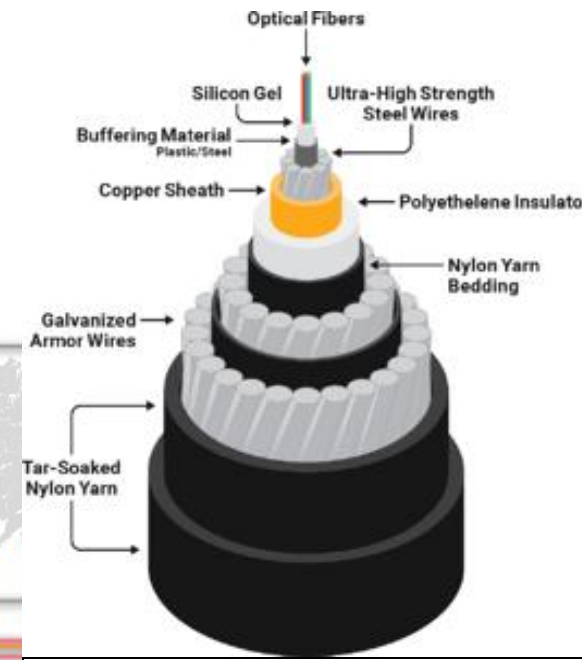
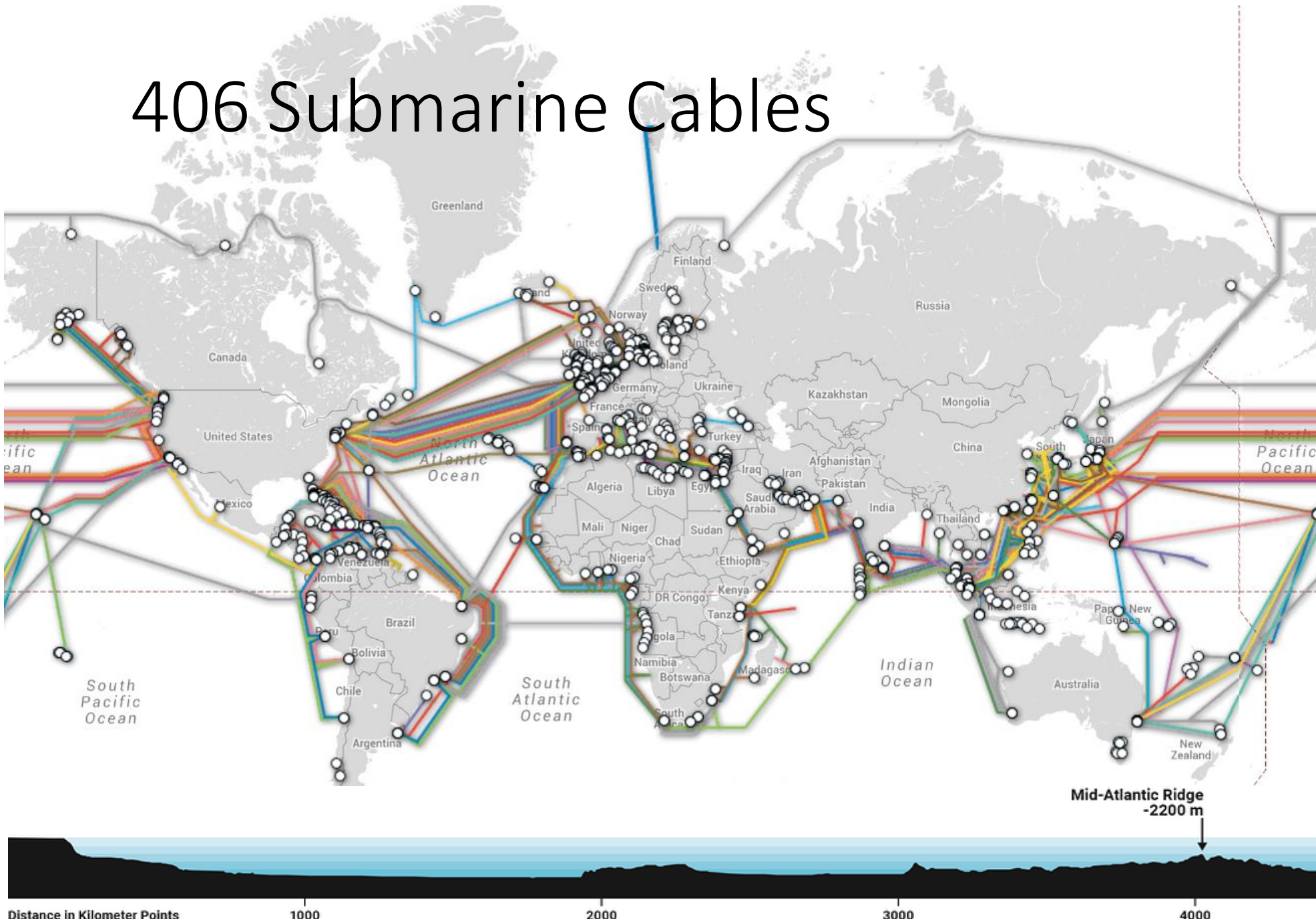


406 Submarine Cables



Minimum design life of 25 years.

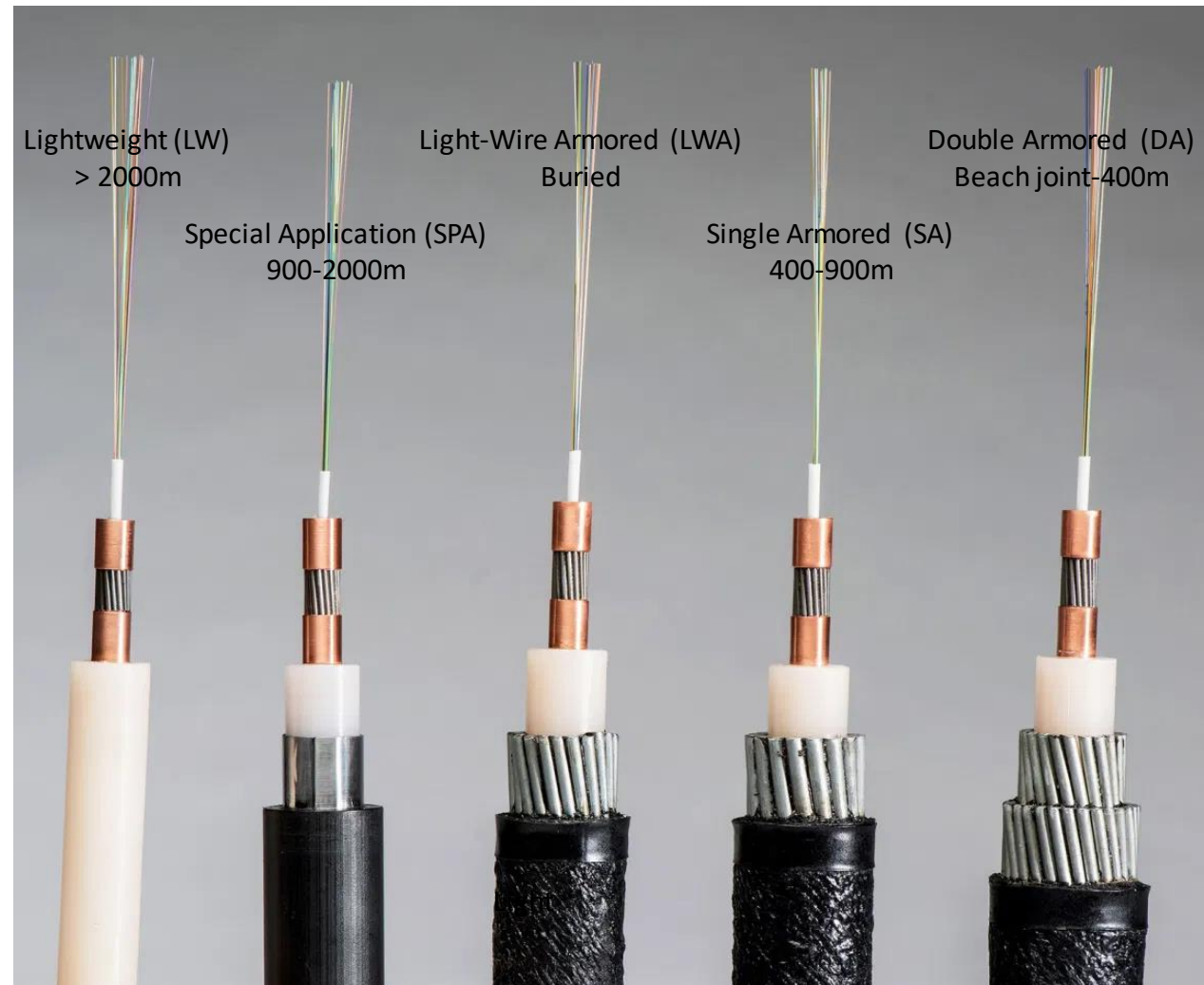
Satellites account for 0.37% of all U.S. international capacity.

