

PERSPECTIVE

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Starlink's Entry into Indonesia: More Complementary than Disruptive?

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Starlink Indonesia. Screen capture of its Facebook page on 16 August 2024.

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EXECUTIVE SUMMARY

- Starlink has entered the Indonesian market with the launching of broadband services powered by low-earth-orbit satellites. Its broadband services promise to be of higher quality than those provided by the two satellite-based broadband incumbents.
- While consumers welcome the new player, responses from incumbent players have been mixed.
- Satellite-based broadband is more cost-effective in serving sparsely populated areas in remote locations. Meanwhile, Starlink's pricing and service strategy targets mid-to-higher-income households and large businesses.
- The new entrant is not likely to challenge the four dominant telcos that provide mobile and cable broadband with greater service stability and speed.
- Since Indonesia's broadband market is still vastly under-served, there is sufficient room for Starlink to operate with its high-pricing strategy, and to complement the existing services.

INTRODUCTION

On 19 May 2024, Elon Musk arrived in Bali to launch Starlink's satellite-based broadband services in Indonesia.¹ These services, although still in their early operational phase, have expectedly been welcomed by consumers as a partial remedy to the insufficient bandwidth that exists in the country.

At the same time, Starlink's entry is being cautiously received by the two incumbent local satellite-based broadband service providers, namely privately-owned PT Pasific Satelit Nusantara (PSN) and PT Telkomsat (Telkomsat), a subsidiary of state-owned PT Telkom Indonesia Tbk.

Interestingly, it is the four dominant mobile and cable broadband service providers, Telkomsel, Indosat Ooredoo, XL Axiata, and Smartfren which have been more critical of Starlink's Indonesia presence. These have urged the government to ensure that the playing field remains level, and that similar regulatory requirements, such as data security and telecommunication charges, are imposed on all. Starlink and the two local satellite broadband providers follow regulatory requirements that are similar, but which however differ from those of mobile and cable internet providers.

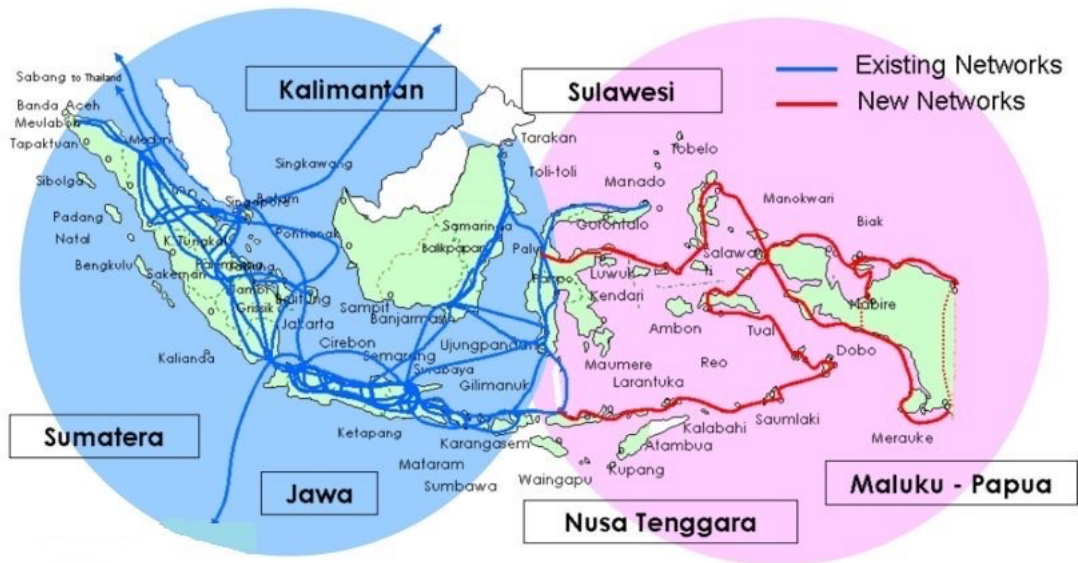
This essay assesses Starlink's potential impact in Indonesia. It first describes the country's current broadband infrastructure, before comparing Starlink's service and features to those offered by the incumbent PSN and Telkomsat's satellite-based services. Finally, an assessment is made on whether Starlink services complement or are disruptive to the country's telecommunication sector.

