

Undersea superhighway

Faster access to Facebook, Google and Netflix? A new 4,600km submarine cable linking Perth to Singapore that delivers a minimum capacity of 40 terabytes per second could make this a possibility. The Straits Times plunges in to explore the Australia Singapore Cable system.

HOW IT WILL BENEFIT CONSUMERS

It provides greater support for content from North America and offers Asian-based content providers and aggregators (Microsoft, Google, Facebook etc) a fast and cost-effective alternative connection to the US than through existing Pacific cable systems.

WHY ANOTHER CABLE SYSTEM

The advanced design and engineering ASC system provides an alternative to the trouble-plagued, ageing and lesser-capacity SEA-ME-WE3 submarine cable which has suffered a number of outages and has been inoperable for weeks at a time.

WHY SINGAPORE

Singapore is regarded as a technology and business hub to the wider Asia region. This route is also less prone to geological activity and will open the door for a new data route called the Great Southern Route which will connect South-east Asia to North America via Australia.

BANDWIDTH DEMAND INCREASING

Content is growing at exponential rates and transferred through undersea network systems. Demand for transit capacity is expected to grow. In the next two years, 8.6 billion Internet of Things devices are forecast to flood the market and increase data consumption.

SO MANY CABLES

Over 99 per cent of intercontinental data traffic is carried by submarine cables as they can carry far more data at far less cost than satellites.

Estimated number of cables worldwide: **448**

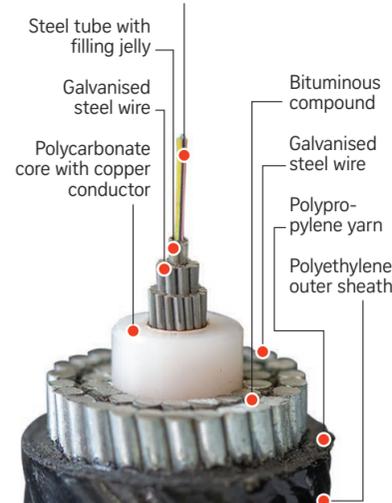
Total length of all cables: More than

1.2 million km

ANATOMY OF ASC

Fibre optic cores

8 individual fibre cores (4 fibre pairs)

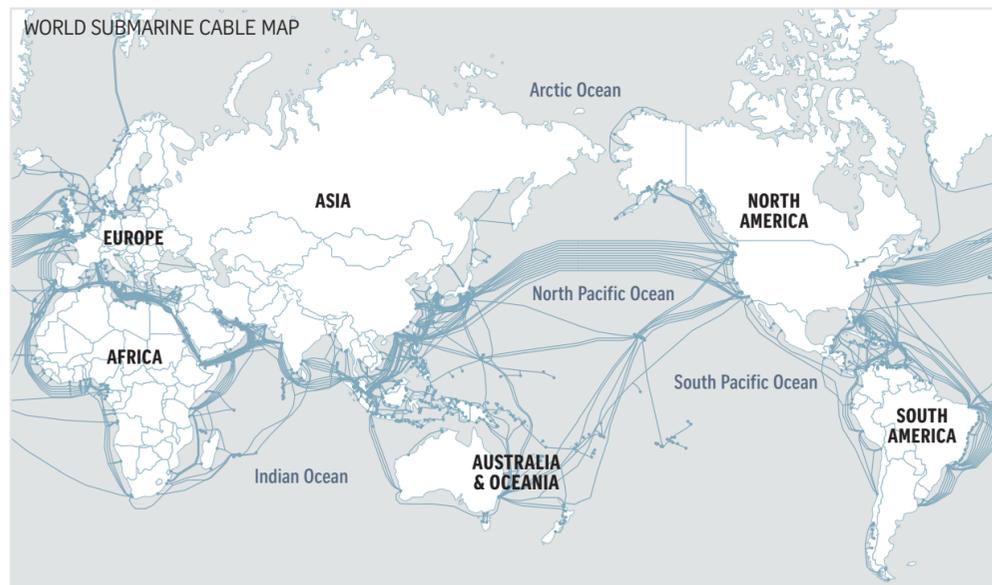


HOW CABLES WORK

Submarine cables use fibre-optic technology. Lasers are fired from one end of the cable at extremely rapid rates down thin glass fibres to receptors at the other end. The filaments that carry light signals are about the diameter of a strand of human hair.

