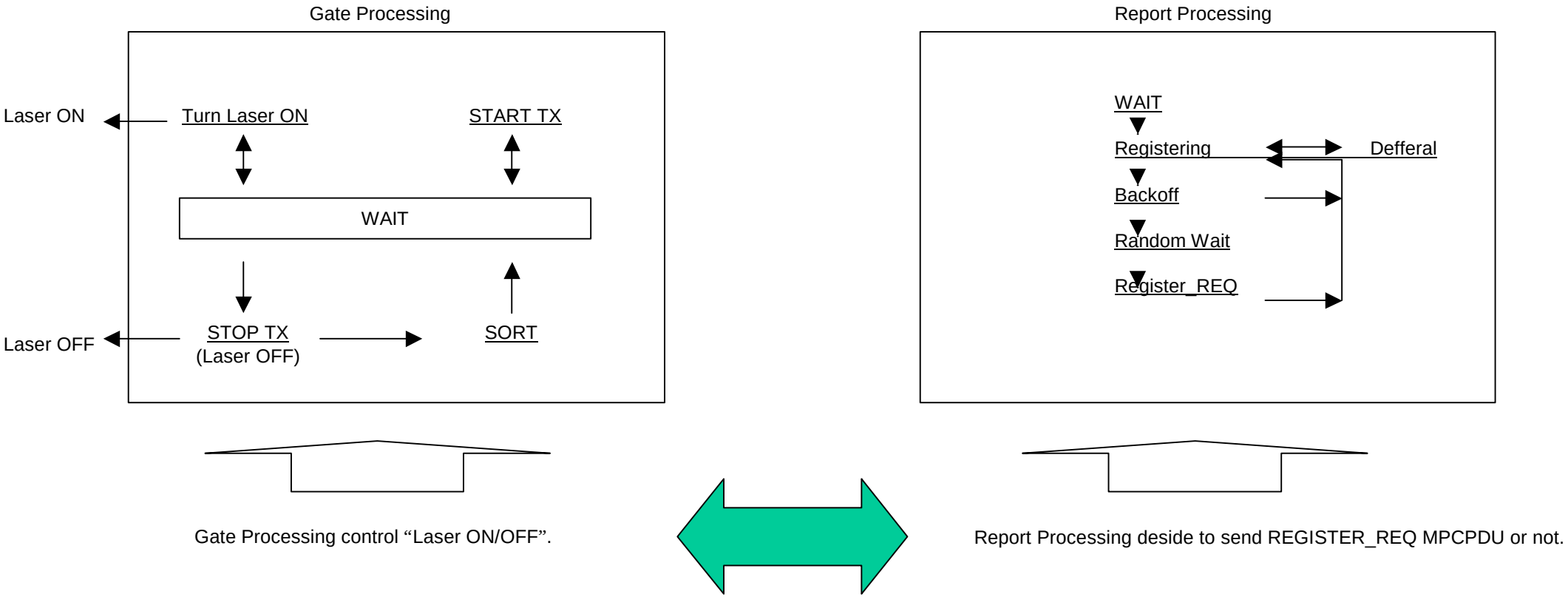
How about add a “Laser Control” into Discovery Proccesing State diagram.

