

# ITU Satellite Symposium 2019 - Bariloche

## NGSO Constellations - O3b, mPower

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PRESENTED BY  
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PRESENTED ON  
24 septiembre 2019

SES Proprietary and Confidential

# With the world's largest multi-orbit, multi-band satellite fleet, we are building a next-generation network for our customers' growth

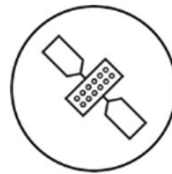
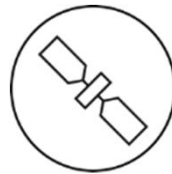


50+

satellites covering

99%

of the globe and world population



Unique

GEO-MEO

constellation complemented by a ground segment, together forming a flexible network architecture that is globally scalable



Driver of

INNOVATION

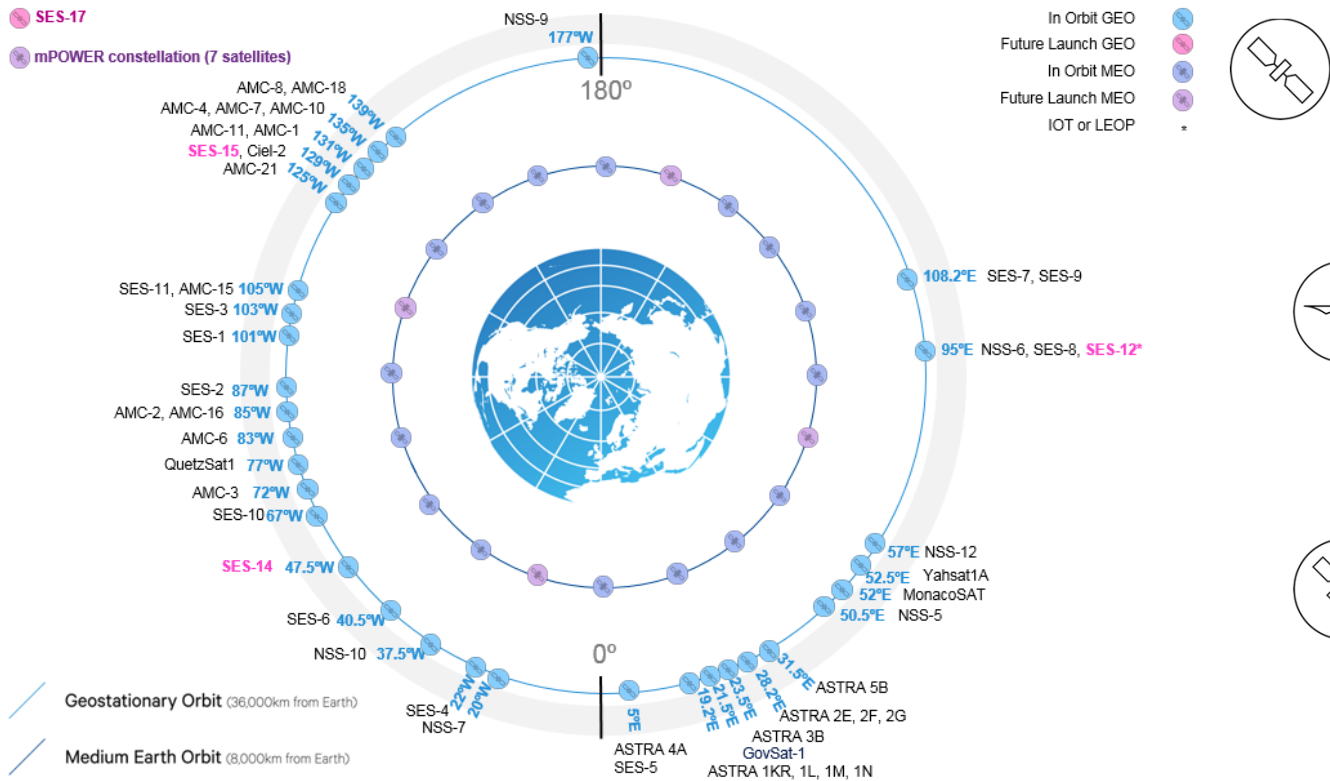
in building a cloud-scale, automated, "virtual fibre" network of the future. Leading in the industry's most influential standards groups