INDONESIA'S INTERNET BROADBAND INFRASTRUCTURE

Building a telecommunication infrastructure that provides broadband connectivity for over 270 million people across some 6,000 inhabited islands and covering three time zones remains a never-ending work-in-progress. With more than 350 million 3-4G mobile subscribers, the Indonesian telecoms market is mobile-centric and ranks as the world's third-largest cellular market behind China and India.²

The Palapa Ring is a 35,000 km backbone fibre-optic cable that connects the larger islands of Sumatera in the west, Jawa-Bali and Kalimantan in between, and Sulawesi and Papua in the east. It is laid under the sea and above land, connecting a network of cables, telco BTSs (base transceiver stations) towers and micro-wave transmissions, and covering both dense urban areas and less populated but still commercially viable areas.³

Palapa Ring's Indonesia Coverage



Source: <https://www.fomsn.com/wp-content/uploads/2019/10/Eastern-Palapa-Ring-fiber-optic-cable-network-Indonesia.jpg>

This telecommunications backbone project began in 2015 and was completed four years later, costing more than USD 540 million.⁴ It was undertaken using a Public Private Partnership (PPP) scheme, wherein the private sector provided funds for the more commercially feasible urban and densely populated areas, while the government took charge of the remote and sparsely populated areas. The government’s portion came from a Universal Service Obligation (USO) Fund, sourced through a government levy on domestic telco revenues.⁵

Connecting to the Palapa Ring are the four major telcos. Through their respective and shared BTS towers and cable networks, they provide mobile and cable broadband services to end-user subscribers.⁶ State-owned Telkom mobile cellular subsidiary Telkomsel, with 237,300 BTS towers, has dominated the cellular subscriber market, followed by Indosat-Ooredoo, XL Axiata and Smartfren.⁷ Complementing mobile broadband services by these four telcos are additional fixed-line (cable) broadband providers. These, among others, are Biznet, Oxygen, MyRepublic, CBN, Transvision, First Media and MNC. most of these also provide pay cable TV channels, mostly to serve end-users in large urban centres.

Table 1: Broadband Service Providers in Indonesia

Company	Broadband Service Type	Market Focus	Network Infrastructure	Mobile Market Share	Cable Market Share
Starlink Indonesia	Satellite	Remote areas	Leo satellites	n.a.	-
PSN Ubiq	Satellite	Remote areas	Geo satellite Satria One	n.a.	-
Telkomsat	Satellite	Remote areas	Geo satellite Merah0-Putih	n.a.	-
Telkomsel/Indihome	Mobile-Cable	Urban and dense areas	237,300 BTS towers	40.3%	87%
Indosat-Ooredoo	Mobile-Cable	Urban and dense areas	132,246 BTS towers	33.4%	-
XL Axiata-Axis	Mobile-Cable	Urban and dense areas	156,706 BTS towers	21.0%	-
Smartfren	Mobile	Urban and dense areas	36,814 BTS towers	5.3%	-
First Media	Cable	Urban	n.a.	-	7%
MNC Play	Cable	Urban	n.a.	-	3%
Biznet	Cable	Urban	n.a.	-	1%
MyRepublic	Cable	Urban	n.a.	-	1%

Source: <https://databoks.katadata.co.id/datapublish/2021/07/30/indihome-mendominasi-pasar-internet-fixed-broadband-di-indonesia>;

<https://databoks.katadata.co.id/datapublish/2023/06/23/ini-operator-seluler-dengan-pengguna-terbanyak-di-indonesia-awal-2023>

and

<https://databoks.katadata.co.id/datapublish/2021/09/27/telkomsel-juarai-kepemilikan-bts-terbanyak-di-indonesia-capai-237-ribu-bts>

Note: n.a. is not applicable

Given the lower cost of building mobile broadband connectivity compared to cable broadband networks, mobile broadband remains affordable and has a broader market usage. Be that as it may, it is the more costly-to-build and higher-priced cable broadband services that offer better stability and quality, and currently, 26% or 18.4 million⁸ households, subscribe to these. At the same time, the quality of Indonesia's fixed-line broadband lags that of most ASEAN countries, and needs a considerable quality upgrade if they are to properly support the education and healthcare sectors.⁹

Most of the mobile and fixed line services of the four major mobile cellular companies are concentrated around the large islands in the western portion of the Palapa Ring. And, although the Palapa Ring extends to the eastern part of the country, cable networks there are very limited, and even mobile network coverage remains sparse, slow and unstable. The per capita income of eastern Indonesia is lower than in the rest of the country, thus building a mobile terrestrial

network linking the small communities across the small islands over a vast area is not profitable.

