

1 4.7 User Population/Split Ratio

2 ODN splitter architectures can be grouped into two categories: pay-as-you-grow approach and
3 capex-first approach, ~~the choice of which will impact splitter fill rates.~~

4 ~~One of the splitter architectures adopts a~~ pay-as-you-grow approach. ~~With this~~
5 ~~architecture,~~ the fiber drop (the fiber connecting from the last splitter to the user's ONU
6 location) is connected to the splitter only when service is ready to be activated. ~~Following this~~
7 ~~approach a~~ An single OLT port, feeder fiber, and splitter are all activated based on demand, and
8 subscribers are connected as needed ~~only when service request comes in~~. Once the splitter is
9 filled, a second OLT port, feeder fiber, and splitter are activated. This approach maximizes
10 utilization of OLT and ODN resources and leads to relatively high splitter fill ratios for splitters.

11 ~~In the capex-first approach, A second splitter architecture adopts a less tedious operational~~
12 ~~model. In this approach every every possible~~ potential user is pre-connected to a splitter port,
13 and all splitters and ~~upstream~~ OLT ports are pre-activated. This approach requires higher initial
14 capital investment (capex) and typically leads to relatively lower splitter fill (on average, equal to
15 the take rate), ~~though~~. ~~The advantage is has~~ lower operational ~~cost~~ expenses (opex), as no
16 truck rolls to the splitters are required to connect subscribers as they request service.

17 At this time, there are no consistent studies of the average number of subscribers connected to
18 a single OLT port in FTTx architectures around in the world. Using data on ONU and OLT port
19 shipments around the world [34], it is possible to conclude that a rather low split ratio is most
20 commonly used, ranging from 1:4 to 1:16, depending on the number of actual OLT ports
21 brought into service. Most new FTTx projects assume 1:16 or 1:32 split ratios, primarily to offset
22 ~~CAPEX~~ capex (electronics and fiber infrastructure) and future ~~OPEX~~ opex related primarily with
23 fiber infrastructure. The number of actual connected and active subscribers is typically lower
24 than the number of splits in the ODN connected to a single OLT port. Depending on the adopted
25 deployment model, demographics, and local competition, take rates between 20% and 90% are
26 common. Take rates of 100% can only be achieved in communities where fiber is connected to
27 all homes in the community and included in a contractual package for residents [44]. It is,
28 therefore, typically very hard to predict with any level of confidence how many active
29 subscribers are present on the access platform once it is deployed, at least as far as residential
30 access is concerned. This deployment model also requires the operators to deploy the capacity
31 first (~~most of CAPEX up front~~ capex-first) and add customers on demand, as services are
32 requested.