

# Satellite: The Solution for Emerging Markets



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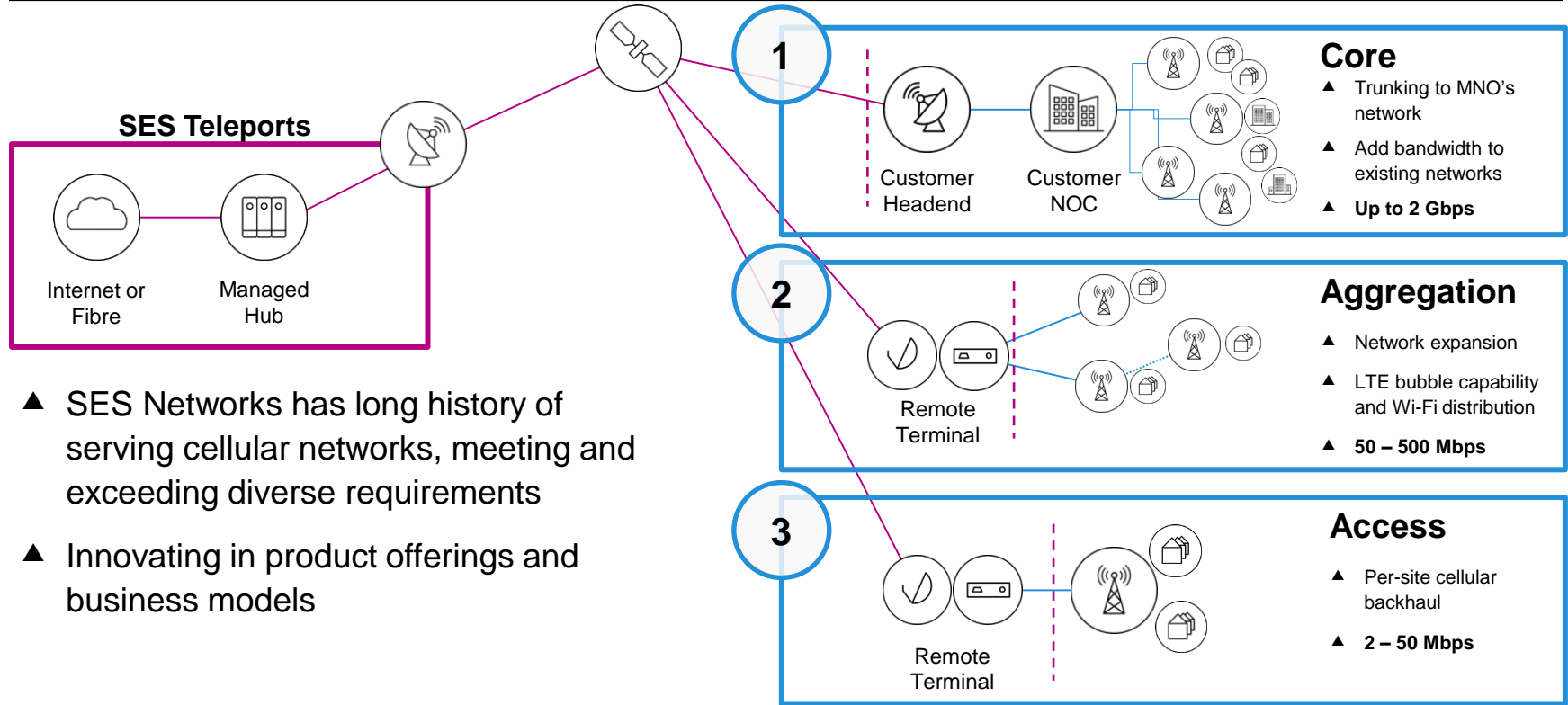
22 June, 2017

## Key drivers for Service adoption

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- ▲ Services that make/save \$
- ▲ User experience (QoE) anytime anywhere
- ▲ Unique satellite reach
- ▲ Network availability
- ▲ Terrestrial coverage
- ▲ True telco products
- ▲ E2E Managed Services

# Managed Networks for Unique Requirements



- ▲ SES Networks has long history of serving cellular networks, meeting and exceeding diverse requirements
- ▲ Innovating in product offerings and business models

# Use Case : TIM | FdN Brazil



TIM beats competition in time to market -revenue growth in B2C & B2B

## Situation

- High value customers left unserved
- 2G only due to backhaul constraints
- Untapped market for LTE

## Solution

- Single eNodeB in 700 MHz
- O3b E-Line for backhaul
- QoS with prioritization

## Result

- Complete islands coverage
- QoE similar to fiber
- VoLTE, ViLTE and VPN enabled



# LTE backhaul (S1) indicative KPIs over MEO

## From Network Performance Centric to User Experience Centric

Accessibility	Target	Actual	Variation
	Acessibilidade LTE (%)	96.00%	99.92%
RRC connection setup SR (%)	90.00%	99.92%	11.02%
E-RAB setup SR (%)	90.00%	99.76%	10.84%
Retainability			
E-RAB Drop Ratio (%)	3.00%	0.33%	89.07%
Mobility			
Intra eNB HO SR (%)	90.00%	95.38%	5.97%
Inter eNB HO X2 SR (%)	90.00%	98.78%	9.76%
Inter eNB HO S1 SR (%)	90.00%	0.00%	-
Usage & Traffic			
Max PDCP Thr DL [kbit/s]	15000.00	56982.00	279.88%
Max PDCP Thr UL [kbit/s]	1500.00	18954.00	1163.60%
Quality			
RSSI PUCCH (dBm)	[-110; -95]	-95.71	OK
RSSI PUSCH (dBm)	[-110; -95]	-107.35	OK
CQI Médio (#)	11.00	10.53	-4.24%

## Ecosystem development

- ▲ Initiated partnership with GSMA to collaborate on future of cellular backhaul over satellite, including standards for 5G over satellite,
- ▲ Submission valuable contributions to 3GPP – SA1/ RAN stream initiate NRoS and distributed ePC cross border etc.
- ▲ Joined OpenCellular and System Integration-Site Optimization workgroups from the Telecom Infra Project (TIP) to provide solutions relevant to the needs of Africa
- ▲ Collaborating with ESA to build satellite-enabled 5G testbed
- ▲ Increasing partnerships with vendors to supply end-to-end solutions including:
  - Mobile Edge Computing solutions (MEC)
  - C-RAN and global roaming
  - LTE Bubble with Wi-Fi Distribution
  - Asset management and monitoring (M2M and IoT)



TELECOM INFRA PROJECT



**Ecosystem development informs smarter products, aligns capabilities with the needs of tomorrow's MNOs,**