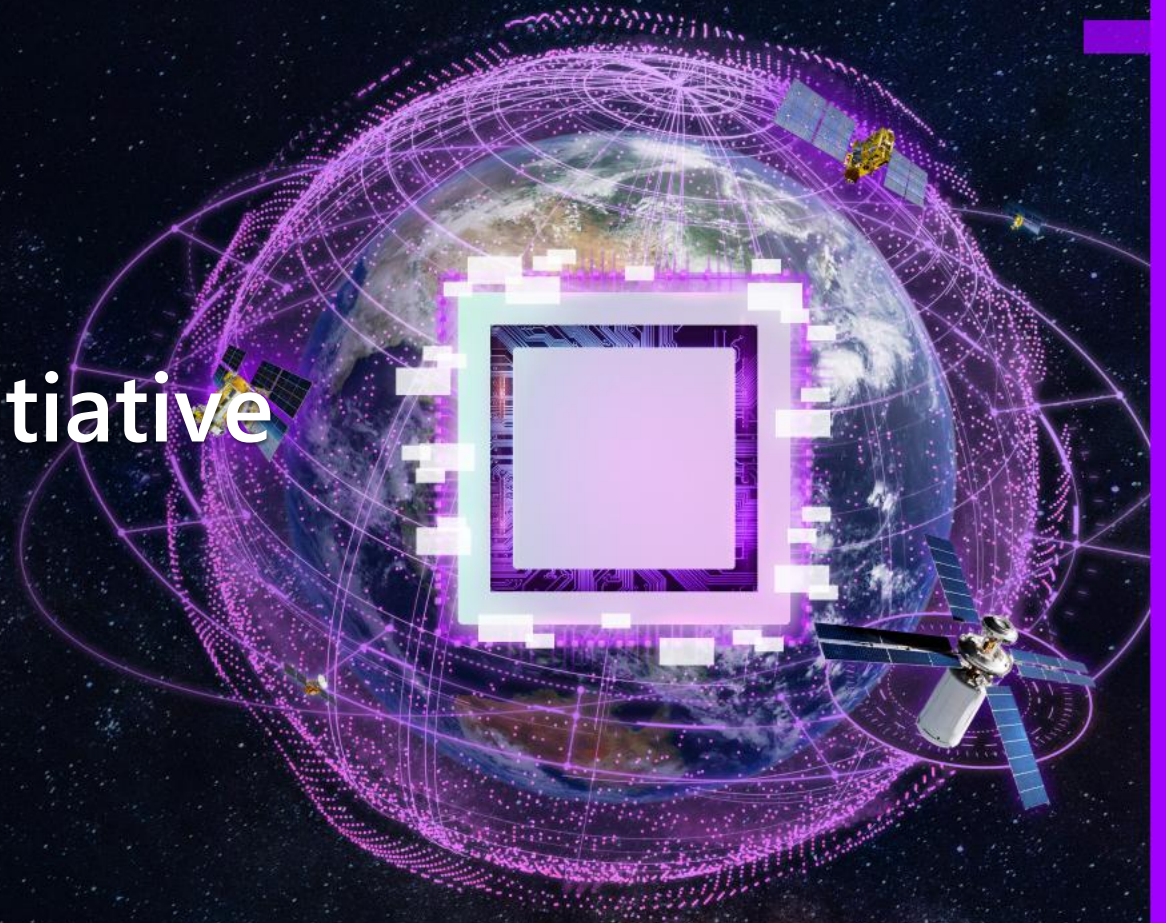


Orbital AI Infrastructure Initiative

Shingo Horiguchi, CEO, DigitalBlast Inc. / SPACEBLAST Inc.



Company Overview

Company Introduction

The DigitalBlast Group builds the platform that expands on-orbit services — Earth observation, communications and experiments — around Space AI Cloud.

Founded in 2018 by Shingo Horiguchi (formerly Nomura Research Institute and The Japan Research Institute), the group has grown to three companies with US\$10.5 million in annual revenue and about 100 specialists from diverse fields.



Develops space hardware. Key assets include AMAZ, an experiment platform that generates artificial microgravity, as well as Space AI Cloud and the Space AI Computer.



Delivers solutions for on-orbit business and supports new-business creation through multi-stakeholder collaboration. Clients include government agencies as well as private companies.



A newly established Dubai-based entity and the group's strategic arm for creating a global hub of life-science innovation in the space industry.

About the Presenter



CEO
Shingo Horiguchi

Profile

- CEO, DigitalBlast Inc. / SpaceBlast Inc.
- Visiting Researcher, Department of Systems Innovation, Graduate School of Engineering, The University of Tokyo
- Born 1981 in Kazo, Saitama, Japan
- At Nomura Research Institute and The Japan Research Institute, led new-business development, marketing strategy and digital strategy, specializing in space, finance, high-tech and telecommunications.
- Founded DigitalBlast in 2018 to build an on-orbit R&D platform and space-environment utilization integration business; also heads SpaceBlast, a spin-off consultancy for space business and DX.
- Author of “Space Transformation: Toward an Era of Expanding Human Habitat” (Sogo Horei Publishing) and other books

History

- 2018 Founded DigitalBlast; appointed CEO
- 2022 Raised ¥400 million from DBJ Capital and Japan Post Capital
- 2022 Announced the Commercial Space Station Concept
- 2023 Passed 100 employees; ¥1 billion revenue in the fifth year
- 2024 Sold a majority stake in the consulting and media business (¥2.5 billion exit) to focus on the on-orbit R&D platform business
- 2024 Appointed CEO of the newly established DigitalBlast Consulting (now SpaceBlast)
- 2025 Established SpaceBlast Research (Dubai); appointed CEO
- 2026 Awarded up to ¥13.5 billion under Japan's Space Strategy Fund Phase II theme “Orbital Data Center Construction Technology”

From LEO, via Earth, to the future — building the space economy

Starting from activity in low Earth orbit, we accelerate industrial innovation on the ground and create a new economic sphere that extends to the Moon and deep space — returning space technology and results to Earth to open up the future.



