

Submarine Cable Network

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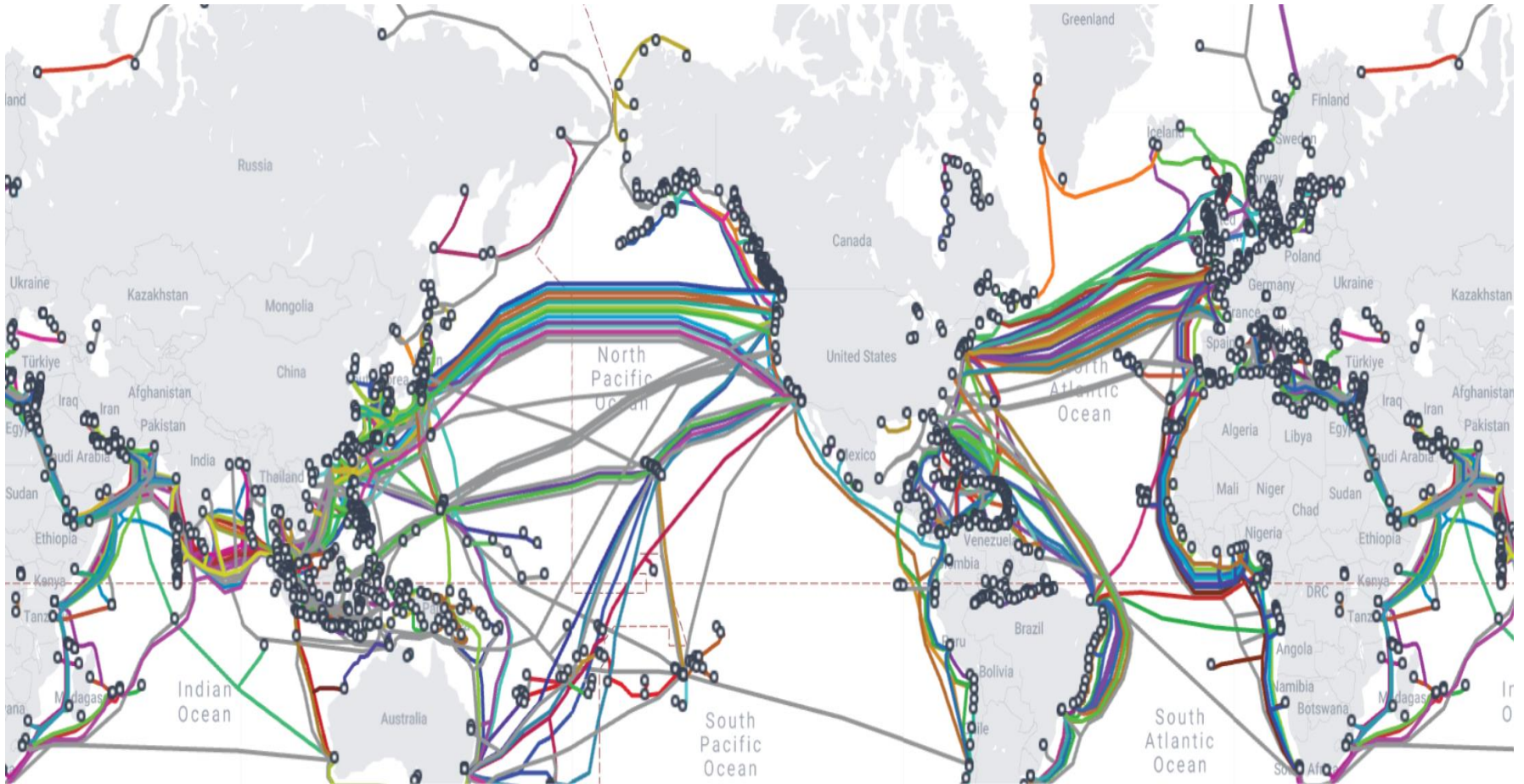
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MYANMAR NETWORK OPERATORS GROUP