DID YOU KNOW

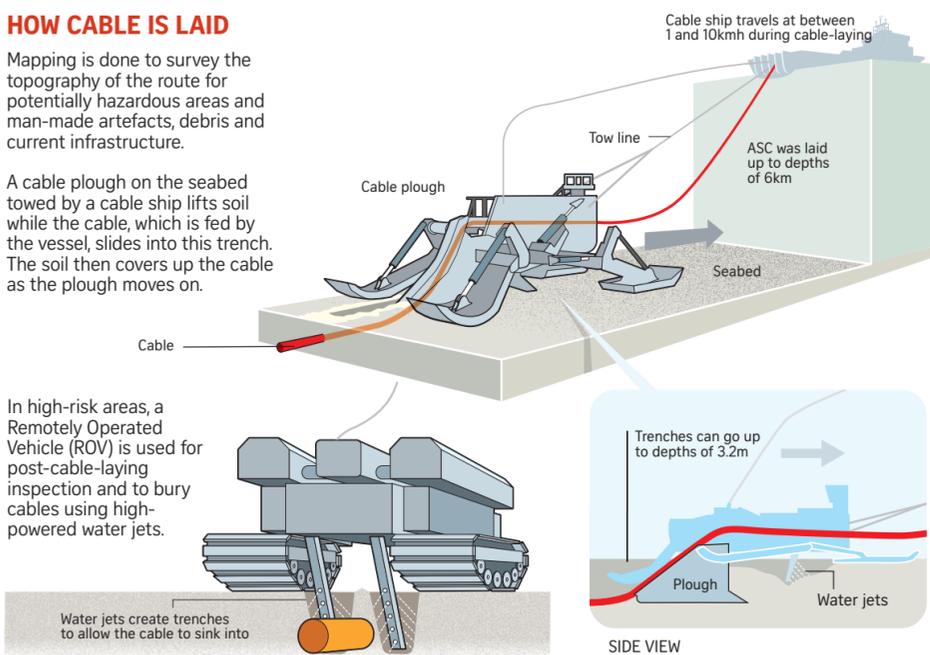
- Speed of light signals from Perth to Singapore through ASC is less than 50 milliseconds
- Capacity of 40 terabytes per second is equivalent to streaming 8 million HD movies simultaneously
- Total weight of ASC is 3,250 tonnes
- ASC system costs US\$170 million (S\$234 million)
- ASC started operation on Sept 14 and is solely owned by Vocus Communications (Australia)
- First submarine cable was laid across the English Channel between UK and France in 1850
- The length of a cable used is 2.5 times the distance
- Lifespan of a cable is about 25-30 years



Length of ASC: 4,600km
Time taken to lay cable: 5 months

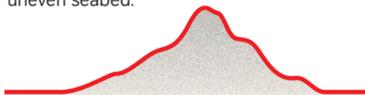
HOW CABLE IS LAID

- 1 Mapping is done to survey the topography of the route for potentially hazardous areas and man-made artefacts, debris and current infrastructure.
- 2 A cable plough on the seabed towed by a cable ship lifts soil while the cable, which is fed by the vessel, slides into this trench. The soil then covers up the cable as the plough moves on.
- 3 In high-risk areas, a Remotely Operated Vehicle (ROV) is used for post-cable-laying inspection and to bury cables using high-powered water jets.



UNDULATING SEABED

The cable is laid over the uneven seabed.



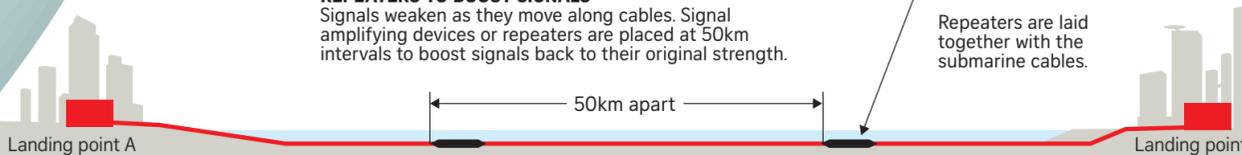
CABLE CROSSINGS

1. The main cable is laid over another cable in its path.
2. The ROV is then used to bury the main cable.



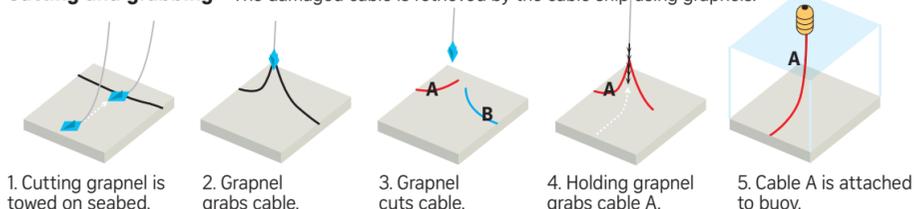
REPEATERS TO BOOST SIGNALS

Signals weaken as they move along cables. Signal amplifying devices or repeaters are placed at 50km intervals to boost signals back to their original strength.

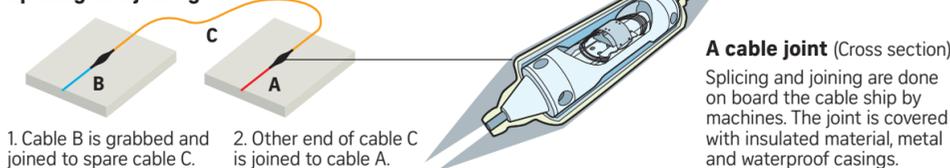


HOW CABLE IS REPAIRED

Cutting and grabbing The damaged cable is retrieved by the cable ship using grapnels.



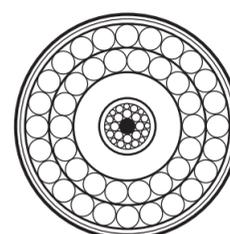
Splicing and joining



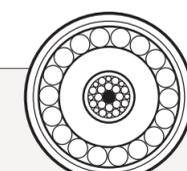
DIAMETERS OF ASC

(Actual sizes)

Cable with two varying diameters is used.



Diameter of 3.75cm is used in high-risk-damage areas and landing sections.



Diameter of 2.8cm is used for the rest of the route.

VARIOUS THREATS TO SUBSEA CABLES

Man-made
Two-thirds of all cable faults are caused by fishing vessels and ships dragging anchors. Others include fishing activities.

Natural hazards
These include current abrasion, underwater landslides and seismic activity or earthquakes.

Sharks
They have been known to bite a few cables but are not a major threat.