Earth Industry

- Drug discovery & bio-manufacturing
- International life-science platform
- Semiconductor innovation
- Ground-based microgravity simulators



LEO Industry

- Space-environment utilization support (user integration)
- On-orbit experiment services with our own hardware
- Orbital data centers
- On-orbit edge computing
- Joint ventures with commercial space station operators



Moon & Deep Space

- Lunar data centers
- Future technologies such as terraforming
- Planetary resource utilization

Our Services

Services 01

Microgravity Experiments on ISS



In partnership with JAXA, we provide user-integration services — coordination and technical support for experiments in low Earth orbit. From experiment planning and payload compatibility checks to launch and operations procedures, we help clients in medicine, materials and biotech gain insights unobtainable on the ground.

Services 02

Post-ISS Business Development



Looking ahead to the ISS retirement in 2030 and the shift to commercial operations, we help companies and research institutes entering LEO business design post-ISS operational architectures, in partnership with Mitsubishi Corporation. We focus on role allocation among stakeholders, operational frameworks, and the sustainability and scalability of R&D in space.

Services 03

Space AI Cloud & Space AI Architecture



Under the Space Strategy Fund theme "Orbital Data Center Construction Technology", we support satellite-data use cases end to end — from planning to service design and social implementation. Combining satellite analytics with GIS, GNSS and ground sensing data, we build practical solutions and drive sustainable commercialization.

Services 04

Space Education & Space Research



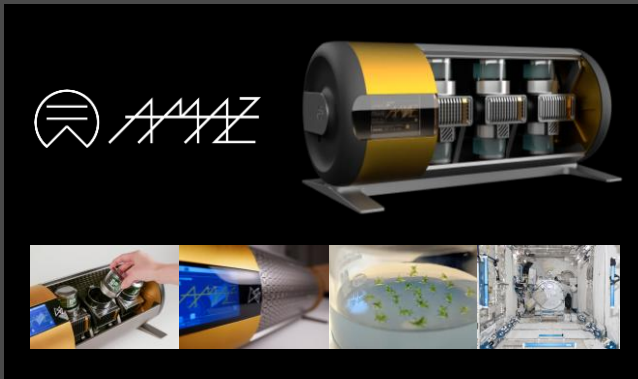
We provide training modules that systematically cover space exploration and utilization for local governments, educational institutions and companies that are new to space. We also host university researchers, run training programs and coordinate with Japanese universities and research institutes on curricula and joint projects.

Our Products

Product 01

Amaz

- Microgravity Generator -



Generates lunar-equivalent gravity (1/6 g) for plant-cultivation experiments; a prototype has been built and is under ground testing. Provides an experiment environment for companies and research institutes, meeting space-experiment needs with our own products.

Product 02

AMAZ α

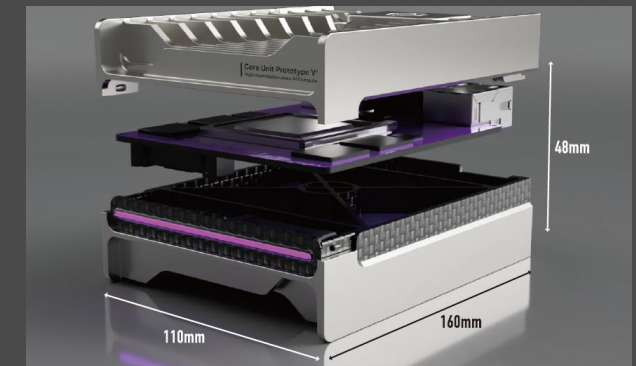
- Microgravity Cell-Culture Unit -



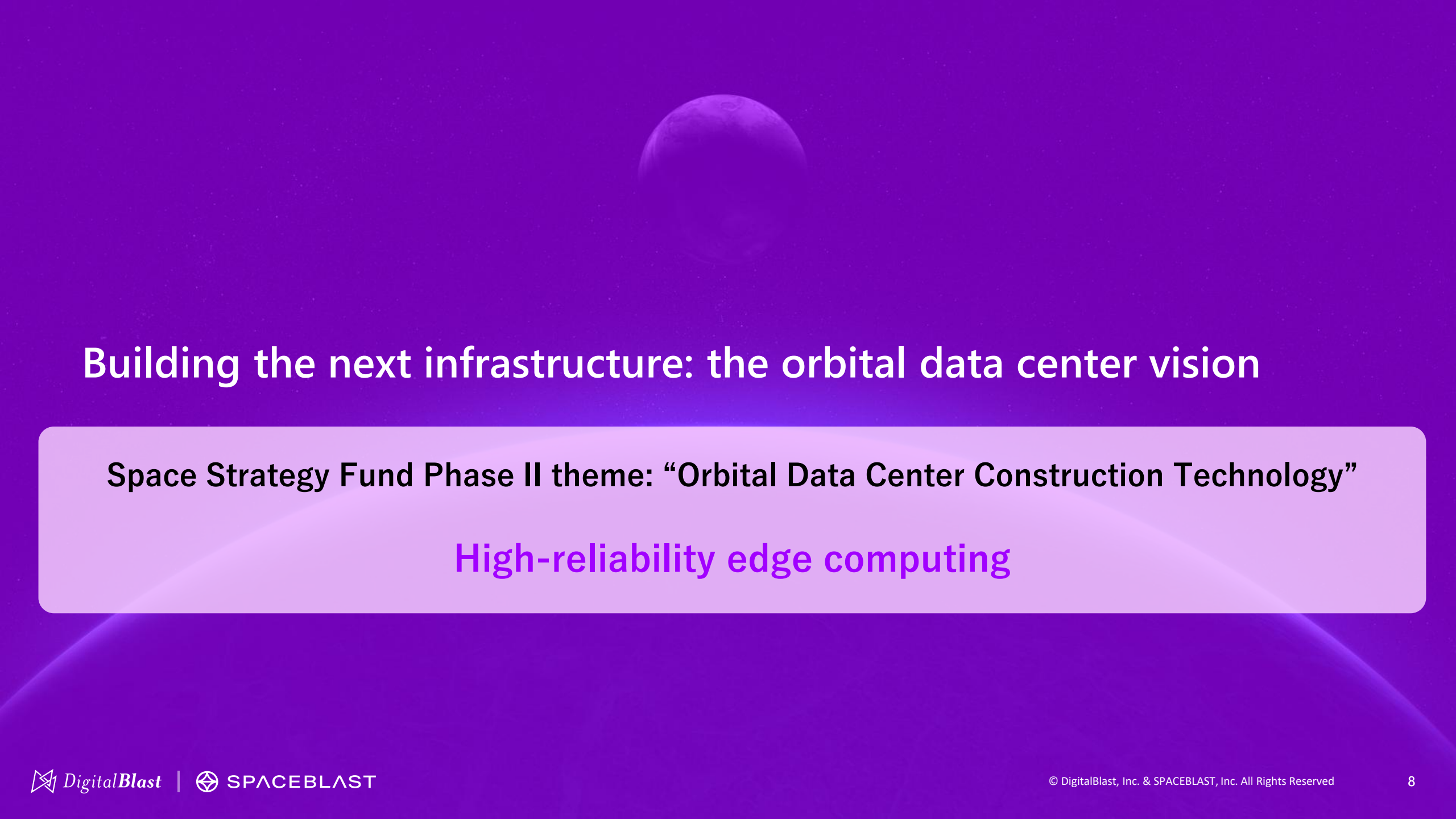
Specialized in cell culture under microgravity, with automatic medium exchange and fluorescence observation. A prototype is under development as an experiment platform for producing the plants and food that future life in space will require.