Presentation of Submarine Fiber Communication

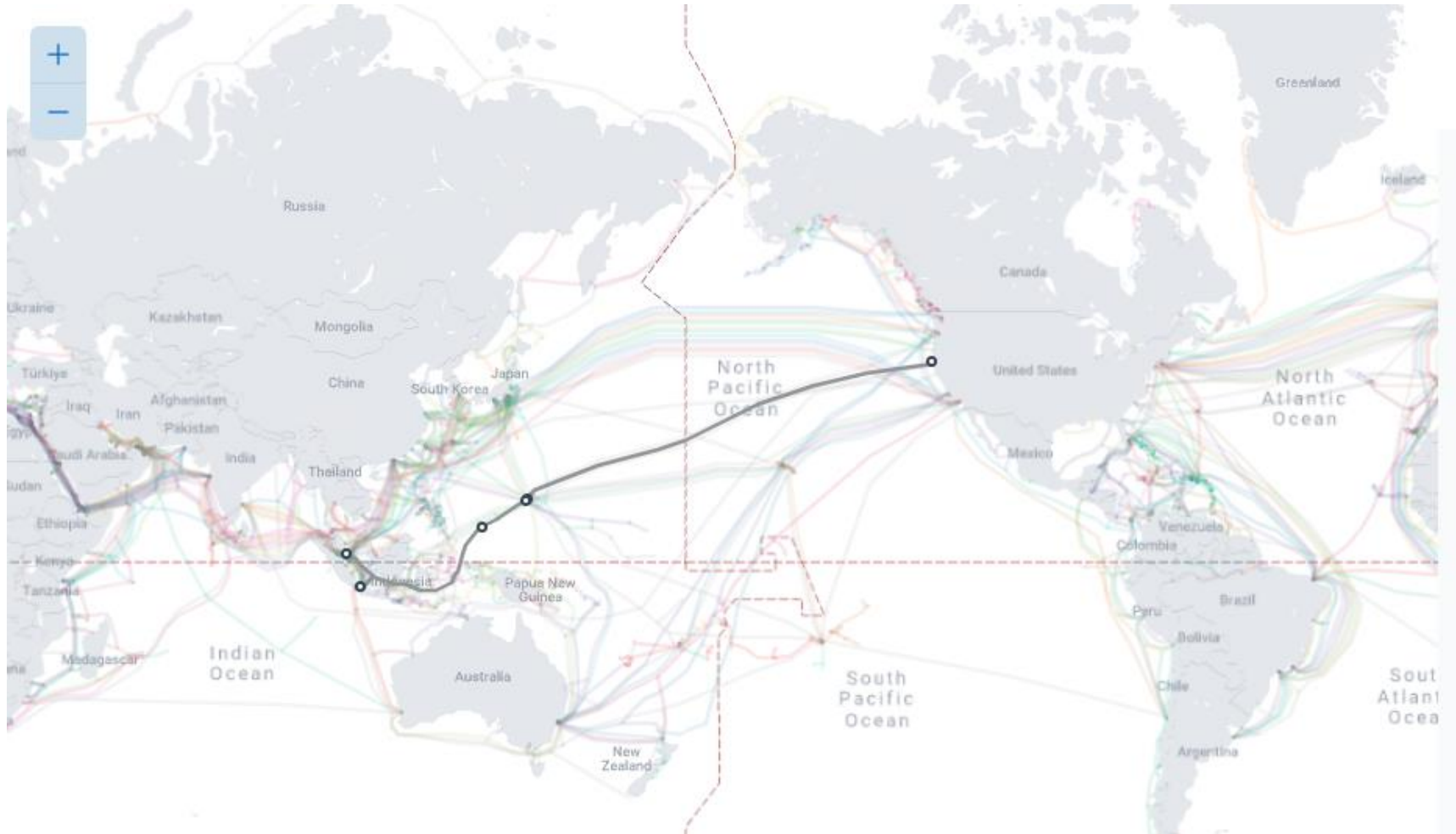
1. Submarine cable are transporting a very high capacity per fiber pair at **1 Tbps** channel
2. Submarine cable are providing high reliability ensure by **25 years** of design life
3. Low traffic latency (Time needed for transmission over submarine cable between USA and Aisa is only **30 millisecond**)
4. **Low Cost** when it is compared to Satellite system

World wide Submarine Cable



<https://youtu.be/DKHZKTRyzeg> Submarine Cable Map

Sample Submarine Cable Route



Presentation of Submarine Fiber Communication

- Cable Name = Echo
- RFS = 2025 Q4
- Cable Length = 17,184 Km
- Owner = Google, Meta
- Landing Point = (Changi North, Singapore, Eureka, CA, US)