This is where satellite technology offers a commercially viable alternative. The government has been launching its series of Palapa communication satellites since the first Palapa A1 satellite was put into space in 1976. Initially, the Palapa satellites were used for TV broadcasts and only subsequently, for telecommunication connectivity.¹⁰ Now, satellites are used as backbone connectivity for the vast network of BTS towers and, where mobile and cable broadband connectivity is unavailable, as providers of broadband services through the use of VSAT (very-small-aperture-terminal) satellite dishes on the ground.

On 18 June 2023, the government, in a PPP arrangement with PSN seeking to raise the quality of broadband service in remote and sparsely populated areas, launched the Satria 1 High-Through-Put (HTP) geo-stationary satellite.¹¹ This was followed on 20 February 2024 by the launch of a similar satellite Merah-Putih 2, owned and operated by Telkomsat.¹² Satellites may have the advantage of covering a broad area more efficiently, but this is tempered with lower quality and stability in communication during heavy rain.

The government is prioritizing broadband coverage over eastern Indonesia and other remote areas and considers the market large enough to allow Starlink entry into the market, alongside PSN and Telkomsat. The government is also trying to get Elon Musk's Tesla electric car company to set up a factory in Indonesia.

STARLINK'S SERVICE AND COMPARISON WITH TELKOMSAT AND PSN

Starlink's broadband service will cover the same ground as PSN and Telkomsat, i.e. state and private institutions as well as households and individuals in remote and sparsely populated areas nationwide, but with a particular emphasis on eastern Indonesia. There are however differences in their services, due to their different satellite configurations.

Comparing PSN and Telkomsat's GEO and Starlink's LEO Satellites: Both Telkomsat's Merah Putih 2 and PSN's Satria1 GEO (Geosynchronous Equatorial Orbit) satellites have an orbital distance to Earth of about 36,000 kilometres. GEO satellites' orbital path follows the Earth's rotation, thus taking 24 hours to orbit the Earth. This means that their spot beams and end footprint on Earth remain fixed in one location. Both the spot beams of Satria 1 and Merah-Putih 2 are focused on Indonesia, with a slight spillover into neighbouring countries.

They also carry the latest high throughput (HTP) satellite technology, with Satria 1 providing 150 Gbps and Merah Putih 2 having 32 Gbps broadband capacity. PSN's USD 550 million Satria 1 satellite uses Ka band frequency and has steerable spot beams that can flexibly direct its bandwidth to high demand areas. Telkomsat's USD 67 million satellite, meanwhile, uses different C and Ku band frequencies. The service and area covered by PSN and Telkomsat satellites are similar, but their combined capacity might still be insufficient to cover the rising demand in remote areas. There is, therefore, room for additional satellite-based broadband providers.

Starlink, unlike PSN and Telkomsat, uses smaller LEO (Low Earth Orbit) satellites. Their orbit to each distance is a much closer 160-2,000 kilometres, and their Earth circling time is just 90-120 minutes. In order to cover a larger area, LEO satellite systems require the launching and operating of a multitude of satellites. They also require close orbital coordination and seamless handing-off of data from one satellite to another to ensure continuous communication over the same area. LEO satellite systems, like Iridium and Starlink, have a global coverage, in contrast to GEO satellites which are national or regional in coverage.

One key advantage of LEO’s orbital proximity to Earth is its low latency or shorter signal delay of around just 50 milliseconds. This low latency allows LEO satellite systems to provide higher quality broadband services, which is required, for example, for real-time communication, such as voice and video conferencing, online gaming and high-resolution imagery. Although this is close to cable broadband quality, it remains less stable during weather disturbances.

In contrast, GEO satellites have a longer latency of 240 milliseconds, but this longer signal delay remains sufficient for running broadband internet applications.¹³ Starlink’s low latency feature is therefore of a more complementary nature to that of PSN and Telkomsat, offering higher quality reception.