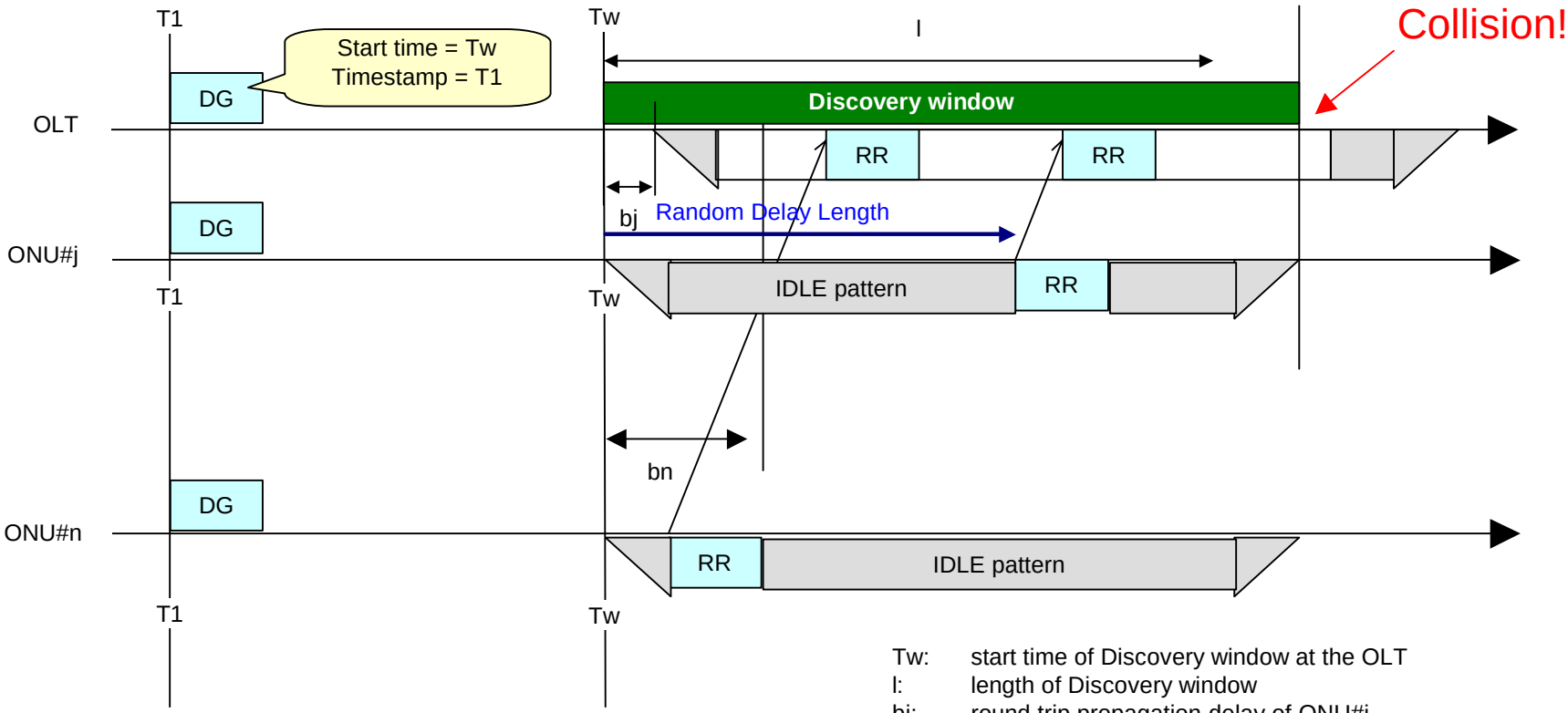
Yasuo Ogura NTT

Current state diagram : No relationship between Gate and Report



There is no relationship between “Gate Processing” and “Report Processing”, so that Laser will be ON/OFF independent to send Register_REQ or not.

