



Terawave Communications, Inc.

P13- An EPON System

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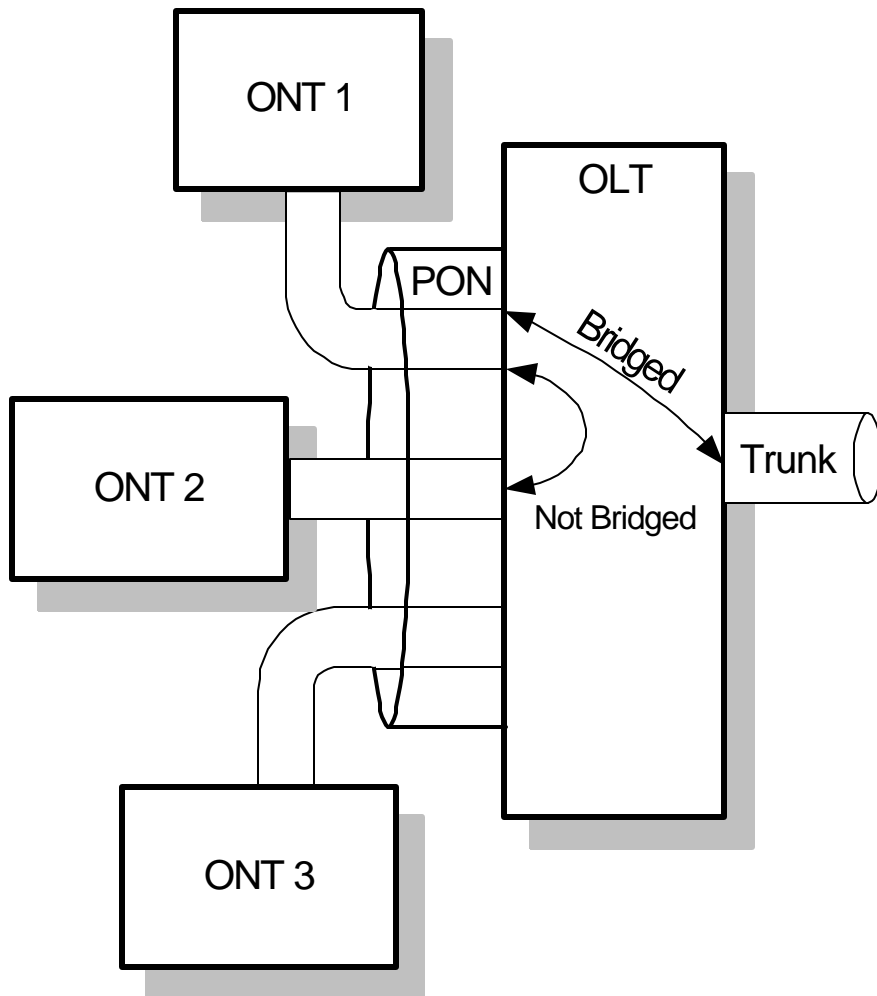
Advanced features in the OLT

- The OLT determines the performance of the system
- The OLT may be basic to full featured – let the customer decide.
- Configuration contained in the OLT
- Any delay compensation is contained in the OLT
- Less messaging makes compatibility simpler

Keep the ONT Simple

- No synchronization
- No delay compensation
- Minimal configuration
- No fragmenting frames

An EPON Network Model



- ✍ Traffic is bridged only to the trunk
 - Broadcast traffic from an ONT is not resent on the PON
 - Traffic must be routed to go between ONTs
- ✍ Other ONTs are not your peer in an access network
- ✍ Still have a peer-to-peer network with the trunk
- ✍ Similar to 802.1p/q VLAN to trunk
- ✍ Do not modify the 802.3 Frame Format with headers



Request-Grant Architecture

New MAC Control Frames Grant Bandwidth

- Frames are sent to each ONT MAC address.
- Broadcast MAC address used for establishing upstream link.