Sample Submarine Cable Route



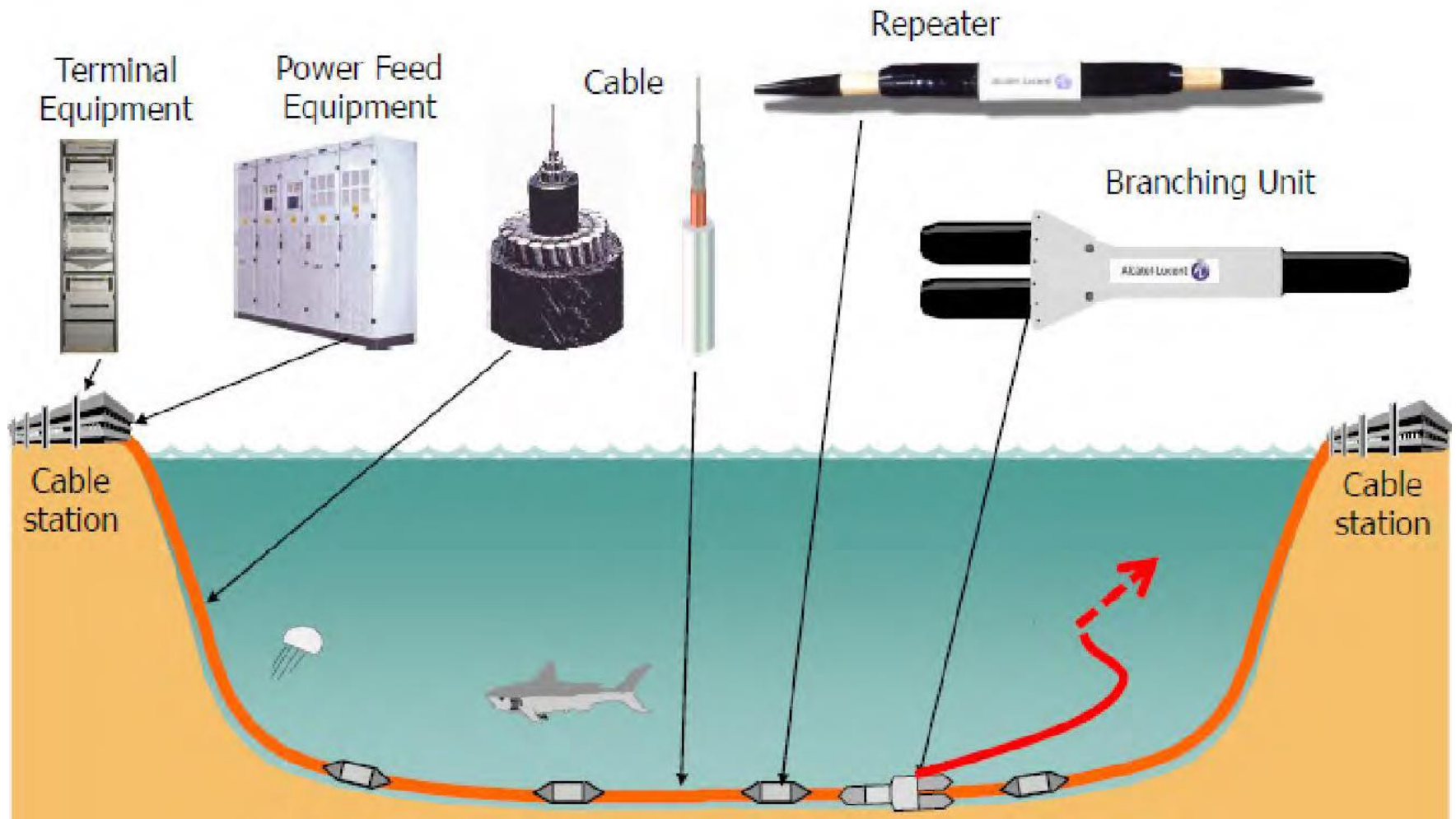


Presentation of Submarine Fiber Communication

ASE (Asia Submarine Express) 100G Waves Available:

-Tokyo/Singapore 63.5 Milliseconds RTD. (lowest latency)