The new MAREA cable is capable of carrying 208 Tbps.

Google, Facebook, Microsoft, and Amazon are major investors in new cable.

Total 1.2 million km (2020)

Manufacturing & Deployment



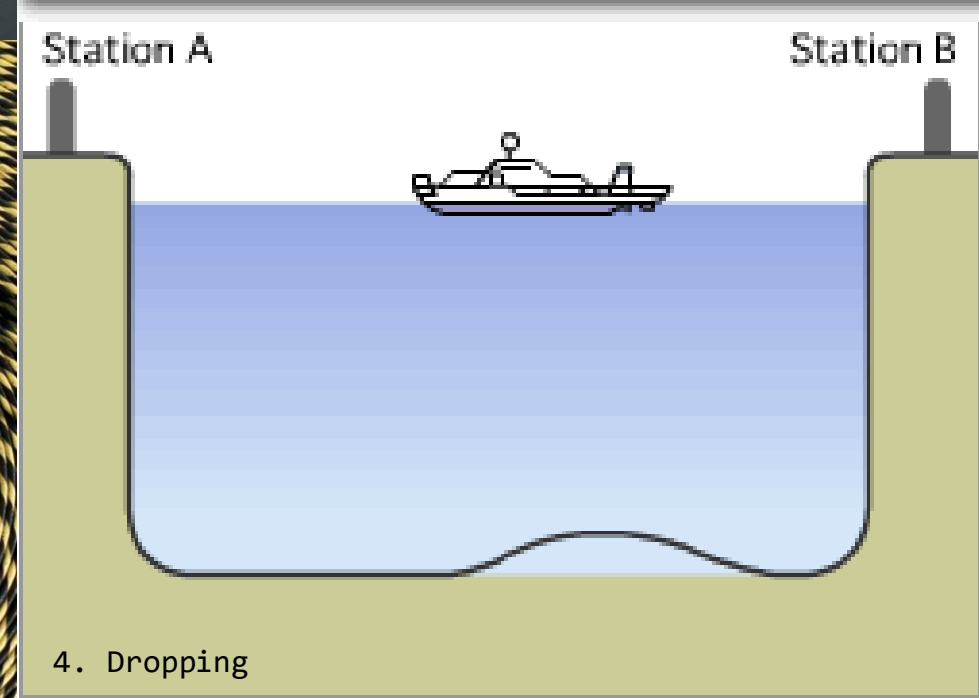
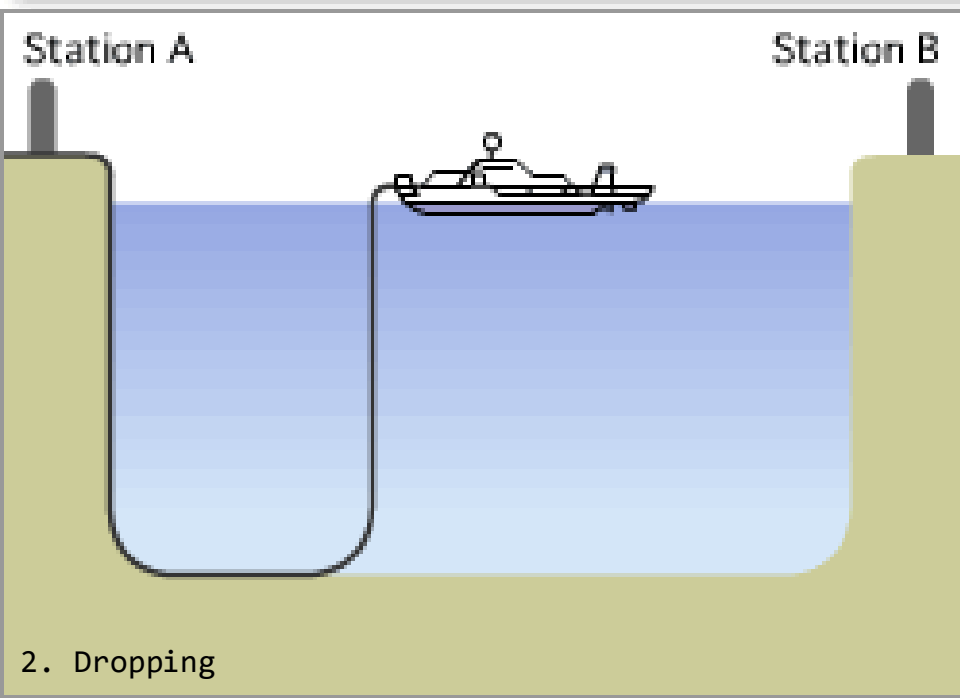
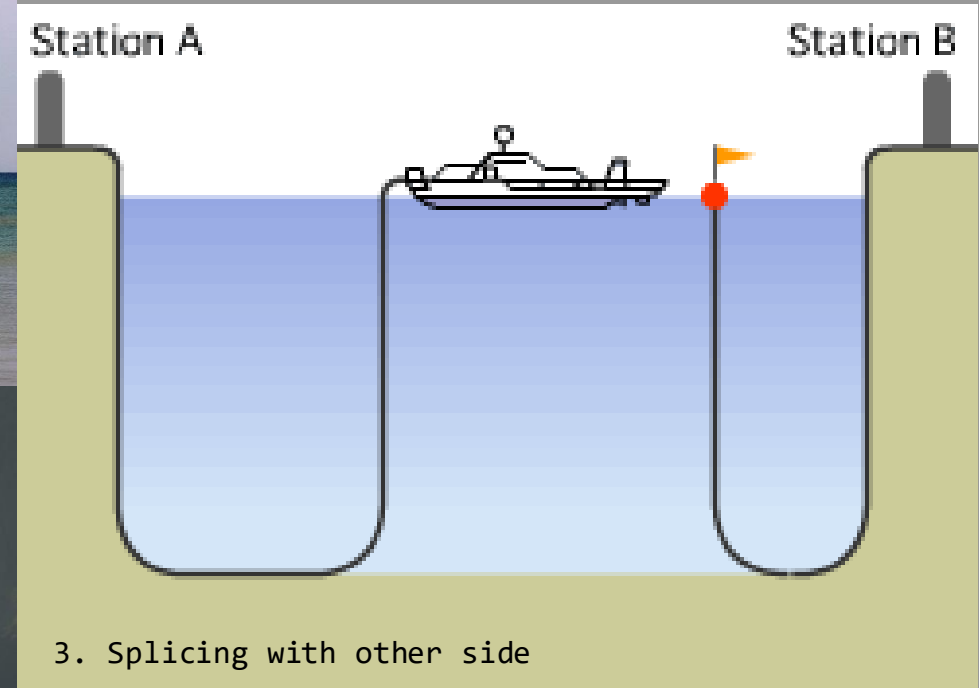
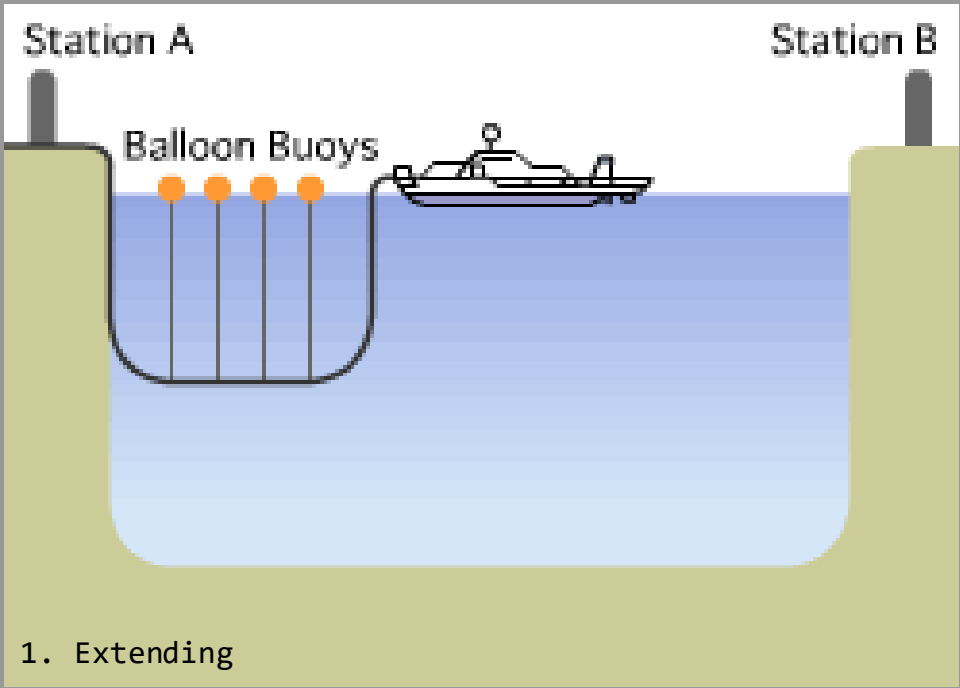
Subcom Fiber Optic Cable Kit.

