



# Extended Spectrum DOCSIS to the rescue

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Cable operators are always looking for the most efficient ways to expand and upgrade their networks to meet increasing customer demand for bandwidth. It is a delicate balancing act of many different factors, including demand, cost, revenue, etc. In this blog, we'll look at Extended Spectrum DOCSIS (ESD), and how some operators are planning to use it to meet customer demand in the near future.

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## Introduction

Cable operators are always looking for the most efficient ways to expand and upgrade their networks to meet increasing customer demand for bandwidth. It is a delicate balancing act of many different factors, including demand, cost, revenue, etc. In this blog, we'll look at Extended Spectrum DOCSIS (ESD), and how some operators are planning to use it to meet customer demand in the near future.

## Upstream demand a key factor

Before we get into ESD, let's explain some critical factors that are influencing operators' network expansion plans. In the past, most of the network demand / congestion was driven by downstream usage, hence why your typical Internet plan offers asymmetric speeds. A typical plan would give a customer 100 Mbps downstream but only 10 Mbps upstream.

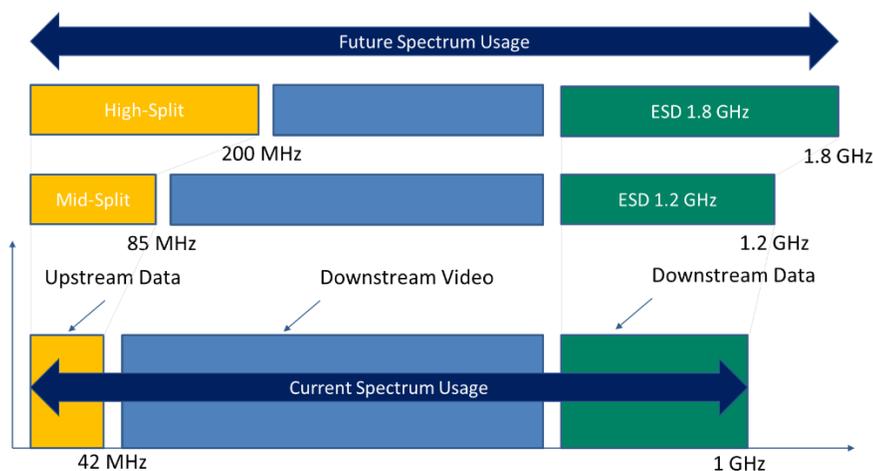
In the near future, however, the congestion is primarily upstream, a crucial change to understand. This upstream demand is driven primarily by "smart home" applications like video monitoring or smart doorbells, and also the increasing use of cloud storage. Hence, previous strategies for network deployments may need to change.

## Previous node actions may not apply

The second factor influencing network planning is that previous node actions used to address congestion may not be as effective in the future. Strategies such as fiber deep and fiber to the home (FTTH), while they effectively address congestion and future demand, are relatively expensive and time consuming, not to mention often including permitting challenges. BAU node splits, on the other hand, simply don't offer enough of a boost to keep up with demand in many cases.

Operators are looking for a way to address upstream demand that is less construction and permitting intensive than Fiber Deep / FTTH, but more of a long-term solution than node splits.

## Enter Mid Split, High Split, and Extended Spectrum DOCSIS



Mid-Split and High-Split are a range of node actions that either extend the portion of usable spectrum or make more efficient use of existing spectrum.

Mid-Split and High-Split take a portion of downstream spectrum and apply it to the upstream. This relieves upstream congestion but comes at a cost of losing some downstream capacity.

Extended Spectrum DOCSIS (ESD) extends the usable portion of the spectrum from 1GHz to as much as 1.8GHz, thus providing additional

bandwidth for both upstream and downstream. How this spectrum is allocated can vary depending on the operators' needs.

### What is the problem?

Traditional access network upgrade techniques such as node-split and fiber-deep are construction intensive and costly.

### Key Takeaways

- Upstream demand is growing
- Node-splits and fiber deep are construction intensive
- Mid-split and high-split can relieve upstream congestion
- Extended Spectrum DOCSIS (ESD) provides additional capacity without additional construction



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## Advantages

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The main advantage of using mid-split, high-split, and ESD actions is that it is far less construction and permitting intensive than the alternatives. In the case of mid-split, no new nodes or fiber need to be deployed. It's a simple module swap at the node and the amplifiers. In the case of high-split, the node, amplifiers, and potentially the taps need to be replaced. This "like for like" swap again requires much less labor and permitting than the alternatives.

Essentially ESD allows operators to squeeze more bandwidth out of existing infrastructure while avoiding the more expensive and time-consuming option of deploying new infrastructure.

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## ESD - part of a nuanced strategy

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While ESD along with mid-split and high-split offers a compelling value proposition for operators, it is not the be-all and end-all. Other node actions may be more appropriate in some cases. For instance, in rural areas with slower growth profiles, BAU node splits may be the best option. In high-value residential areas, Fiber Deep may still make sense. In dense commercial areas, FTTH may provide the best value.

Extended Spectrum DOCSIS (ESD) enables multi-gigabit speeds, downstream and upstream, without capital intensive fiber investment. When combined with distributed access architecture, it enables operators to squeeze the maximum capacity out of the existing infrastructures, both coax and fiber.[1]

[1] <https://www.teleste.com/technologies/extended-spectrum-docsis>

