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Global network traffic report

Understanding the growing impact of advancing technologies on future networks

NOKIA BELL LABS

Traffic models content

Consumer Cellular

3G→6G

| Video | Social | Gaming | XR |

Consumer Fixed

Fixed BB | FWA | WiFi | Satellite

| Video | Social | Gaming | XR | Cloud |

Office Enterprise

Fixed BB | FWA | WiFi

| Video calls | Productivity | Cloud Services |

Industrial Enterprise
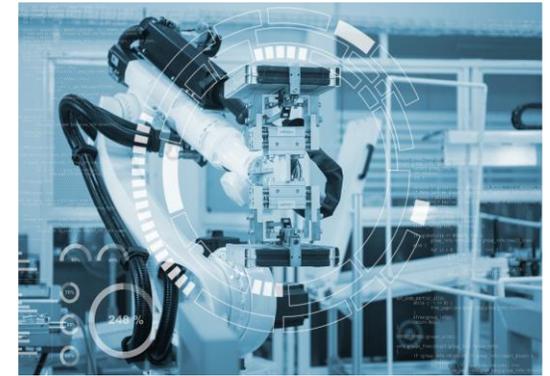

3G→6G | Fixed BB | WiFi | Satellite

| IIoT | Automation | XR |

> Fixed Broadband: xDSL, Fiber, Cable

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Global Traffic forecast – Assumptions, Risks and Impact

	1 Macroeconomic environment	**2** Technology Advancements	**3** Access Technology Penetration	**4** Consumer Behavior Changes
Drivers				
Assumptions	Stable macroeconomic, policy & regulatory environment	▪ Continued demand for higher resolution streaming video ▪ Stable evolution in device ecosystem maturity	Rate of deployment and rollout of faster access technologies will continue at stable pace	Stable video consumption/day, cloud AR/VR adoption
Risks	• Economic volatility, geopolitics and policy changes can have significant impact	• Advancements in device maturity, on-device AI & video upscaling capability • Up to 33% Bit Rate Reduction of high-quality streaming videos	• Capex variations and rollout execution impact broadband access bandwidth • Access b/w variation: CAGR ±0.5%	▪ Cloud AR/VR adoption • Fixed: ± 6% CAGR • Enterprise: ±3% CAGR, • Mobile: ± 2% CAGR
Impact	• Positive: in high-GDP, less policy restrictive environments • Negative: in economic uncertainty, increased geo-political tensions	• Positive: N/A - Default assumes no AI upscaling • Negative: -16% by 2033 , CAGR: -1.7%	• Positive: +4.7% by 2033, CAGR +0.54% • Negative: -3.4% by 2033, CAGR -0.4%	• Positive: +4.5% by 2033, CAGR +0.52% • Negative: -2.3% by 2033, CAGR -0.3%

Disclaimer: Forecasting accuracy is predicated on quality of input data. Bell Labs Consulting has developed the traffic forecast model leverages multiple data sources including census data, GSMA Intelligence, ABI Research, Statista, GlobalData, OMDIA, Gartner and others for aspects such as demography, device shipments, subscriptions, etc. to estimate and forecast traffic. Changes in the primary input data can have an impact on the forecast.

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Global network traffic is projected to grow 5x-9x through 2033 with CAGR 18%-27%

Global Traffic (EB/month)

