



## Central and Eastern Europe - 2021 Forecast Highlights

### IP Traffic

- In Central and Eastern Europe, IP traffic will grow 3-fold from 2016 to 2021, a compound annual growth rate of 22%.
- In Central and Eastern Europe, IP traffic will reach 17.1 Exabytes per month in 2021, up from 6.2 Exabytes per month in 2016.
- Central and Eastern Europe's IP networks will carry 561 Petabytes per day in 2021, up from 204 Petabytes per day in 2016.
- In Central and Eastern Europe, IP traffic will reach an annual run rate of 204.7 Exabytes in 2021, up from an annual run rate of 74.5 Exabytes in 2016.
- In Central and Eastern Europe, IP traffic will reach 35 Gigabytes per capita in 2021, up from 13 Gigabytes per capita in 2016.
- In Central and Eastern Europe, average IP traffic will reach 52 Tbps in 2021, and busy hour traffic will reach 260 Tbps.
- In 2021, the gigabyte equivalent of all movies ever made will cross Central and Eastern Europe's IP networks every 21 minutes.

### Internet Traffic

- In Central and Eastern Europe, Internet traffic will grow 2.8-fold from 2016 to 2021, a compound annual growth rate of 23%.
- In Central and Eastern Europe, busy hour Internet traffic will grow 4.4-fold from 2016 to 2021, a compound annual growth rate of 35%.

- In Central and Eastern Europe, Internet traffic will reach 15.8 Exabytes per month in 2021, up from 5.6 Exabytes per month in 2016.
- Central and Eastern Europe's Internet traffic will be 521 Petabytes per day in 2021, up from 180 Petabytes per day in 2016.
- Central and Eastern Europe's Internet traffic in 2021 will be equivalent to 48 billion DVDs per year, 4 billion DVDs per month, or 5 million DVDs per hour.
- In 2021, the gigabyte equivalent of all movies ever made will cross the Internet every 22 minutes.
- Central and Eastern European Internet traffic in 2021 will be equivalent to 241x the volume of the entire Central and Eastern European Internet in 2005.
- In Central and Eastern Europe, Internet traffic will reach 32 Gigabytes per capita in 2021, up from 11 Gigabytes per capita in 2016.
- In Central and Eastern Europe, average Internet traffic will increase 2.8-fold by 2021 and will reach 48 Tbps.
- In Central and Eastern Europe, busy hour Internet traffic will increase 4.4-fold by 2021 and will reach 242 Tbps.

### Wired Wi-Fi and Mobile Growth

- Central and Eastern Europe's Fixed/Wi-Fi was 56% of total IP traffic in 2016, and will be 52% of total IP traffic in 2021.
- Central and Eastern Europe's Fixed/Wired was 29% of total IP traffic in 2016, and will be 18% of total IP traffic in 2021.
- Central and Eastern Europe's Mobile was 15% of total IP traffic in 2016, and will be 30% of total IP traffic in 2021.
- Central and Eastern Europe's Fixed/Wi-Fi was 59.9% of total Internet traffic in 2016, and will be 55.6% of total Internet traffic in 2021.
- Central and Eastern Europe's Fixed/Wired was 24% of total Internet traffic in 2016, and will be 12% of total Internet traffic in 2021.
- Central and Eastern Europe's Mobile was 16.1% of total Internet traffic in 2016, and will be 32.0% of total Internet traffic in 2021.
- In Central and Eastern Europe, mobile data traffic will grow 6-fold from 2016 to 2021, a compound annual growth rate of 41%.
- In Central and Eastern Europe, mobile data traffic will reach 5.1 Exabytes per month in 2021, up from 901 Petabytes per month in 2016.
- Central and Eastern European mobile data traffic will grow 2 times faster than Central and Eastern European fixed IP traffic from 2016 to 2021.
- Central and Eastern Europe's Mobile was 15% of total IP traffic in 2016, and will be 30% of total IP traffic in 2021.
- In Central and Eastern Europe, mobile data traffic in 2021 will be equivalent to 72x the volume of the entire Central and Eastern European Internet in 2005.

### IP Video

- In Central and Eastern Europe, IP video traffic will grow 4-fold from 2016 to 2021, a compound annual growth rate of 30%.

- In Central and Eastern Europe, IP video traffic will reach 13.3 Exabytes per month in 2021, up from 3.6 Exabytes per month in 2016.
- In Central and Eastern Europe, IP video will be 78% of all IP traffic in 2021, up from 57% in 2016.
- In Central and Eastern Europe, Ultra HD will be 11.0% of IP Video traffic in 2021, up from 0.6% in 2016 (135.1% CAGR).
- In Central and Eastern Europe, HD will be 63.0% of IP Video traffic in 2021, up from 37.9% in 2016 (44.0% CAGR).
- In Central and Eastern Europe, SD will be 26.0% of IP Video traffic in 2021, compared to 61.6% in 2016 (9.5% CAGR).
- In Central and Eastern Europe, consumer IP video traffic will be 81% of consumer IP traffic in 2021, up from 63% in 2016.
- In Central and Eastern Europe, business IP video traffic will be 66% of business IP traffic in 2021, up from 43% in 2016.

