144.3.7 Discovery Process in dual-rate systems

The MPCP Discovery Process (see 144.3.5) facilitates the coexistence of different types of Nx25G-EPON ONUs on the same PON. The coexistence mode allows, for example, 25/10G-EPON, 50/10G-EPON, and 50/25G-EPON ONUs to be deployed on the same ODN and to be connected to the same Nx25G-EPON OLT.

144.3.7.1 OLT rate-specific discovery

The DISCOVERY MPCPDU (see 144.3.4.6) includes the *DiscoveryInfo* field, which gives the Nx25G-EPON OLT control over the types of ONUs allowed to participate in the given discovery window. Using the *DiscoveryInfo* field, the OLT indicates its receive line rate capabilities (10 Gb/s and/or 25 Gb/s) as well as the specific line rate(s) allowed in the given discovery window. The OLT may open separate (non-overlapping) discovery windows for 10 Gb/s and 25 Gb/s transmission using two separate DISCOVERY MPCPDUs or it may open a single discovery window for both 10 Gb/s and 25 Gb/s line rates using a single DISCOVERY MPCPDU.

Table 144-9 illustrates the different types of ONUs that may respond to a DISCOVERY MPCPDU with the given settings of the *DiscoveryInfo* sub-fields.

Table 144–9—DISCOVERY MPCPDUs for various Nx25G-EPON ONU types

ONU types targeted by DISCOVERY MPCPDU					*DiscoveryInfo* field value			
					Upstream capable		Discovery window	
25/10G-EPON	25/25G-EPON	50/10G-EPON	50/25G-EPON	50/50G-EPON	10G	25G	10G	25G
X		X			1	0/1	1	0
	X		X	X	0/1	1	0	1
X	X	X	X	X	1	1	1	1

144.3.7.2 ONU rate-specific registration

An unregistered Nx25G-EPON ONU is capable of receiving DISCOVERY MPCPDU transmitted by the OLT on DISC_PLID. When received by a 25/10G-EPON or 50/10G-EPON ONU, the DISCOVERY MPCPDU is parsed, and if a 10 Gb/s discovery window is opened, the ONU may attempt to register in the EPON, if other conditions are also satisfied (see definition of the *RegAllowed* variable in 144.3.5.3). When received by a 25/25G-EPON, 50/25G-EPON, or 50/50G-EPON ONU, the DISCOVERY MPCPDU is parsed, and if a 25 Gb/s discovery window is opened, the ONU may attempt to register in the EPON.

In general, the ONUs attempt to register using the highest upstream transmission rate supported by both the OLT and the ONU. If the OLT advertised itself as 25G-capable, but in the current DISCOVERY MPCPDU it has not enabled the 25 Gb/s discovery window, the 25G-capable ONU skips such discovery attempt and waits for a future discovery window in which 25 Gb/s transmission is enabled.

Table 144–10 shows the action the ONU shall take based on the ONU transmit capabilities and the received discovery information.

Table 144–10—ONU action during discovery window

DiscoveryInfo field				ONU upstream capability		ONU action
Upstream capability		Discovery window				
10G	25G	10G	25G	10G	25G	
1	0	1	0	1	0/1	Attempt 10G registration
1	0/1	1	0/1	1	0	Attempt 10G registration
0/1	1	0/1	1	0/1	1	Attempt 25G registration
1	1	0	1	1	0	Wait for 10G discovery window
1	1	1	0	0/1	1	Wait for 25G discovery window

The ONU transmits the REGISTER_REQ MPCPDU in envelopes with the discovery PLID (DISC_PLID, see 144.3.3).