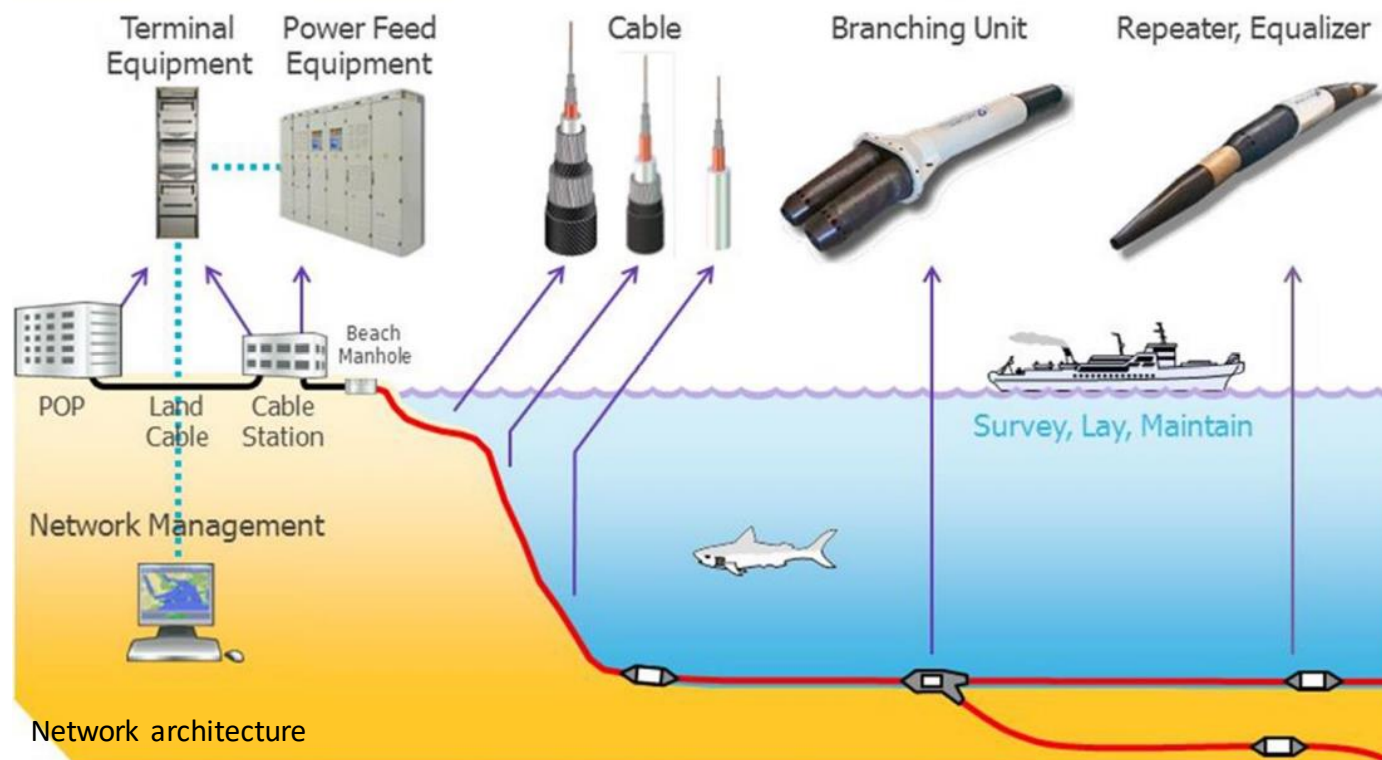
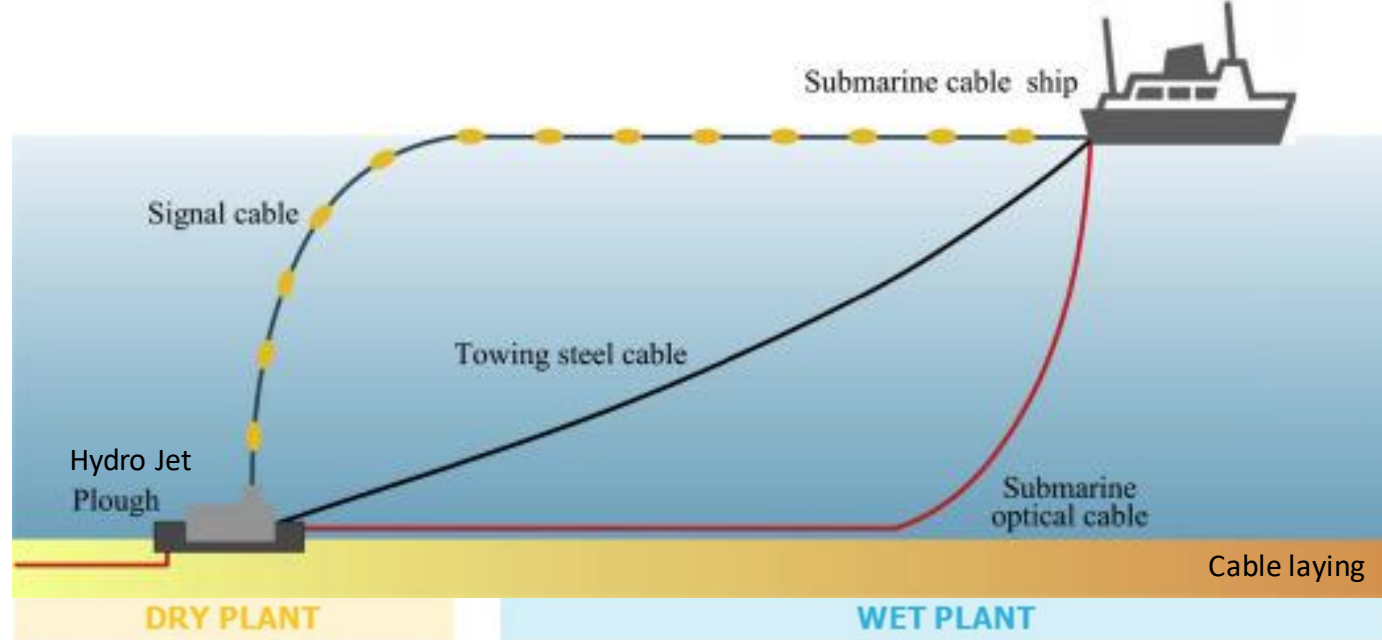
- Japanese NEC developed 20 fiber pair (40) cable. (2020)
- Google announced a cable with 24 pairs of optical fibers.
- Bandwidth of 12-pair **Dunant** is declared at 250 Tbps.
- DWDM allows 100 wavelengths over a single fiber.

