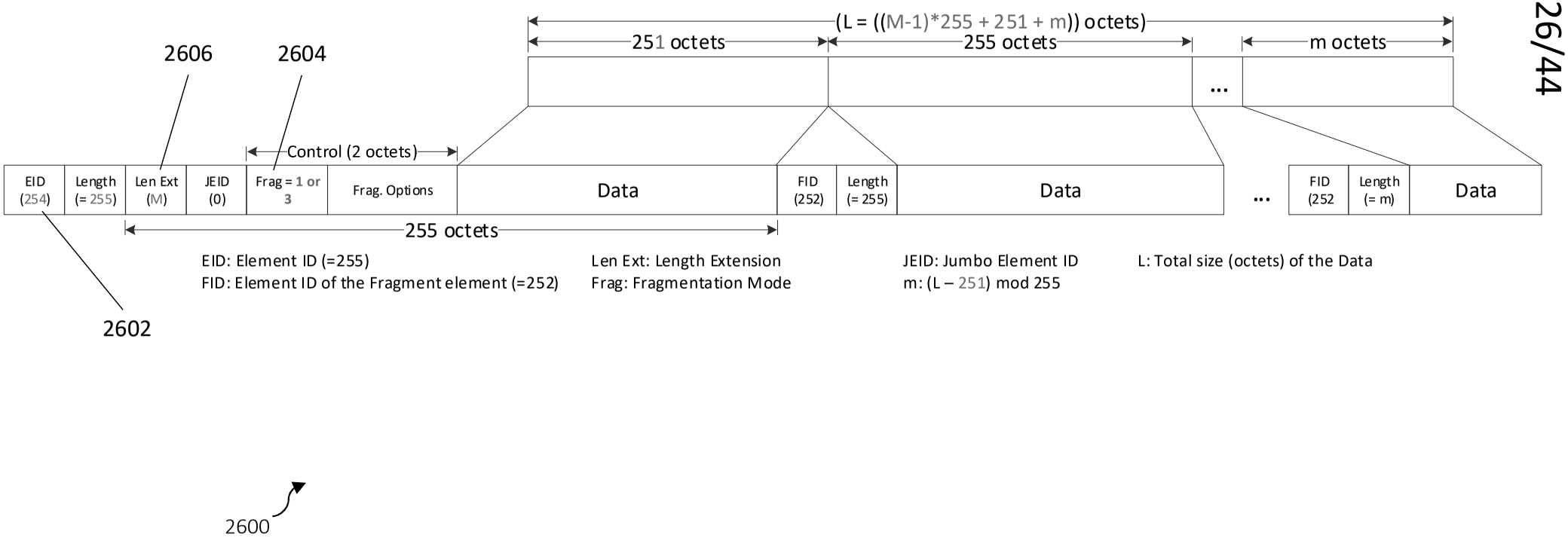

(L = ((M-1)*255 + 251 + m)) octets)
251 octets
255 octets
m octets
2606
2604
Control (2 octets)
EID (254)
Length (= 255)
Len Ext (M)
JEID (0)
Frag = 1 or 3
Frag. Options
Data
FID (252)
Length (= 255)
Data
FID (252
Length (= m)
Data
255 octets
2602
EID: Element ID (=255)
FID: Element ID of the Fragment element (=252)
Len Ext: Length Extension
Frag: Fragmentation Mode
JEID: Jumbo Element ID
m: (L – 251) mod 255
L: Total size (octets) of the Data
2600

Figure 26

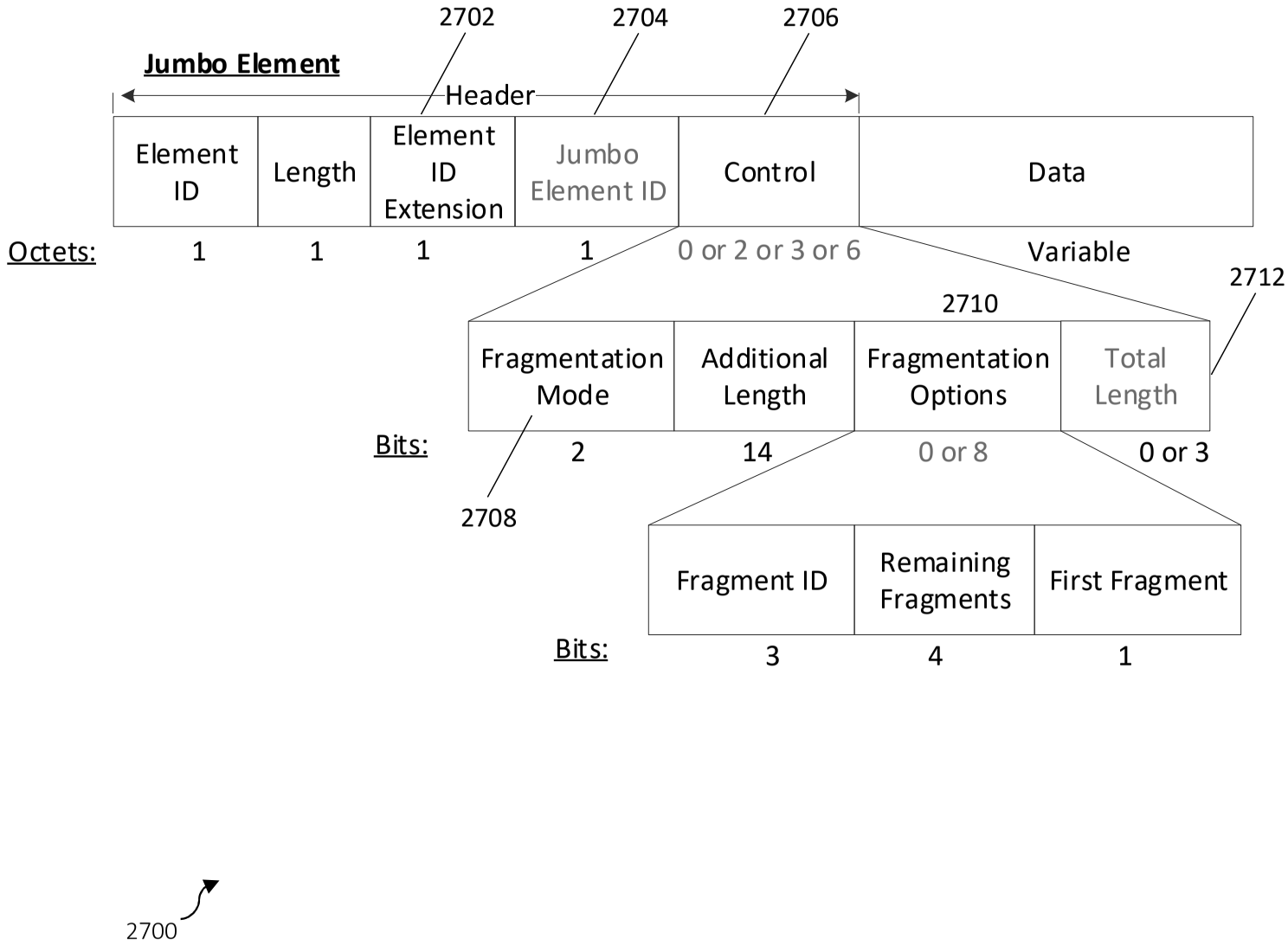

Jumbo Element
2702
2704
2706
Header
Element ID
Length
Element ID Extension
Jumbo Element ID
Control
Data
Octets:
1
1
1
1
0 or 2 or 3 or 6
Variable
2712
2710
Fragmentation Mode
Additional Length
Fragmentation Options
Total Length
Bits:
2
14
0 or 8
0 or 3
2708
Fragment ID
Remaining Fragments
First Fragment
Bits:
3
4
1
2700