Probrem : Collision in the Discovery window

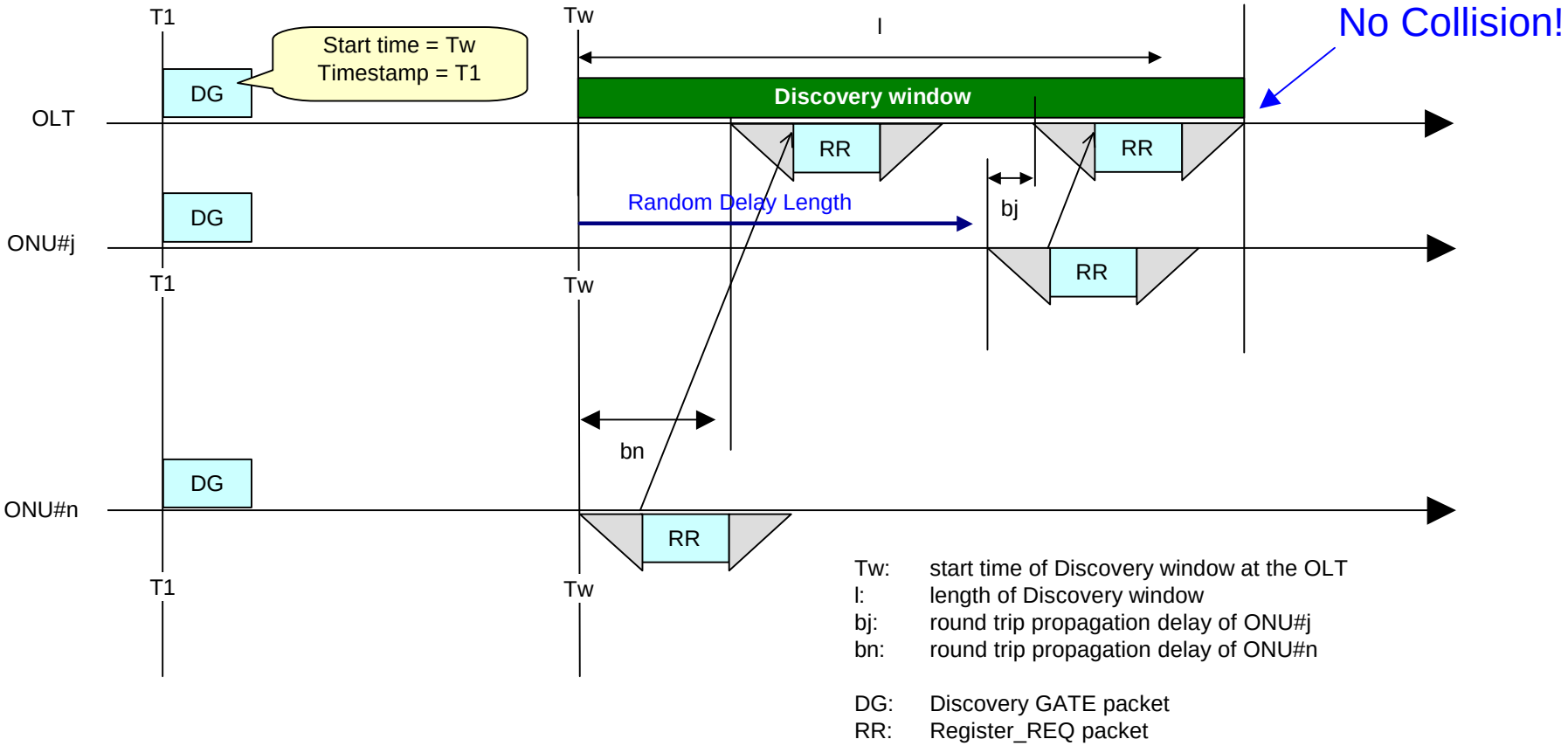


Tw: start time of Discovery window at the OLT
l: length of Discovery window
bj: round trip propagation delay of ONU#j
bn: round trip propagation delay of ONU#n

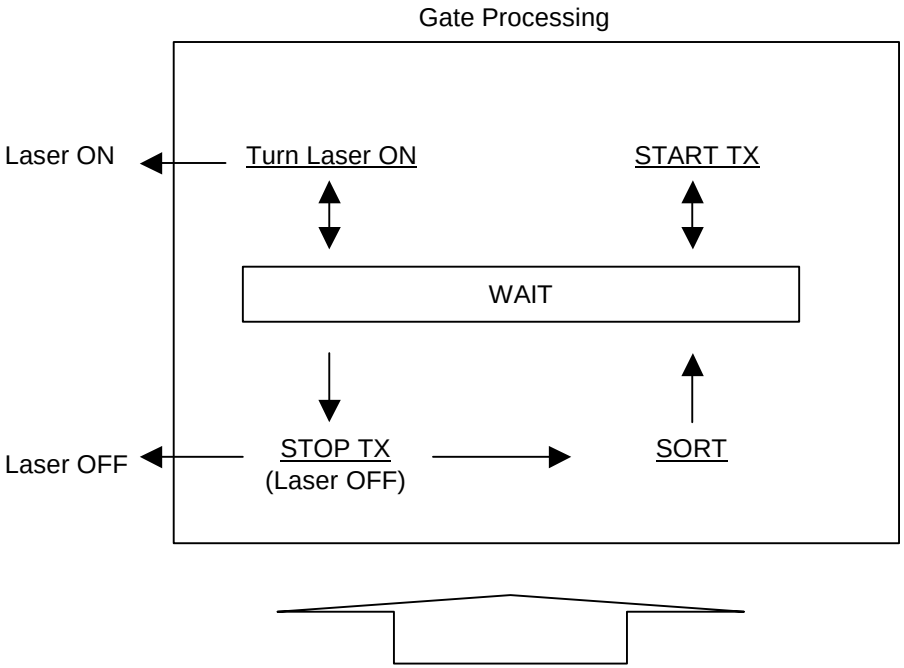
DG: Discovery GATE packet
RR: Register_REQ packet