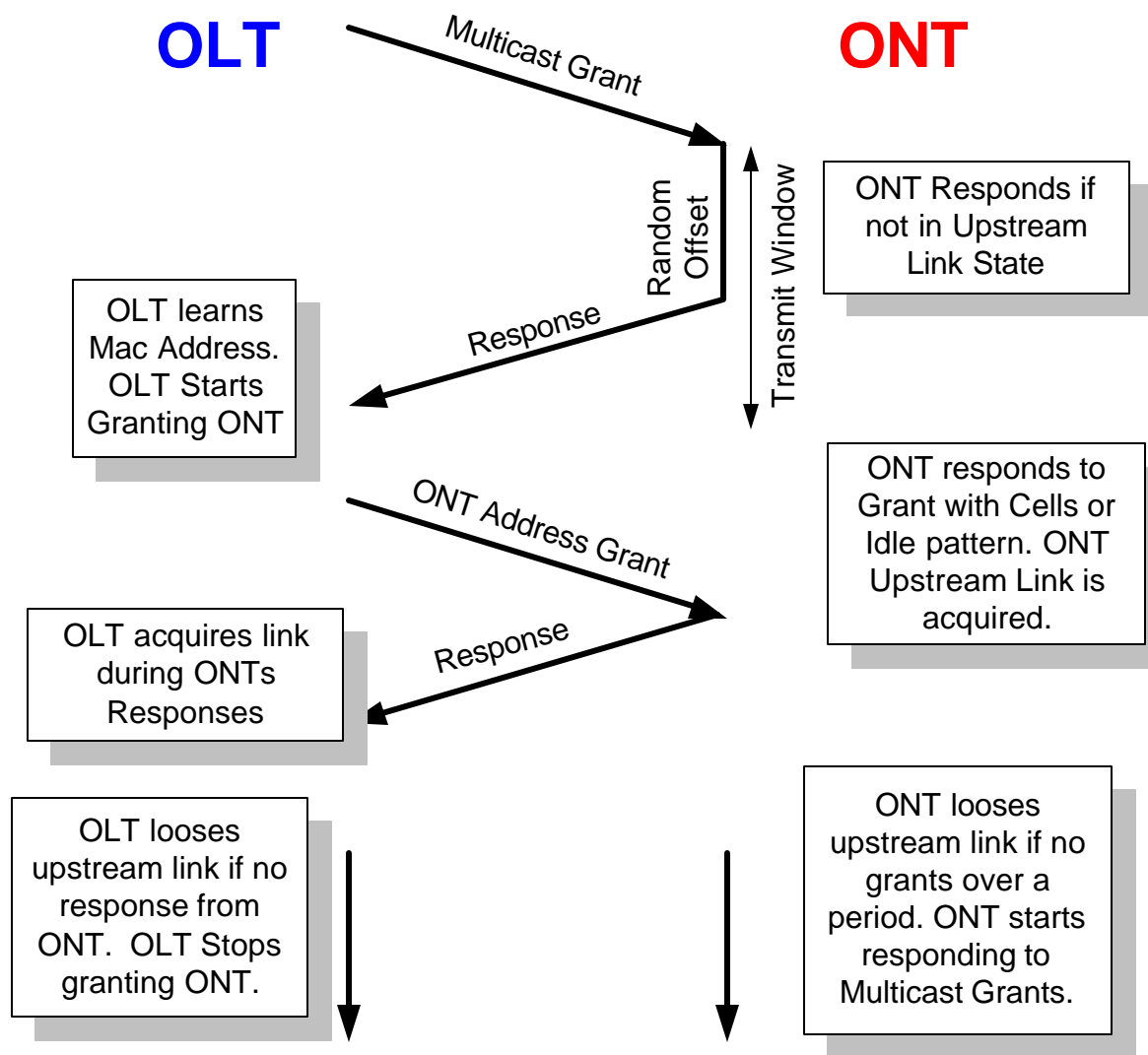
Optional New MAC Control Frames may Request Bandwidth

- Frame are sent by an ONT to an OLT
- Request Frames not used in a static system

Bandwidth allocation may be static or dynamic.