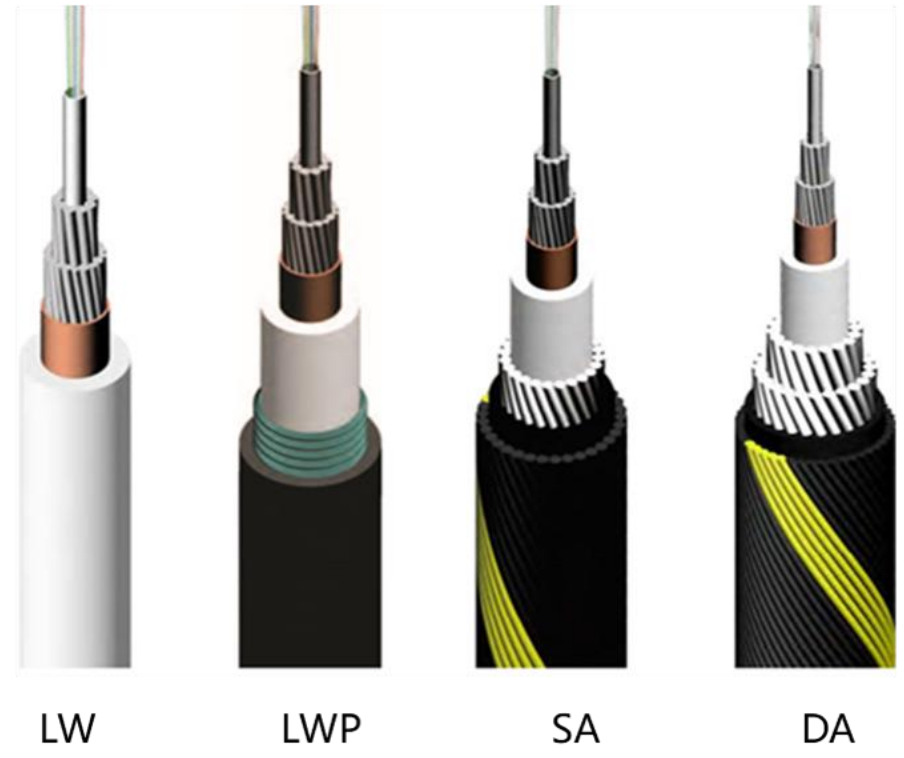
Submarine Network (Basic Configurations)



Configuration of Submarine Fiber Communication

1. The cable
2. The repeater
3. The brunching units (BU)
4. PFE (Power feeding equipment)
5. SLTE (Submarine Line Termination Equipment)
6. Network Management System

Submarine Fiber Cable



[The cable](#) video

Submarine Fiber Cable

Light Weight (LW) is the core of the cable family. The LW cable adopts inner vault steel wires design with polyethylene (PE) extrusion outside. The LW cable can be deployed & recovered down to 8,000m water depth.

Light Weight Protected (LWP) incorporates an external screen and an additional outer polyethylene sheath on the LW cable. The LWP cable is suitable for deployment in the environment that exposure to moderate abrasion and marine animal bites down to 7,000m water depth.

Single Armor (SA) equips a single layer of high strength galvanized armor wires at the external of the LW cable. The SA cable can be deployed & recovered at buried areas and risky regions with bottom trawling fishing etc. down to 2,000m water depth.

Double Armor (DA) adds two layers of high strength galvanized armor wires at the external of the LW cable. The DA cable is suitable for shallow water within 600m water depth where anchors can reach and abrasion might be a risk.

Repeater

High Fiber Count

The world-first 32 fiber pairs repeater, meeting the large- capacity transmission requirement.

Ultra-long Distance

High output optical power and low noise figure enable up to 160km span in a repeatered system, and support up to 16,000km in transoceanic system.

High Reliability

Utilize pressure-resistant and anti-corrosion titanium alloy housing, high-sealing structural design and high reliability redundancy design to ensure stable operation at 8,000m water depth for 25 years.



The Repeater

Branching Unit

High Fiber Count

Up to 32 fiber pairs for different network applications, meet the needs of Large-capacity transmission.

Flexible Configuration

Support traffic allocation at different levels (Fiber/Spectrum) to enhance networking flexibility.

Fault Isolation

Support flexible optical switch and high voltage hot switch to increase traffic resilience.

High Reliability

Utilize pressure-resistant and anti-corrosion titanium alloy housing and high-sealing structural design, and high-reliability redundancy backup design to ensure stable operation at 8,000m water depth for 25 years.