— Moderate
— Aggressive
— Disruptive

6641
4525
3280

2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033
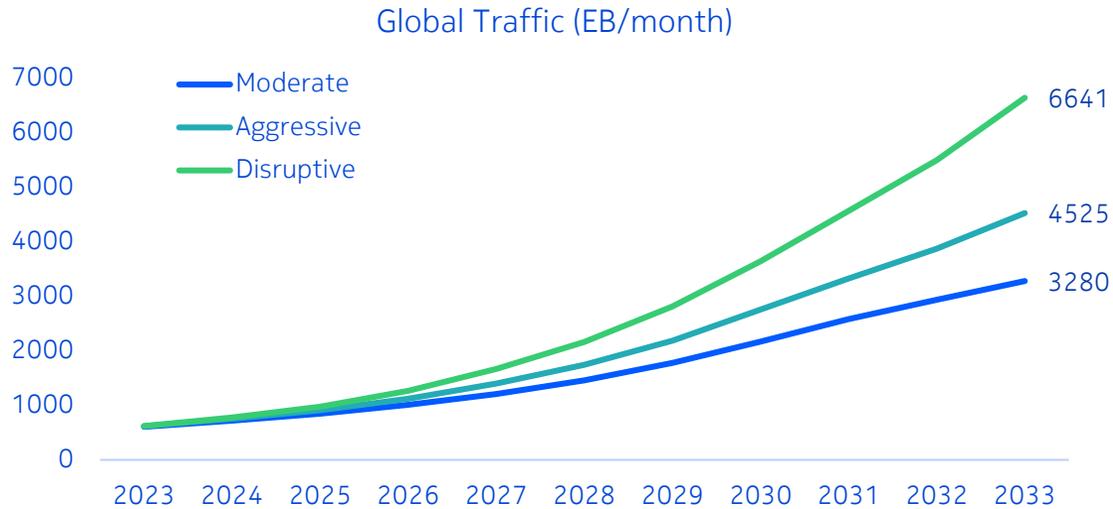
Note: Scale of the graph is expressed in EB/month to be consistent with the rest of the traffic report

GLOBAL TRAFFIC GROWTH BY DOMAIN, MODERATE SCENARIO

- Consumer cellular
- Consumer Fixed (xDSL,Cable, Fiber, Satellite)
- Consumer Fixed (FWA)
- Enterprise + Industrial

Year	Consumer cellular	Consumer Fixed (xDSL,Cable, Fiber, Satellite)	Consumer Fixed (FWA)	Enterprise + Industrial
2033	21.5%	49%	9.4%	19.4%
2028	21.5%	53%	7.5%	18.2%
2023	19.9%	62%	5.2%	13.5%
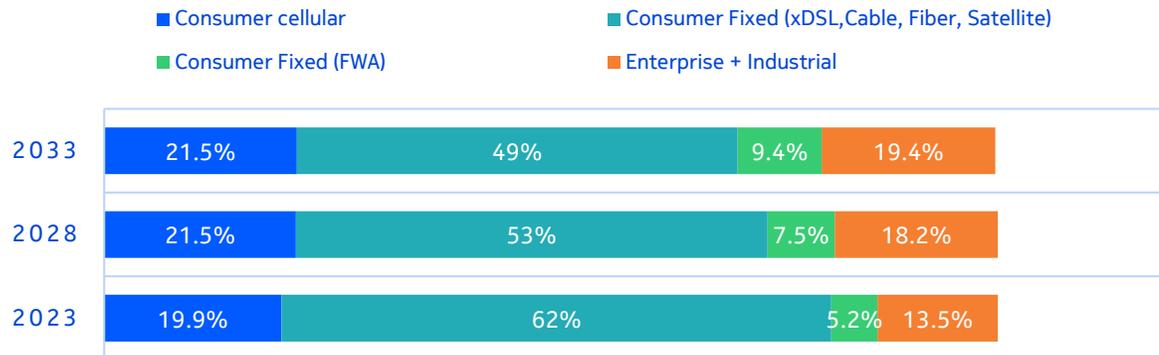
Services WAN traffic share, 2033