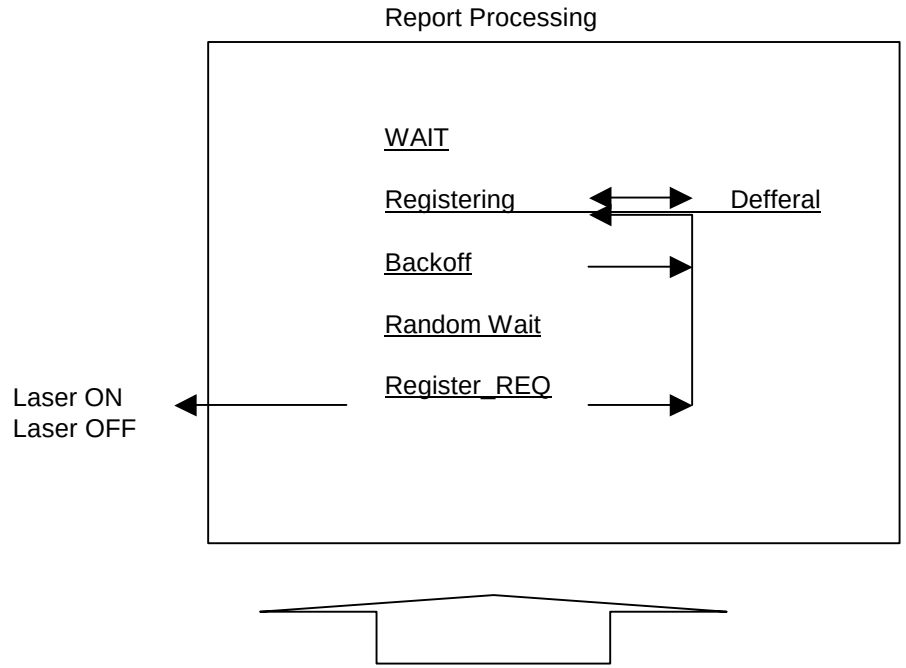
ONU#j and ONU#n turn Laser ON at the same time, collision will happen in the Discovery window.
It seems difficult to proccess AutoDiscovery successfully when multiple ONUs are power ON.

Solution:Laser ON/OFF during Register_REQ



How about turn laser ON while ONU is sending a Register_REQ only?
It seems easy that OLT receive multiple Register_REQ in a single Discovery Window.





NormalGATE : Gate Processing control “Laser ON/OFF” .
DiscoveryGATE: Discovery Processing should control.

Report Processing deside to send REGISTER_REQ MPCPDU and control Laser ON/OFF at the same time.

ONU decide to send Register_REQ or not in the Discovery Processing,

▼

In the Discovery Processing, ONU should contol Laser ON/OFF.
In the Gate Processing, only Normal GATE will be processed.