Product 03

Space AI Cloud / Space AI Architecture



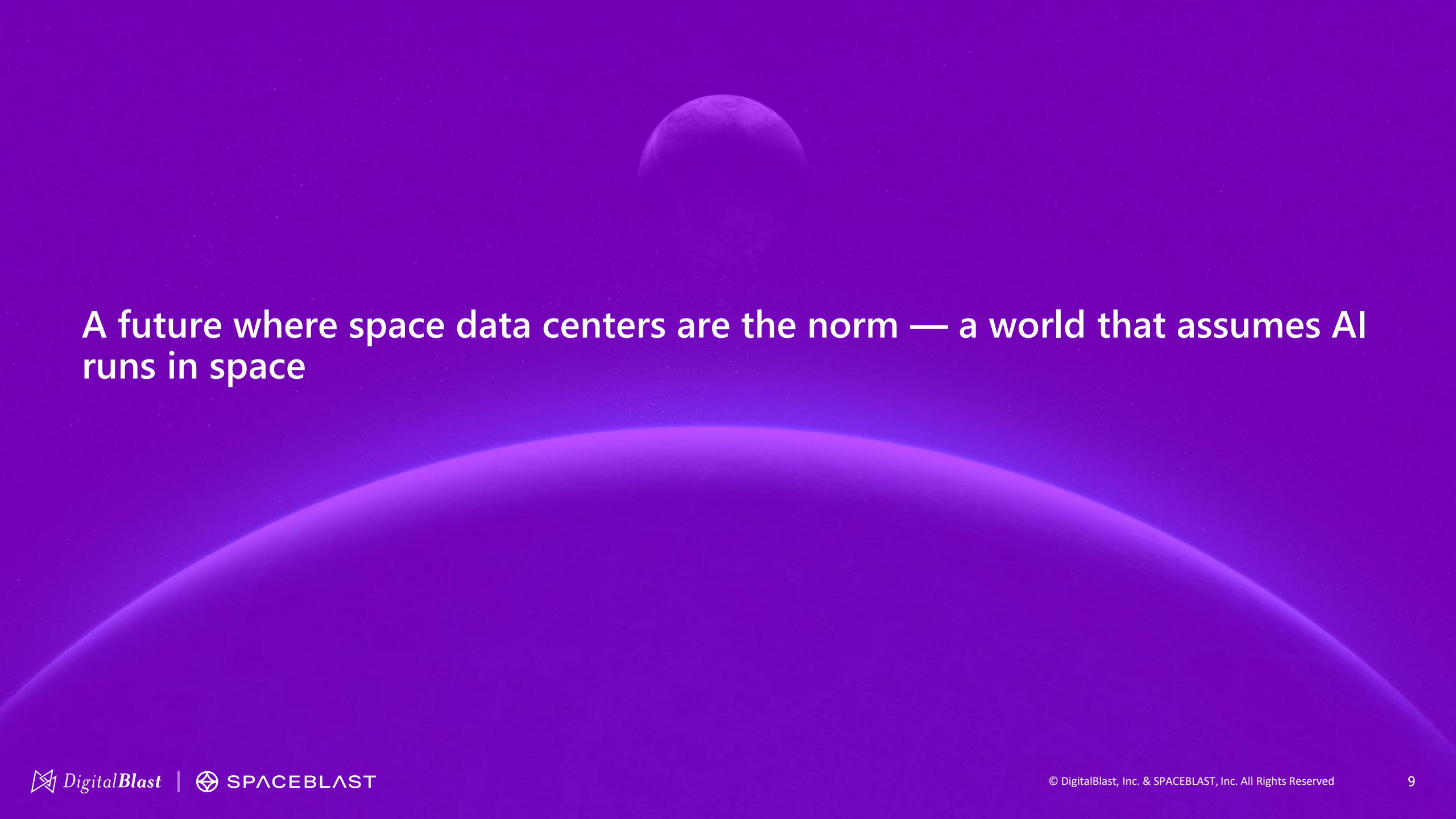
Running AI in space requires computers built with commercial off-the-shelf (COTS) semiconductors. But strong radiation in space easily causes bit flips, and in a vacuum heat does not dissipate, so heat generated in the enclosure must be managed. Existing technologies have not solved these problems. We are developing a self-healing architecture that solves them.



Building the next infrastructure: the orbital data center vision

Space Strategy Fund Phase II theme: “Orbital Data Center Construction Technology”

High-reliability edge computing



A future where space data centers are the norm — a world that assumes AI runs in space

Space infrastructure must move from “observing” to “thinking”

AI analysis in orbit is what creates value from data

Legacy



Massive raw data downlinked as is



All data sent to the ground



Analysis starts on the ground

Hours to days before data is usable

Analysis in ground data centers

Advanced sensors (constellations)



Even more raw data downlinked as is (sensor upgrades)