Figure 27

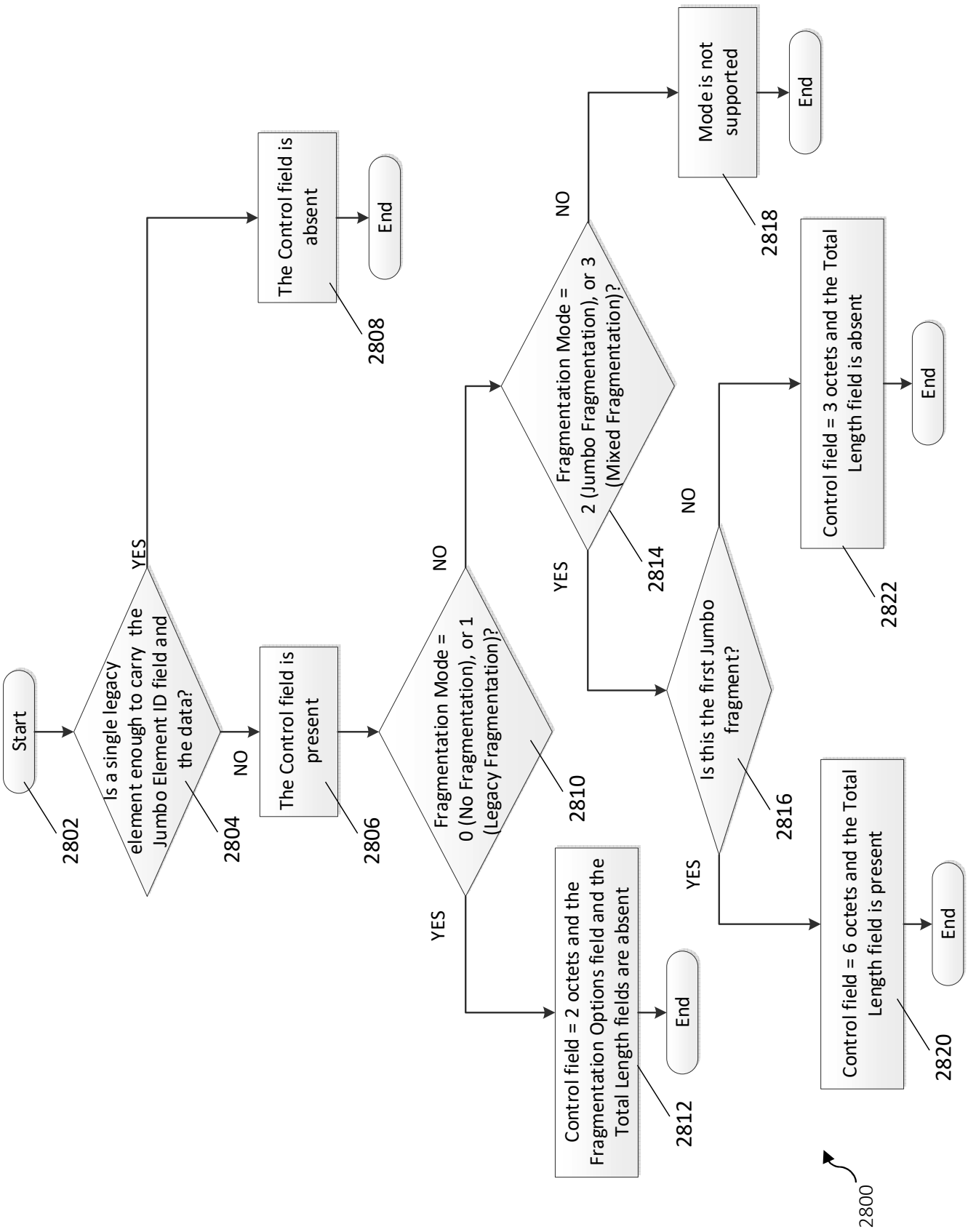

Start
2802
Is a single legacy element enough to carry the Jumbo Element ID field and the data?
2804
YES
The Control field is absent
2808
End
NO
The Control field is present
2806
Fragmentation Mode = 0 (No Fragmentation), or 1 (Legacy Fragmentation)?
2810
YES
Control field = 2 octets and the Fragmentation Options field and the Total Length fields are absent
2812
End
NO
Fragmentation Mode = 2 (Jumbo Fragmentation), or 3 (Mixed Fragmentation)?
2814
YES
Is this the first Jumbo fragment?
2816
YES
Control field = 6 octets and the Total Length field is present
2820
End
NO
Control field = 3 octets and the Total Length field is absent
2822
End
NO
Mode is not supported
2818
End
2800

Figure 28

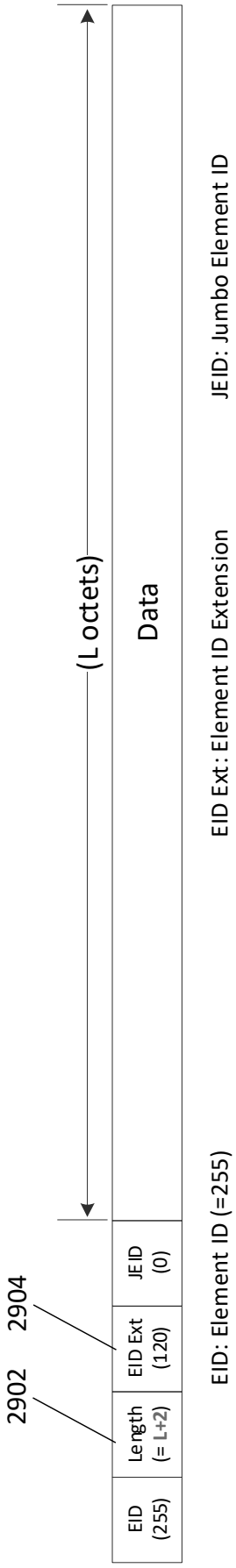

2902
2904
EID (255)
Length (= L+2)
EID Ext (120)
JEID (0)
Data
(L octets)
EID: Element ID (=255)
L: Total size (octets) of the Data
EID Ext: Element ID Extension
A. Len: Additional Length
JEID: Jumbo Element ID
2900

