Before the
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Washington, D.C. 20554

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Application for License for Starcloud Orbital Datacenter System	)	File No.
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APPLICATION FOR LAUNCH AND OPERATING AUTHORITY FOR THE STARCLOUD ORBITAL DATACENTER SYSTEM

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Starcloud seeks authorization from the Federal Communications Commission to launch and operate a constellation of satellites to operate as a distributed datacenter to train and operate artificial intelligence ("AI") models and other cloud computing services. These satellites will utilize the unique advantages of space: near-constant solar power, radiative cooling, and the ability to scale sizes and power levels not possible on earth. Leveraging these advantages over terrestrial datacenters these satellites will deliver transformative cost and energy efficiency while significantly reducing the negative impacts associated with terrestrial datacenters.

Starcloud is designing its satellite system to accommodate the explosive growth of datacenter demands driven by AI which is already encountering severe roadblocks to efforts to scale on the ground. Starcloud intends to deploy a system of up to 88,000 satellites operating within narrow orbital shells spanning up to 50 km each to deliver the compute capacity required for large-scale AI inference and datacenter applications serving billions of users globally. Starcloud will operate in close coordination with other users of these orbits. This system will operate between 600 km and 850 km altitude in sun-synchronous orbit inclinations with a nominal 06:00 crossing time. Each deployed satellite will be functionally identical in size, mass, maneuverability, communications and control systems, but may support a range of different computing hardware within the payload.

Starcloud's system will rely nearly exclusively on laser links for communications. These optical links will route traffic to satellites from upcoming mesh backhaul networks and with interoperable optical terminals such as Starlink, Amazon LEO, Terrawave, Kepler Communications and others, subject to commercial arrangements. These constellations will, in turn, transmit to authorized earth stations on the ground. As such, in day-to-day operations Starcloud does not plan to communicate with the ground using any radio frequency or optical

transmissions. The aforementioned third-party networks will provide the primary means by which the Starcloud constellation will communicate with users of the Starcloud system. However to enhance system reliability, especially during critical early mission and post-mission phases, satellites may include equipment for backup communications solely for telemetry, tracking, and command ("TT&C"), operating solely in the non-geostationary orbit ("NGSO") primary portion of the Ka-band on a non-interference, unprotected basis.

Orbital datacenters are the only truly scalable way to meet the ever-accelerating demand for electricity to meet the coming demands for AI compute. Expansion and buildout of terrestrial energy infrastructure in the western world has not kept pace with the demand for AI and this situation is likely to continue to worsen. Fortunately, the development of fully reusable launch vehicles like Starship and others, which will bring the capability to deploy millions of tons of mass per year to orbit, means on-orbit processing capacity can reach unprecedented scale and speed compared to terrestrial buildouts. The capacity for intelligence processing in space could surpass global electricity consumption. To build out at this scale on the ground would impose immense cost and disruption of upgrading Earth's strained electrical grid, negative societal and environmental impacts of datacenter and power station buildouts, and eventually negative environmental impacts from the waste heat generated by these datacenters. In turn, solar-powered orbital datacenters are the most cost-effective, energy-efficient, and environmentally sound way to build infrastructure to meet accelerating demand for AI-enabled goods and services.

Starcloud's system will operate in a select set of narrow orbital shells spanning up to 50 km each within the altitude range of 600 km and 850 km focusing on lightly used orbital altitudes within that range. Operating in sun-synchronous orbits enables near-continuous power generation, reducing dependence on batteries and power cycling and making these orbits well-suited to energy-

intensive AI workloads that require steady, baseload compute. These altitudes have been selected based on trade-offs between average sunlight exposure, radiation exposure, the effects of atmospheric drag and accessibility from planned launch sites and launch vehicles.

The built-in efficiencies of solar-powered orbital datacenters and falling launch costs allow Starcloud to cost-effectively expand its constellation as demand grows and compute architectures evolve, serving the broad AI datacenter market and enabling U.S. companies developing and using AI to flourish. By avoiding the constraints of terrestrial deployment, space datacenters will be the most cost effective and scalable way to deliver compute this decade. This cost advantage would help U.S. companies train and operate the world's most capable AI models in support of broad societal benefit.

Starcloud takes seriously the safe and sustainable use of these soon-to-be highly utilized orbits. The Starcloud constellation will build on well-established space sustainability design and operational practices, including safe orbit raising and responsible end-of-life disposal. It will use automated collision avoidance for low-latency risk assessment and response, leveraging a range of SSA systems, such as the SpaceX Stargaze system, along with high-thrust, low-complexity propulsion that enables precise, rapid maneuvers. Starcloud is committed to transparent coordination with other operators by sharing data and proactively mitigating high-risk conjunctions. For initial testing and checkout, Starcloud will deploy at lower altitudes before raising to its operational orbit to ensure that any satellite that fails early will deorbit quickly due to higher levels of atmospheric drag, fully burn up on re-entry, and present no calculable risk to people on the ground.

Post-mission operations for these satellites will comply with U.S. government and international orbital debris mitigation guidelines. Starcloud will dispose of satellites through

controlled atmospheric re-entry. Each satellite is designed for full demisability and will pose no calculable risk to people on the ground during re-entry. Each satellite will also include triple redundant propulsion systems and sufficient propellant reserves to support all phases of its lifecycle, including orbit raising, station-keeping, collision avoidance, and disposal. Starcloud will also work closely with the astronomy community to protect essential observations, including implementing established brightness mitigation measures.

The constellation will use spectrum efficiently and will not create a risk of harmful interference to other users. The system will primarily rely on optical inter-satellite links with satellites in third-party constellations as its primary means of communication. To further enhance reliability, satellites may also carry backup communications equipment solely for TT&C, limited to the NGSO-primary portion of the Ka-band and operated on a non-interference, unprotected basis. Starcloud's system will use the 18.8–19.3 GHz (space-to-Earth) and 28.6–29.1 GHz (Earth-to-space) bands, which the Commission designates for NGSO FSS operations on a primary basis (See 47 C.F.R. § 2.106, n.NG165). The Commission has repeatedly found that non-interference TT&C operations serve the public interest by improving the reliability and sustainability of next-generation space station systems, particularly during early-mission, post-mission, and emergency operations. Limiting radiofrequency operations to NGSO-primary bands on a non-interference basis further narrows the scope of operations and ensures compatibility with current and future spectrum uses.

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As Starcloud's request complies with all applicable Commission rules, regulations, and policies, including the technical requirements for NGSO space station operations in the primary Ka-band and the Commission's orbital debris mitigation requirements, granting the application would serve the public interest. For these reasons and as set forth in the accompanying materials, Starcloud respectfully requests that the Commission expeditiously authorize Starcloud to launch and operate its datacenter system.

Respectfully submitted,

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