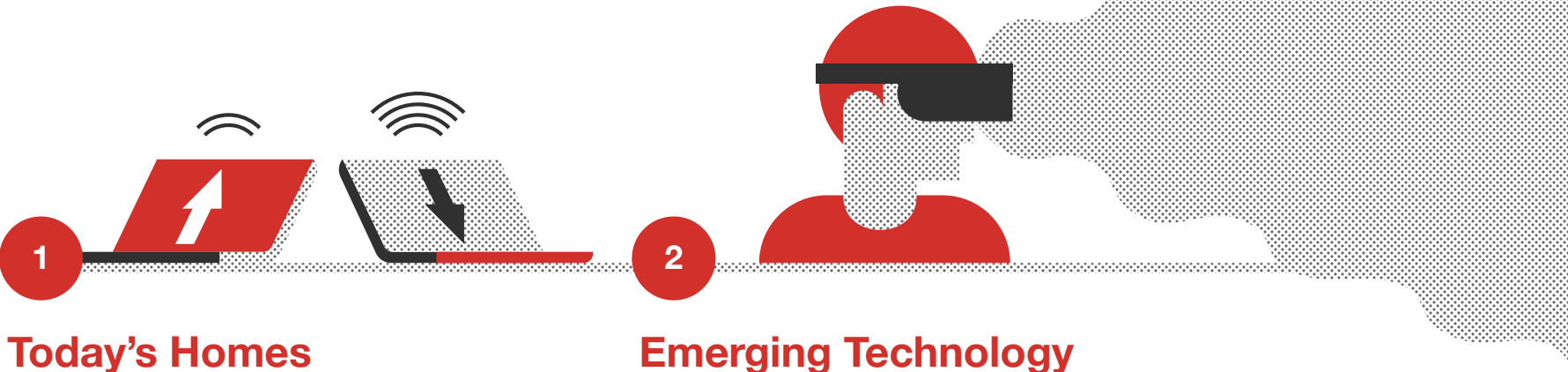


# Full Duplex DOCSIS® 3.1 Technology

## What is Full Duplex DOCSIS Technology?

Full Duplex DOCSIS 3.1 technology is an extension of the DOCSIS 3.1 specification that significantly increases upstream capacity and enables symmetric multi-Gigabit services over existing HFC networks.

DOCSIS 3.1 enabled the potential of 10Gbps downstream and 1 Gbps upstream broadband. With Full Duplex DOCSIS 3.1 technology, the upstream and downstream traffic has the potential to flow at up to 10 Gigabits concurrently, doubling the efficiency of spectrum use.

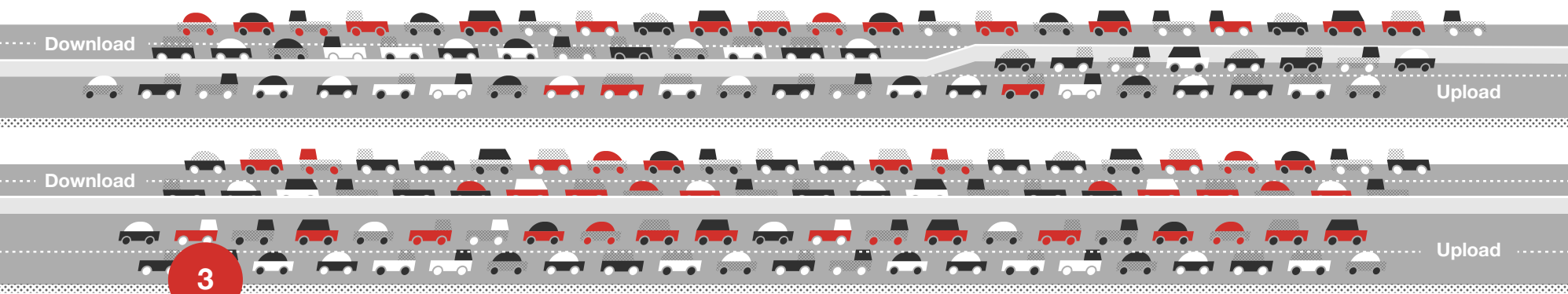


### 1 Today's Homes

In consumers' homes today, customers typically have higher download speeds than upload speeds.