Disruptive
Aggressive
Moderate

0%   20%   40%   60%   80%   100%

- Video Streaming
- Consumer XR
- AI
- Consumer Cloud
- Others
- Enterprise Office
- Enterprise Industrial
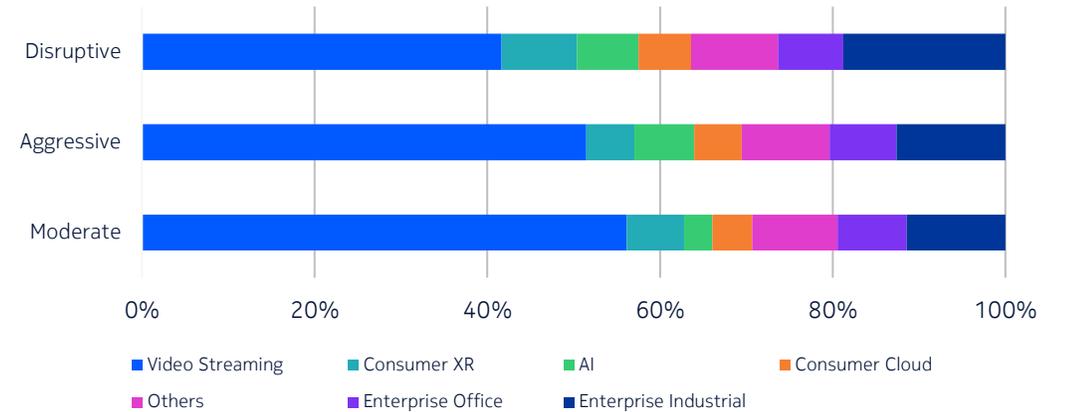
Projections for 2033

GLOBAL WAN TRAFFIC
3280 – 6641 EB/month
CAGR of 18%-27%

- **Video and AR/VR will drive overall volume increase**
- **Share of enterprise (+industrial) traffic will increase with AI usage**

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Global fixed traffic continues the impressive growth trend to reach 2551-5431 EB/month by 2033

Global Fixed traffic including FWA, EB/Month

- Moderate — (CAGR: 18%) — 2551
- Aggressive — (CAGR: 22%) — 3612
- Disruptive — (CAGR: 27%) — 5431

Global fixed traffic, Moderate scenario, EB/month

- Fixed Consumer — 1936
- Fixed Enterprise — 615
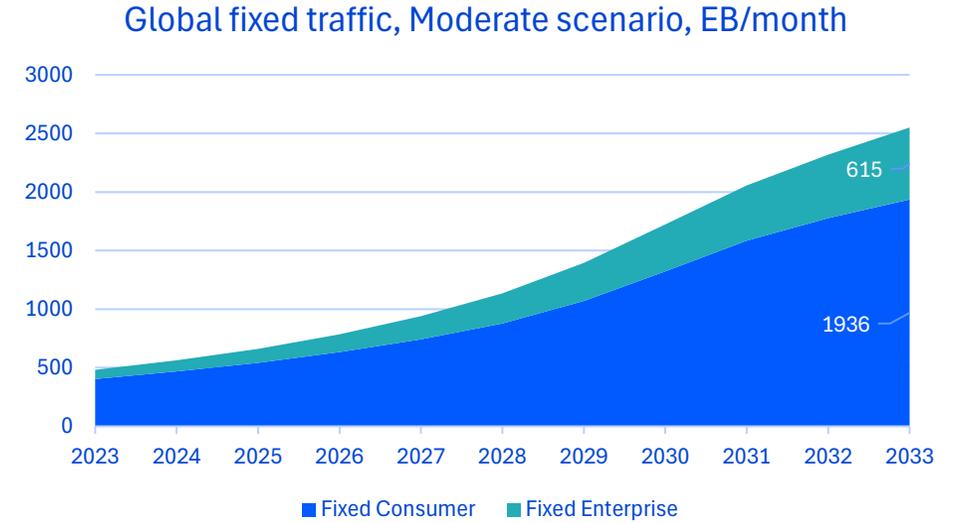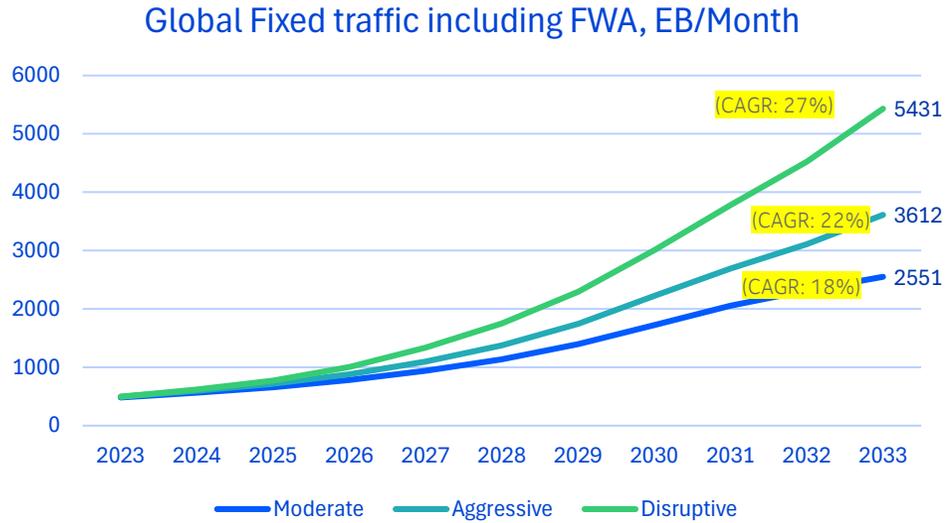
Fixed consumer traffic distribution (Moderate Scenario)