The Branching Unit

Power Feeding Equipment

- High precision constant current supply (2.0 A max)
- Maximum output Voltage (10 kV ~ 18 kV)
- Output Power (27 kW)
- Multiple interlock to ensure personal safety
- Emergency Power Off Button
- Redundancy
- Used in repeatered submarine cable system



PFE (Power feeding equipment)

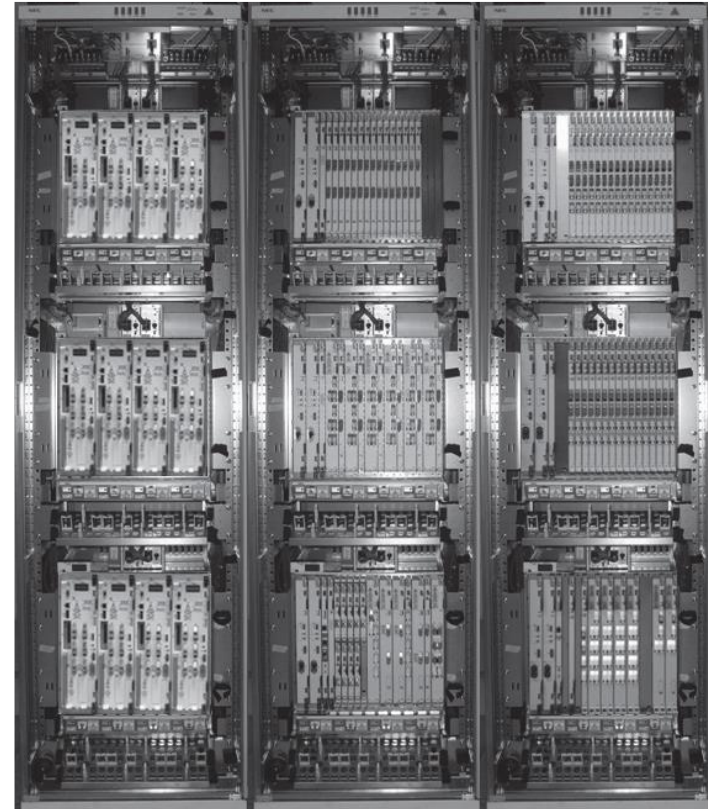
Submarine Line Terminal Equipment

- Technologies for Ultra-large/ Ultra Long
- DWDM Technology
- Optical Signal Modulation (QPSK)
- Error Correction (FEC)
- Wavelength Dispersion compensation
- Pre-emphasis Function
- ROADM for Branching Unit
- N:1 Redundancy (Switching from working unit to protection unit)

Transponder Block

WDM Block

Redundancy Block



SLTE (Submarine Line Terminal Equipment)