Figure 29

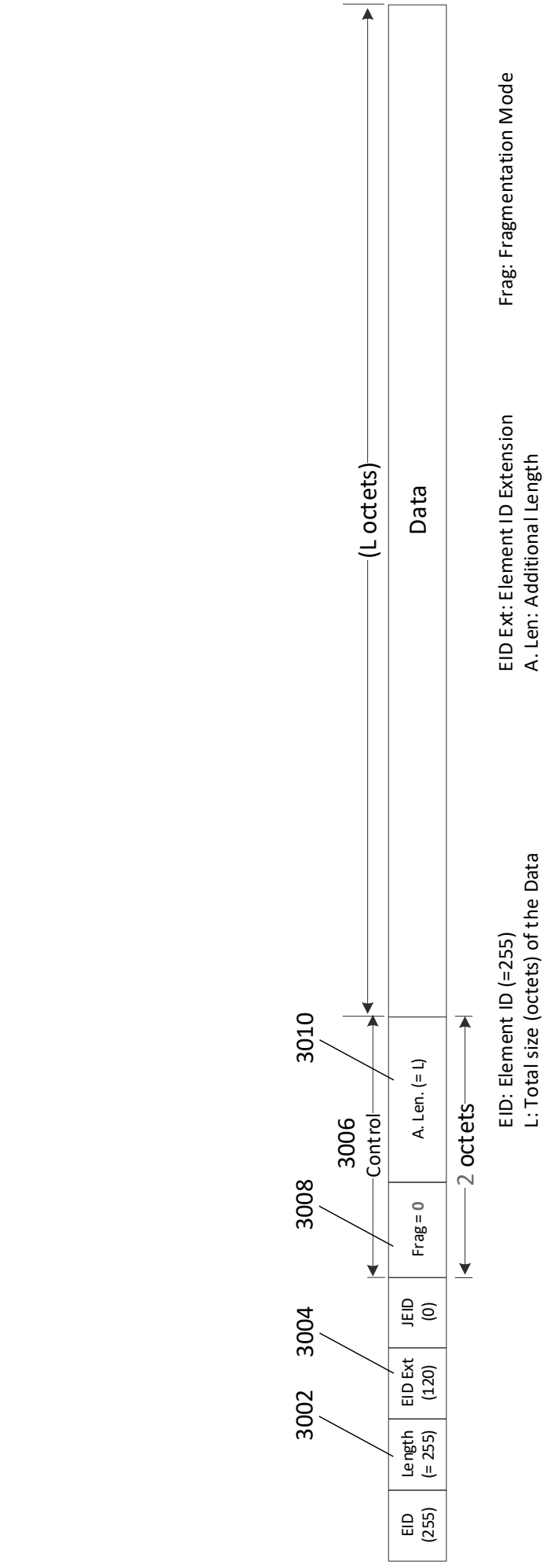

EID (255)
Length (= 255)
EID Ext (120)
JEID (0)
Frag = 0
A. Len. (= L)
Data
(L octets)
2 octets
Control
3002
3004
3006
3008
3010
3050
EID: Element ID (=255)
L: Total size (octets) of the Data
EID Ext: Element ID Extension
A. Len: Additional Length
Frag: Fragmentation Mode

Figure 30

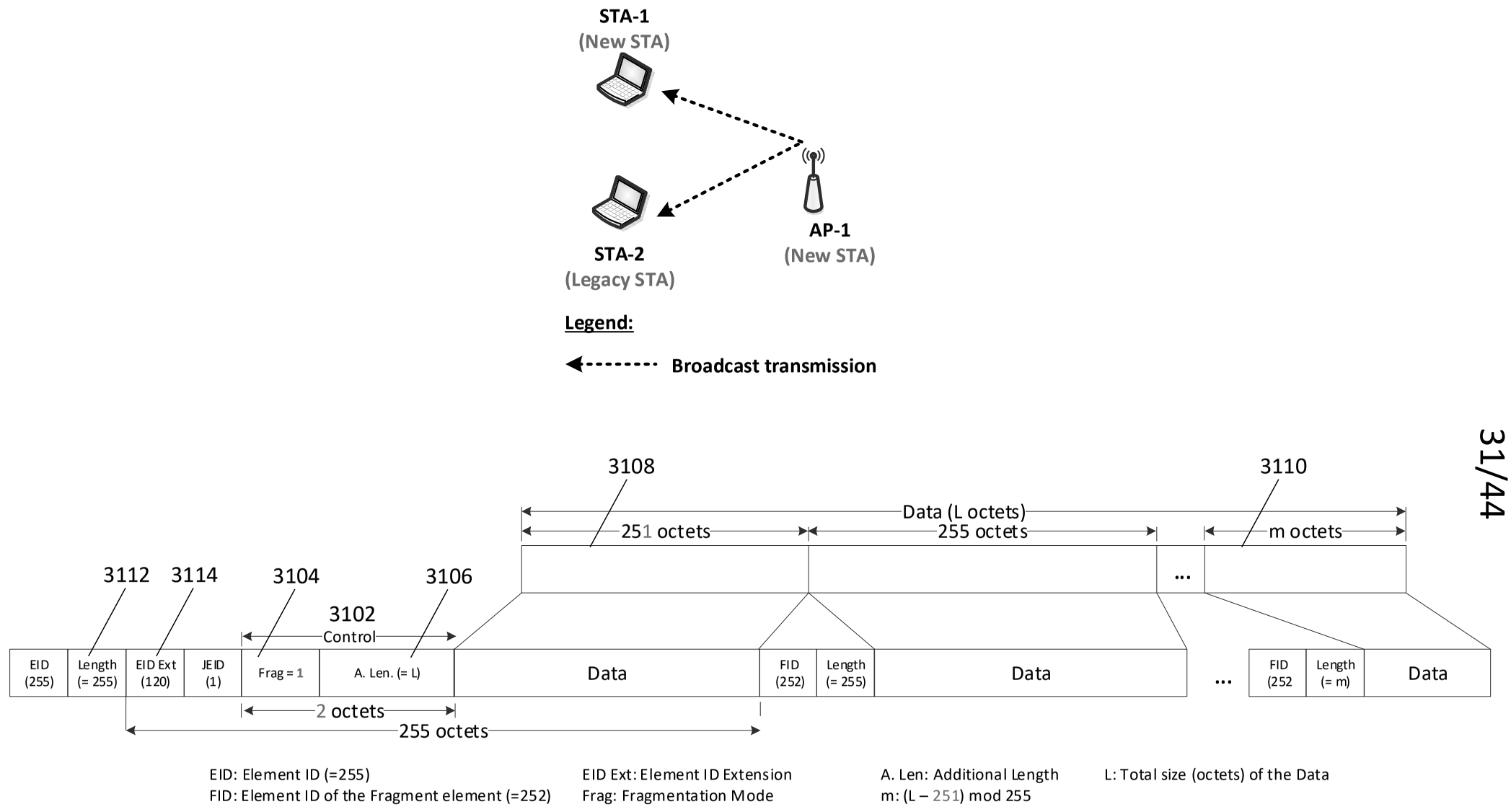
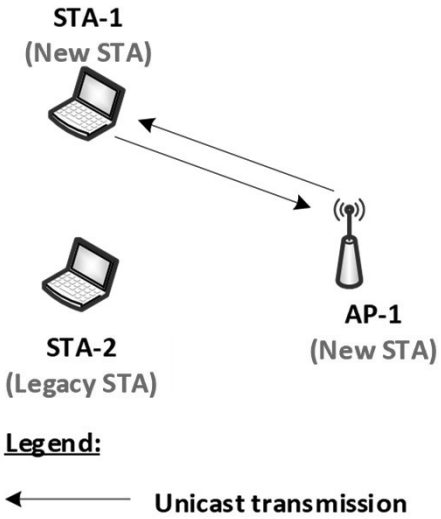

STA-1
(New STA)
AP-1
(New STA)
STA-2
(Legacy STA)
Legend:
Broadcast transmission
3108
3110
Data (L octets)
251 octets
255 octets
m octets
3112
3114
3104
3106
3102
Control
EID
(255)
Length
(= 255)
EID Ext
(120)
JEID
(1)
Frag = 1
A. Len. (= L)
Data
FID
(252)
Length
(= 255)
Data
FID
(252
Length
(= m)
Data
2 octets
255 octets
EID: Element ID (=255)
FID: Element ID of the Fragment element (=252)
EID Ext: Element ID Extension
Frag: Fragmentation Mode
A. Len: Additional Length
m: (L – 251) mod 255
L: Total size (octets) of the Data
3100