Legend: Video, Social, Gaming, Cloud, Messaging, Marketplace, Browsing, VR, Other

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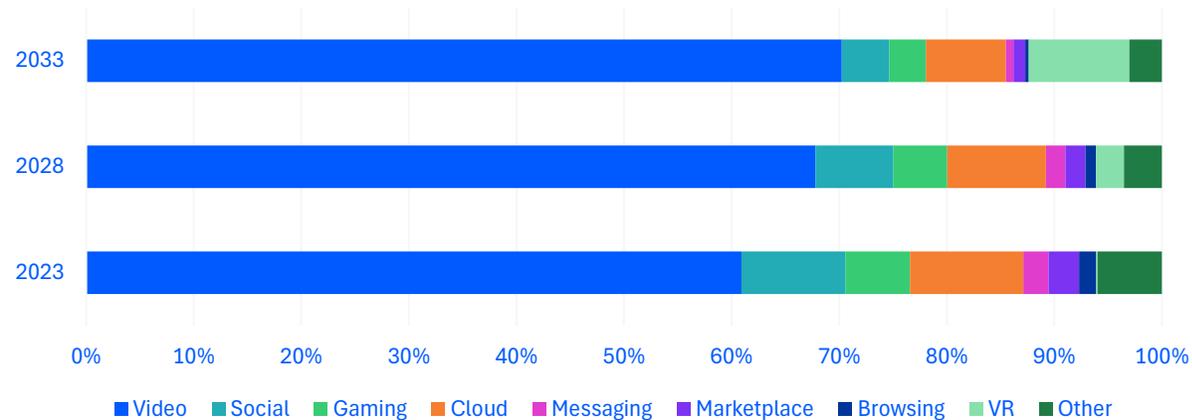
Methodology for evaluating consumer data traffic driven by artificial intelligence

- % of user adoption
- Number of posts created /day/used and Size of the post

% of Marketplace transactions using AI

- % Games/Apps using AI characters/NPC/assets

- Generative AI Platform visits
- Time spent, and traffic generated on each visits

Video/Image/Social Media posts content creation using AI platforms

AI assisted shopping, online payments, trading etc.

Gaming, AR/VR apps

Text generative AI

Direct AI Traffic
AI applications, Games, Transactions etc.