All data sent to the ground



Analysis on data as it trickles in

Hours to days, plus ever more complex processing

Analysis in ground data centers

On-orbit AI



CORE UNIT runs AI in orbit and downlinks only what is needed



Only processed data is sent to the ground



Usable the moment it arrives

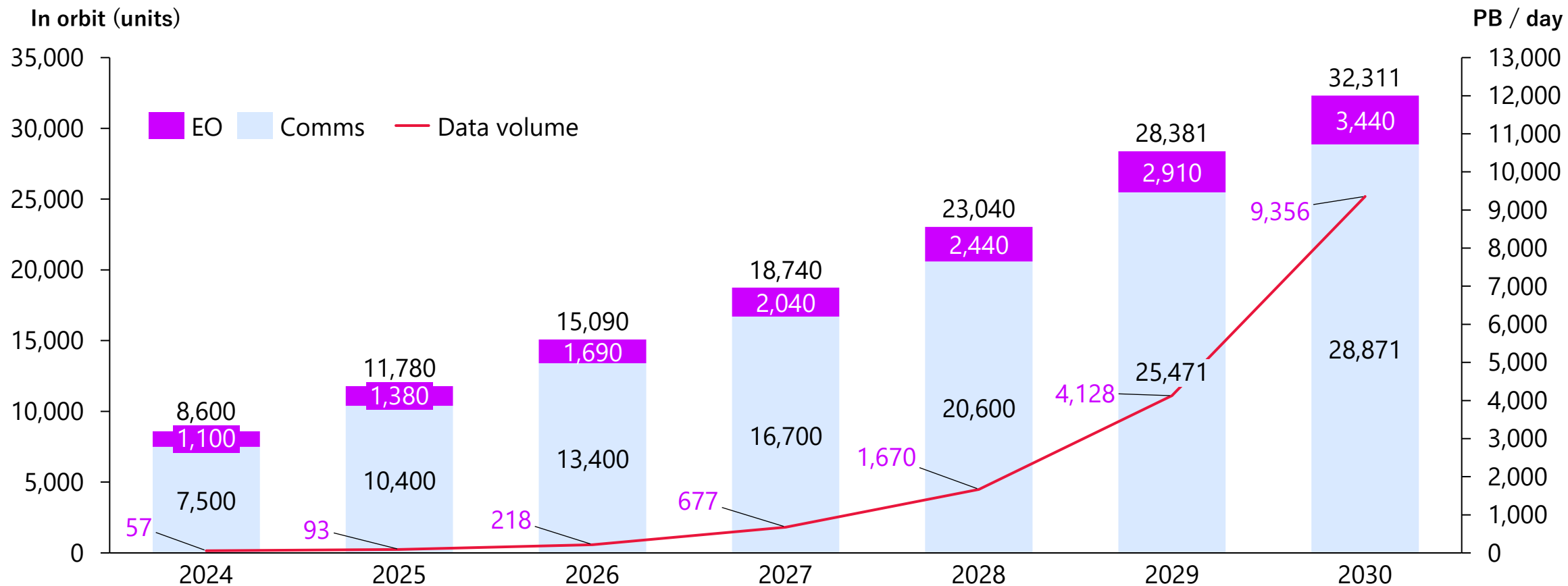
Analyzed insights, instantly:
seconds after capture

Analysis in orbit

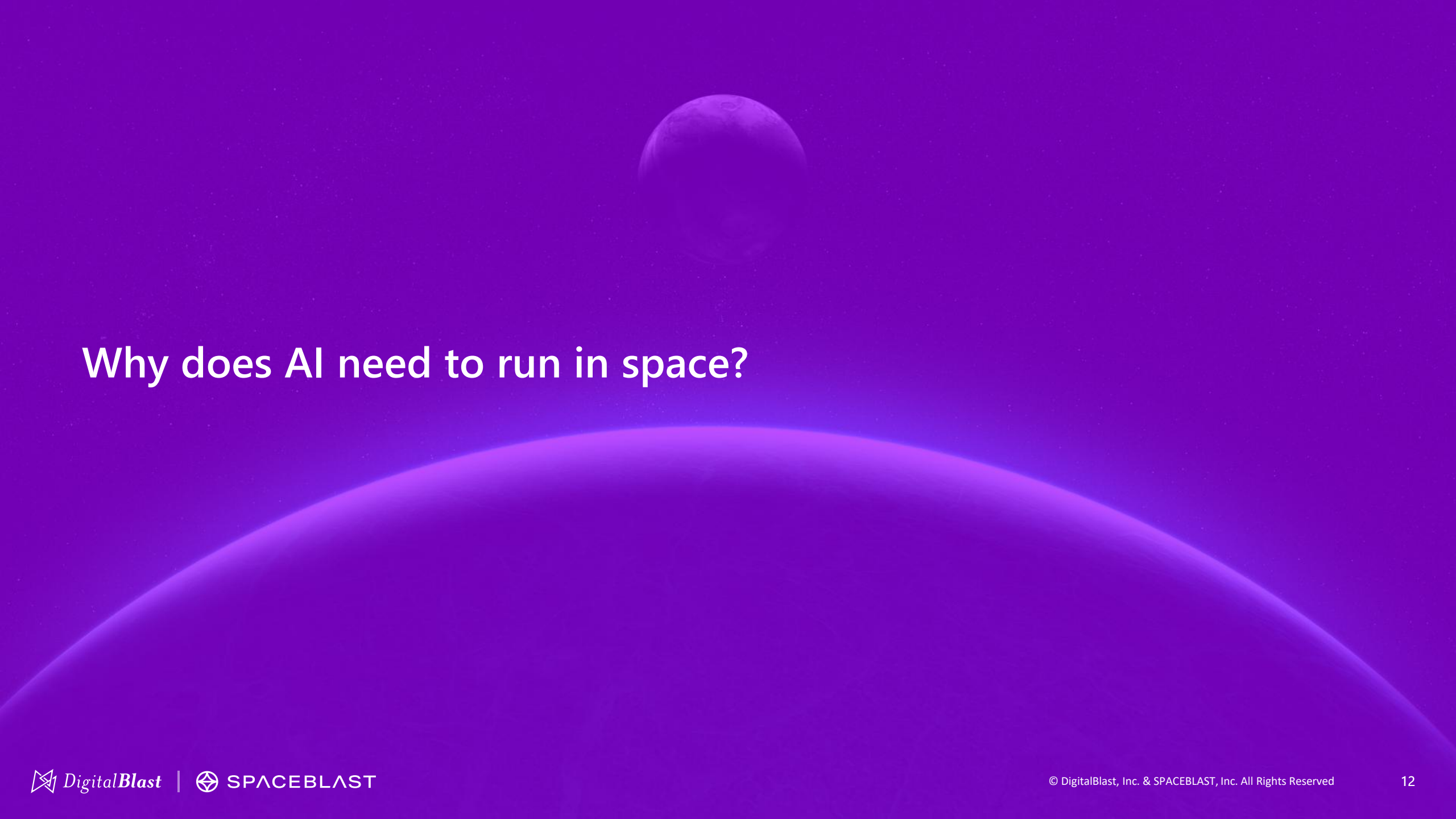
Data volume

(Reference) Forecast of data volume generated in orbit

- Data volumes are exploding in both Earth observation (EO) and communications
- By 2030, more than ~160× today's volume is expected (downlink basis)



Source: company estimates based on Novaspace (formerly Euroconsult) — <https://nova.space/press-release/seven-tons-of-sat...>
Company estimates based on Grand View Research — <https://www.grandviewresearch.com/industry-analysi...>

A background image of space featuring the Earth's horizon in the foreground and the Moon in the distance.