- Largest manufacturers:

- Alcatel Submarine Networks (ASN) (France)
- TE SubCom (USA)
- Nippon Electric Company (NEC) (Japan)
- Prysmian (Italy)
- Nexans (France)
- Hengtong (China)
- Zhongtian (China)

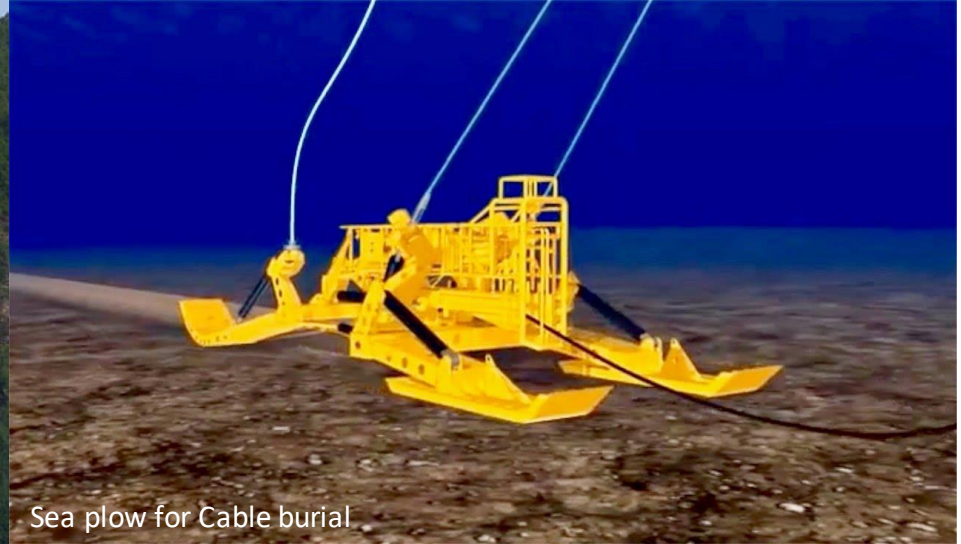








Installation ship



Sea plow for Cable burial



Polynesia submarine cable



Survey ship



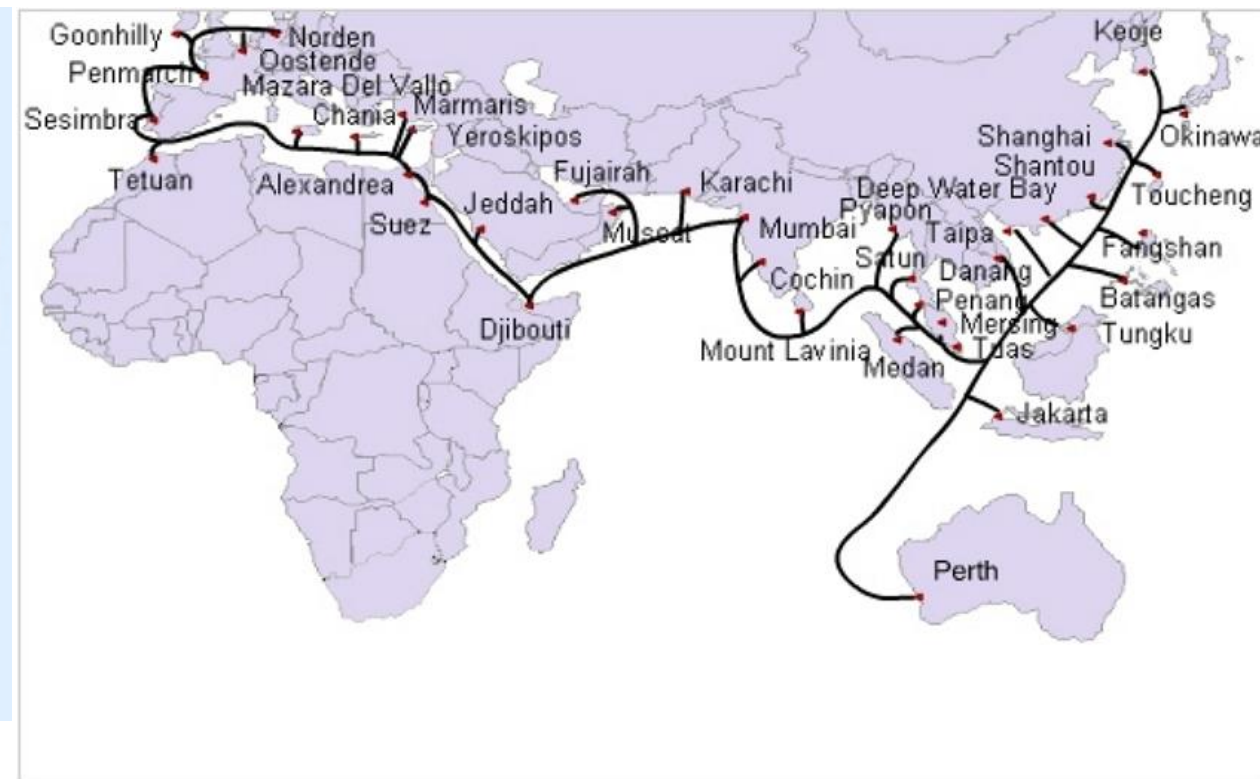
Maintenance ship

FEA



