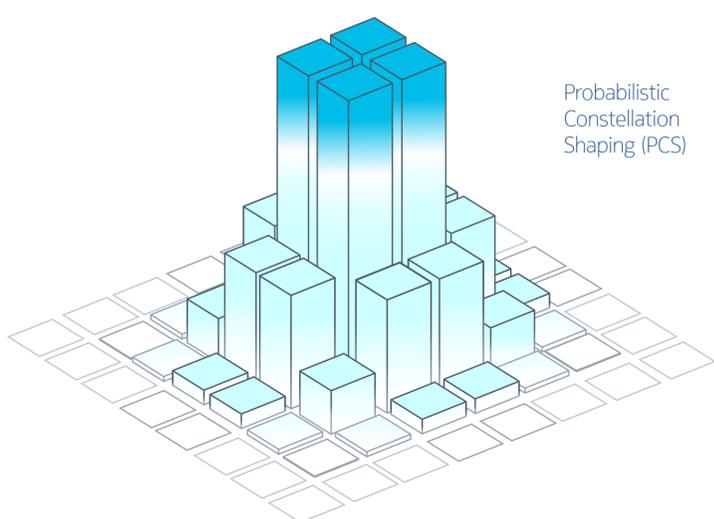


# Taking light to the limit

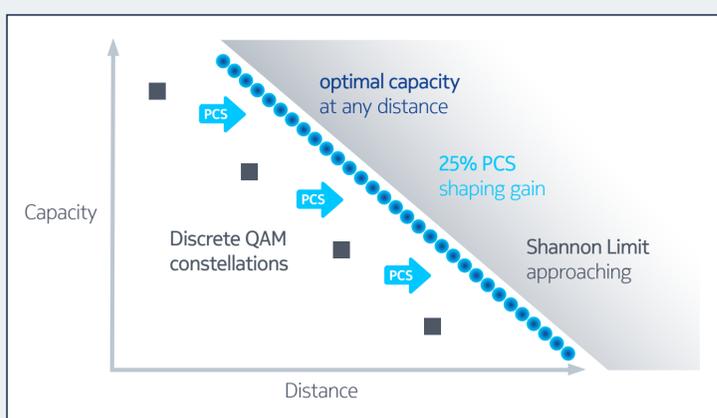
Pioneered by the innovators at Nokia Bell Labs, the trail-blazing Super Coherent PSE-3 chipset is shaping the future of optical networking.

Engineered with the only algorithm (Probabilistic Constellation Shaping, or PCS) proven to approach the theoretical capacity limit of optical fiber, it combines the latest in electronics, and algorithms to offer performance never before seen in a digital signal processor (DSP). It's the final piece of the puzzle in Super Coherent technologies.



Probabilistic Constellation Shaping (PCS)

Discover the shape of things to come



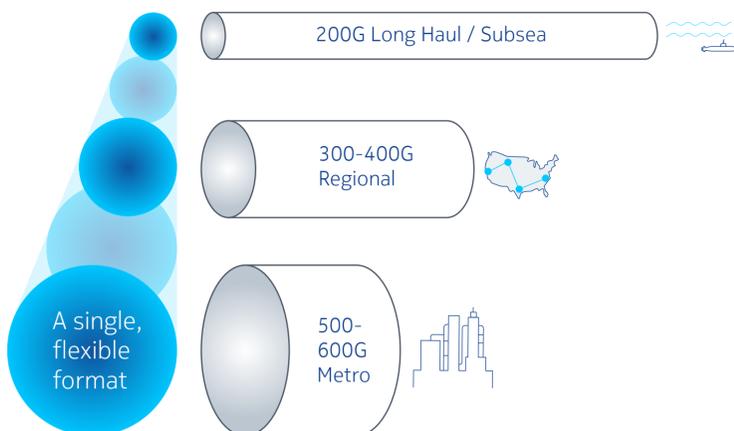
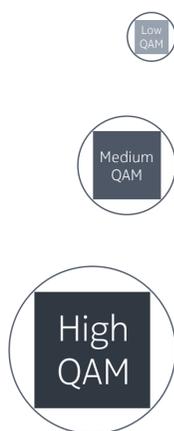
## Taking light to the (Shannon) limit

Nokia has maximized spectral efficiency by taking optical performance close to the Shannon Limit - the maximum information transfer rate that's theoretically physically possible - resulting in dramatically lower per-gigabit optical networking costs.

## Delivering new levels of optical performance any distance, any fiber



Chipset to implement PCS, pushing fiber-optic performance close to theoretical limits at any distance - from 10 km to 10,000 km and beyond.



### QAM - sub-optimal and rigid

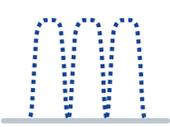
Traditionally, discrete QAM modulation formats are used to transport information within an optical fiber. However, this is inefficient because the square modulation formats don't fully occupy the channel capacity, and a limited number of formats are available for different distances.

### PCS - optimally shaped, infinitely flexible

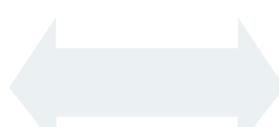
But with PCS, shaped modulation fully fills each channel to near Shannon capacity. And just a single, flexible format is required for all rates and reaches, always optimizing the trade off between distance and capacity.

## Radical simplicity, breakthrough programmability

Spectral consistency



Eliminates fragmented spectrum



Simplifies planning and provisioning

Capacity optimization



Facilitates and speeds restoration

## What limits us, inspires us

Service providers and Internet content providers (ICPs) can enjoy limitless new competitive potential and meet the surging traffic demands of video, cloud and 5G. By maximizing the capacity and performance of every link in the network, they can continue to reduce their total cost of ownership.

**Ultimate performance**

Achieve Shannon Limit approaching performance over any fiber type or distance (metro to subsea) - with no compromise

**Unconstrained flexibility**

Dynamically maximize every wavelength in the network with infinite granularity

**Extreme programmability**

Drive down operational complexity with simplified spectrum planning and real-time wavelength optimization for maximum network performance

## Turning innovation to commercial advantage

Massive capacity + reduction in cost per bit = **lowest TCO and operational simplicity**

Optical wavelength performance vs today's most advanced systems

**+ 25%**

Increase in capacity over commonly deployed networks

**+ 65%**

Reduction in power per bit

**+ 60%**

## Discover limitless possibilities