Why does AI need to run in space?

Why does AI need to run in space?

Not because space is a convenient place for AI — but because, for humanity to operate in space, there is no option other than running AI in space

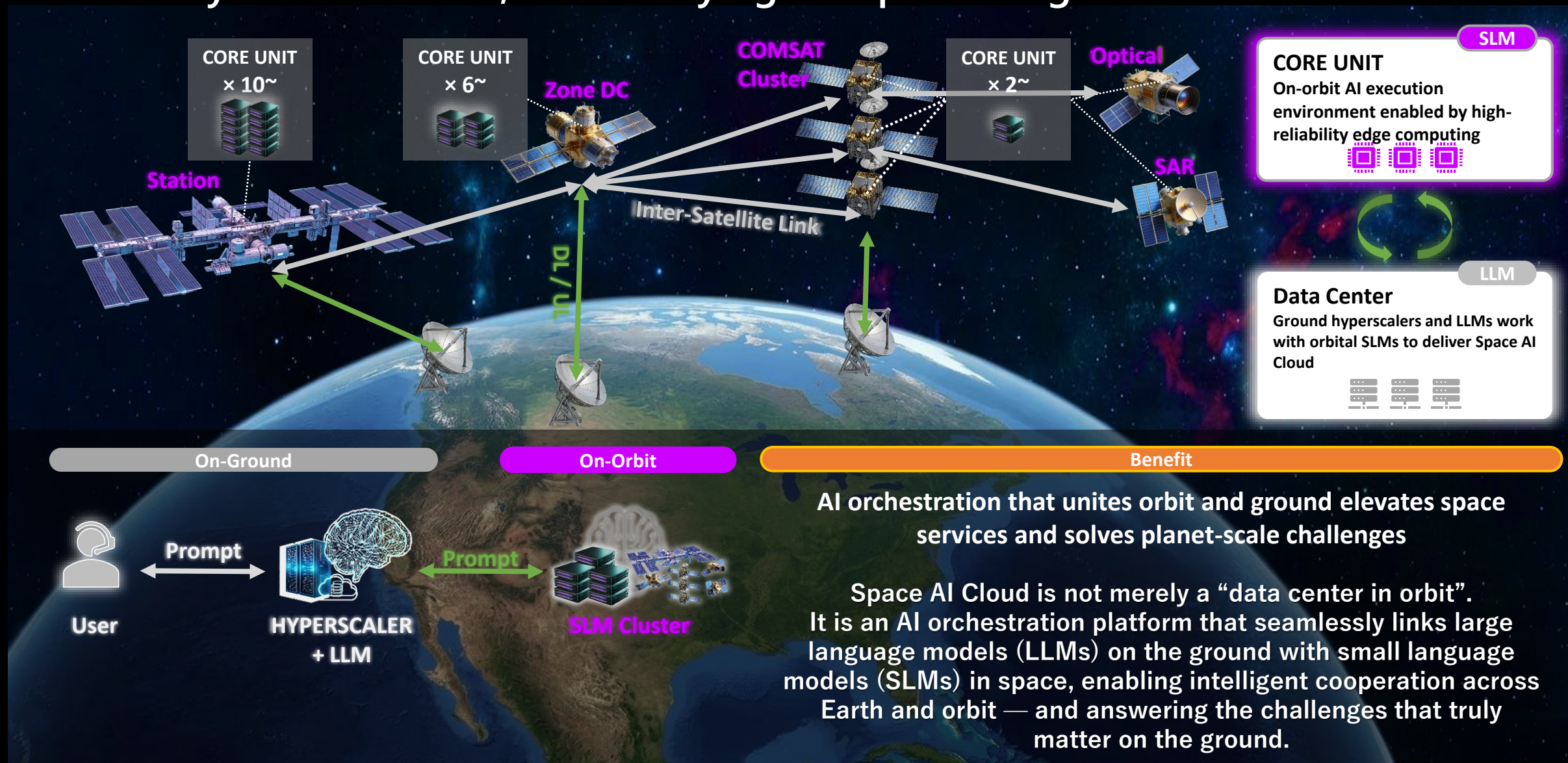
- ✓ Data volumes are exploding; not all of it can be sent back to Earth
- ✓ Immediacy that only space provides — directly tied to human life and security
- ✓ More advanced and efficient space experiments (semiconductor manufacturing and processes, new possibilities in regenerative medicine)
- ✓ Ground data centers face the triple burden of power, cooling and land

...

A photograph of Earth from space, showing the curvature of the planet and the horizon. The Moon is visible in the background, partially obscured by the Earth's horizon. The sky is a deep blue.

Satellites: from “eyes” to “brains”.
Space stations: from places to “stay” to places that “produce”

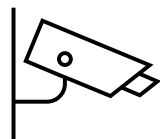
From "eyes" to "brains", from "staying" to "producing"