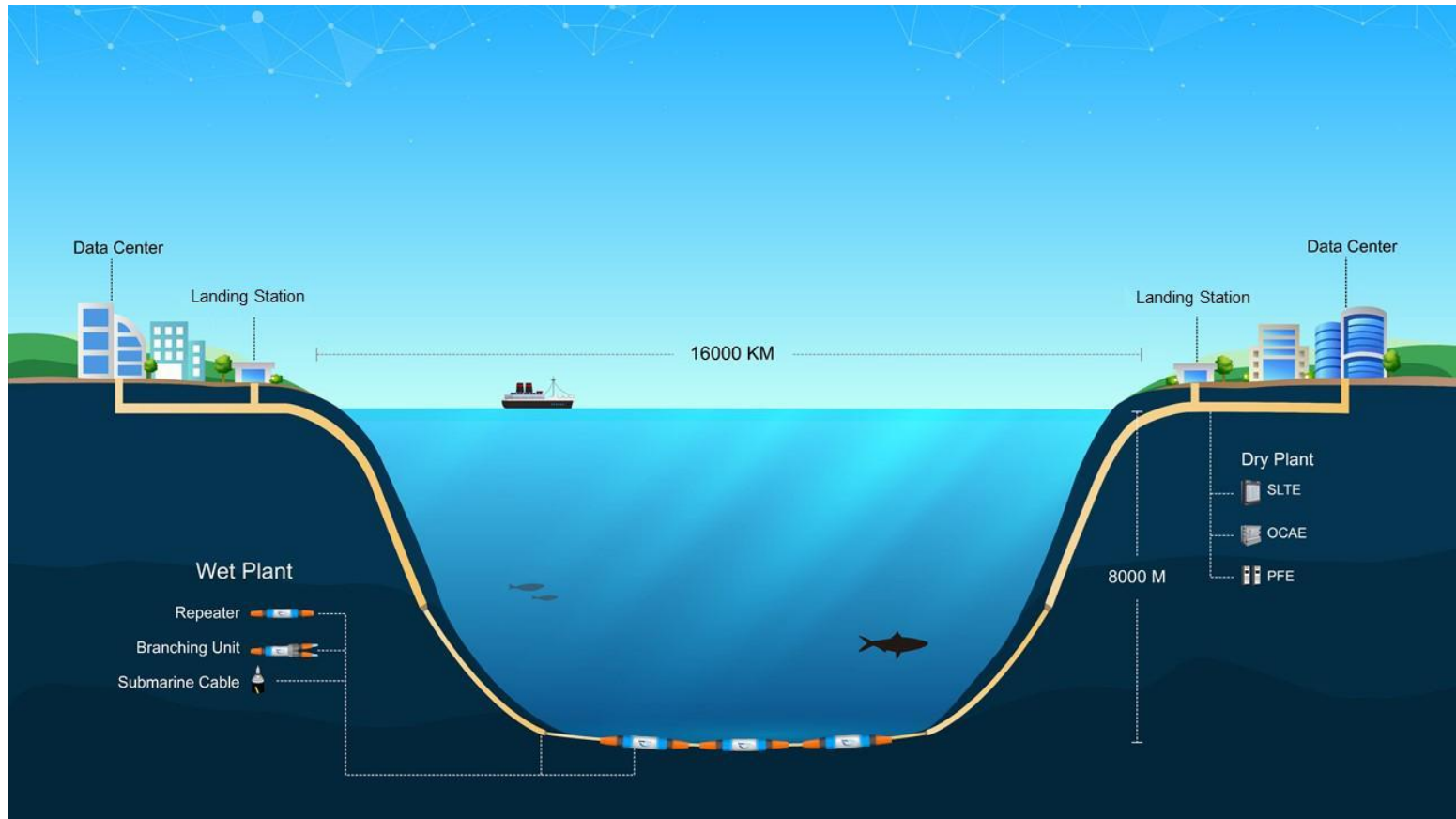
Network Management System

- Supervisory System
- Overall system monitoring
- Repeater Performance Monitoring