Indirect AI Traffic
Content/transactions influenced by AI

AI Traffic

Non-AI influenced Traffic

Overall Traffic
Moderate Traffic as base

Video Traffic

Social NW, Audio streaming, Marketplace

Web-browsing

Increased Engagement guided by Personalized AI Recommendations

Increased Engagement guided by Personalized AI Recommendations

Generative AI cuts browsing time

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Global WAN AI traffic projected to reach 1088 EB per month by 2033, growing at 24% CAGR

Global WAN Traffic (moderate: EB/month)

Chart legend:
- Consumer Regular (non-AI)
- Enterprise WAN Regular (non-AI)
- Consumer AI Indirect
- Consumer AI Direct
- Enterprise WAN AI

Chart annotations:
- (CAGR: 57%) — 81
- (CAGR: 51%) — 174
- (CAGR: 21%) — 832
- (CAGR: 21%) — 556
- (CAGR: 15%) — 1636

1088 EB/mo. CAGR: 24%
2192 EB/mo. CAGR: 16%

X-axis: 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033
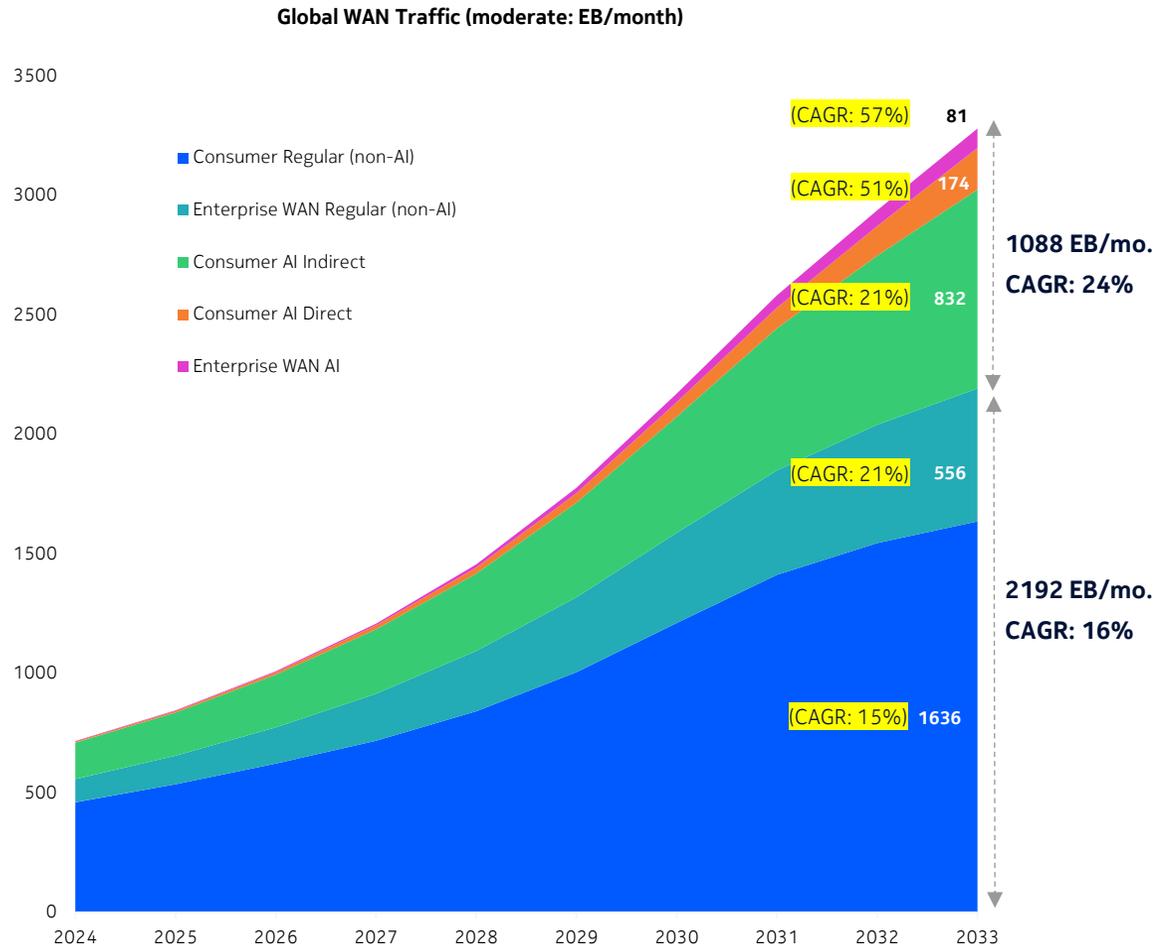
GLOBAL WAN AI TRAFFIC
1088 EB/month (33% of Global WAN Traffic)
CAGR: 24%