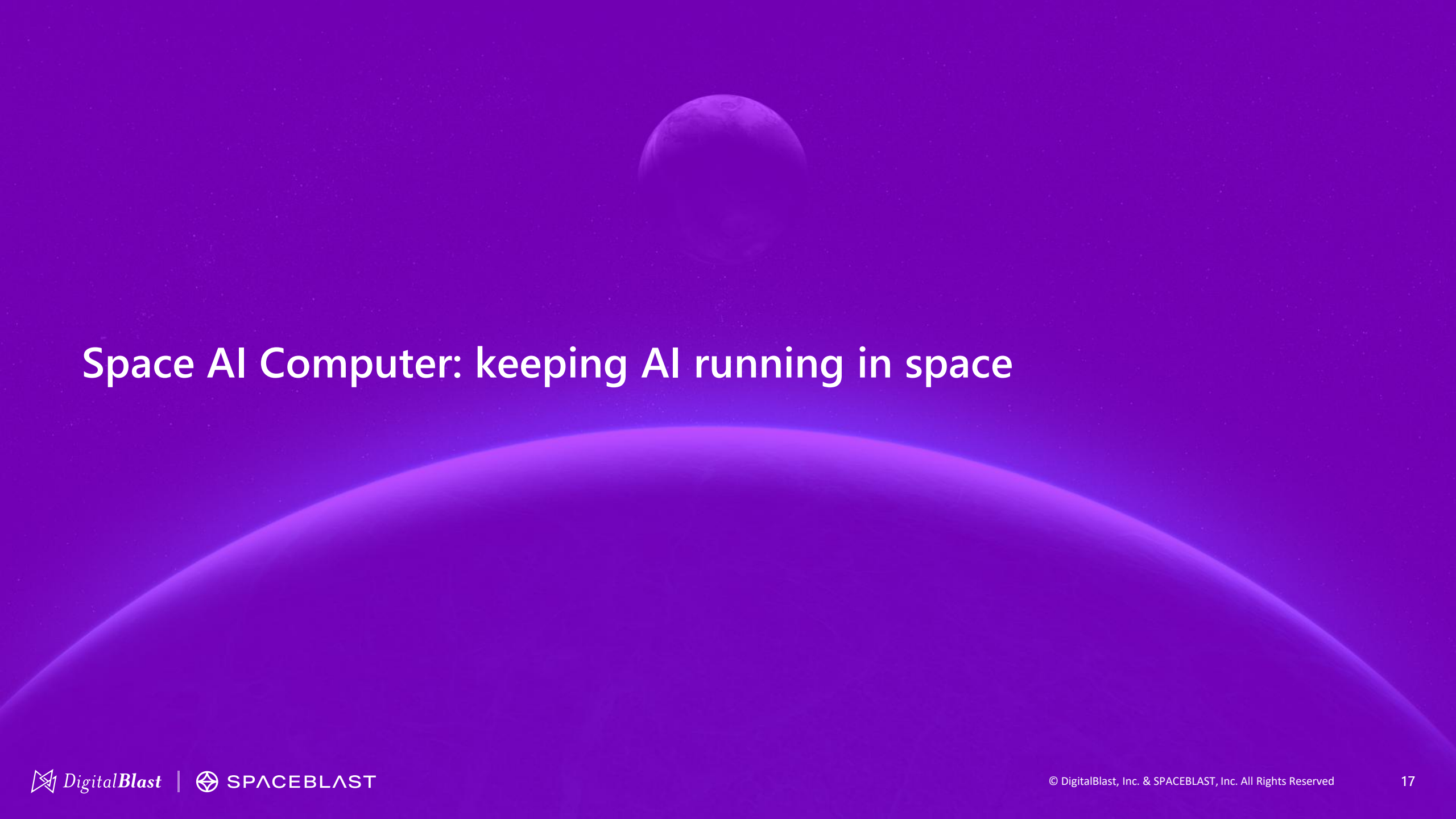


What an orbital AI data center provides

- Space becomes the “fastest brain” for Earth's real-time challenges

VALUE 01 Connect	VALUE 02 Detect	VALUE 03 Protect	VALUE 04 Synchronize	VALUE 05 Act
Resilient communications from space — independent of ground networks, never interrupted	Downlink only “answers”, not raw data — on-orbit AI detects anomalies and changes in real time	An “ultimate air gap”: physically isolated from ground-based physical and cyber attacks	Millisecond-accurate absolute position and time reference, synchronized to every edge device	On-orbit AI decides and acts in real time — without waiting for ground commands
Assumed Use Case - Guaranteed backup communications in major disasters and emergencies - Ultra-low-latency direct control of remote drones and robots - Global device-to-device (D2D) connectivity	Assumed Use Case - Comprehensive wide-area infrastructure monitoring by cooperating satellites - Continuous AI screening of critical maritime zones with instant alerts - Ultra-fast “change-only” downlink when disasters strike	Assumed Use Case - A training base for sovereign AI, free from foreign jurisdiction - On-orbit cold storage for national secrets and central-bank data - Secure fallback and distribution hub for sensitive LLM/SLM models	Assumed Use Case - Precise cooperative control of autonomous drone fleets - Absolute timestamps for global financial transactions and HFT - Global infrastructure synchronization for 6G networks	Assumed Use Case - Direct detect-to-dispatch loops for search-and-rescue and maritime enforcement - Autonomous first-response routing for rescue drones after disasters - Fully autonomous debris detection, avoidance and rendezvous in orbit



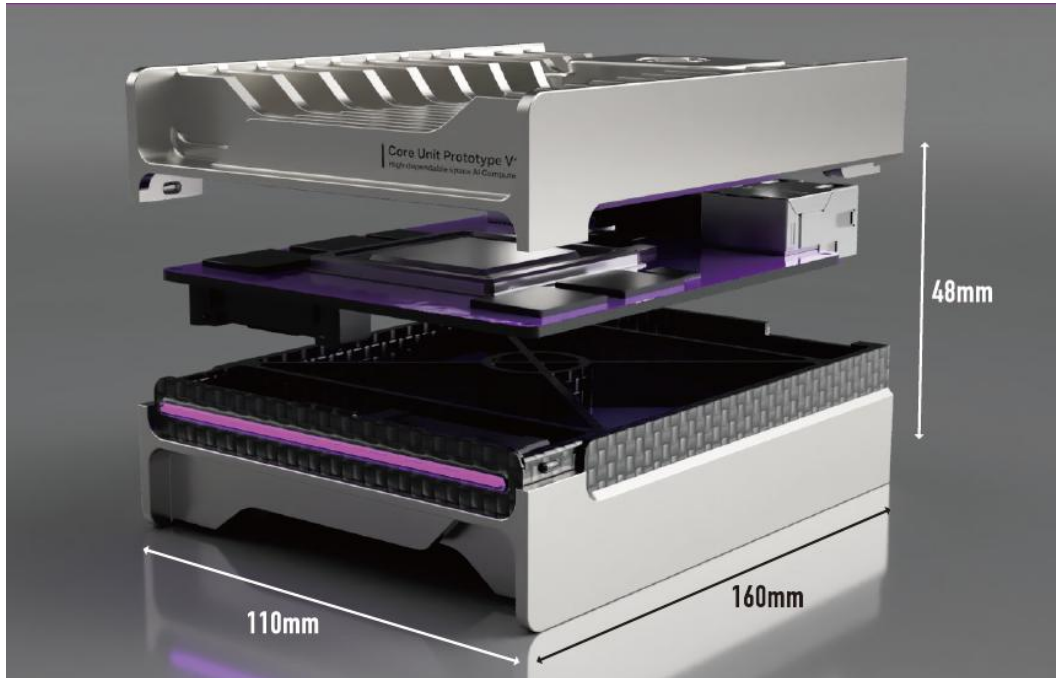
A background image of space featuring a large, curved horizon of Earth in the foreground and a full moon in the distance against a starry sky.

