



Hi-Tech

Roadmap and Investments

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LTTS Investor & Analyst Day 2018
BEING #1

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Hi-Tech Snapshot

SEMICONDUCTOR



Semiconductor and sensors for IoT market: **\$53B** by 2020

CONSUMER ELECTRONICS



20 Billion connected devices to be in use by 2020

TELECOMMUNICATIONS



Mobile Industry To Invest **\$500B** in 5G Capex By 2020

SOFTWARE & INTERNET



Software Spending expected to reach **\$94B** by 2020.

MEDIA & ENTERTAINMENT



New Media to account for **\$450B** by 2021

10+ Years of Experience

8+ Strategic Engagements

5+ Offshore Delivery Centers

3500+ Skilled Resources

3000 + New Product Design Contribution

The Hi-Tech Market: What's cooking?

SEMICONDUCTORS

The Chip market has expanded from OEMs to all new-age tech giants!

DEVICES

Biggest growth in devices that require **minimal bandwidth & remote connectivity**

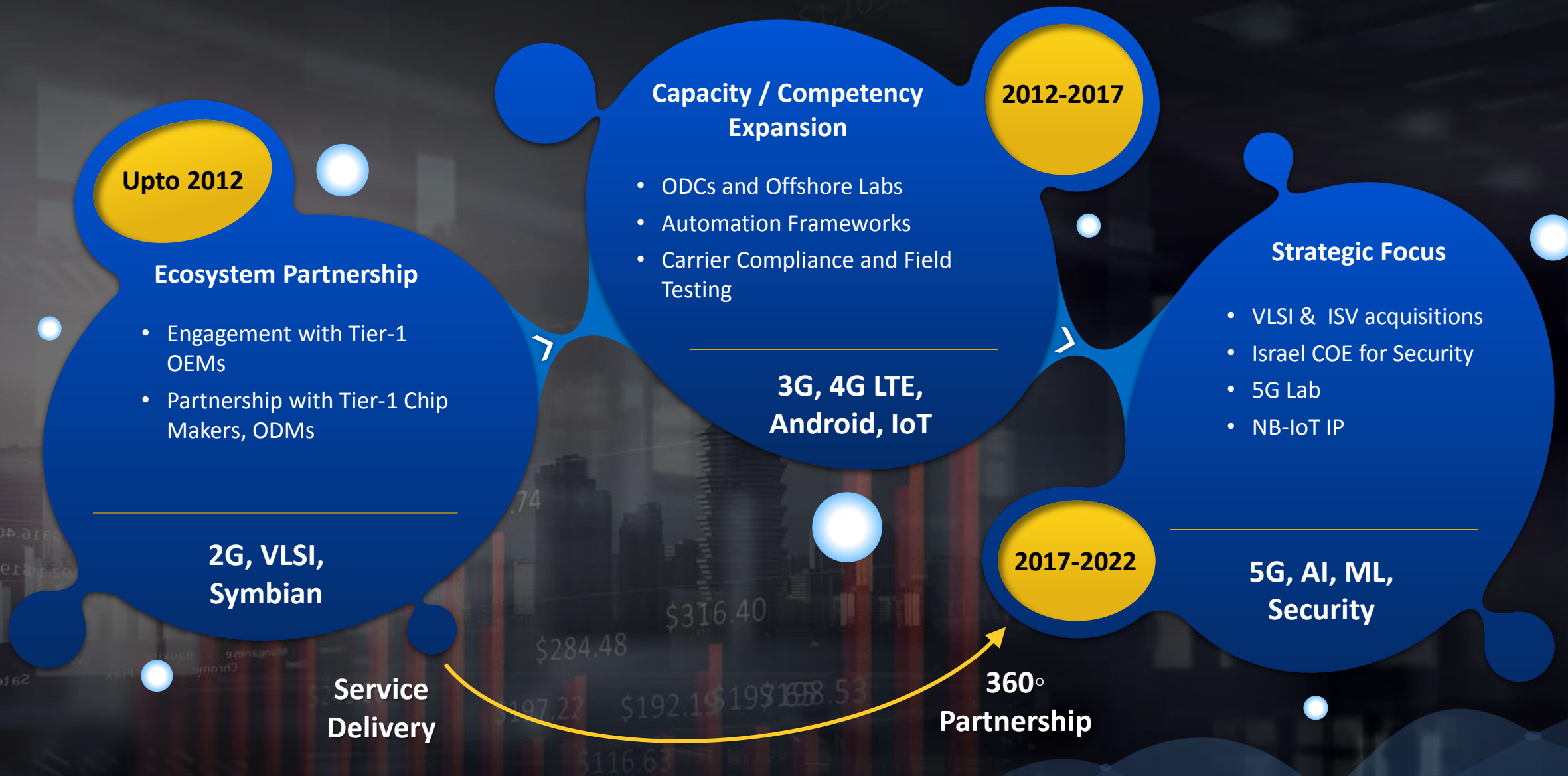
TELECOM

Low Cost, Open Network Communication Platforms are the future

SOFTWARE

'Software on product' is the area to watch out for

Our Journey – Hi-Tech



Why is 5G & IoT a game-changer?

Enhanced Mobile Broadband

Faster, more Uniform Experience

Use Cases



Mobile Devices



AR/VR

Massive Connectivity

For Everything

Use Cases



Wearable



Smart City



Smart Home



Utilities

Machine Critical Control

Instant Action

Use Cases



Smart vehicles,
Transport



Remote
Health Care



Industrial
application &
Control