TELECOM INFRA PROJECT



# SES Constellations



## GEO wide beam

- ▲ Over 50 satellite constellation
- ▲ Reaching >350 million TV households worldwide

## GEO HTS

- ▲ Expanding HTS fleet: SES-12, SES-14, SES-15, future SES-17
- ▲ Improving value proposition for data applications

## MEO HTS

- ▲ Operational since 2015, now 20 satellites
- ▲ High throughput, low latency
- ▲ 7 next-generation satellites in 2021

# Across industries, business customers are embracing digital technologies, the cloud, IoT and big data



Enterprise

IT spending priorities shifting to digital business, IoT, big data<sup>1</sup>



Education

E-learning revenues in LATAM have doubled over last 5 years<sup>2</sup>



Financial

Mobile banking, omni-channel experience driving bandwidth growth



Energy

82% of mining execs will increase digitalization spending over next 3 yrs<sup>3</sup>



MNO

Hosted functions moving to the edge as connected “things” proliferate



Government

Top 9 countries moving up in the UN E-Gov Development Index are in LATAM<sup>4</sup>

Sources: 1) Gartner 2018; 2) Docebo, 2016 ; 3) Deloitte 2018; 4) United Nations, 2017

# Closing the broadband penetration gap – and making connectivity resilient – has measurable economic benefits



Source: United Nations, 2017

# PROVEN IMPACT



SES<sup>▲</sup>

MEO capacity  
**50 Gbps**  
in nearly 50 countries

digital access  
**10,000+**  
civil servants  
in Burkina Faso

Cloud access now possible for  
**millions**  
of end users

With 4 new satellites  
in 2019

**26%**  
additional O3b  
MEO capacity

**4 of 6**  
oil & gas super majors

**100,000**  
cruise passengers  
per month

## SES Solutions Address Multiple Government, Enterprise Markets

### WHAT WE OFFER

- Widebeam, GEO/MEO HTS capacity
- High Availability Ka+C Band Hybrid Services
- Industry-leading latency over any satellite-based broadband system
- Mobility Network services

### WHAT WE ENABLE

- High performance 3G and 4G services, delivering on ubiquitous 2G coverage
- Enterprise Access to Cloud Applications, Storage and Compute
- Connecting 1000's of corporate sites in finance, manufacturing, education & health
- Bringing communication services to remote communities, enabling WiFi adoption
- Rural Broadband Access Expansion
- Humanitarian, Disaster Relief Programs
- Connect thousands airplanes traversing across oceans, skies and lands; connect thousands of vessels traversing across oceans or locally
- Provide high-quality live inflight or onboard entertainment, and fast internet

Serving

**>300** customers in

**>130** countries

WORLD'S  
**1<sup>st</sup>**



MEF CE 2.0  
Certification over satellite





# FIXED DATA

SES<sup>▲</sup>

## CASE STUDY

- ▲ 2G/3G/4G – 24 MNO/Telcos today are offering end users with either 3G or 4G/LTE satellite-enabled services
- ▲ More than an estimated 15 million MNO/Telco end users benefit from O3b MEO connectivity today.

- ▲ Deployment of 4G/LTE services







# ENERGY

SES<sup>▲</sup>

- ▲ The O3b system serves 4 out of the 6 oil & gas super majors in key offshore markets.



# CLOUD

SES<sup>^</sup>

- ▲ Cloud data center traffic will represent 95 percent of total data center traffic by 2021.
- ▲ Enabling MNOs to integrate into our satellite networks easily and in a standards-driven environment.

- ▲ IBM Cloud Direct Link Service Provider Program
- ▲ MEF Carrier Ethernet 2.0 certification



# Crisis Connectivity

## On-Demand Crisis Connectivity, Field-Proven Experience



Proven experience with leading emergency communication platforms



SES played a key role in Puerto Rico recovery, using C-band GEO and Ka-band MEO satellites to help restore 4G/LTE connectivity

SES deployed MEO capacity to support government, first responders in Florida after Hurricane Michael



### PROJECT LOON

Restoring connectivity after mudslides

SES MEO and Alphabet's Project Loon collaborated to restore critical telecommunications after flooding in Peru