Figure 31


STA-1
(New STA)
AP-1
(New STA)
STA-2
(Legacy STA)
Legend:
Unicast transmission

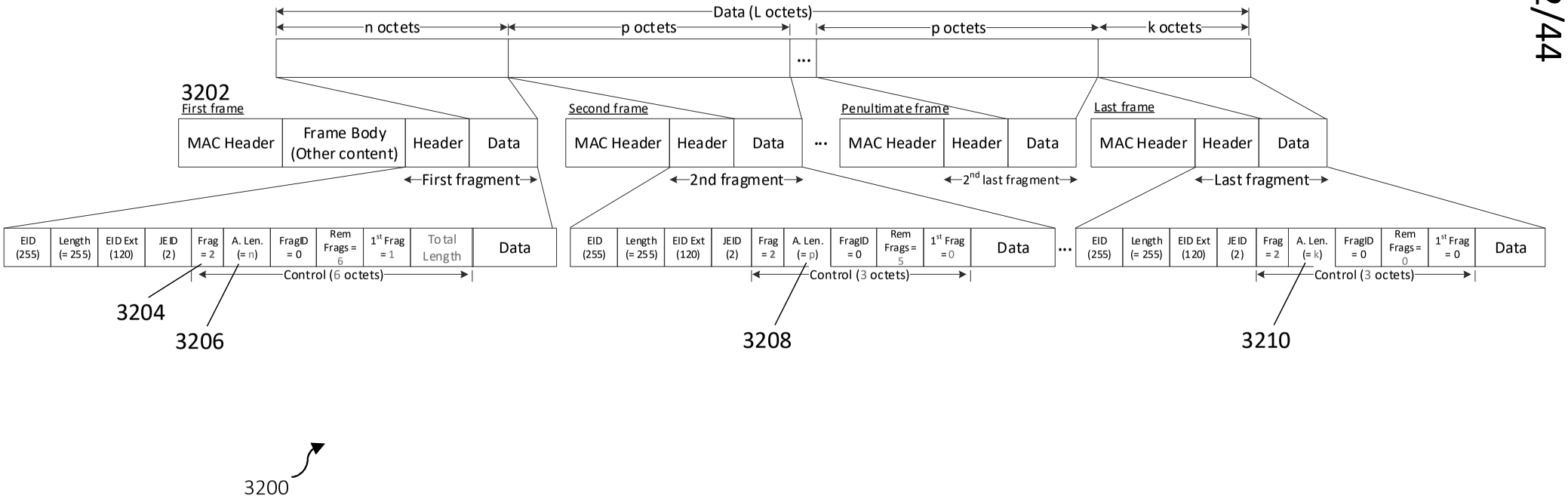
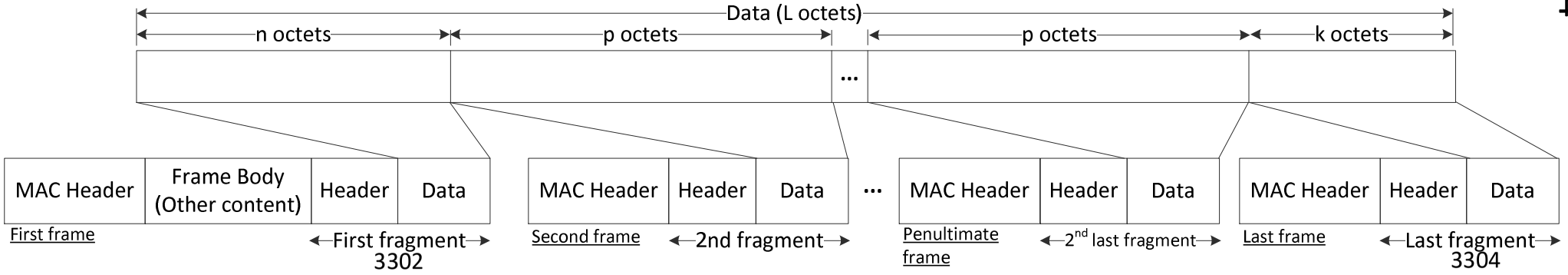

Data (L octets)
n octets
p octets
p octets
k octets
3202
First frame
Second frame
Penultimate frame
Last frame
MAC Header
Frame Body (Other content)
Header
Data
First fragment
2nd fragment
2nd last fragment
Last fragment
EID (255)
Length (= 255)
EID Ext (120)
JEID (2)
Frag = 2
A. Len. (= n)
FragID = 0
Rem Frags = 6
1st Frag = 1
Total Length
Control (6 octets)
A. Len. (= p)
Rem Frags = 5
1st Frag = 0
Control (3 octets)
A. Len. (= k)
Rem Frags = 0
3204
3206
3208
3210
3200

Figure 32



3300

Figure 33

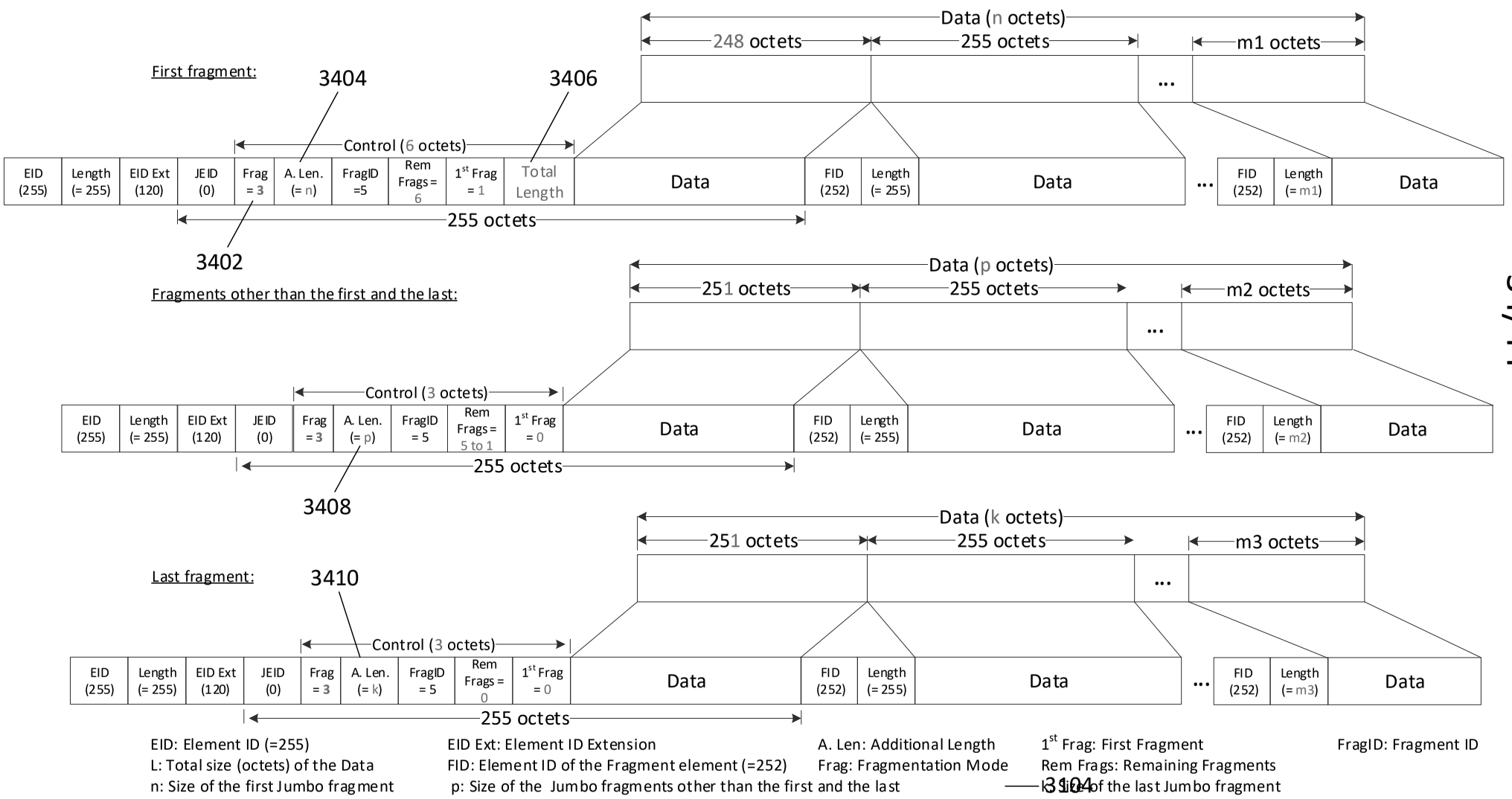

First fragment:
3404
3406
Data (n octets)
248 octets
255 octets
m1 octets
Control (6 octets)
EID (255)
Length (= 255)
EID Ext (120)
JEID (0)
Frag = 3
A. Len. (= n)
FragID =5
Rem Frags = 6
1st Frag = 1
Total Length
Data
FID (252)
Length (= 255)
Data
FID (252)
Length (= m1)
Data
255 octets
3402
Fragments other than the first and the last:
Data (p octets)
251 octets
255 octets
m2 octets
Control (3 octets)
EID (255)
Length (= 255)
EID Ext (120)
JEID (0)
Frag = 3
A. Len. (= p)
FragID = 5
Rem Frags = 5 to 1
1st Frag = 0
Data
FID (252)
Length (= 255)
Data
FID (252)
Length (= m2)
Data
255 octets
3408
Last fragment:
3410
Data (k octets)
251 octets
255 octets
m3 octets
Control (3 octets)
EID (255)
Length (= 255)
EID Ext (120)
JEID (0)
Frag = 3
A. Len. (= k)
FragID = 5
Rem Frags = 0
1st Frag = 0
Data
FID (252)
Length (= 255)
Data
FID (252)
Length (= m3)
Data
255 octets
3410
EID: Element ID (=255)
EID Ext: Element ID Extension
A. Len: Additional Length
1st Frag: First Fragment
FragID: Fragment ID
L: Total size (octets) of the Data
FID: Element ID of the Fragment element (=252)
Frag: Fragmentation Mode
Rem Frags: Remaining Fragments
n: Size of the first Jumbo fragment
p: Size of the Jumbo fragments other than the first and the last
k: Size of the last Jumbo fragment
3104
3400

