www.explainthatstuff.com

Total internal reflection

Cladding has lower refractive index

Core has higher refractive index
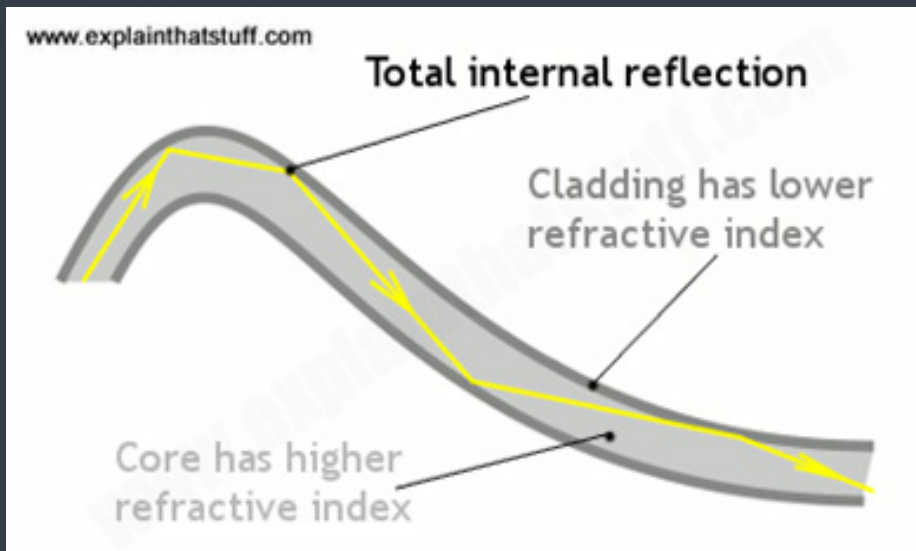
OBJECTIVE

We are simulating how internet transmission works over fibre optics.

HOW IT WORKS

A request for a tune is sent from each house. The server then transmits the sound back through the fibre using only light.

 The data is transformed to light pulses, which then reflect through the fibre as shown in the image to the left. The light hits the inside glass at a shallow angle, so it acts like a mirror, which means the light reflects and continues down the fibre.

HOW IT WORKS

Once the signal reaches the other end it is decoded and plays through the speaker. Here we use LEDs but the real system uses lasers to send these signals. In the UK current consumer maximum speeds are around 1 Gigabit/second (Gbps). This means that you could download an 80 Gb game in around 11 minutes! With a 55 Megabit/second (Mbps) connection this would take over three hours. For data centres we are seeing speeds of over 400 Gigabit/second (Mbps), 400 times faster than the best speeds at home, and these are increasing all the time.

Now the industry is aiming for speeds of 1.6 Terabits/per second (Tbps), 1600 times faster than the best home connection.
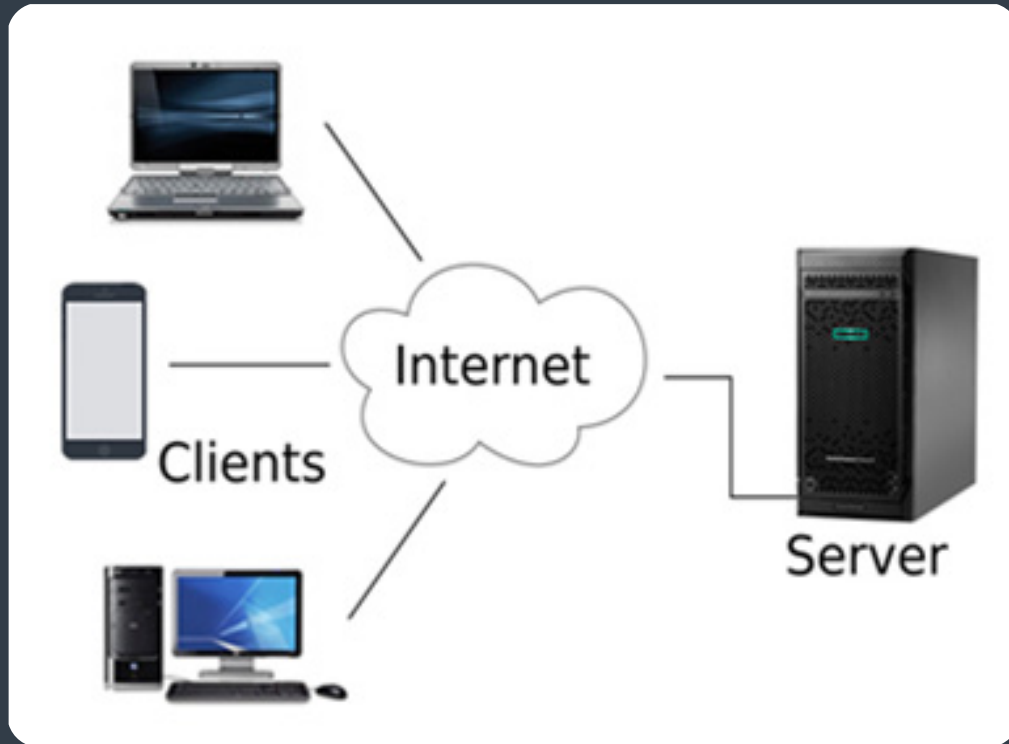
Maybe in a few years we can download massive games in seconds

Sound of Light Demo

Internet connection, we are replicating this in our challenge.

Below is an example of high speed home internet connection. Yelo provide equipment for our customers to test devices that allow these speeds to be achieved.