# O3b mPOWER

SES Networks

MULTI-TERABIT  
CAPACITY

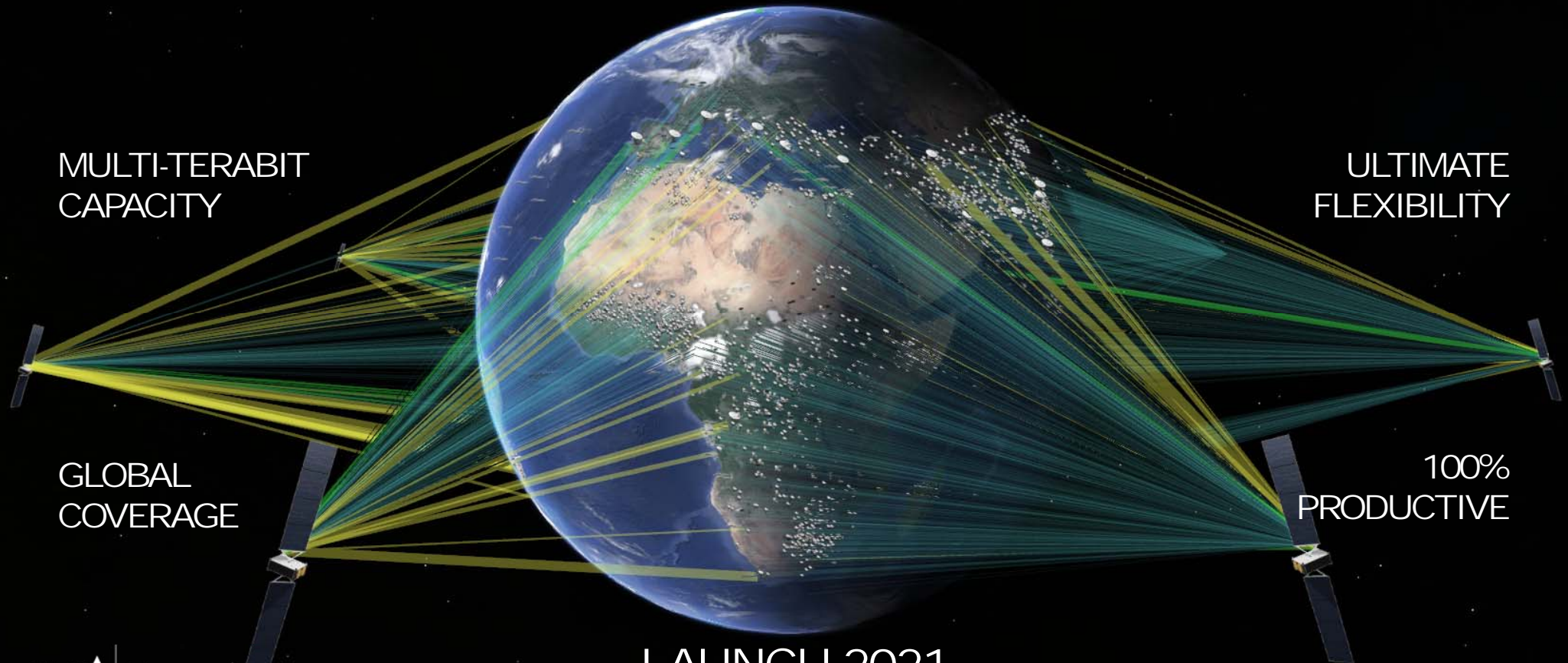
ULTIMATE  
FLEXIBILITY

GLOBAL  
COVERAGE

100%  
PRODUCTIVE

SES Networks

LAUNCH 2021



## 03b **mPOWER**

### cloud-ready capabilities

- ▲ Fully digitised payload
- ▲ Electrically steered beam-forming
- ▲ High throughput (10Mbps+ to 10Gbps+)
- ▲ Flexible forward-to-return throughput ratio
- ▲ Low latency MEO (<150msec)
- ▲ Inherent security & flexibility
- ▲ Scalable constellation

**SES**<sup>▲</sup>



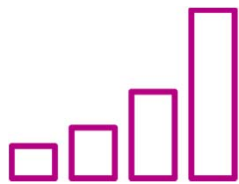
# A New MEO Constellation

## The Most Powerful Satellite System Ever

### O3b **mPOWER**

- ▲ SES operates the only MEO satellites for the lowest-latency service from space
- ▲ In 2021, seven next generation MEO satellites will be added to the O3b fleet
- ▲ Setting new industry benchmarks across multiple performance metrics