Figure 34

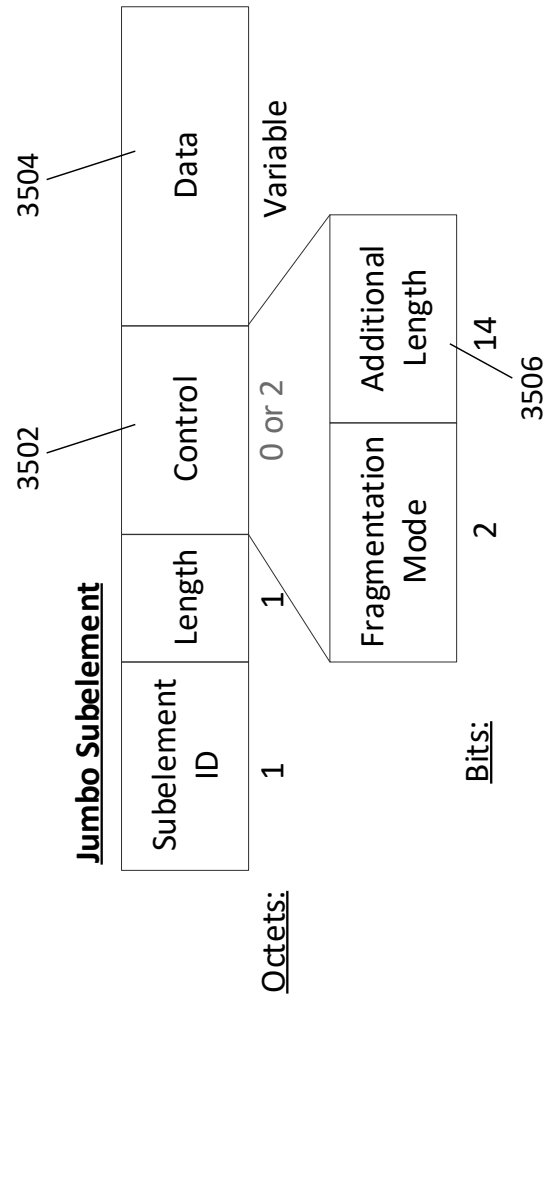
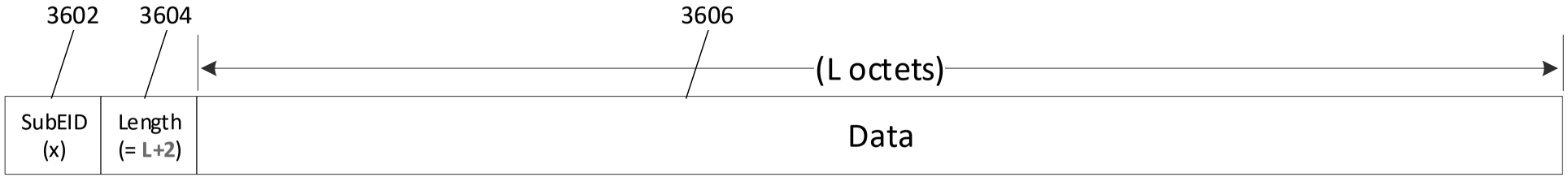

Jumbo Subelement
Subelement ID
Length
Control
Data
Octets:
1
1
0 or 2
Variable
Bits:
2
14
Fragmentation Mode
Additional Length
3500
3502
3504
3506

Figure 35



SubEID: Subelement ID
L: Total size (octets) of the Data

Frag: Fragmentation Mode

A. Len: Additional Length

3600

Figure 36

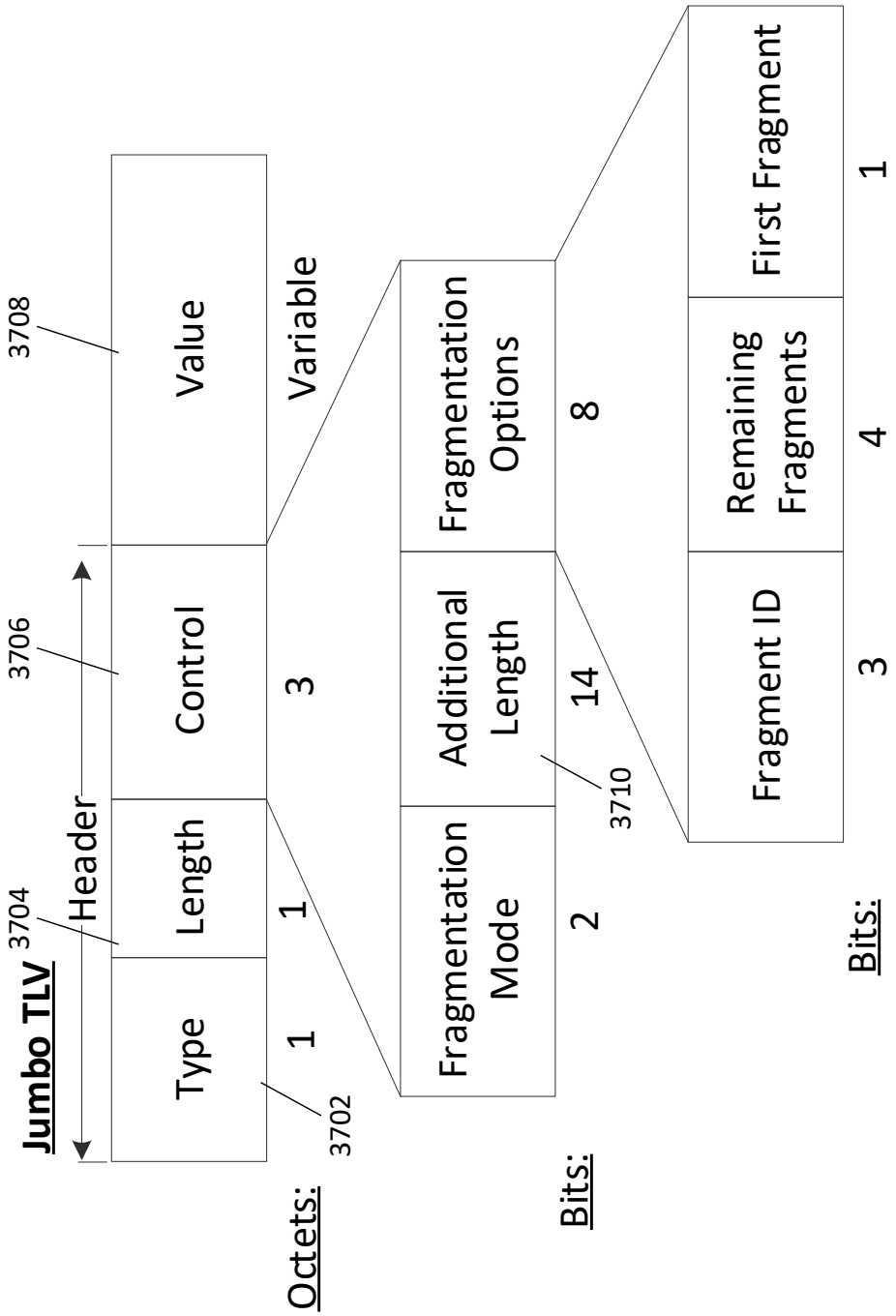

Jumbo TLV
3704
Header
3706
3708
Type
Length
Control
Value
Octets:
1
1
3
Variable
3702
Fragmentation Mode
Additional Length
Fragmentation Options
Bits:
2
14
8
3710
Fragment ID
Remaining Fragments
First Fragment
Bits:
3
4
1
3700