Table 2: Comparison between GEO and LEO satellites

	GEO	LEO
Orbital distance from Earth	36,000 kilometres	500-1,200 kilometres
Satellites required for covering large area	Three	Numerous
Advantages	<ul style="list-style-type: none"> - High throughput enables basic broadband internet applications - Fewer satellites over a very large fixed area - 15 year life 	<ul style="list-style-type: none"> - Enables virtual gaming and high performance computing applications - Smaller, lower power satellites and batch launched (lower cost)
Disadvantages	<ul style="list-style-type: none"> - High altitude and distant ground networking impacts latency-sensitive applications - Signal power losses require larger satellites and antennas 	<ul style="list-style-type: none"> - Complex tracking and ground networks, need many satellites in place before starting service - Business model still unproven, risky technology and space debris risk - 5 year life

Source: footnote 10

Comparing the pricing schedule of PSN’s Ubiqu with Starlink Indonesia: PSN, with its Ubiqu broadband service, was first to list its pricing schedule, and was followed later by Starlink Indonesia. Telkomsat has yet to announce theirs formally, and so, this assessment will limit itself to PSN and Starlink’s pricing and service.

Table 3: Features and Pricing Schedule of PSN's Ubiqu and Starlink Indonesia

Broadband Service	PSN's Ubiqu	Starlink Indonesia
Satellite Orbit Position	GEO (36,000 kilometres)	LEO (550 kilometres)
Satellite In Orbit	One 4,600 kg Satria 1 HTP Thales Satellite	6,078 small 800 kg Satellites
Coverage	Indonesia	Global
Satellite Lifespan	15 years	5 years (each)
Broadband internet speed	5-100 Mbps	100 Mbps average
Latency	600-700 milliseconds	Less than 99 milliseconds
Service Package Pricing		
	Ubiqu Fit (Speed up to 5 Mbps)	Personal
Upfront Equipment Cost	Rp 9.1 million	-Residential: Rp 5.9 million -Land vehicle: Rp5.9 million -Sea: Rp 43.7 million
Monthly Cost	-Fit 1 Rp 500,000 -Fit 2 Rp750,000 -Fit 3 Rp 1.2 million -Fit 4 Rp 2.1 million	-Residential: Rp 750,000 -Land vehicle Rp 990,000 -Sea: 50GB: Rp 4.3 million 1 TB: Rp 17.2 million 5 TB: Rp 86.1 million
	Ubiqu Big (Speed up to 10 Mbps)	
Upfront Equipment Cost	Rp 9.1 million	
Monthly Cost	-Big 1 Rp 4.5 million -Big 2 Rp 7.4 million -Big 3 Rp 13.5 million	
	Ubiqu Max (Speed up to 100 Mbps)	Business
Upfront Equipment Cost	Rp 9.1 million	Fixed: Rp 7.8 million Land Vehicle: Rp 43.7 million Sea: Rp 43.7 million
Monthly Cost	-Max 100 Rp 1.0 million (FUP* 100 GB per month) -Max 300 Rp 3.0 million (FUP* 300 GB per month) -Max 500 Rp 4.5 million (FUP* 500GB per month)	Fixed: -40GB: Rp 1.1 million -1 TB: Rp 3.0 million -2TB: Rp 6.1 million -6 TB: 12.3 million Land vehicle & Sea: -50GB: Rp 4.3 million -1TB: Rp 17.2 million -5TB: Rp 86.1 million

	Ubiqu Sinyalku (for small reseller)	
Upfront Equipment & Software Billing & Promotional Material Cost	Rp 12.5 million	
Monthly Cost	Reseller gets a sales fee based on size of vouchers sold to end-user. So reseller customer pays usage based on vouchers purchased.	

Source: <https://ubiqu.id> & <https://www.starlink.com/id>

Note:* FUP is Fair Use Policy: Internet speed drops when FUP limit is reached

At first glance, Starlink’s fees at the lower end of its “Personal” service carries a lower upfront equipment cost. Although PSN’s lowest monthly fee is below Starlink’s, the better speed and quality of Starlink’s service make it look quite competitive in comparison. Still, paying for PSN for Starlink’s upfront equipment and monthly fees may be out of reach for an average household, especially in eastern Indonesia. This would mean that end-users will mostly be from the mid-to-upper income market segment and from mid-to-large businesses.

Trying to make broadband service more affordable for the lower-income segment, especially in remote areas, PSN’s Ubiqu has a separate “Sinyalku” package recruiting small resellers to promote the use of Ubiqu broadband service vouchers. With this innovation, end-users buy vouchers according to their broadband usage. The upfront cost of Rp 12.5 million, comprising of a satellite VSAT dish, a modem, a long-range outdoor WiFi router with an omni antenna, promotional material, and a billing system, is borne by the reseller, who owns and operates the satellite ground equipment and earns a percentage from the voucher sales.