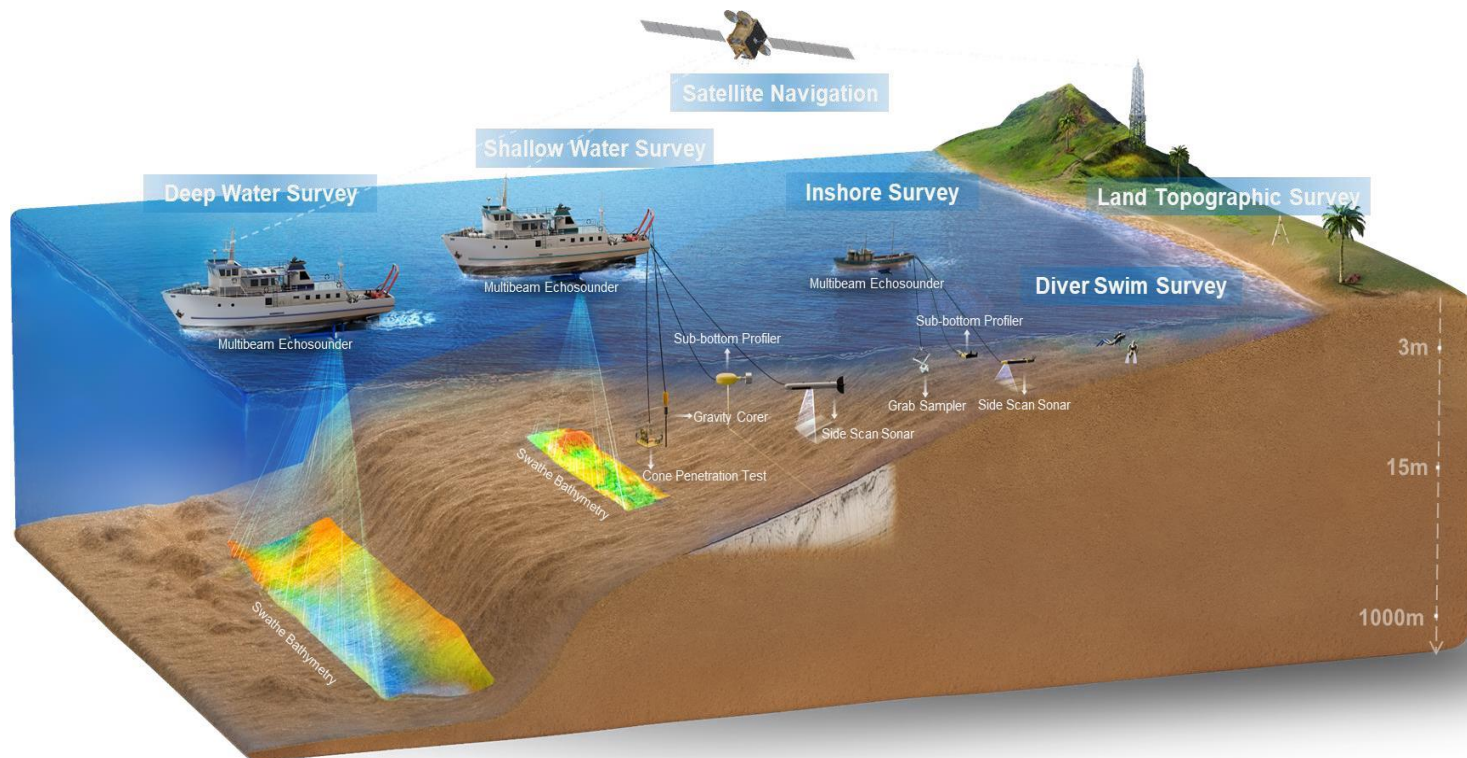


Network Management System

Dry Plant and Wet Plant Components



Marine Operation: Survey



Basic Submarine Survey Technics

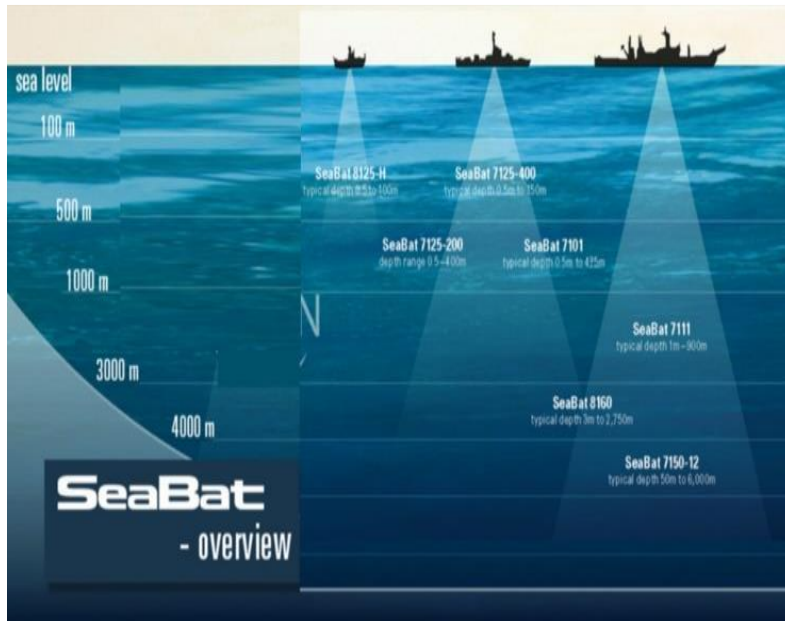


Survey Vessel



Topographic Survey

Basic Submarine Survey Technics



Bathymetry Survey



Diver Survey

Marine Operation: Installation

Cable Installation Ship



Ships (100-150 m\$)

Global Marine (UK)
 Orange (France)
 Acatel (France)
 Subcom (US)
 OMS (Malaysia)
 HMNtech 9China)

Cable Laid Ship = 35

Cable Maintenance Ship = 30 (200 faults /year)

