

144.3.5 Gate Processing

A key concept pervasive in Multipoint MAC Control is the ability to arbitrate a single transmitter out of a plurality of ONUs. The OLT controls an ONU's transmission by assigning grants.

The transmitting window of an ONU is indicated in the GATE message where each granted LLID is explicitly identified (*LLID #n* field, see 144.3.6.1) and granted (*Grant Length #n* field, see 144.3.6.1). All granted LLIDs share the same grant start time (*Grant Start Time* field, see 144.3.6.1). An ONU begins transmission when its *LocalTime* variable matches the value indicated in the *Grant Start Time* field in the GATE message. An ONU concludes its transmission with sufficient margin to ensure that the laser is turned off before the grant length interval has elapsed.

Multiple outstanding grants may be issued to each ONU. The OLT shall not issue more than the maximum supported maximum outstanding grants as advertised by the ONU during registration (see pending grants in 77.3.6.3).

In order to maintain the watchdog timer at the ONU, grants are periodically generated. For this purpose empty GATE messages may be issued periodically.

When registered, the ONU ignores all DISCOVERY GATE MPCPDUs where the Discovery flag is set.

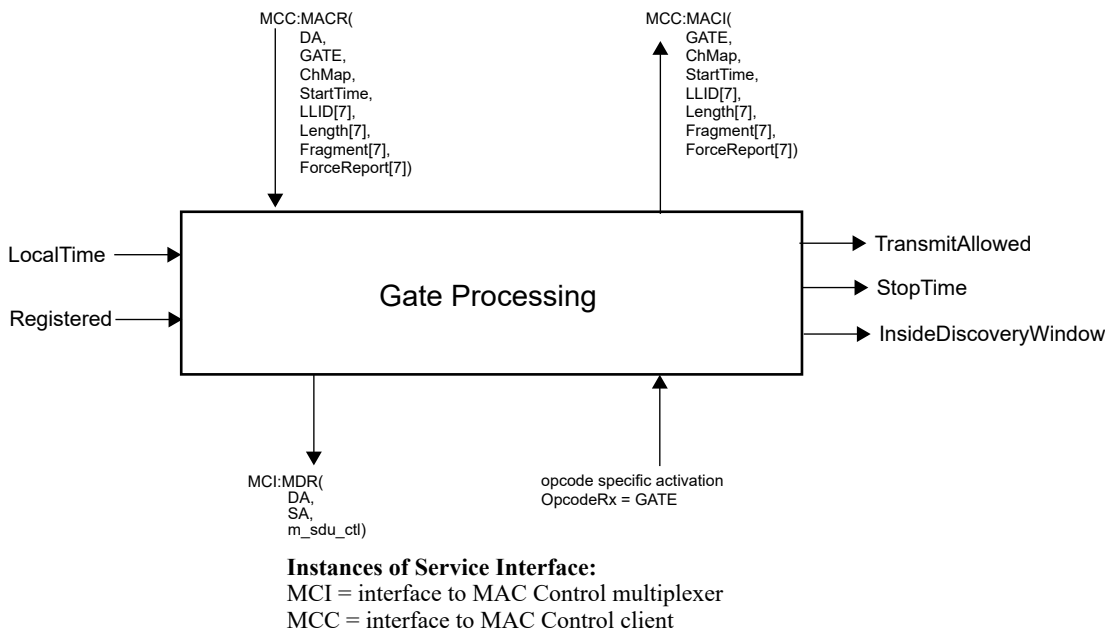


Figure 144–23—Gate Processing service interface

144.3.5.1 Constants

MpcpProcessingDly

TYPE: 32-bit unsigned

This constant represents the minimum time required for the ONU to complete MPCPDU processing, expressed in the units of 1 EQ.

Value: 0x00001900 (16.384 μs)

144.3.5.2 Variables

ChIndex

TYPE: 2-bit unsigned integer

The value of this variable indicates the channel the Envelope Descriptor is intended for, where the value of 0 corresponds to channel 0, value of 1 - channel 1, etc.

ChMap[]

TYPE: 4-bit unsigned integer

The value of this variable corresponds the value of bits 0 through 3 of the *Channel Assignment* field in the GATE MPCPDU (see Table 144–1).

ChStatus

TYPE: 4-bit unsigned integer

The value of this variable represents a binary-encoded status of individual channels at the ONU. The status of each channel is position encoded, where bit 0 corresponds to channel 0, bit 1 - channel 1, etc. The value of each bit has the following meaning:

1 = channel is enabled

0 = channel is disabled

144.3.5.3 Functions

None

144.3.5.4 Messages

MA_DATA.request (DA, SA, m_sdu)