Figure 37

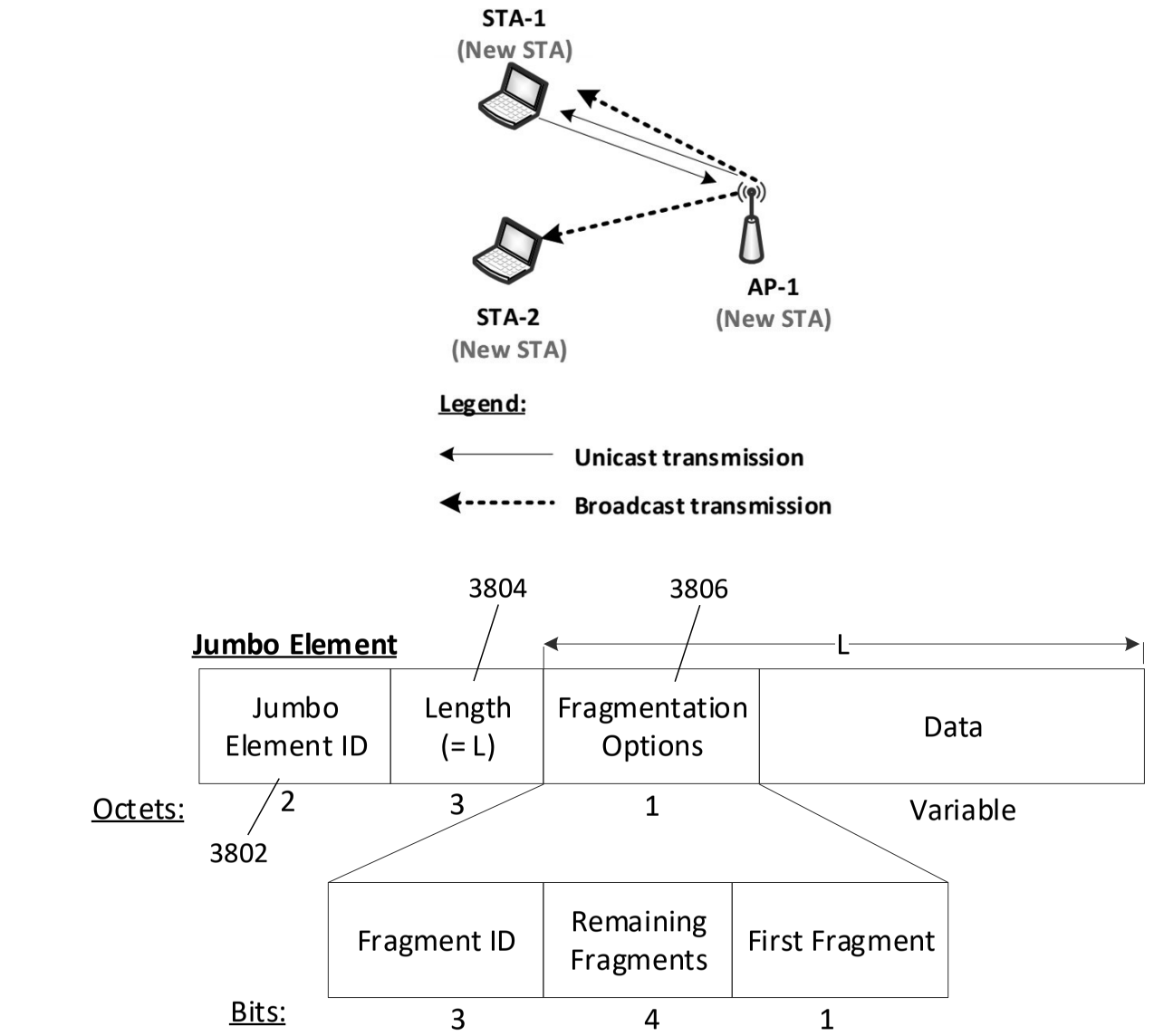
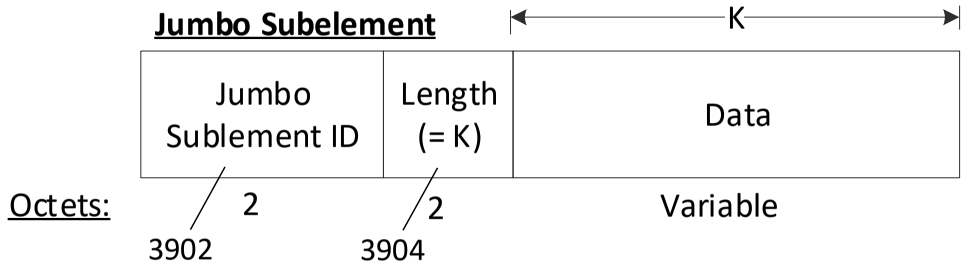

STA-1
(New STA)
AP-1
(New STA)
STA-2
(New STA)
Legend:
Unicast transmission
Broadcast transmission
3804
3806
Jumbo Element
L
Jumbo Element ID
Length (= L)
Fragmentation Options
Data
Octets:
2
3
1
Variable
3802
Fragment ID
Remaining Fragments
First Fragment
Bits:
3
4
1
3800

Figure 38



3900

Figure 39

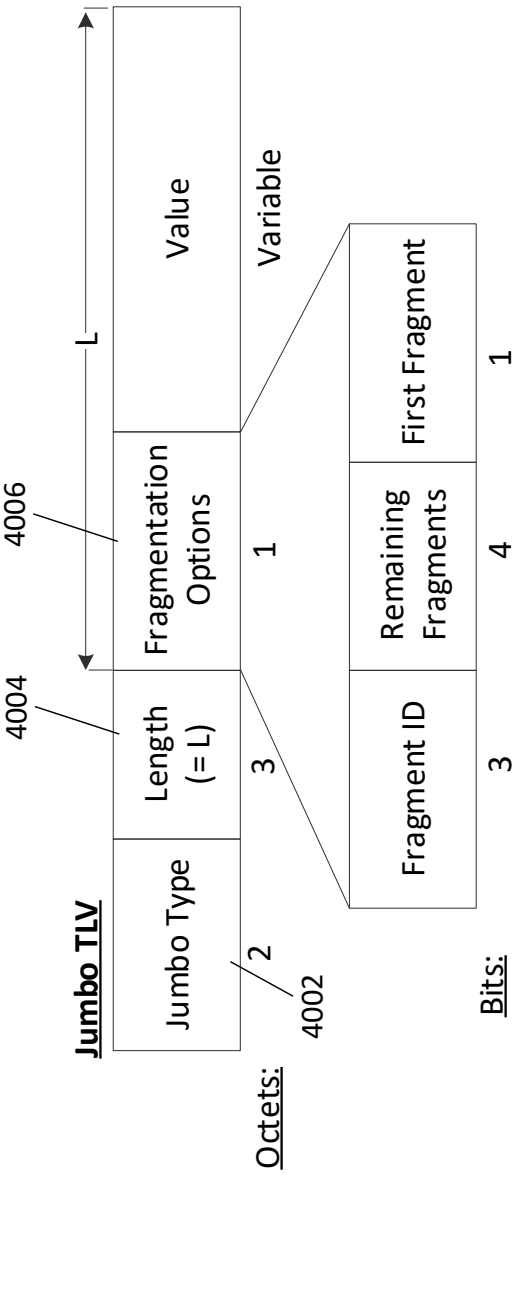

Jumbo TLV
Jumbo Type
Length (= L)
Fragmentation Options
Value
Fragment ID
Remaining Fragments
First Fragment
Octets:
2
3
1
Variable
Bits:
3
4
1
L
4002
4004
4006
4000