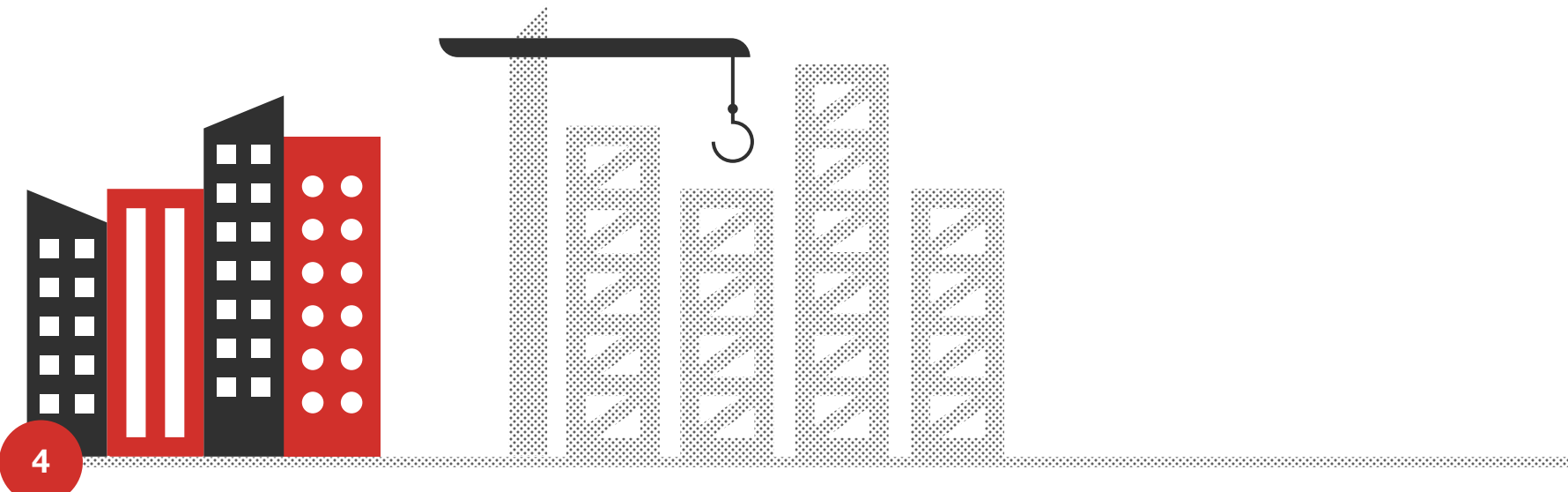
### 2 Emerging Technology

This is sufficient for how most of us use broadband today, but with emerging technologies like Virtual Reality and Augmented Reality – things will change.



### 3 Making the Difference

Full Duplex DOCSIS technology allows future applications that need high speed symmetric services or high upstream speeds to work equally well. It's the difference from a moveable median barrier, to full double-decker lanes!



### 4 Forward Thinking

While most customers today do not yet need symmetric services, the industry is being proactive about anticipating their needs.



### 5 Small Business Benefits

For small and medium sized business – this will vastly improve network efficiency right now!

### 6 Coaxial Households

Today, over 90 percent of U.S. households are serviced by coaxial cable. Because Full Duplex DOCSIS technology leverages existing coaxial infrastructure developed by the cable industry, DOCSIS technologies can service the masses.

## Why Full Duplex DOCSIS Technology?

In Full Duplex DOCSIS technology, the upstream and downstream traffic flows concurrently use the same spectrum, doubling the efficiency of spectrum use. This enables upstream and downstream

traffic to efficiently use the same spectrum at the same time. As DOCSIS technologies continue to evolve, access to gigabit broadband speeds and network efficiency will only continue to increase.