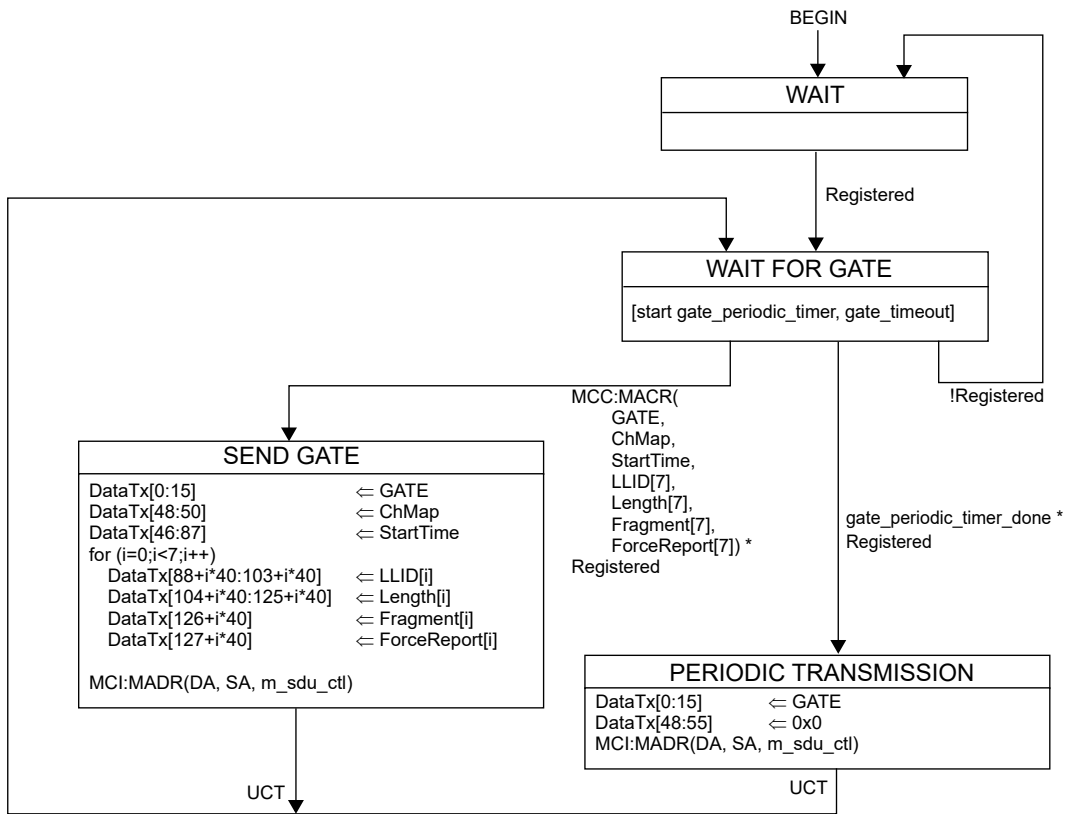
The service primitive is defined in 2.3.2.

MA_CONTROL.request(DA, GATE, ChMap, StartTime, LLID[7], Length[7], Fragment[7], ForceReport[7])

This service primitive is defined in 144.3.3.5.

144.3.5.5 State diagram

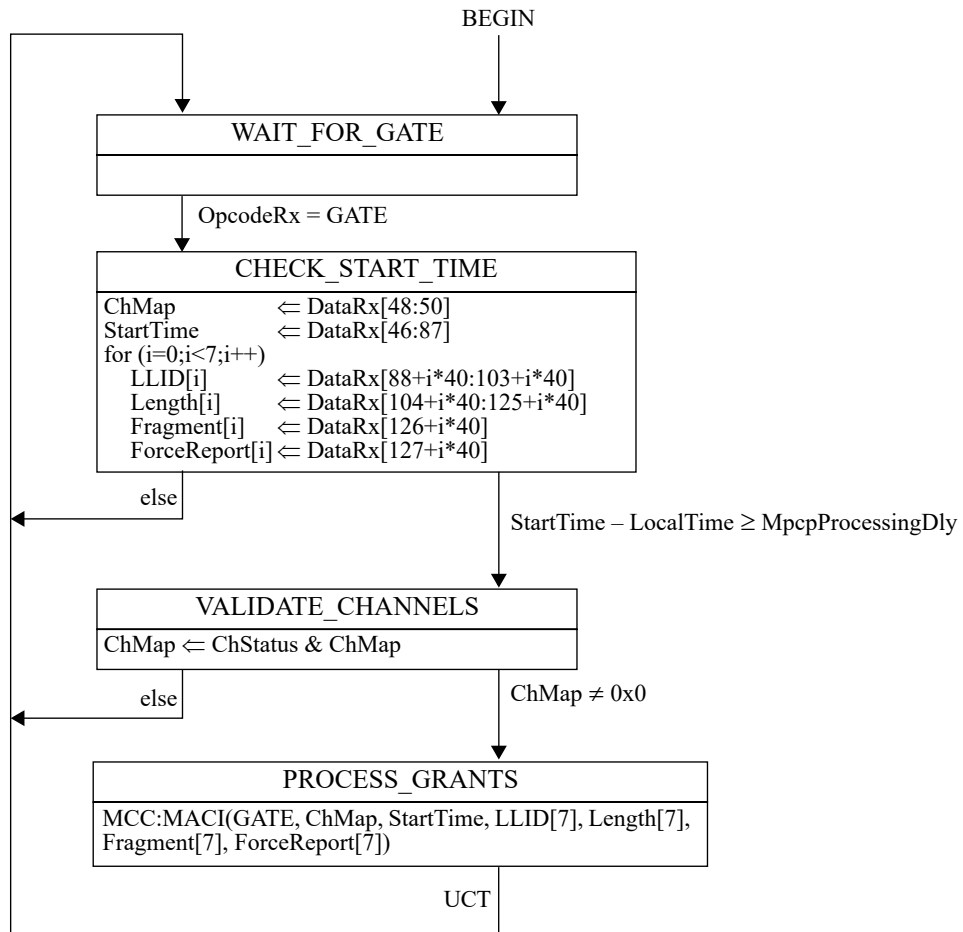
The Gate Process in the OLT shall implement the Gate Processing state diagram as shown in Figure 144–24. The Gate Process in the ONU shall implement the Gate Processing state diagram as shown in Figure 144–25. Should there be a discrepancy between a state diagram and descriptive text, the state diagram prevails.



Instances of Service Interface:
 MCI = interface to MAC Control multiplexer
 MCC = interface to MAC Control client

Figure 144–24—Gate Processing state diagram at OLT

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54



Instances of Service Interface:
 MCC = interface to MAC Control client

Figure 144–25—ONU GATE Reception Process state diagram

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54