Figure 40

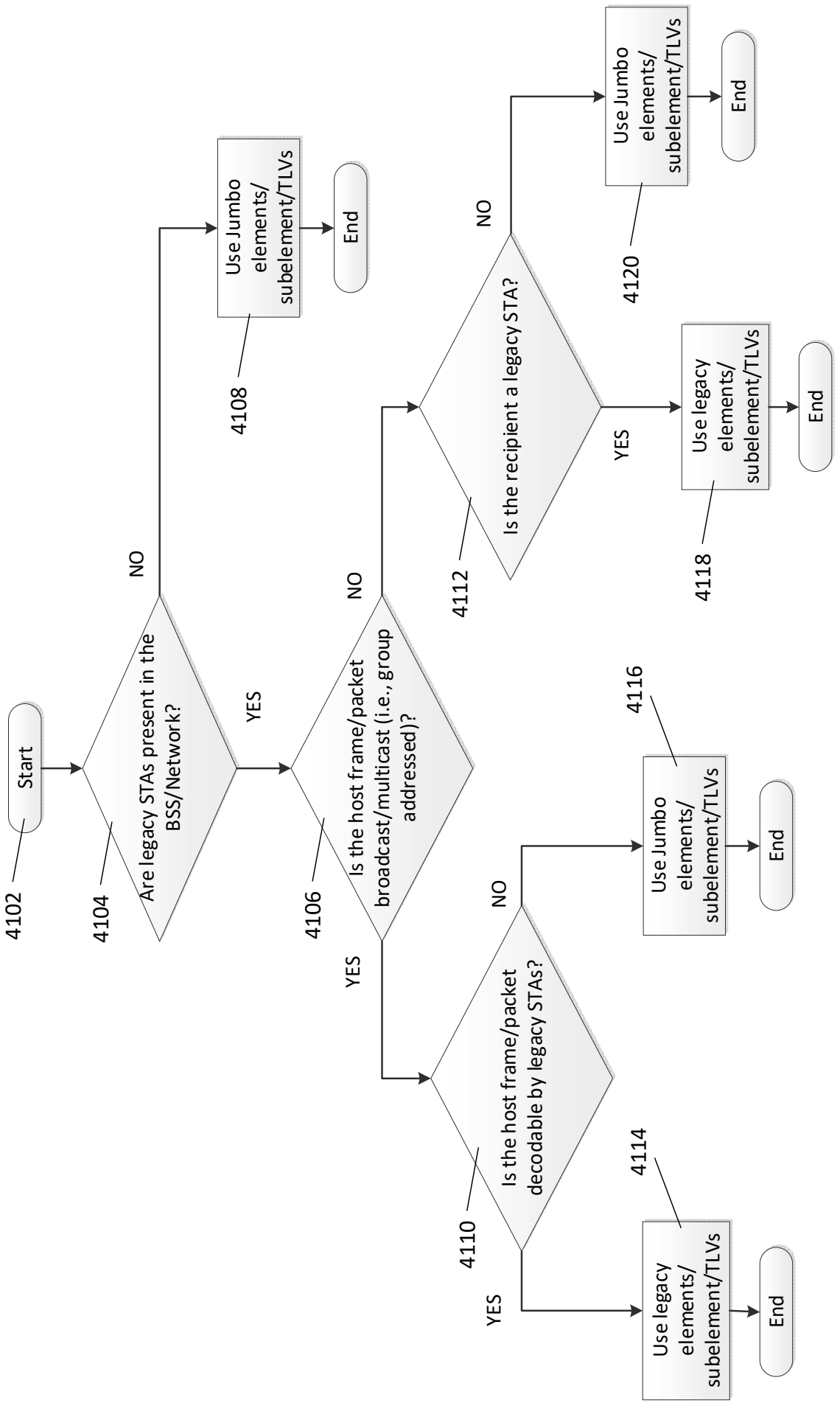

Start
4102
Are legacy STAs present in the BSS/Network?
4104
NO
YES
Use Jumbo elements/ subelement/TLVs
4108
End
Is the host frame/packet broadcast/multicast (i.e., group addressed)?
4106
NO
YES
Is the recipient a legacy STA?
4112
NO
YES
Use Jumbo elements/ subelement/TLVs
4120
End
Use legacy elements/ subelement/TLVs
4118
End
Is the host frame/packet decodable by legacy STAs?
4110
NO
YES
Use Jumbo elements/ subelement/TLVs
4116
End
Use legacy elements/ subelement/TLVs
4114
End
4100