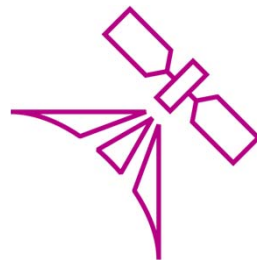
#### CAPACITY



**Multi-terabit**  
Scalable to 10s of Tbps globally

#### FLEXIBILITY

Shape, moderate, route,  
shift & switch



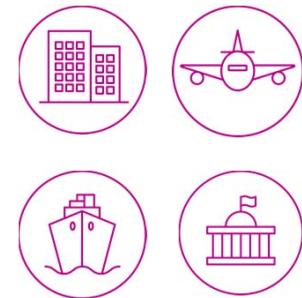
**4,000+**  
beams per satellite

#### COVERAGE



**400M**  
Square kilometres covered

#### PRODUCTIVITY



**100% productive**  
Beams go to customers,  
not empty territory



# Empowering the Digital Economy and Digital Equality

## Cloud-based Enterprise Applications and Access to Global Markets

- ▲ Extends high-performance digital access to more remote schools, hospitals and communities

Managed applications

Access to data centres

Intelligent traffic routing

Cloud productivity & efficiency

- ▲ Unleashes the potential of small businesses in remote, underserved or unconnected areas
- ▲ Delivers access to digital resources to fuel enterprise growth and help them compete
- ▲ Transforms any business into a cloud-based enterprise

## Helping MNOs Rapidly Expand to Reach Millions More Users

- ▲ Brings mobile broadband, video and other content-rich services to developing markets
- ▲ Enables new service in underserved areas and “fill-in” coverage gaps in developed markets
- ▲ Globalising LTE, futureproof to 5G
- ▲ Supports advanced apps and architectures

Multi-access edge computing

HD video

## More Maritime and Aero Markets

More ships, any route

Global commercial  
airline fleets

Private business jet fleets

Commercial shipping  
fleets

- ▲ Business-grade productivity and communications applications
- ▲ Streaming entertainment
- ▲ Delivers a robust passenger experience

## Critical Civil and Disaster Recovery Operations

- ▲ Secure, real-time data and communications for rapidly-deployed assets and operations anywhere

**Dynamically allocated and formed beams  
resilient to interference**

**Autonomous management of gateways,  
capacity, availability and routing**

## Enabling Universal Connectivity Via Satellite

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- ▲ Satellites will help **build digital societies** by **enabling universal connectivity** – from the densest urban cores to the hardest-to-reach places

Direct  
Connectivity

Connecting households, schools, hospitals, government buildings

Satellite  
Backhaul

Extending coverage of fixed and mobile networks

Cloud Computing  
and IoT

Enabling e-commerce for governments, businesses and consumers

Video  
Distribution

Digital TV transition, live news, sports and entertainment

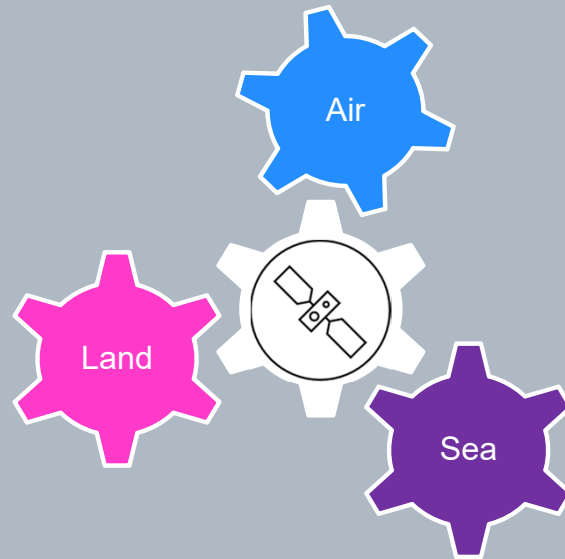
Emergency  
Telecomm's

Public safety and disaster recovery

- ▲ Satellites do all of this today, and **stand ready** to do this in the **5G era and beyond**
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# Cloud and network service providers