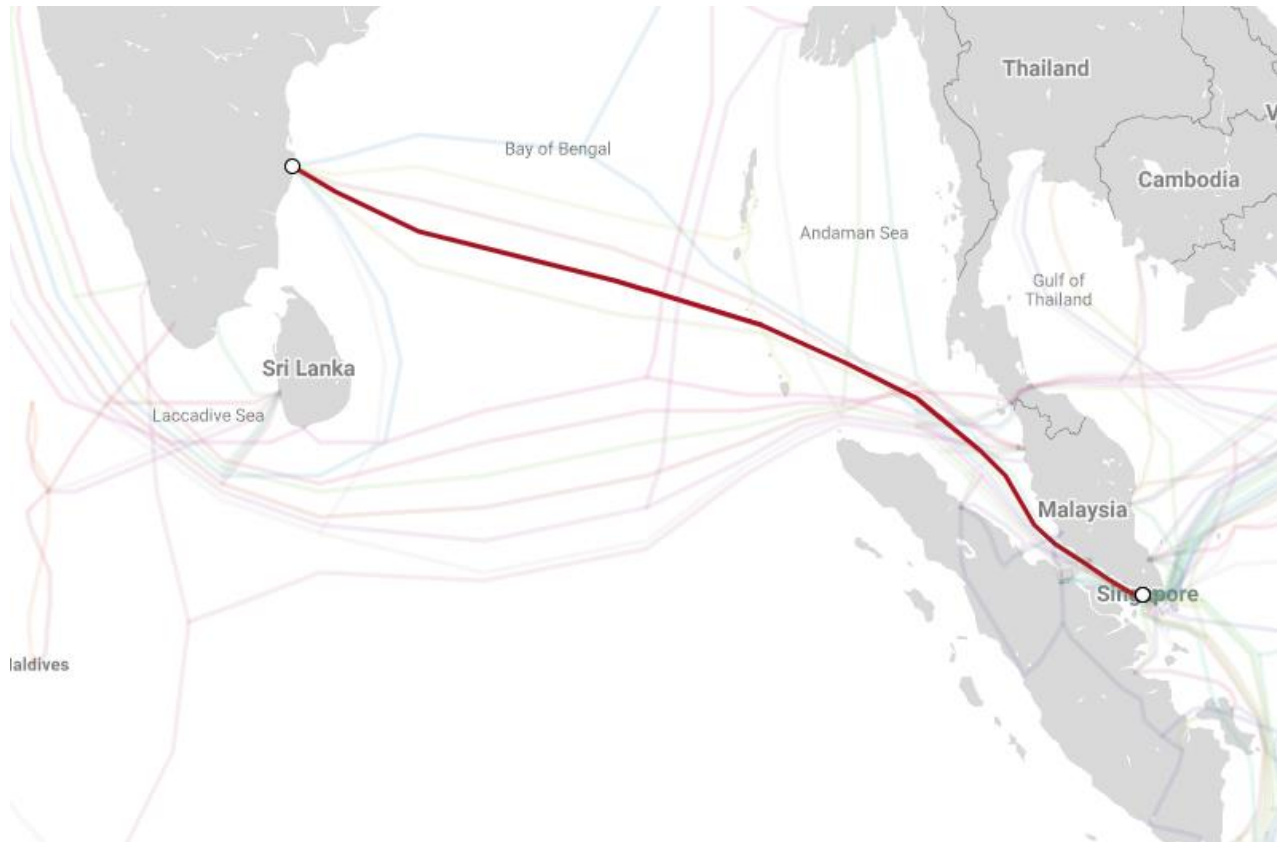
- The FLAG Europe Asia (Fiber-optic Link Around the Globe).
- Length: 28,000km, Capacity: 80Gbps (1997)
- Operators: Global Cloud Xchange (RCOM) (1)
- CLS: Chennai (Tata Comm.) (18)

SEA-ME-WE 3



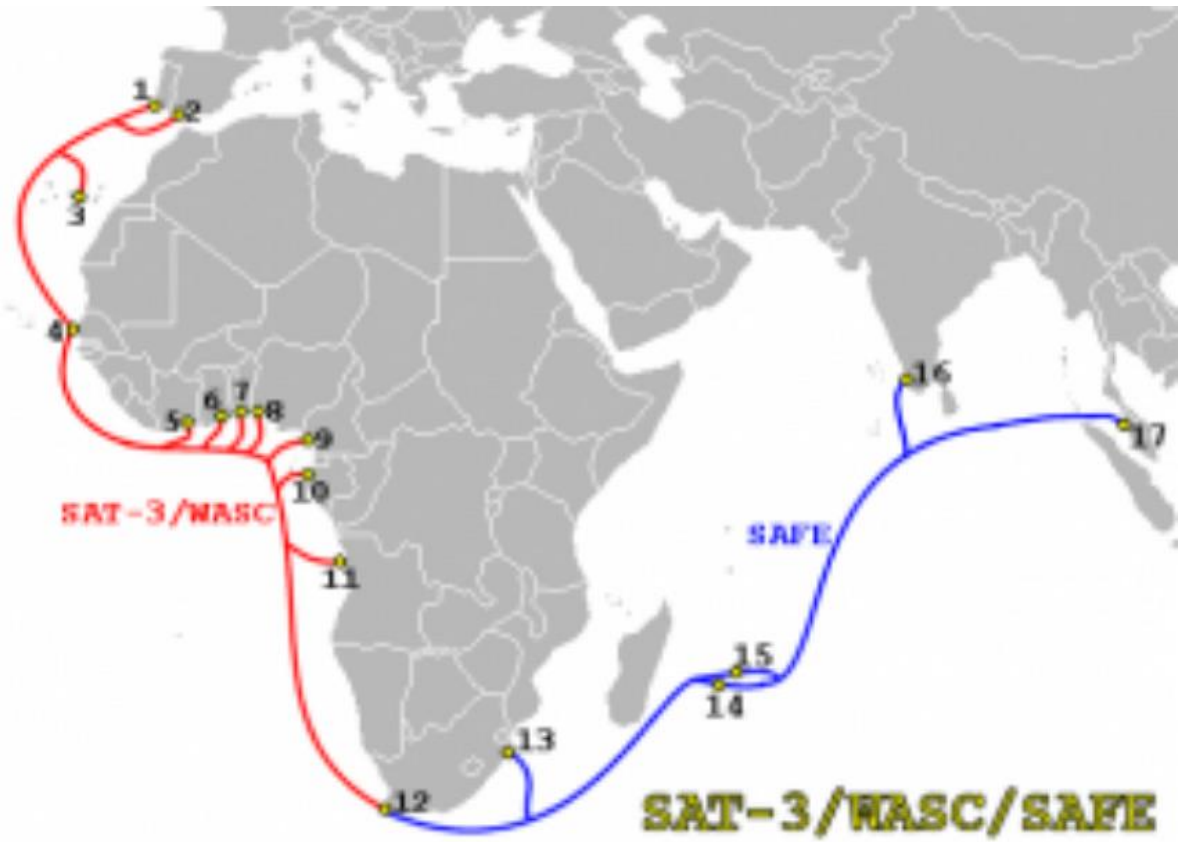
- The South-East Asia Middle East Western Europe 3.
- Length: 39,000km, Capacity: 100G (1999)
- Operators: BSNL (92)
- CLS: Mumbai (Tata Comm.), Kochi (Tata Comm.) (39)