Space AI Computer: keeping AI running in space

High-reliability architecture (Space AI Computer: TENEDGE)

- Developing a computer that can run AI in the space environment

SPACE AI COMPUTER



SPACE AI COMPUTER — a technology built on a new architectural concept. Rather than trying to avoid errors in a harsh environment, it accepts them and secures reliability through detection and self-healing.

Low heat $\sim 80\text{Wh}$

GS/CFRP materials: twice the thermal conductivity of copper at one-fifth the weight (800 W/m/K)

Reliable

5
error detection
& correction

Error detection and correction built into memory, combinational logic, latches and CRAM. Detects heavy-ion strikes and neutron showers.

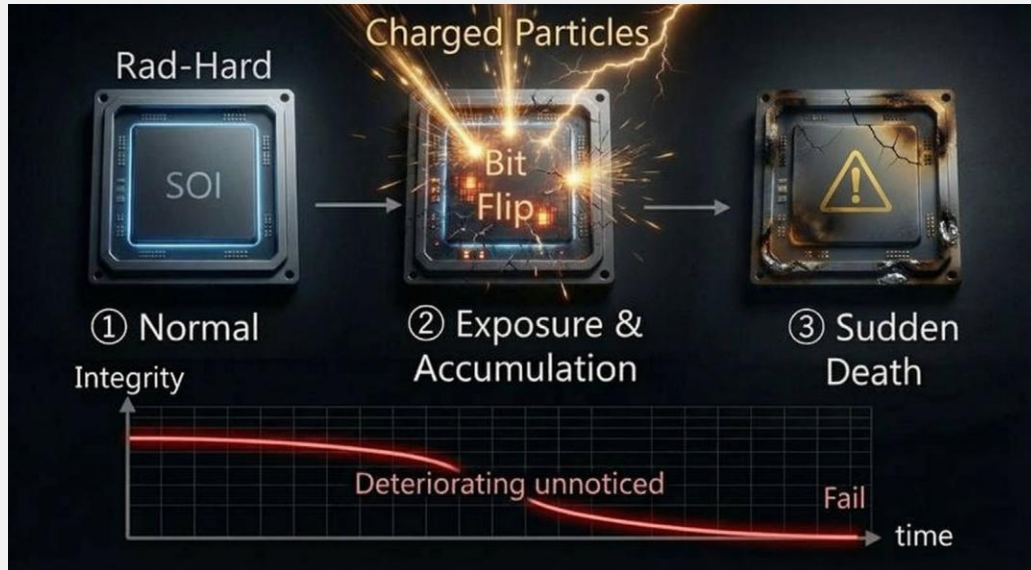
Powerful $> 60 \text{ TOPS}$

This AI capability enables real-time analysis of multiple high-resolution video streams, on-orbit object detection, classification and filtering, and a major reduction in data sent to the ground.

Space AI Computer: a self-healing architecture

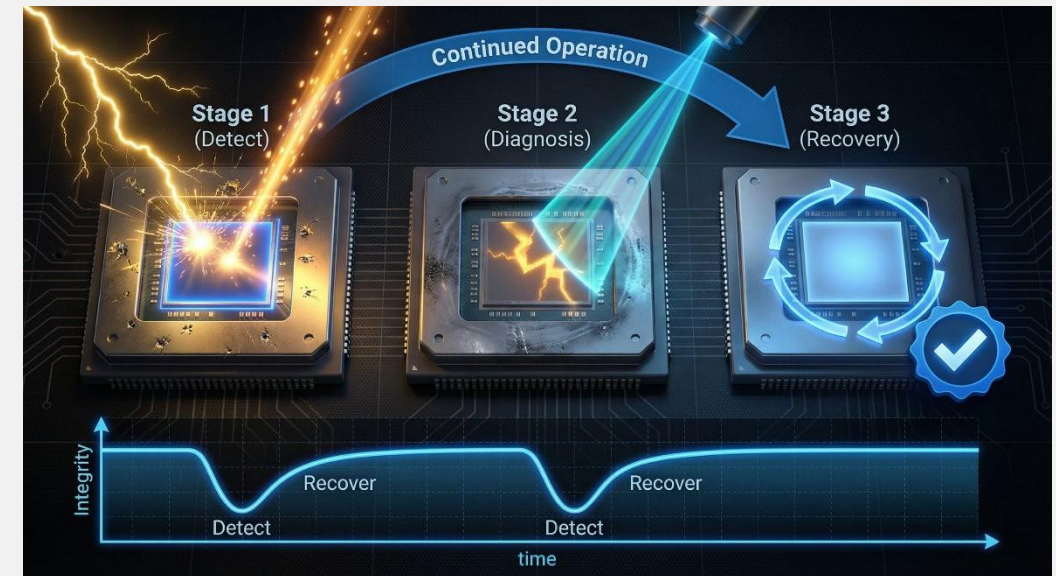
- Detect, diagnose, recover — autonomous intelligence built to survive space

