1 Gbps to 10 Gbps Migration

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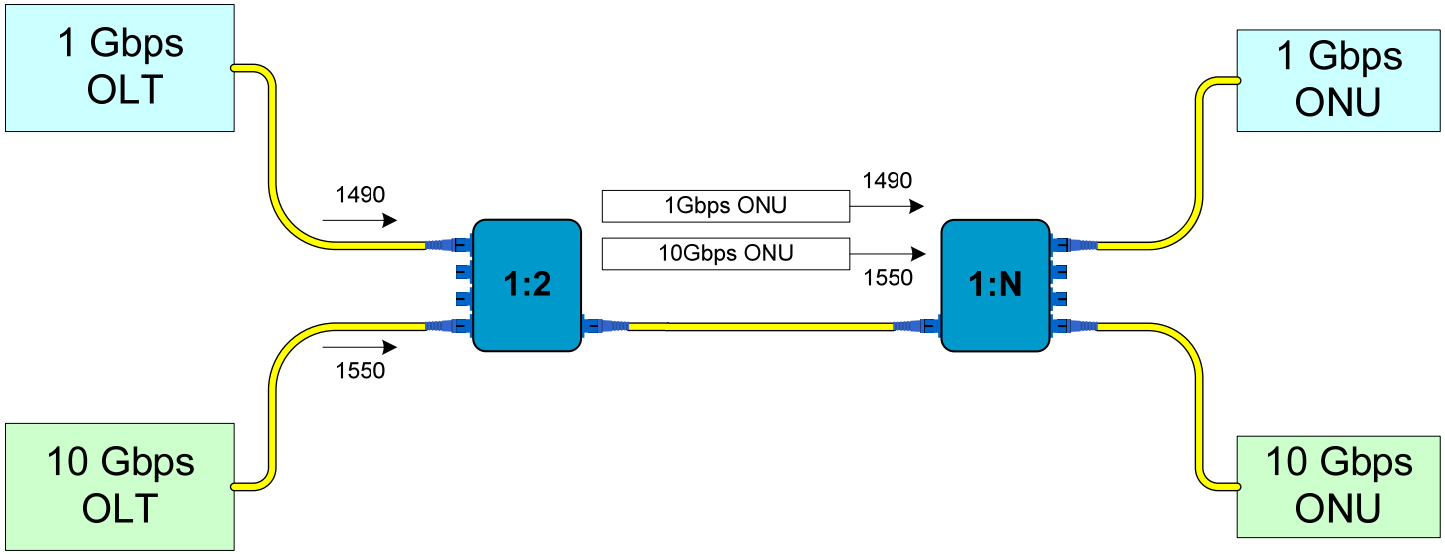
Multiple Options

- Operators who have deployed 1Gbps PON have seamless migration paths to 10Gbps

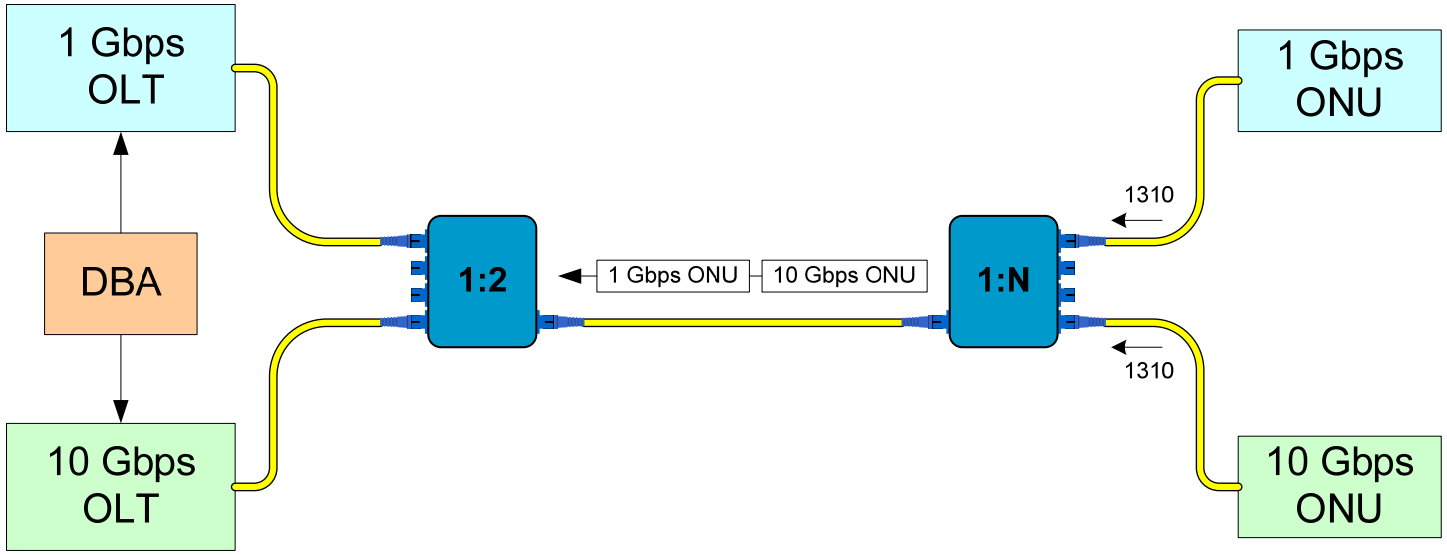
- Option1 : OLT upgrade
  - Support both 1 and 10Gbps ONUs simultaneously
- Option2 : ONU upgrade
  - Rate sensing ONU can operate at 1 or 10Gbps
  - When all ONUs are converted OLT may be upgrade from 1 to 10Gbps