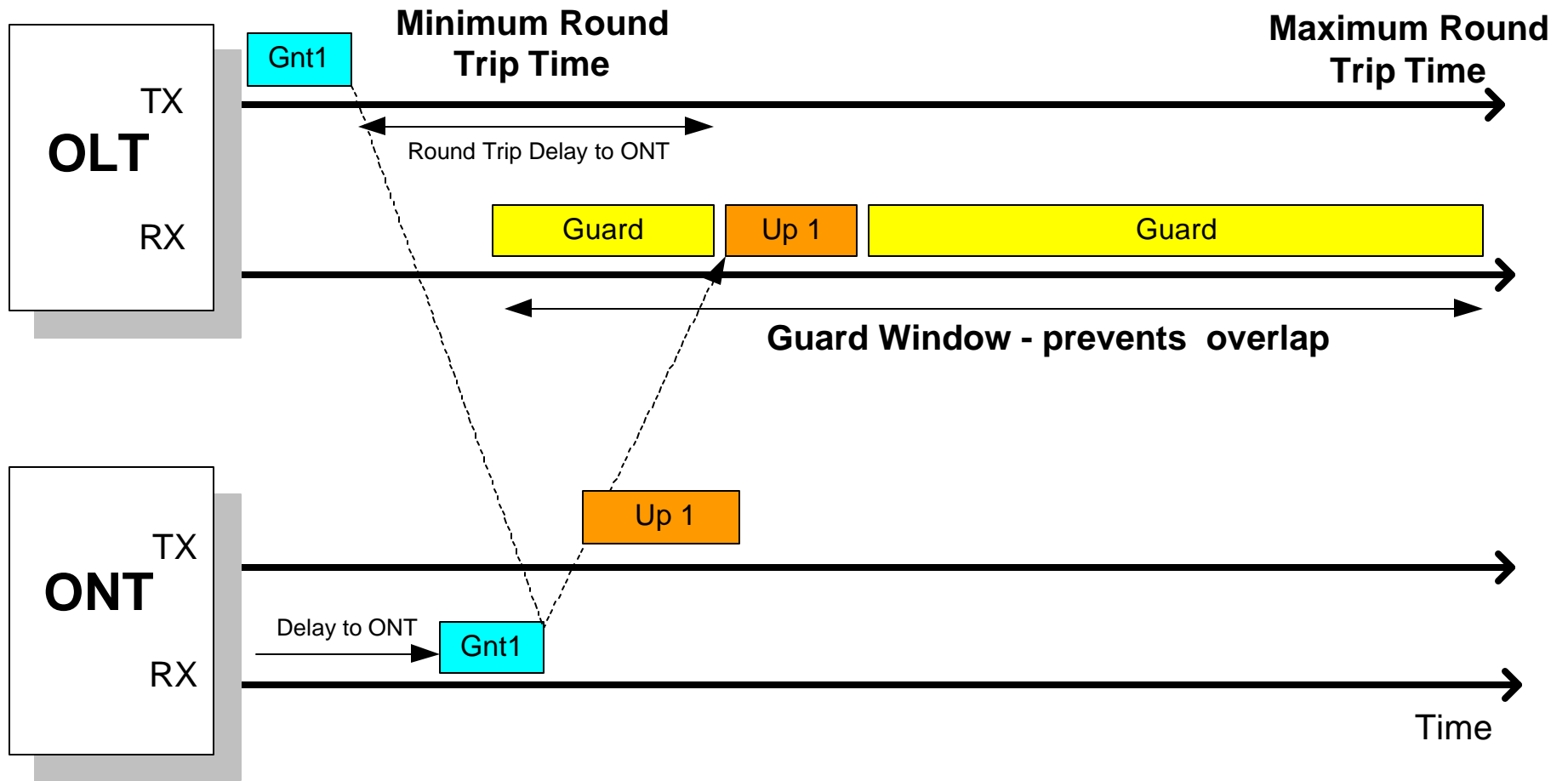
- Does not inhibit SLAs, QoS, or over subscription.
- No rigid frame structures limiting data rate or latency

