# Elon Musk's Most Alarming Power Grab

Can anyone stop his space-based internet? By <u>Ross Andersen</u>

> When Elon Musk's engineers bundled a batch of prototype satellites into a rocket's nose cone six years ago, there were fewer than 2,000 functional satellites in Earth's orbit. Many more would soon be on the way: All through the pandemic, and the years that followed, Musk's company, SpaceX, kept launching them. More than 7,000 of his satellites now surround Earth like a cloud of gnats. This fleet, which works to provide space-based internet service to the ground, dwarfs those of all other private companies and nation-states put together. And almost every week, Musk adds to it, flinging dozens more satellites into the sky.

I recently asked the space historian Jonathan McDowell, who keeps an online registry of Earth's satellites, if any one person had ever achieved such dominance over the orbital realm, and so quickly. "This is unique," he said. Then, after considering the question further, McDowell realized there was a precedent, but only one: Sergei Pavlovich Korolev, the Soviet engineer who developed Sputnik and its launch vehicle. "From 1958 to 1959, when no one else had any satellites in orbit, Korolev was the only guy in town." Musk is not the only guy in town circa 2025, but the rapid growth of his space-based network may represent a Sputnik moment of its own.

Musk first announced his intention to build a space-based internet, which he would eventually call Starlink, in January 2015. He had <u>plans to settle Mars</u>, then the moons of Jupiter, and maybe asteroids too. All those space colonies would have to be connected via satellite-based communication; Starlink itself might one day be <u>adapted</u> for this use. Indeed, Starlink's <u>terms of service</u> ask customers to affirm that they "recognize Mars as a free planet and that no Earth-based government has authority or sovereignty over Martian activities."

Musk is clearly imagining a future in which neither his network nor his will can be restrained by the people of this world. But even now, here on Earth, space internet is a big business. Fiber networks cannot extend to every bit of dry land on the planet, and they certainly can't reach airborne or seaborne vessels. More than 5 million people have already signed up for Starlink, and it is growing rapidly. (You may end up <u>using</u> <u>Starlink when you fly United</u>, for example.) In the not-too-distant future, an expanded version of this system—or one very much like it—could overtake broadband as the internet's backbone. A decade or two from now, it could be among our most crucial information infrastructure. The majority of our communications, our entertainment, our global commerce, might be beamed back and forth between satellites and the Earth. If Musk continues to dominate the launches that take satellites to space, and the internet services that operate there, he could end up with more power over the human exchange of information than any previous person has ever enjoyed.

Musk recognized that Starlink's early adopters would be in remote and rural areas, where cables may not reach, and there are few, if any, cell towers. The U.S. is, for now, his biggest market, and the U.S. government may soon become a major customer: President Donald Trump has just delayed a \$42 billion federal effort to expand broadband services, especially in rural areas. His administration has decided to make that project "tech-neutral," such that cable hookups aren't necessarily preferred over satellite—<u>which means</u> that Starlink can compete for the money. In the meantime, Starlink's internet service is now also in planes, in ships at sea, in deep jungles, tundras, and deserts. In Gaza, medics have used Starlink while healing the wounded. At times when the people of Myanmar and Sudan learned that the internet had been shut off by their autocratic governments, they turned to Starlink. Ukraine's soldiers use it to communicate on the front lines.

Musk's ability to deliver this crucial service the ability to coordinate action in conflict zones—has given him unprecedented geopolitical leverage for a private citizen. Reportedly, Pentagon officials have already had to go hat in hand to Musk after he threatened to restrict Starlink's service to Ukraine's troops, who were using it to launch attacks inside Russia. "He is not merely a mogul," Kimberly Siversen Burke, a director at Quilty Space, an aerospace-research firm, told me. "This is someone who can flip a switch and decide the outcome of a war." (Neither Musk nor Starlink responded to requests for comment.)

#### Read: When a telescope is a national-security risk

Political leaders all over the world have come to understand that Starlink's dominance will be hard to dislodge, because SpaceX is so good at

making satellites and getting them to space. The company makes its satellites in a factory outside of Seattle. Even in their bundled-up, larval form, they are enormous. The newest ones weigh more than half a ton, and once their solar-panel wings unfurl, they measure about 100 feet across. The company can reportedly manufacture at least four of these behemoths a day, and SpaceX's reusable Falcon 9 rocket can hold more than 25 of them at once, all folded up inside its nose cone. Musk is able to launch these bundles of satellites at a Gatling-gun pace, while his competitors operate at musket speed with rockets that must be rebuilt from scratch each time. Last year, SpaceX successfully lofted 133 rockets into orbit, and more than 60 percent of them were carrying Starlink satellites. Every one of Musk's commercial competitors, and

also every nation's military combined, launched fewer rockets than he did.