Proposal1 : OMP Parser/Multiplexer RX State Diagram

P.126 56.3.3.1.6 State Diagram

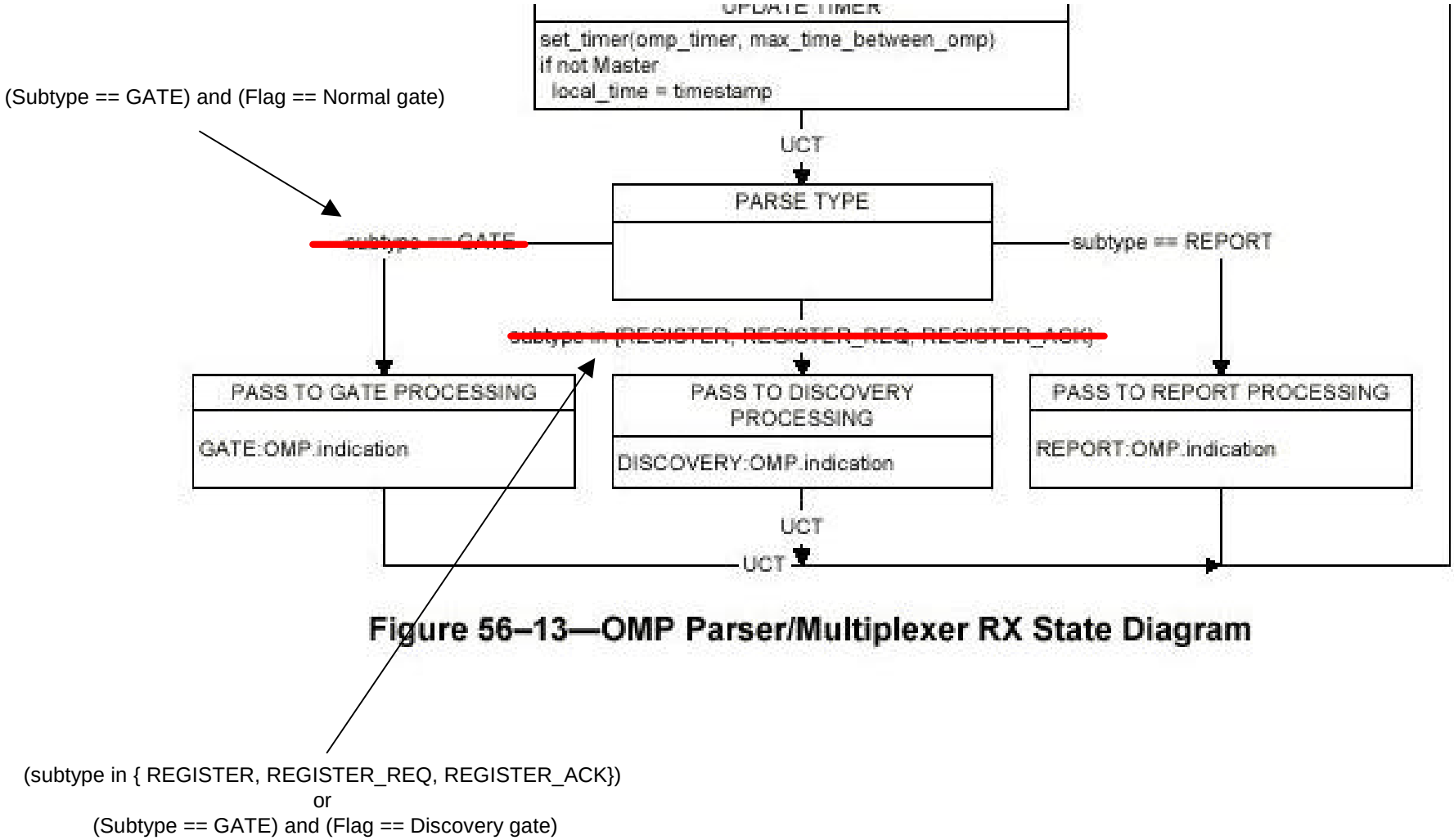


Figure 56–13—OMP Parser/Multiplexer RX State Diagram