CONSUMER WAN AI TRAFFIC
1006 EB/month (CAGR: 23%)

**ENTERPRISE WAN AI TRAFFIC**
81 EB/month (CAGR: 57%)

GLOBAL CONSUMER AI TRAFFIC: 38% of Global Consumer Traffic

CONSUMER DIRECT AI TRAFFIC
174 EB/month (CAGR: 51%)

**CONSUMER IN-DIRECT AI TRAFFIC**
832 EB/month (CAGR: 21%)

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AI traffic over inter-DC links

Wide area network (WAN)
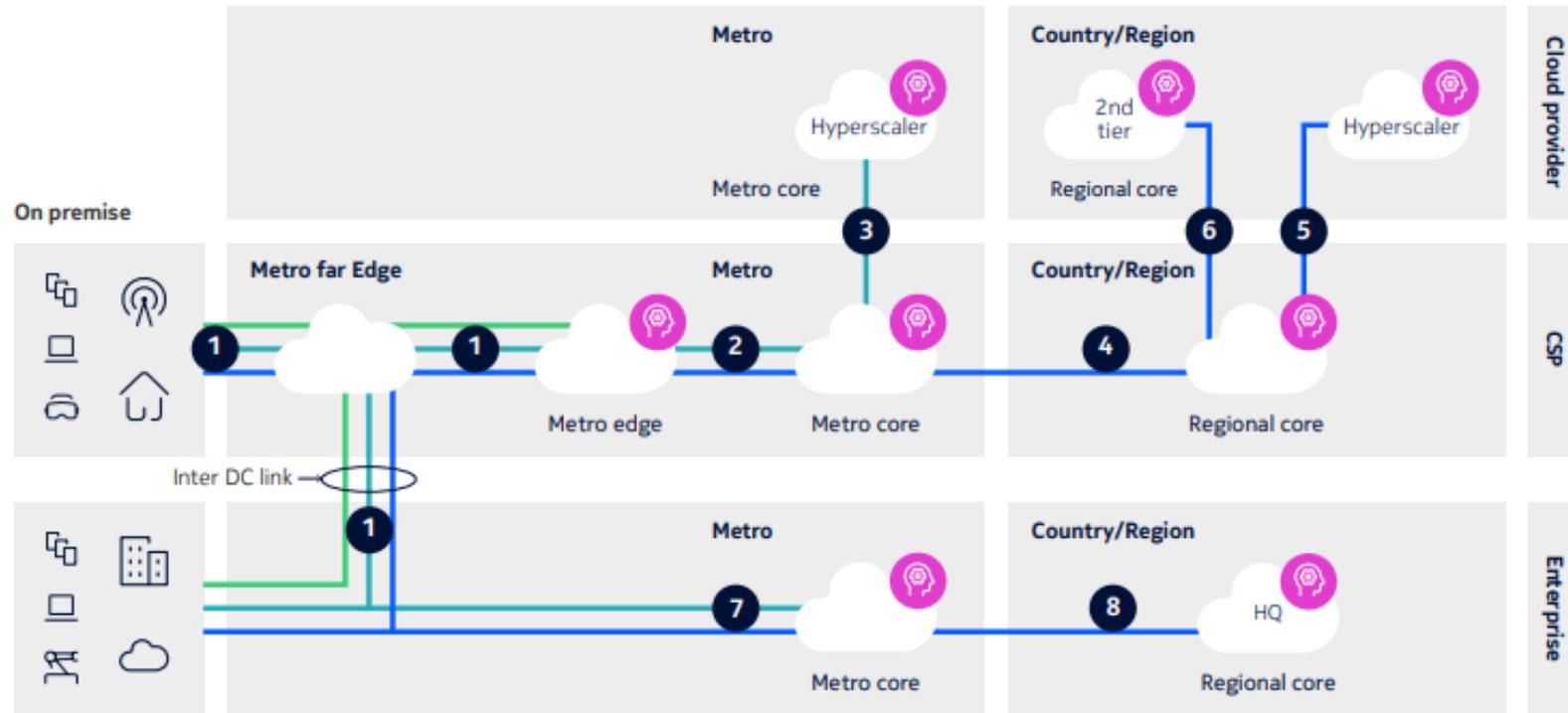
Access to AI inference workloads