Upstream Link



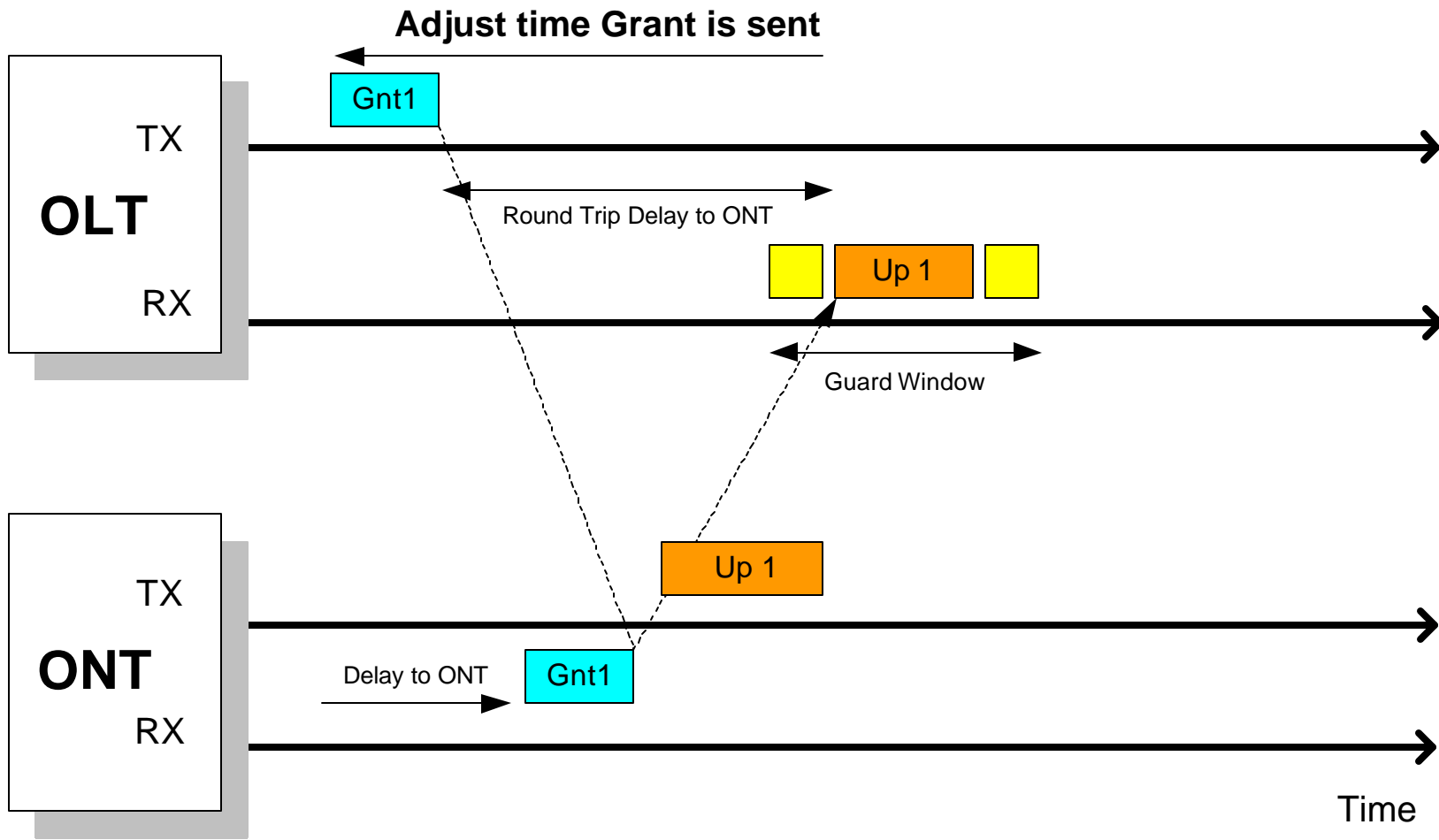
- ✍ Both OLT and ONT maintains upstream link state
- ✍ OLT must first learn MAC Address of ONT.
- ✍ Link acquired with Idle and Frames similar to 1000BX