CURRENT

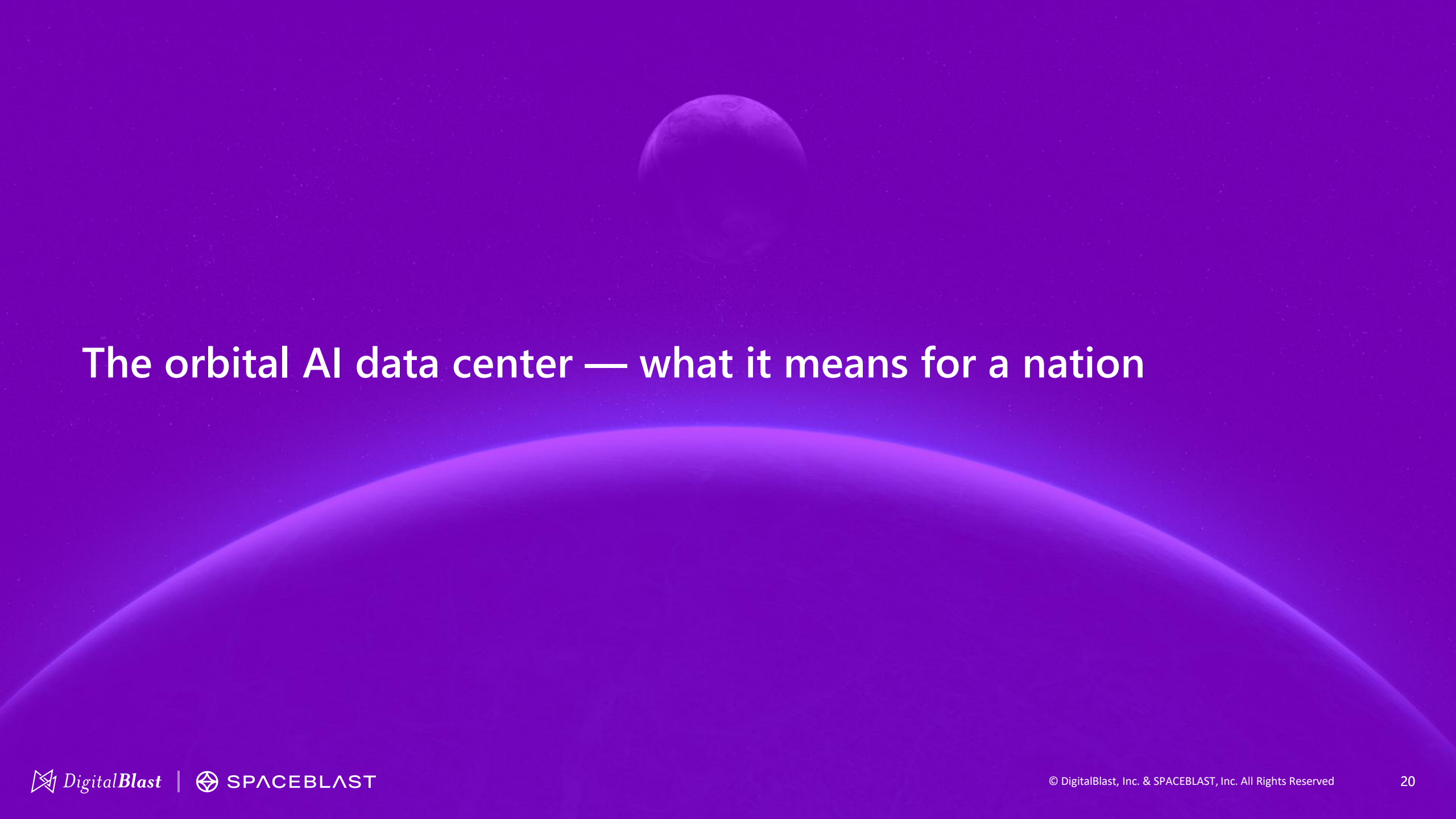


- 1 Rad-hard designs provide fault tolerance (SOI, redundancy) but have no ability to detect or diagnose faults.
- 2 Bit flips and silent degradation progress undetected, with no visible sign of failure.
- 3 Once a threshold is crossed, the system fails immediately and irrecoverably — the mission is lost.

FUTURE with CORE UNITs



- 1 High-precision sensors identify the effects of charged particles and pinpoint the fault location.
- 2 Autonomous ML-based diagnosis analyzes anomaly patterns to identify the affected scope and fault type.
- 3 Autonomous recovery from bit and configuration errors (through functional redundancy and majority voting) keeps the system healthy and operational.

The background of the slide is a composite image of space. In the foreground, the curved horizon of the Earth is visible, showing a gradient from dark blue to light blue. In the background, the Moon is visible as a bright, cratered sphere against the blackness of space.

The orbital AI data center — what it means for a nation

Five reasons a nation needs its own AI compute in orbit

“Whether a nation can own its AI processing in space is the dividing line”

A resilient orbital AI data center puts sovereign infrastructure in orbit

Data sovereignty

Keep secrets off foreign clouds

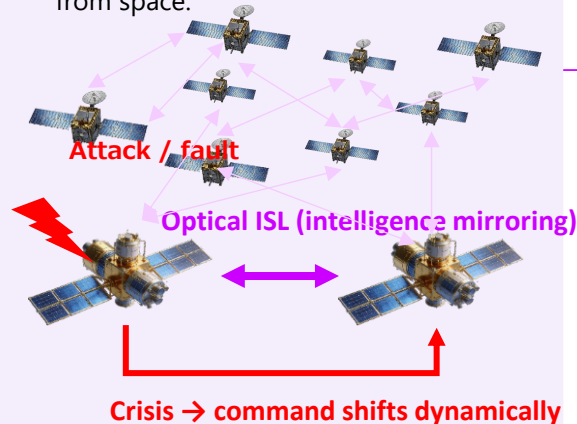
- ✓ Isolated, nationally controlled compute = self-reliant sovereign AI.
- ✓ Sovereignty as a service becomes an export industry.



Resilience

Infrastructure that survives attack

- ✓ The moment an attack is detected, intelligence and data autonomously evacuate within the network and command shifts dynamically.
- ✓ “Not worth targeting” is the ultimate deterrent — continuity in crises, secured from space.



Disaster response

Answers in seconds, not days

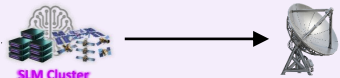
- ✓ Today imagery takes hours to days to reach analysts — by then the situation has changed.
- ✓ AI on the satellite reports floods or quakes seconds after capture — response starts on the spot.



Communications

Process in orbit, downlink only “answers”

- ✓ By 2030 satellites will generate ~160× today's data; downlinks and ground stations cannot keep up.
- ✓ On-orbit AI downlinks only “answers”, cutting traffic by orders of magnitude.



Industry

Compute that compounds with use

- ✓ CORE UNITS sell with every satellite, and each use adds data and know-how that make the service smarter.
- ✓ The data flywheel Google and Amazon built on Earth — built first in orbit, by Japan and its partners.







Realizing Orbital Data Centers

Jinbocho mitsui building 19F,
1-105 Kanda Jinbocho, Chiyoda-ku,
Tokyo, 101-0051, Japan