I2ICN



- The i2 Cable Network.
- Length: 3,100km, Capacity: 8.4Tbps (2002)
- Operators: Bharti Airtel (2)
- CLS: Chennai (Airtel) (2)

SAFE



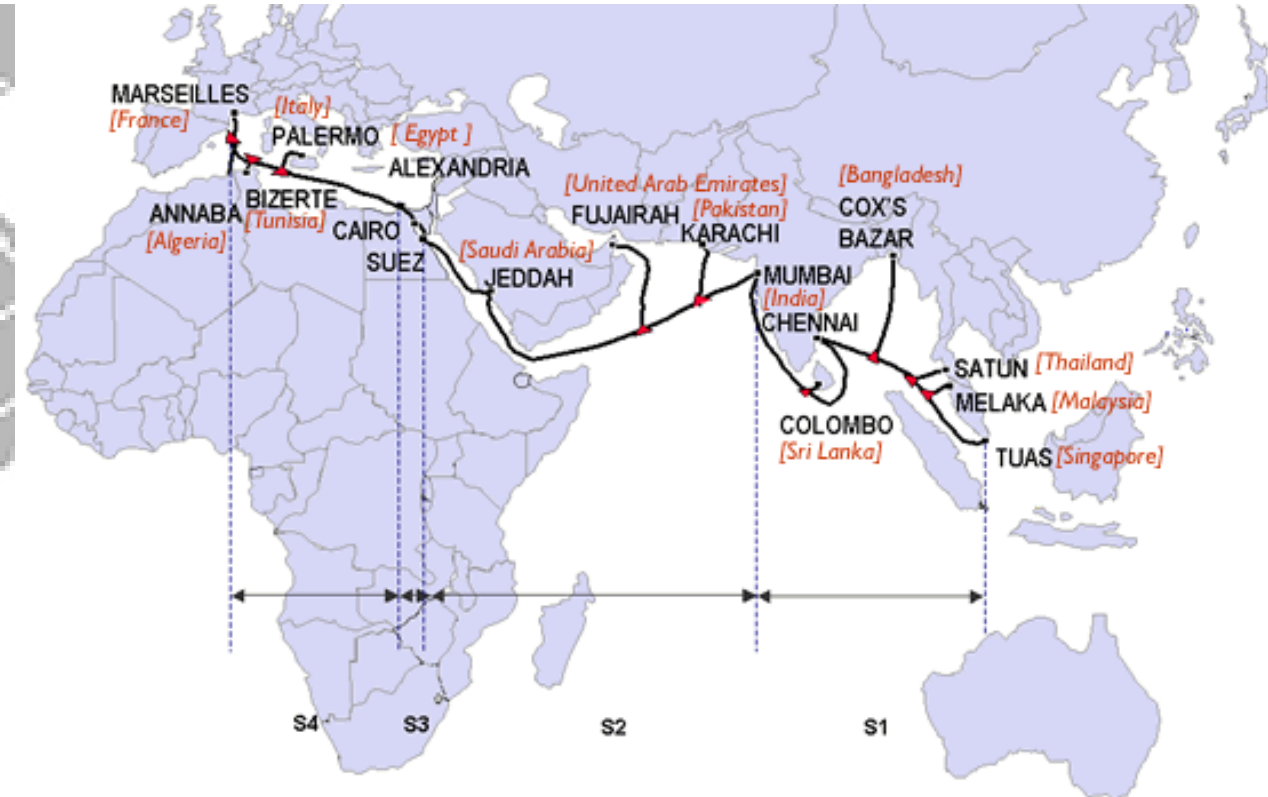
- The South Africa Far East.
- Length: 13,500km, Capacity: 130Gbps (2002)
- Operators: Tata Comm. (30)
- CLS: Cochin (Tata Comm.) (6)

TIC



- The Tata Indicom Cable.
- Length: 3,175km, Capacity: 5.1Tbps (2004)
- Operators: Tata Comm. (1)
- CLS: Chennai (Tata Comm.) (2)

SEA-ME-WE 4



- The South East Asia-Middle East-West Europe 4.
- Length: 18,800km (4), Capacity: 4.6Tbps (2005)
- Operators: Tata Comm., Bharti Infotel (16)
- CLS: Mumbai (Airtel), Chennai (Airtel) (17)

BLCS



- The Bharat Lanka Cable System.
- Length: 320km, Capacity: 1Tbps (2006)
- Operators: BSNL(2)
- CLS: Tuticorin (Reliance) (2)

FALCON



- The FLAG Alcatel-Lucent Optical Network.
- Length: 11,859km, Capacity: 2.56Tbps (2006)
- Operators: Global Cloud eXchange (16)
- CLS: Mumbai (Reliance) (17)

SEACOM



- The SEACOM Cable.
- Length: 17,000km, Capacity: 1.5Tbps (2009)
- Operators: (5)
- CLS: Mumbai (Tata Comm. / VSNL) (9)

IMEWE



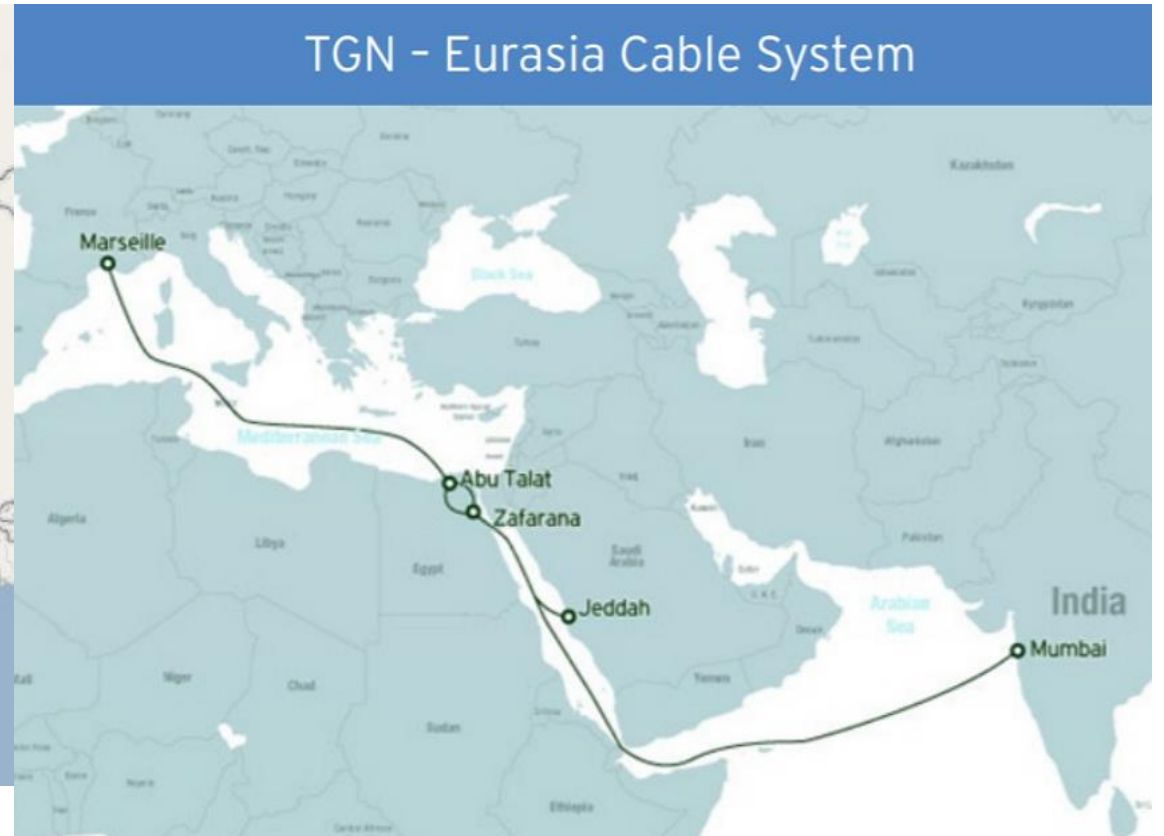
- The India Middle-East Western-Europe.
- Length: 12,091km, Capacity: 5.6Tbps (2010)
- Operators: Bharti Airtel, Tata Comm. (9)
- CLS: Mumbai (Tata Comm.) (10)