A Simple Non Delay Compensated system



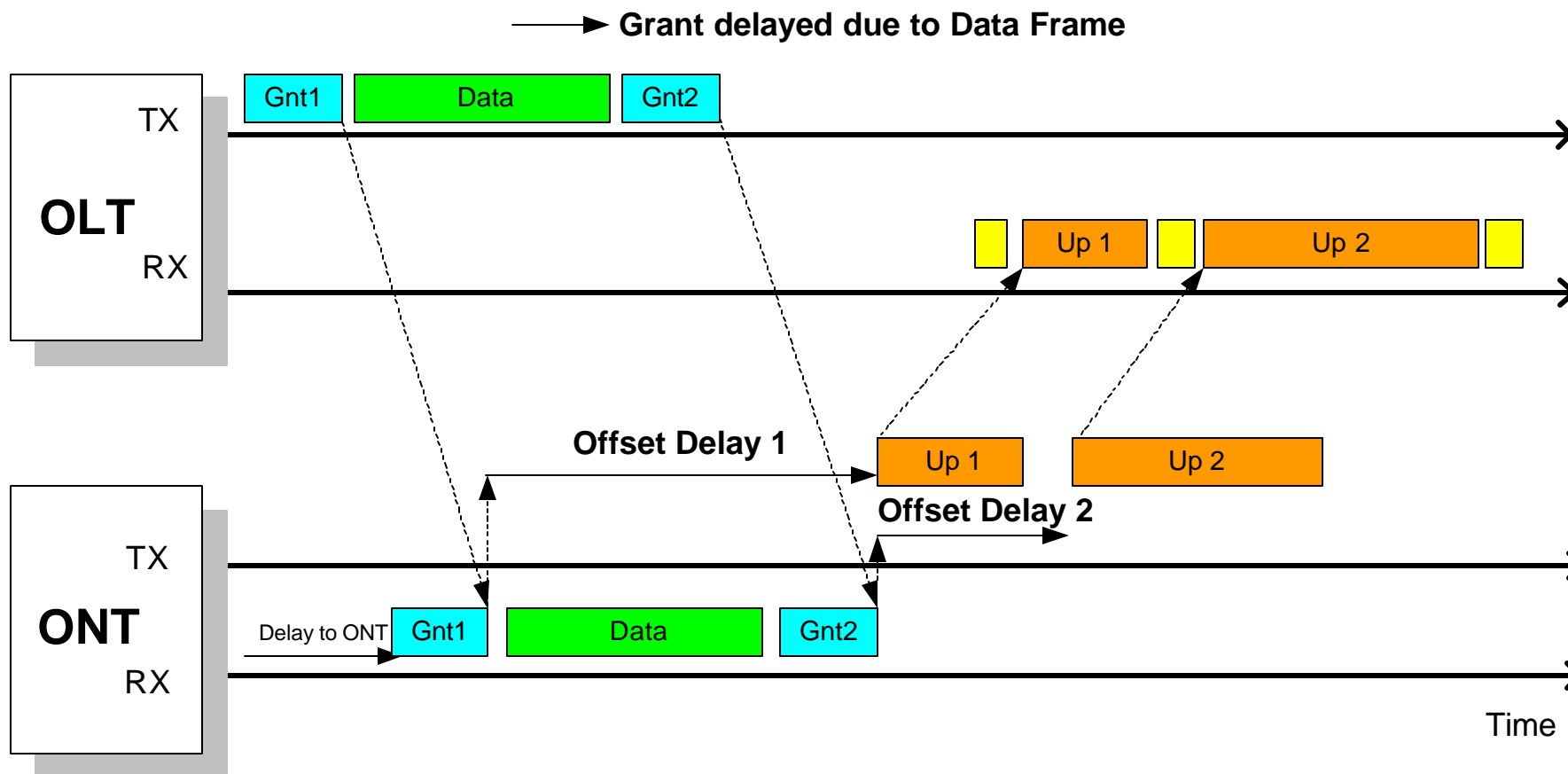
 Guard Time Large enough to prevent overlap at receive

An Optional Delay Compensated system



- ✍ Compensate for delay by adjusting when Grant is Sent.
- ✍ Guard Window is Reduced, Upstream Bandwidth is Increased

Delay Compensation-Continued



- ✍ Offset Delay will be used to resolve contention in the OLT.
- ✍ The ONT transmits after delaying by the Offset Delay.
- ✍ Offset Delay may be adjusted for each Grant.

Summary



- ✍ The complexity of the system is contained in the OLT.
 - Optional delay compensation
 - Optional dynamic bandwidth allocations
 - Minimal interaction with the ONTs.
- ✍ The ONT is very simple.
 - No knowledge of delay compensation.
 - No synchronization
 - No distributed state (configured grants or ranging delays)
- ✍ ONTs are bridged to the trunk and not to other ONTs

The End.