Proposal2 : Discovery Processing Slave State Diagram 1

P.135 56.3.4.1.6 State Diagram

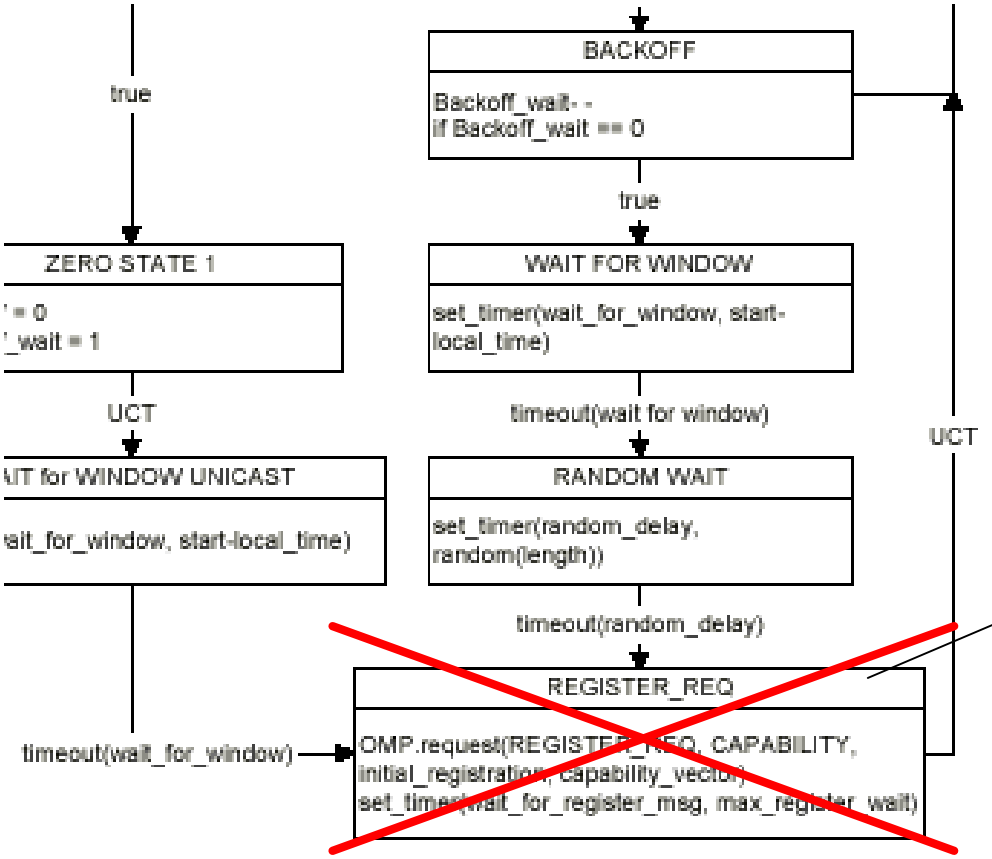
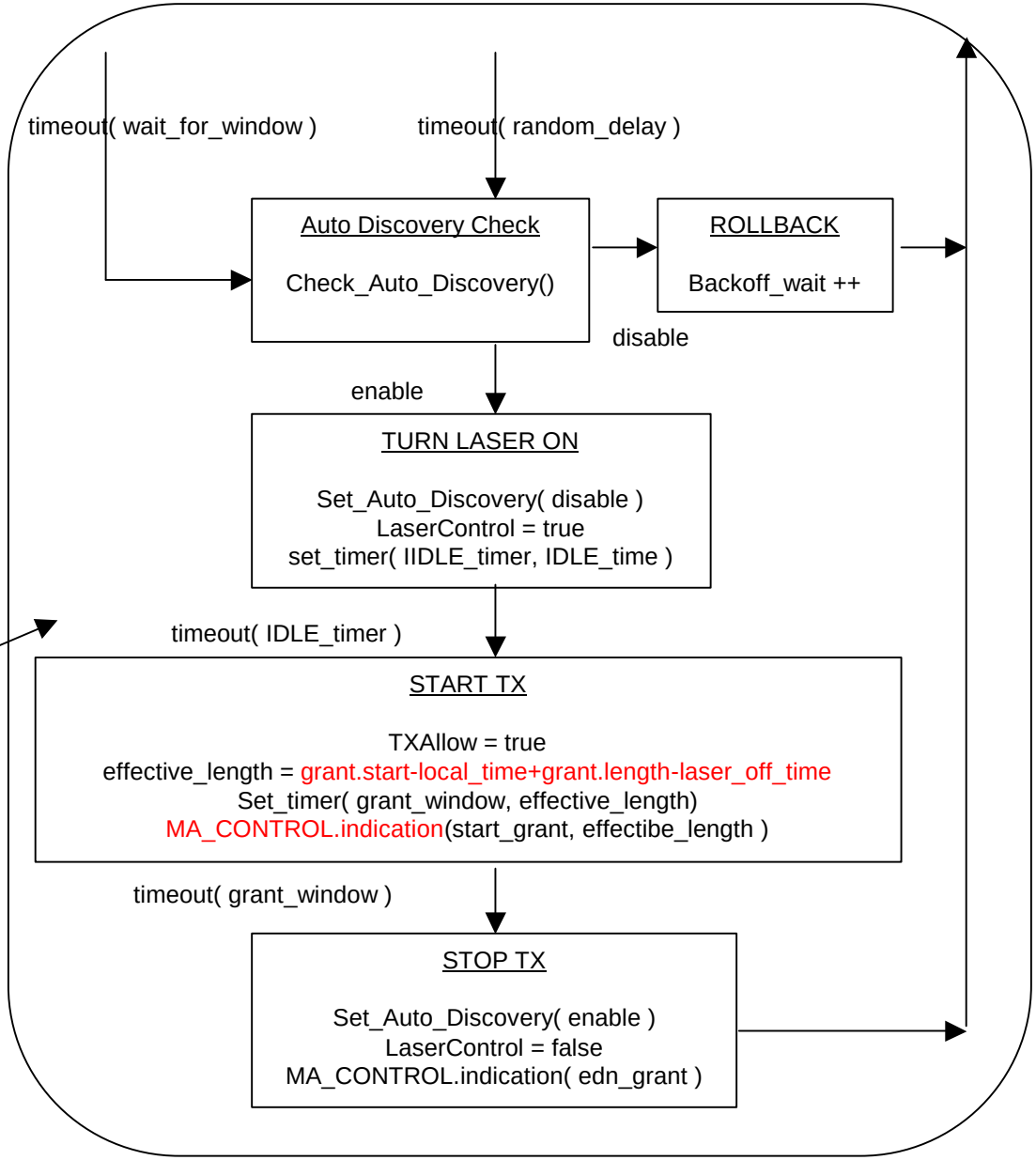