Figure 41

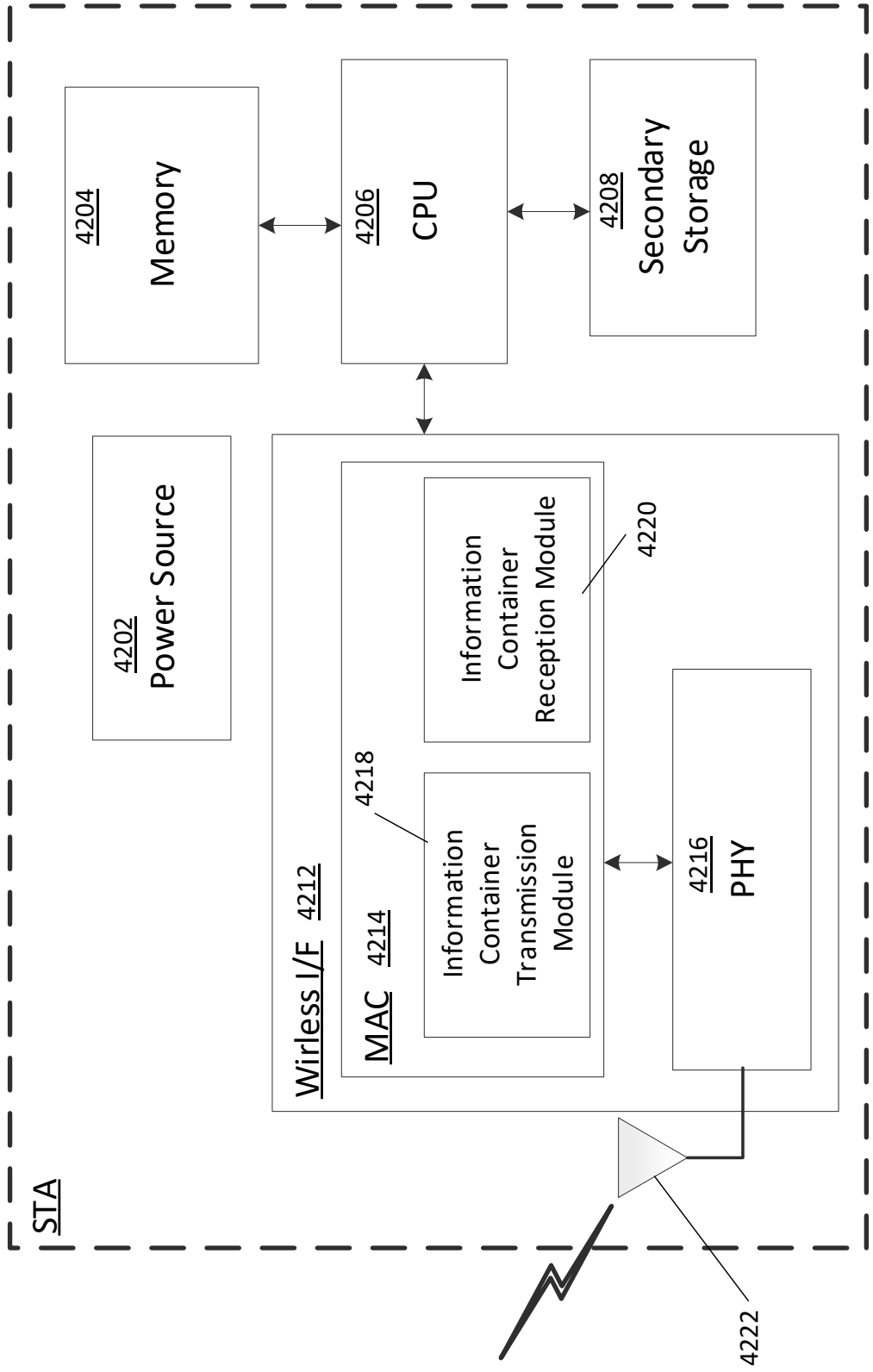

STA
4202
Power Source
4204
Memory
4206
CPU
4208
Secondary Storage
Wirless I/F 4212
MAC 4214
4218
Information Container Transmission Module
Information Container Reception Module
4220
4216
PHY
4222
4200

Figure 42

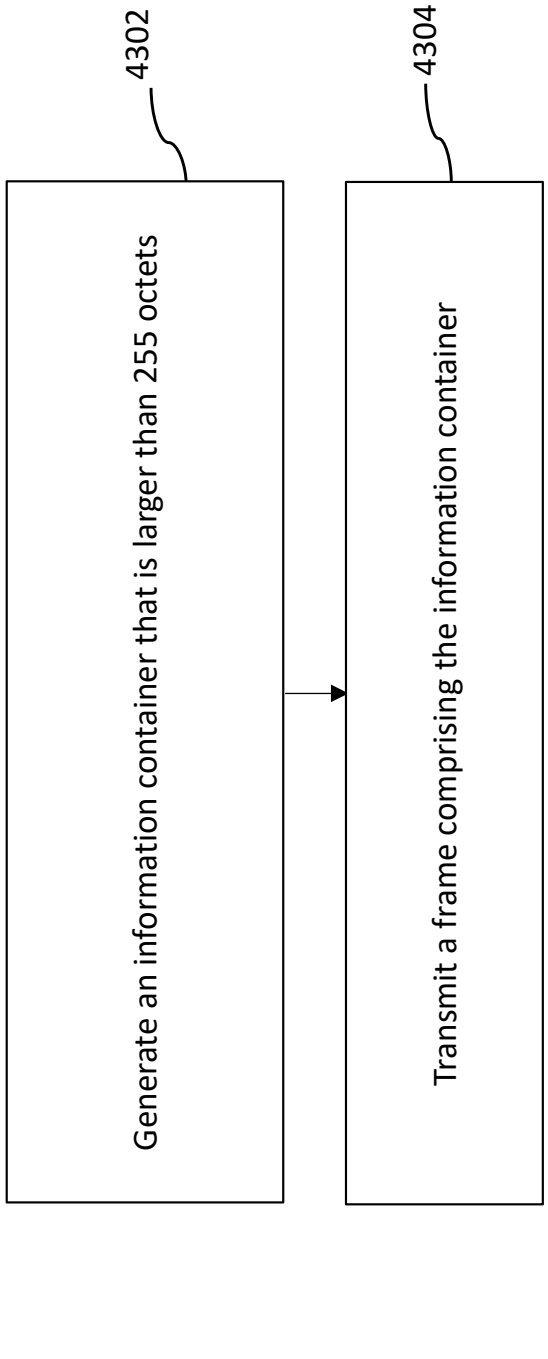

4302
4304
Generate an information container that is larger than 255 octets
Transmit a frame comprising the information container
4300

Figure 43

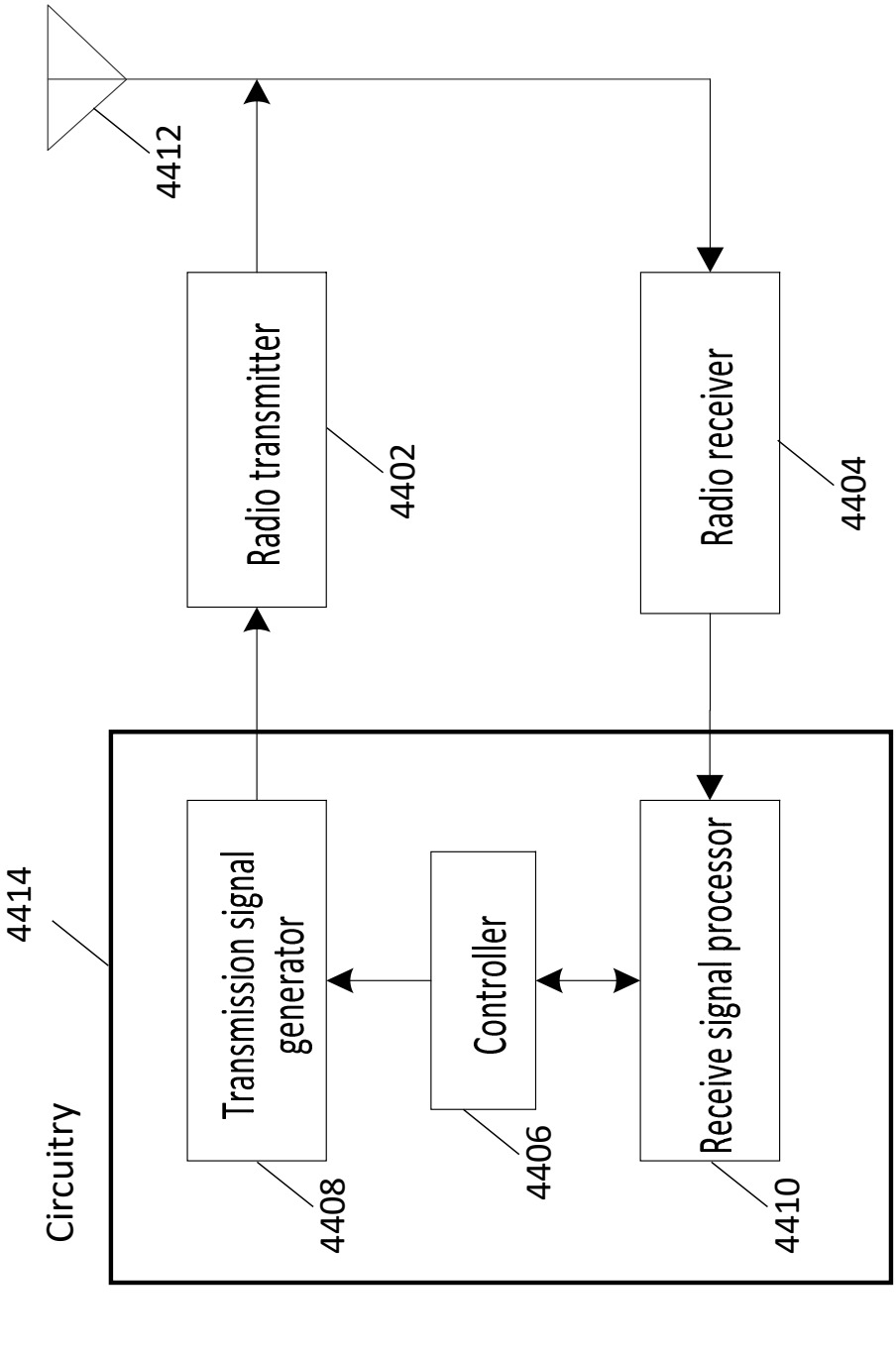

4412
Radio transmitter
4402
Radio receiver
4404
4414
Circuitry
Transmission signal generator
4408
Controller
4406
Receive signal processor
4410
4400

Figure 44