EIG



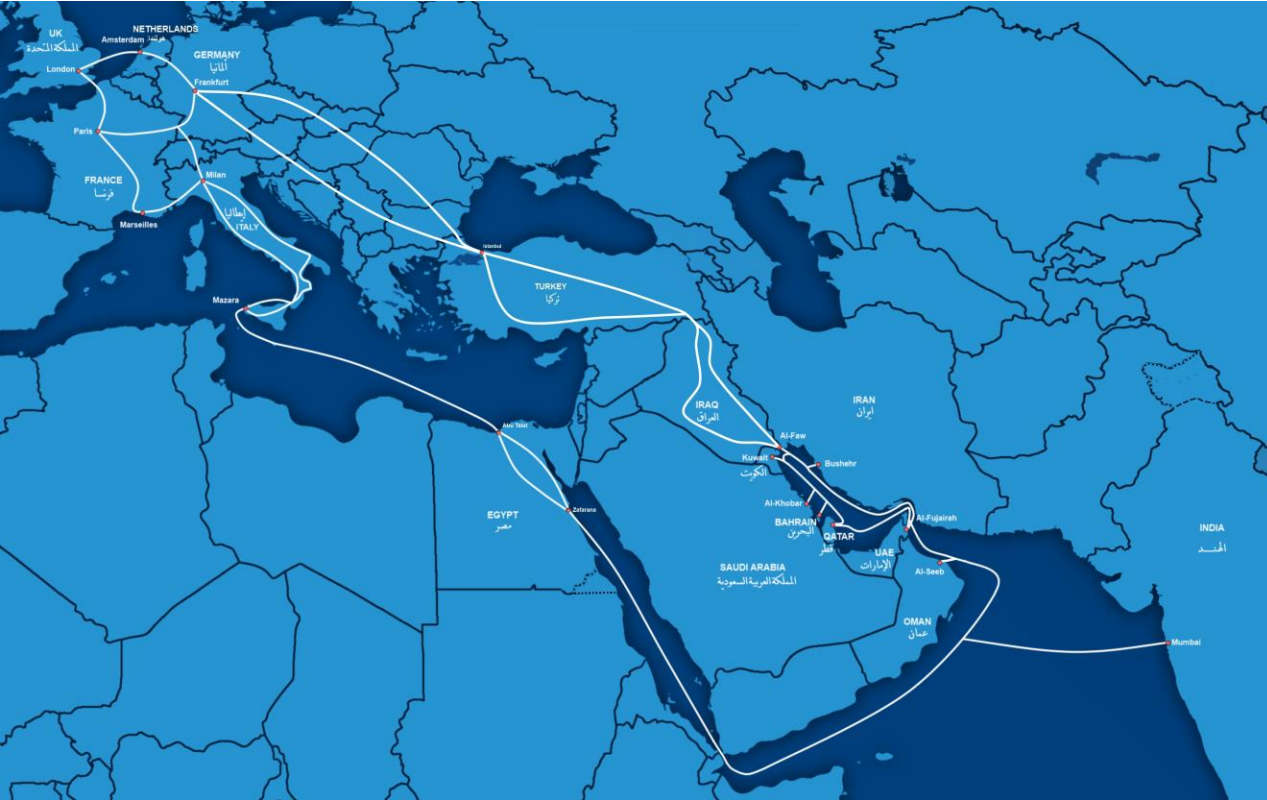
- The Europe India Gateway.
- Length: 15,000km (4), Capacity: 3.8Tbps (2011)
- Operators: Bharti Airtel, BSNL (16)
- CLS: Mumbai (Airtel) (12)

TGN-EA



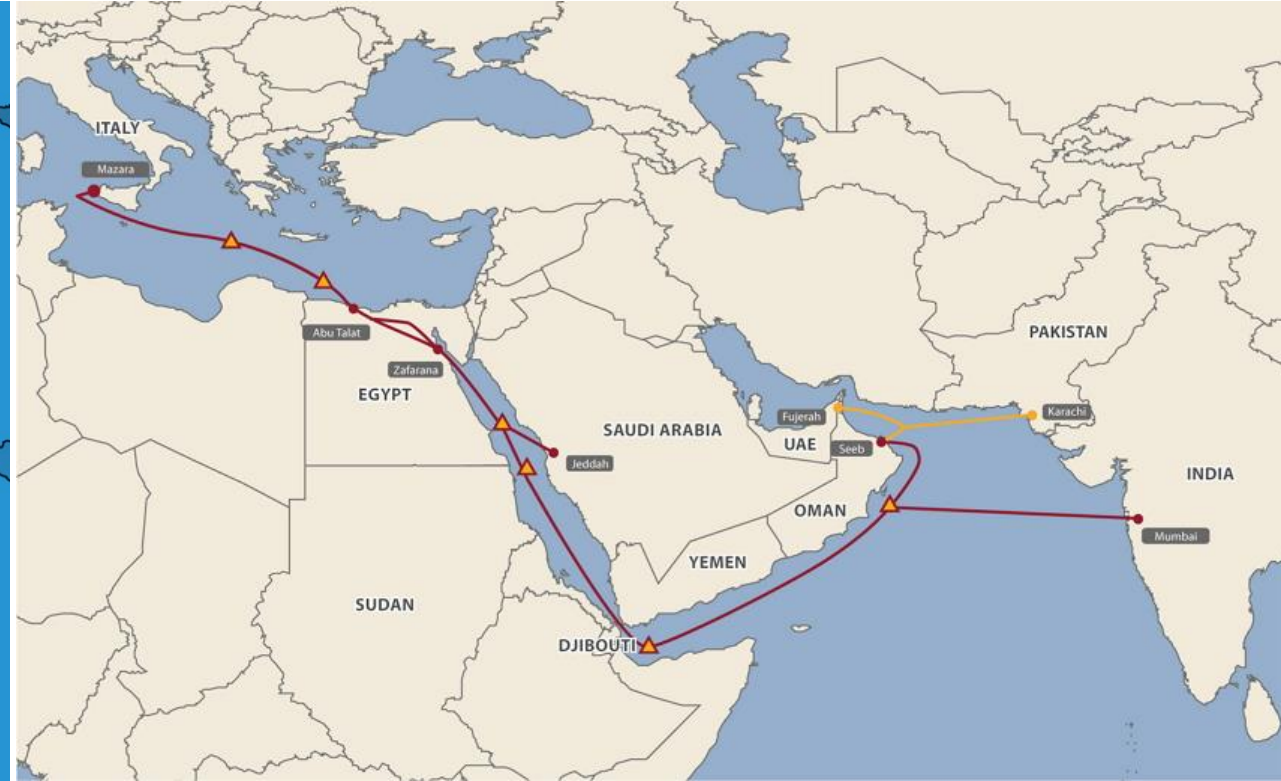
- The Tata Global Network-Eurasia.
- Length: 9,280km, Capacity: 1.28Tbps (2012)
- Operators: Tata Comm.(1) (RTD: 92ms)
- CLS: Mumbai (Tata Comm./ VSNL) (5)