Figure 56–17—Discovery Processing Slave



Proposal3 : Add some variables and functions

56.3.4.1.2 Variables

LaserControl

This variable is used to control the transmit path. It is set to true when the transmit path is enabled, and is set to false when the transmit path is being shut down. LaserControl is always on for the OLT, except when disabled, and changes its value according to the state of the Gate Processing sublayer.

TYPE: on/off

DEFAULT VALUE: off for ONU

on for OLT

TXAllow

This variable is used to control PDU forwarding in the transmit path. It is set to true when the transmit path is enabled, and is set to false when the transmit path is being shut down. TXAllow is always true for the OLT, and changes its value according to the state of the Gate Processing sublayer.

TYPE: boolean

DEFAULT VALUE: false for ONU

true for OLT

time

This variable is used for temporary storage of a normalized time value. It holds the expected start time of an event normalized for elapsed time.

TYPE: 32 bit unsigned

DEFAULT VALUE: 00-00-00-00

effective_length

This variable is used for temporary storage of a normalized net time value. It holds the net effective length of a grant normalized for elapsed time, and compensated for the periods required to turn the laser on and off, and waiting for receiver lock.

TYPE: 32 bit unsigned

DEFAULT VALUE: 00-00-00-00

laser_on_time

This variable holds the time required to initiate the laser. It counts in time_quanta units, the time from the LaserControl signal assertion, to the point where transmission output is stable and decodable.

This value is typically hard coded or sensed by higher layers and then set.

TYPE: 32 bit unsigned

DEFAULT VALUE: 00-00-00-3E (992 nano seconds)

IDLE_time

This variable holds the time required to stabilize the receiver at the OLT. It counts in time_quanta units from the point where transmission output is stable to the point where it is decodable.

This value is set following registration, as it is broadcast by the OLT.

TYPE: 32 bit unsigned

DEFAULT VALUE: 00-00-00-10 (256 nano seconds)

laser_off_time

This variable holds the time required to terminate the laser. It counts in time_quanta units, the time from the LaserControl signal deassertion, to the point where transmission output is undetectable.

This value is typically hard coded or sensed by higher layers and then set.

TYPE: 32 bit unsigned

DEFAULT VALUE: 00-00-00-3E (992 nano seconds)

56.3.4.1.3 Functions

Boolean Check_Auto_Discovery()

This function is used to check whether any other LLIDwere processing Auto Discovery.When the function returns the value enable, you can start to send a REGISTER_REQ, and flase otherwise.

Set_Auto_Discovery(enable/disable)

This function is used to set disable before sending REGISTER_REQ, and set enable when after sending a REGISTER_REQ.During setting disable, you can inhibit any other LLID are sneding REGISTER_REQ.