### Internet Video

- In Central and Eastern Europe, Internet video traffic will grow 4-fold from 2016 to 2021, a compound annual growth rate of 31%.
- In Central and Eastern Europe, Internet video traffic will reach 12.2 Exabytes per month in 2021, up from 3.1 Exabytes per month in 2016.
- In Central and Eastern Europe, total Internet video traffic (business and consumer, combined) will be 77% of all Internet traffic in 2021, up from 56% in 2016.
- In Central and Eastern Europe, Ultra HD will be 11.0% of Internet video traffic in 2021, up from 0.6% in 2016 (131.3% CAGR).
- In Central and Eastern Europe, HD will be 62.4% of Internet video traffic in 2021, up from 36.3% in 2016 (46.2% CAGR).
- In Central and Eastern Europe, SD will be 26.6% of Internet video traffic in 2021, compared to 63.1% in 2016 (10.4% CAGR).
- In Central and Eastern Europe, consumer Internet video traffic will be 79% of consumer Internet traffic in 2021, up from 60% in 2016.
- In Central and Eastern Europe, business Internet video traffic will be 67% of business Internet traffic in 2021, up from 45% in 2016.
- In Central and Eastern Europe, Internet-Video-to-TV traffic will be 15% of fixed consumer Internet video traffic in 2021, up from 11% in 2016.
- In Central and Eastern Europe, Internet-Video-to-TV traffic will increase 4-fold between 2016 and 2021 (33.7% CAGR).
- In Central and Eastern Europe, 223 billion minutes (423,689 years) of video content will cross the Internet each month in 2021. That's 84,738 minutes of video streamed or downloaded every second.
- In Central and Eastern Europe, 58% of all Internet video traffic will cross content delivery networks in 2021, up from 44% in 2016.
- In Central and Eastern Europe, 65.8% of all Internet video traffic will be long-form video (including live) in 2021, up from 66.5% in 2016.
- In Central and Eastern Europe, 11.8% of all Internet video traffic will be Live video in 2021, up from 3.4% in 2016.

- In Central and Eastern Europe, Live Internet video traffic will increase 14-fold between 2016 and 2021 (68.3% CAGR).

## IP VOD

- In Central and Eastern Europe, Ultra HD will be 13.8% of IP VOD traffic in 2021, up from 0.1% in 2016 (247.6% CAGR).
- In Central and Eastern Europe, HD will be 79.3% of IP VOD traffic in 2021, up from 66.7% in 2016 (29.2% CAGR).
- In Central and Eastern Europe, SD will be 6.9% of IP VOD traffic in 2021, compared to 33.2% in 2016 (-8.9% CAGR).

## Gaming

- In Central and Eastern Europe, gaming traffic will grow 4-fold from 2016 to 2021, a compound annual growth rate of 34%.
- In Central and Eastern Europe, gaming traffic will reach 355 Petabytes per month in 2021, up from 83 Petabytes per month in 2016.
- In Central and Eastern Europe, gaming traffic will be 3% of consumer Internet traffic in 2021, up from 2% in 2016.

## Devices

- In Central and Eastern Europe, there will be 1.9 billion networked devices in 2021, up from 1.2 billion in 2016.
- In Central and Eastern Europe, there will be 3.8 networked devices per capita in 2021, up from 2.5 per capita in 2016.
- In Central and Eastern Europe, 48% of all networked devices will be mobile-connected in 2021.
- In Central and Eastern Europe, M2M modules will account for 51% (967.6 million) of all networked devices in 2021, compared to 32% (387.1 million) in 2016, (20.1% CAGR).
- In Central and Eastern Europe, PCs will account for 4% (81.6 million) of all networked devices in 2021, compared to 10% (119.3 million) in 2016, (-7.3% CAGR).
- In Central and Eastern Europe, Tablets will account for 4% (76.4 million) of all networked devices in 2021, compared to 5% (55.6 million) in 2016, (6.6% CAGR).
- In Central and Eastern Europe, Smartphones will account for 27% (505.6 million) of all networked devices in 2021, compared to 28% (335.7 million) in 2016, (8.5% CAGR).
- In Central and Eastern Europe, Connected TVs will account for 10% (185.6 million) of all networked devices in 2021, compared to 8% (98.1 million) in 2016, (13.6% CAGR).
- In Central and Eastern Europe, Non-Smartphones will account for 2.1% (38.6 million) of all networked devices in 2021, compared to 17% (200.5 million) in 2016, (-28.1% CAGR).
- In Central and Eastern Europe, Other Portables will account for 2% (28.8 million) of all networked devices in 2021, compared to 1% (12.7 million) in 2016, (17.8% CAGR).
- In Central and Eastern Europe, 4K TVs will account for 52% (47.1 million) of all flat panel TVs in 2021, compared to 11.4% (4.5 million) in 2016, (59.8% CAGR).
- Central and Eastern Europe's IP traffic from non-PC devices was 38% of total IP traffic in 2016, and will be 77% of total IP traffic in 2021.
- In Central and Eastern Europe, PCs accounted for 62% of IP traffic in 2016, and will be 23% of IP traffic in 2021.
- In Central and Eastern Europe, TVs accounted for 8% of IP traffic in 2016, and will be 11% of IP traffic in 2021.