Before the rise of SpaceX, the French company Arianespace had dominated the global satellite-launch market. But its newest rocket, the Ariane 6, has so far been a boondoggle, with development delays and a costly one-anddone design. (The company expects to launch only 10 of them a year.) This is one reason that Europe has had a hard time fielding a serious competitor to Starlink, despite a desire to reduce Musk's influence on future conflicts on the continent. Europe is home to Starlink's largest commercial competitor, at least to this point, in OneWeb, a subsidiary of the French company Eutelsat. OneWeb has more than 600 satellites, compared with Musk's more than 7,000, and its hardware is less advanced. As a

result, the internet service it provides is slower than Starlink's.

Separately, European Union nations have spent years planning the construction of a dedicated network of satellites for military and civilian use. But this project was recently dealt a blow when Giorgia Meloni, Italy's prime minister—<u>a friend of Musk's</u>—announced that she now prefers a <u>deal with Starlink</u>. The governments of Germany and Norway are each working on their own sovereign fleets, but they're nowhere near having them up and running.

#### Read: The military is about to launch a constellation

The U.S. government, too, would have good reasons to avoid full dependence on Musk's company for access to the space-based internet. The American military has an orbital network of military-grade satellites that allows for secure government communications and reconnaissance. But this too is a Musk product: SpaceX builds the satellites and <u>ferries</u> them to orbit.

The Pentagon's leaders know this is a problem, or at least they once did. During the end of the Biden administration, the U.S. Space Force published a new strategy that ordered policy makers to avoid overreliance on any single company. But that was before the Defense Department came under the control of Trump, whose victorious campaign received more than \$250 million in support from Musk. When I wrote to the Pentagon to ask whether avoiding overreliance on one provider was still a priority, I did not hear back. Even if the agency does end up diversifying its vendors, that process will take years, Masao Dahlgren, a fellow at the Center for Strategic and International Studies who specializes in space and defense, told me. "You can look at the launch schedule, and look at how many you need up there, and tell that it's going to be a while."

China's People's Liberation Army reportedly has its own concerns about Musk's dominance over the potential future of communication in space. Several Chinese companies are currently building satellite-internet services; the largest one has roughly 90 satellites in orbit at the moment, and provides service only in the city of Shanghai. If that pilot project works, the network's operator intends to expand across the country and beyond. China's total number of satellites could tick up fast, because unlike Europe, the country is actually capable of launching a lot of rockets.

But of all of the aspiring competitors to Starlink, the most formidable is based in the U.S. Although Amazon has only just started launching satellites for its **Project Kuiper**, the company is looking to manufacture several thousand more in the coming years. It has also done the hard work of designing small, inexpensive terminals for users on the ground, which can compete with Starlink's sleek, iPadsize consumer equipment. If Jeff Bezos's space company, Blue Origin, can make its own reusable rocket fully operational, Amazon will start flinging satellites up into the sky in big batches as SpaceX does.

Of course, Musk is not going to sit still while the rest of the space industry catches up. Starlink is already available in more than 100 countries, and in Nigeria, Africa's most populous country, it will soon be the largest internet provider of *any* kind. Other developing countries will likely want to make that same leapfrog bet that they can skip an expensive broadband build-out and go straight to satellite. And not just for the internet: Musk recently secured permission from the FCC to offer cellphone service via Starlink too. And he's doing all this with his current technology. If SpaceX can finish testing its much bigger, next-generation Starship rocket within a year or two, as analysts expect, Musk will be able to expand his orbital fleets dramatically. SpaceX has previously said that the Starship will be able to carry up to 100 satellites in a single launch.

"In five years, we've gone from around 1,000 functional satellites to around 10,000," McDowell told me. "I would not be surprised if in another 10 years, we get to 100,000 satellites." They will beam more information down to the Earth than those that whirl around it today. They will offer an unprecedented degree of connectivity to people and devices, no matter where they are on the planet's surface. The space internet of the future may become the central way that we communicate with one another, as human beings. Information of every kind, including the most sensitive kinds, will flow through it. Whoever controls it will have a great deal of power over us all.

## ABOUT THE AUTHOR



### Ross Andersen

Follow

<u>Ross Andersen</u> is a staff writer at *The Atlantic*. He was previously the magazine's deputy editor. As a writer for the magazine, he has reported in Russia, China, India, Pakistan, and Greenland. He is also the author of *The Long Search*, forthcoming from Random House.