Marine Operation: Installation



Burial Tools - Plows



Remotely Operated Vehicle

Marine Operation: Installation



Cable Tanks

Marine Operation: Installation



Shore Ends Installation

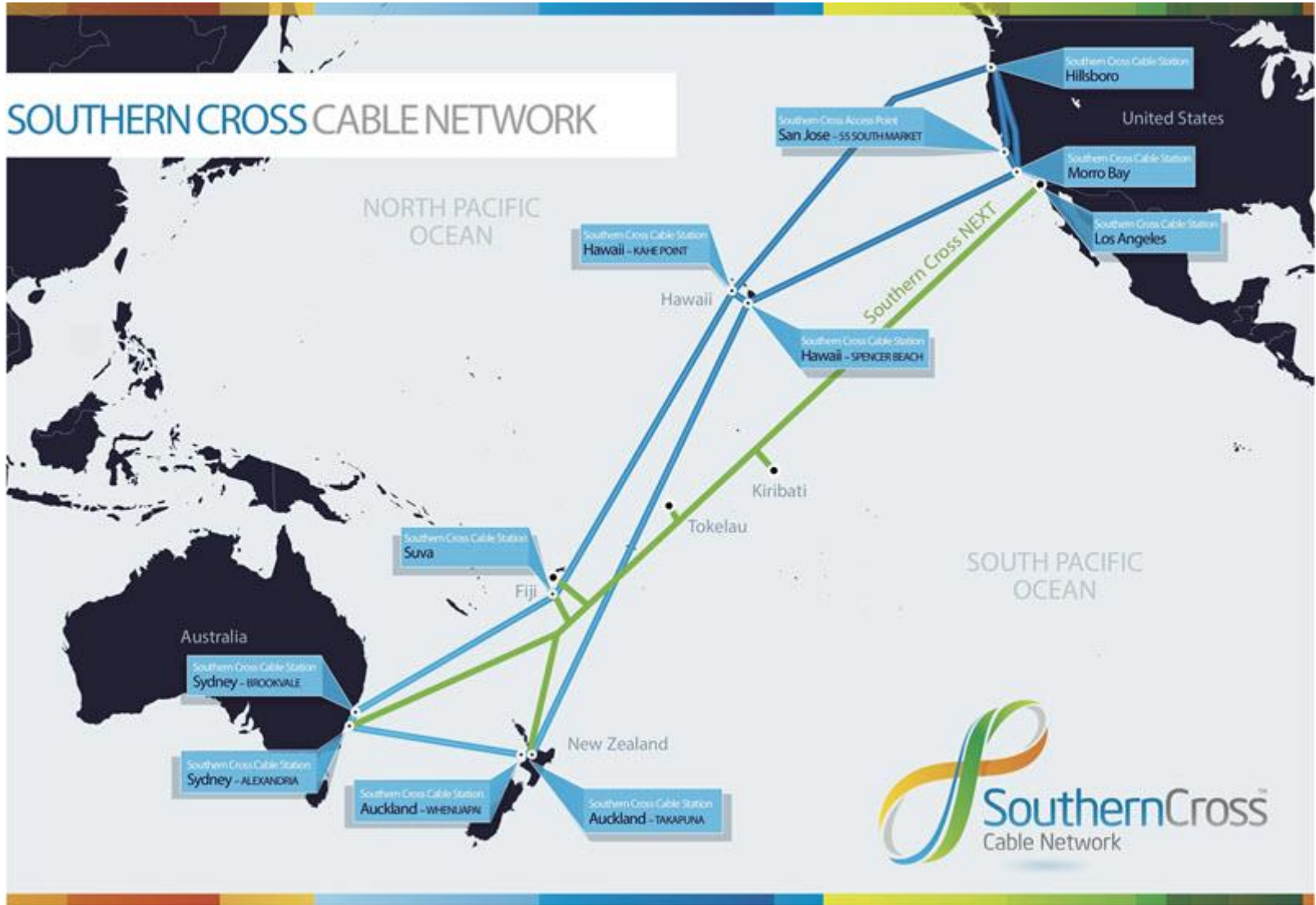


Beach Manhole

Future Evolution of Submarine Network

- 99% of Network Data is sent over subsea network
- Transmission technology will be 200G, 400G and 500G
- Multicore Fiber (current single mode fiber limitation is 100 Tbps)
- Special Division Multiplexing
- Dual Cable Design

Dual Cable System



End