OLT: Downstream path migration



- 1 Gbps and 10 Gbps may use different lambdas in the downstream (i.e. 1490nm for 1 Gbps and 1550nm for 10 Gbps)
- Each lambda operates its own MPCP MAC
- ONUs use a blocking filter or WDM to receive their lambda

OLT: Upstream path migration

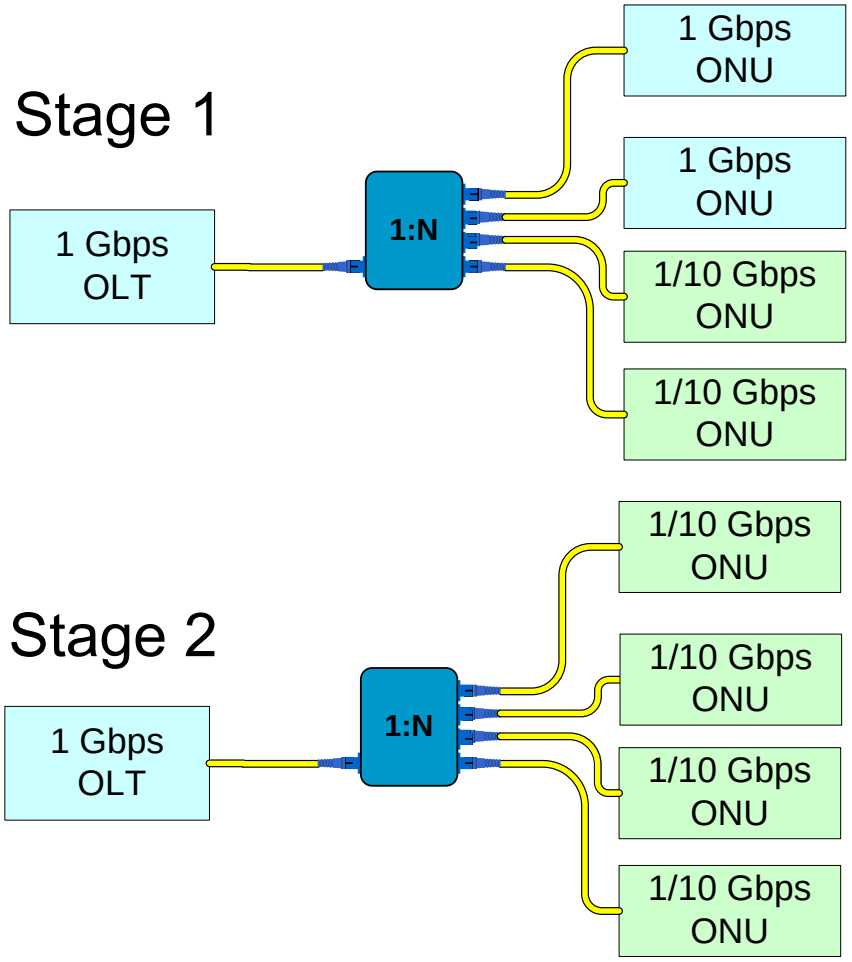


- Upstream path may use a common 1310 lambda
- TDMA multiplexing of each ONU is a function of the DBA.
- A common DBA function can schedule upstream for both 1Gbps and 10Gbps ONUs such that the upstream bursts do not overlap.
- A 10Gbps ONU may transmit upstream at 1Gbps or 10Gbps.

OLT: Benefits

- Central office equipment may be upgraded to 10 Gbps while still supporting 1 Gbps ONUs in the field.
- ONUs may be upgraded as required to offer advanced 10 Gbps services.
- Solution is compatible to current IEEE 802.3ah standard. No changes to the MAC or MPCP would be required.
- Clock recovery at the OLT receiver could lock to a 1 Gbps or 10 Gbps upstream burst making dual upstream rates feasible.
- Common DBA function prevents optical collisions in the upstream.

ONU: Migration



- Stage 1:
  - Upgrade with dual sensing ONUs
- Stage 2:
  - When all ONUs upgraded, convert OLT

Conclusion

- **Seamless upgrade paths for 1 GEPON to 10 GEPON exist.**
- **10 Gbps and 1 Gbps EPON may coexist on the same fiber plant.**
- **Upgrade path is choice of operator, and may not be limited by IEEE standard.**