— Path A – Regional Core
— Path B – Metro Core
— Path C – Metro Edge

🧠 AI workload

Inter-DC links

1	AU – MEC	5	RCC – RCH
2	MEC – MCC	6	RCC – RCT
3	MCC – MCH	7	EU – MCE
4	MCC – RCH	8	MCE – RCE

Acronyms

AU	All Users (consumer and enterprise	MCH	Metro Core by Hyperscaler
EU	Enterprise User Only	RCC	Regional Core by CSP
MCC	Metro Core by CSP	RCE	Regional Core by Enterprise
MCE	Metro Core by Enterprise	RCH	Regional Core by Hyperscaler
MEC	Metro Edge by CSP	RCT	Regional Core by 2nd Tier Provider

AI traffic demands major network capacity expansion

AI traffic over inter-datacenter links, EB/month
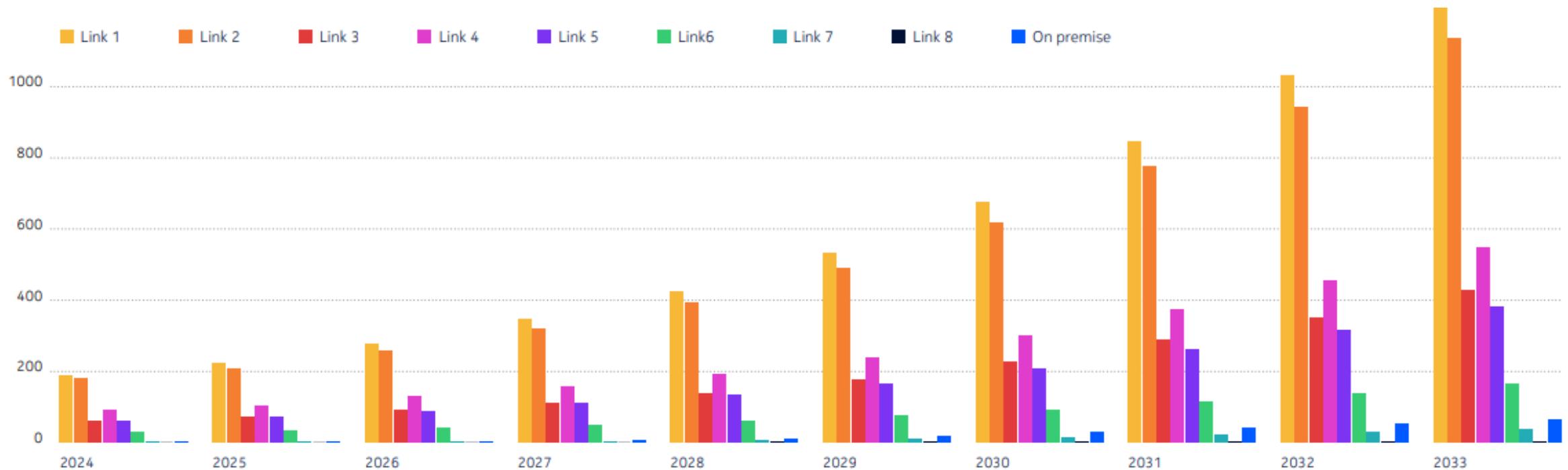
Source generated AI inference traffic reaching **1441 EB/month in 2033**, creating more than twice traffic of **3386 EB/month over the inter DC links**, **73%** of which demands capacity expansion of CSP's transport and **20%** concerning inter-DC links between CSP and hyperscaler

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