GIBY



- The Gulf Bridge International.
- Length: 7km, Capacity: 5.6Tbps (2012)
- Operators: Bharti Airtel (?)
- CLS: Mumbai (Sify Tech.) (10)

MENA



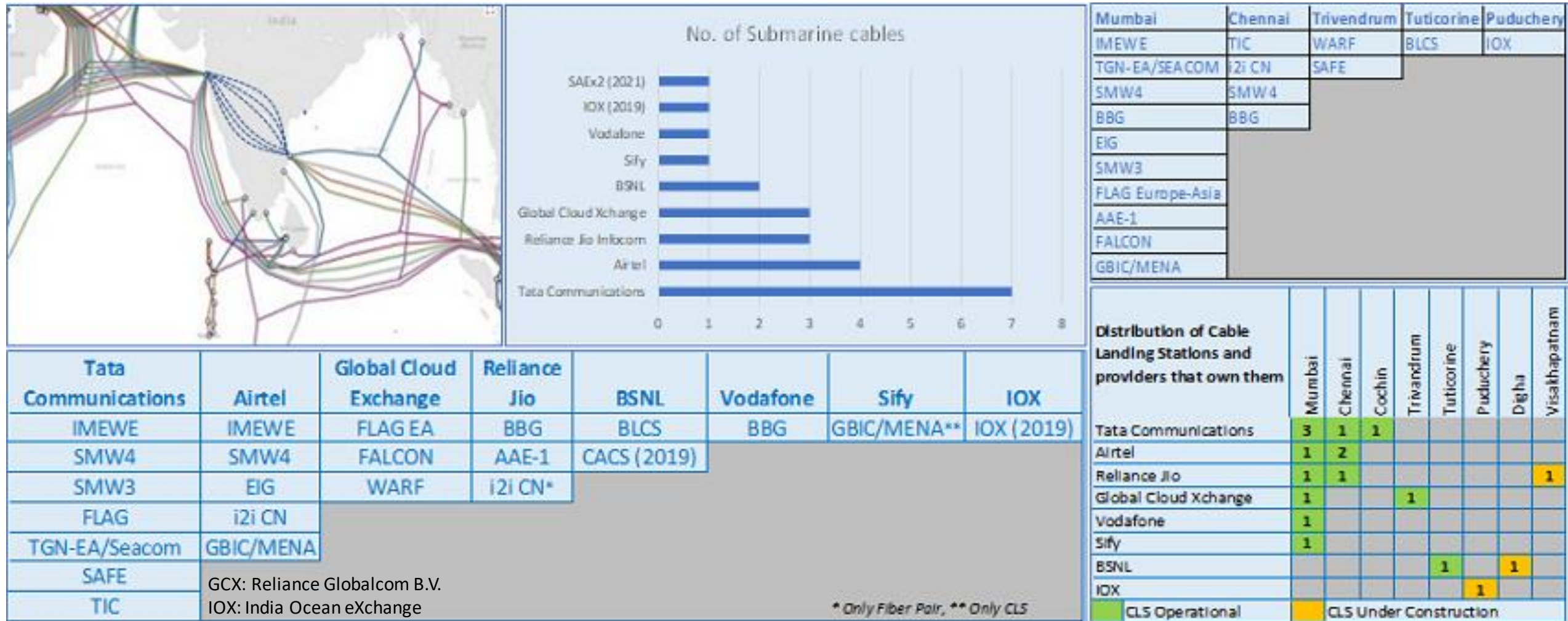
- The Middle East North Africa.
- Length: 8,800km, Capacity: 5.8Tbps (2014)
- Operators: Bharti Airtel (?)
- CLS: Mumbai (Sify Tech.) (7)

CANI



- The Chennai - Andaman and Nicobar Islands.
- Length: 2300km, Capacity: 6.4Tbps x 4 (Aug 2020)
- Operators: BSNL(?), Cost: 1224 Cr.
- CLS: (9), Handled by: NEC Corp. (Japan)

Cable Landing Stations in India



S No.	Submarine Cable System	Landing City	Landing Party	RFS	Length (kms)	No. of Fiber Pair	No. of Consortium Members
1	FLAG EA	Mumbai	GCX	1997	28,000	Two-fiber-pair	1
2	SMW3	Mumbai, Cochin	TCL	1999	39,000	Two-fiber-pair	54
3	SAFE	Cochin	TCL	2002	13,500	Two-fiber-pair	29
4	i2i	Chennai	Airtel	2002	3,200	Eight-fiber-pair	1
5	TIC	Chennai	TCL	2004	3,175	Six-fiber-pair	1
6	SMW4	Mumbai, Chennai	TCL, Airtel	2005	20,000	Two-fiber-pair	16
7	BLCS	Tuticorin	BSNL	2006	325	Two-fiber-pair	2
8	FALCON	Mumbai	GCX	2006	10,300	Six-fiber-pair	1
9	WARF	Cochin	GCX	2007	680	Two-fiber-pair	3
10	IMEWE	Mumbai	TCL, Airtel	2010	12,091	Three-fiber-pair	9
11	TGN-EA/SEACOM	Mumbai	TCL	2011	9,280	Two-fiber-pair	1
12	EIG	Mumbai	Airtel	2011	15,000	Four-fiber-pair	16
13	GBIC/MENA	Mumbai	Sify	2012	1,500	Four-fiber-pair	1
14	BBG	Mumbai, Chennai	Jio, Vodafone	2016	8,100	Three-fiber-pair	10
15	AAE-1	Mumbai	Jio	2017	25,000	Five-fiber-pair	19
16	CACN	Chennai	BSNL	2019	2,300	Four-fiber-pair	1
17	IOX	Puduchery	IOX	2019	8,850	Four-fiber-pair	1
18	SAEx2	Chennai	SAEX	2021	13,900	Six-fiber-pair	1
19	Jio New Cable	Mumbai, Chennai	Jio	2022	8,000	Twelve-fiber-pair	2/3/4(!)
20	IIP New Cable	Mumbai, Chennai	IIP	2022	10,000	12/16/32 fiber-pair	3/4 (!)

Landing of an Italy-USA cable (4,704 nautical miles long), on the Rockaway beach, New-York, January 1925.