Look to space to reach underserved markets



Oil Platform



Aero ISR



Sensors



Maritime



Enterprise



Mission Terminal

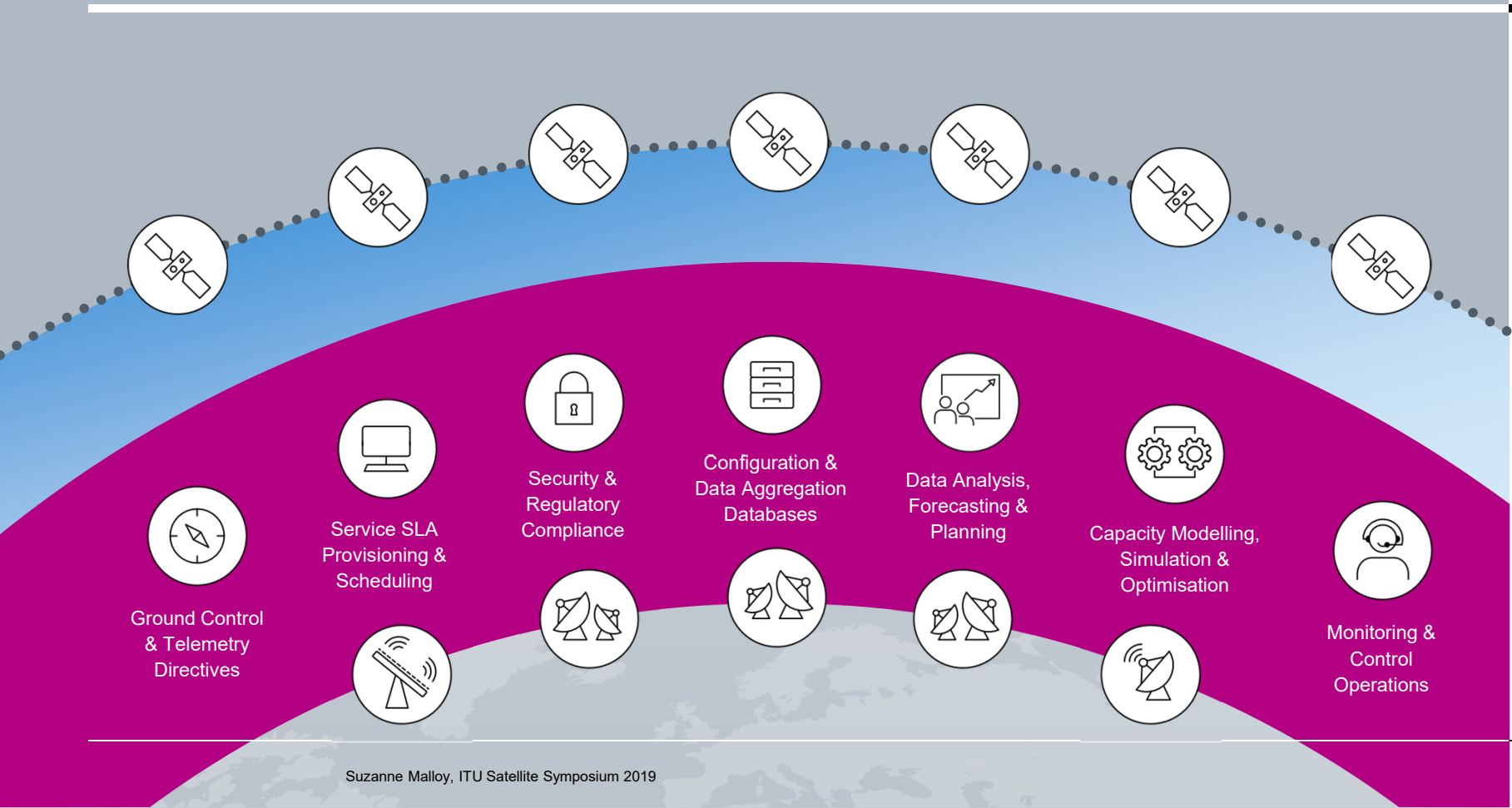


Production Facility



Emergency Disaster Response

# O3b mPOWER Adaptive Resource Control System





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