- In Central and Eastern Europe, Smartphones accounted for 20% of IP traffic in 2016, and will be 50% of IP traffic in 2021.
- In Central and Eastern Europe, Tablets accounted for 8% of IP traffic in 2016, and will be 10% of IP traffic in 2021.
- In Central and Eastern Europe, M2M modules accounted for 1.7% of IP traffic in 2016, and will be 5.9% of IP traffic in 2021.
- In Central and Eastern Europe, PCs accounted for 58% of consumer Internet traffic in 2016, and will be 20% of consumer Internet traffic in 2021.
- In Central and Eastern Europe, TVs accounted for 5% of consumer Internet traffic in 2016, and will be 8% of consumer Internet traffic in 2021.
- In Central and Eastern Europe, TVs accounted for 4% of total Internet traffic in 2016, and will be 6% of total Internet traffic in 2021.

### Speed Evolution

- In Central and Eastern Europe, the average fixed broadband speed will grow 1.6-fold from 2016 to 2021, from 29.2 Mbps to 45.5 Mbps.
- In Central and Eastern Europe, 93% of fixed broadband connections will be faster than 5 Mbps in 2021, up from 81% today.
- In Central and Eastern Europe, 83% of fixed broadband connections will be faster than 10 Mbps in 2021, up from 63% today.
- In Central and Eastern Europe, 45.5% of fixed broadband connections will be faster than 25 Mbps in 2021, up from 33.8% today.
- In Central and Eastern Europe, 36.2% of fixed broadband connections will be faster than 50 Mbps in 2021, up from 23.2% today.
- In Central and Eastern Europe, the average Wi-Fi speeds from mobile devices will grow 1.9-fold from 2016 to 2021, from 16.7 Mbps to 32 Mbps.
- In Central and Eastern Europe, the average mobile connection speed will grow 3-fold from 2016 to 2021, reaching 18 Mbps in 2021.

### Traffic per User and Household

- In Central and Eastern Europe, the average Internet user will generate 32.3 Gigabytes of Internet traffic per month in 2021, up 116% from 15.0 Gigabytes per month in 2016, a CAGR of 17%.
- In Central and Eastern Europe, the average Internet household will generate 86.4 Gigabytes of Internet traffic per month in 2021, up 118% from 39.7 Gigabytes per month in 2016, a CAGR of 17%.
- In Central and Eastern Europe, the average FTTx Internet household will generate 119.4 Gigabytes of Internet traffic per month in 2021, 77.2% more than other broadband households.
- In Central and Eastern Europe, the average FTTx Internet household generated 65.0 Gigabytes of Internet traffic per month in 2016, 110.3% more than other broadband households.
- In Central and Eastern Europe, there will be 8 million Internet households (8.3% of all Internet households) generating more than 250 Gigabytes per month in 2021.

- In Central and Eastern Europe, there will be 3 million households (2.9% of all Internet households) generating more than 500 Gigabytes per month in 2021.
- In Central and Eastern Europe, there will be 1 million households (1.2% of all Internet households) generating more than a terabyte per month in 2021.
- In Central and Eastern Europe, the average mobile connection will generate 7,753 Megabytes of mobile data traffic per month in 2021, up from 1,526 Megabytes in 2016.

### Traffic Topology and Traffic Patterns

- In Central and Eastern Europe, 21% of Internet traffic will be carried metro-to-metro in 2021, up from 9% in 2016.
- In Central and Eastern Europe, 14% of Internet traffic will be carried on regional backbones (without touching cross-country backbones) in 2021, compared to 8% in 2016.
- In Central and Eastern Europe, 65% of Internet traffic will traverse cross-country backbones in 2021, compared to 83% in 2016.
- In Central and Eastern Europe, 50% of all Internet traffic will cross content delivery networks in 2021, up from 28% in 2016.
- In Central and Eastern Europe, peak Internet traffic will grow at a compound annual growth rate of 35% from 2016 to 2021, compared to 23% for average Internet traffic.