Thus, PSN’s Ubiqu and Starlink Indonesia’s different broadband packages target different though sometimes overlapping markets, showing enough complementary; Ubiqu focuses on the lower-income end, where quality and speeds are lower but more affordable, while Starlink takes care of the large resource-based companies operating in remote areas, like plantations, agricultural estates, and forestry, mining, oil and gas, as well as logistics and shipping companies. Starlink’s roaming broadband services for land vehicles and sea transport are suited for these businesses. The competitive overlap is limited to the mid-to-upper income market segment.

Response of Local Broadband Providers: So far, concern over Starlink’s presence comes largely from the four telcos providing terrestrial mobile and cable broadband services. When Starlink reduced its upfront equipment cost from Rp 7.8 million to Rp 5.9 million, lower than those of Telkomsel, First Media and Biznet,¹⁴ there were concerns over Starlink’s “predatory pricing” capabilities.¹⁵ The argument was that Starlink’s vast global market potential would allow it to spread its fixed costs over a larger subscriber base, thus bringing down its pricing. But as of now, there remains a considerable gap between Starlink’s higher priced service

compared to that of terrestrial broadband providers. Besides, cable broadband reception remains more stable in speed and quality.

Table 4: Monthly Fee Comparison between Starlink and the Four Major Terrestrial Broadband Providers

	Starlink	Telkomsel	XL Axiata	Indosat	Smartfren
Monthly fee	100GB: Rp750,000	70GB: Rp 138,000	72GB: Rp252,500	100GB: Rp 200,000	66GB: Rp 137,000

Source: <https://katadata.co.id/digital/teknologi/64f1a68951fd6/daftar-lengkap-harga-internet-starlink-telkomsel-xl-tri-indosat>

There were also concerns over Starlink’s recently announced launch of a “direct to cell” satellite, enabling them to connect directly to anyone with a mobile phone, thus not requiring a VSAT and satellite modem equipment on the ground, thus competing directly with existing mobile and cable broadband service providers. Starlink’s “direct to cell” feature is still in its experimental phase and, if the testing runs according to schedule, the service will only be launched sometime in 2025.¹⁶ The Indonesian Association of Telecommunication Providers (ATSI) is however already calling for government regulations to protect existing telcos once this service is launched.¹⁷

Market Impact of Starlink’s Entry and Outlook: With existing broadband services unable to keep up with growing demand, Indonesian consumers have welcomed Starlink’s market entry. In a recent report, PT Telkom’s President Director, Ririek Adriansyah, mentioned the advantage and disadvantage of both Telkom and Starlink. He explained that Telkom, with its fiber cable network, has a more reliable service, while Starlink’s service is better suited to cover remote and sparsely populated areas, where the cost of laying down a cable network is prohibitive. Thus, both services complement each other, he further noted.¹⁸ It is too early to assess the full impact of Starlink’s entry, but satellite broadband providers are closely reviewing their pricing and ensuring they provide better after-sales service, something that Starlink has had difficulty providing in other markets, given its usual limited local presence.

Local satellite players are also looking into smaller LEO satellites and considering how a more limited equatorial orbital coverage would require less LEO satellites. Existing telcos are also under pressure to upgrade the stability and quality of their services and more aggressively plan for expanding their cable and mobile networks into areas previously served by satellite broadband but which are rapidly developing and making such networks commercially viable. As one satellite telecommunication expert noted, no matter how good the service quality may be, once usage grows and congestion happens, satellite broadband service speeds suffer.

In sum, Starlink Indonesia’s services appear to complement rather than compete with what is currently available. Furthermore, Starlink’s high pricing limits its market to the mid-to-upper end-user segment and large established businesses, thus providing sufficient space for local players. Looking ahead, it will be interesting to see how local players adopt and utilize LEO satellites to improve their services’ latency performance and thus compete directly with Starlink. As for the mobile and cable broadband providers, even with Starlink’s upcoming

“direct to cell” service, their more stable service and large customer base should provide them with some short-term advantage.

ENDNOTES

- ¹ <https://apnews.com/article/indonesia-bali-elon-musk-starlink-internet-service-8444ca8b5-da4f4a9973a66f8fd1d3e0f>
- ² <https://www.trade.gov/country-commercial-guides/indonesia-information-and-telecommunications-technology>
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