Support a very large
scale of connections



Low Cost
per bit



Reduce equipment
complexity



Minimize power
consumption



Improved indoor
coverage

How is LTTS positioned to impact this ecosystem?

CHIPSET



Enhanced Mobile Broadband

- Low Power
- High Complexity and Multi-functional
- NB-IoT Enabled
- AI Embedded
- Security and Encryption

CONNECTIVITY



Ubiquitous Connectivity

- 5G Virtualization
- IOT Service Monetization
- Disruptive Open Source Network Roll Outs

DEVICES



Device-to-Device Communication

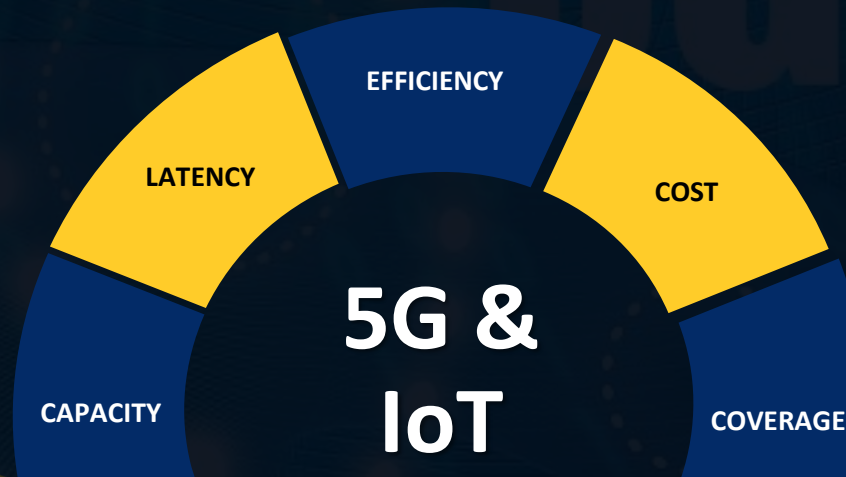
- Security
- Ruggedization
- 5G Control Applications
- Operator Customizations

SOFTWARE



Software Defined Everything

- Software Defined Networks
- Specialized Cybersecurity team
- Proven Industrial AR/ VR Applications
- Analytics – Edge & Cloud



\$250 Billion by 2021

Some of the Cutting-Edge Work We Do



**Terrestrial Wireless
Internet Connectivity**



**Image
Processing SoC**



**LTE chipset
Enablement**



**Connected
Drones**

Facilitating Connectivity for the Developing World

Mesh Network



Terrestrial Wireless Mesh Network for Urban Areas

- 60GHz high speed wireless connectivity system solutions
- Architecture, Design & Field Testing

Solar Drone



Design Activities

- Next generation hardware & software
- Drastic Power & Weight Reduction
- Advance Network Processing Unit
- Custom ASIC

5G Rollout



- 5G Base Station & Core Network Development
- Development of NFV/SDN platform and Tools
- Development of Diagnostics and Outage Isolation Tools

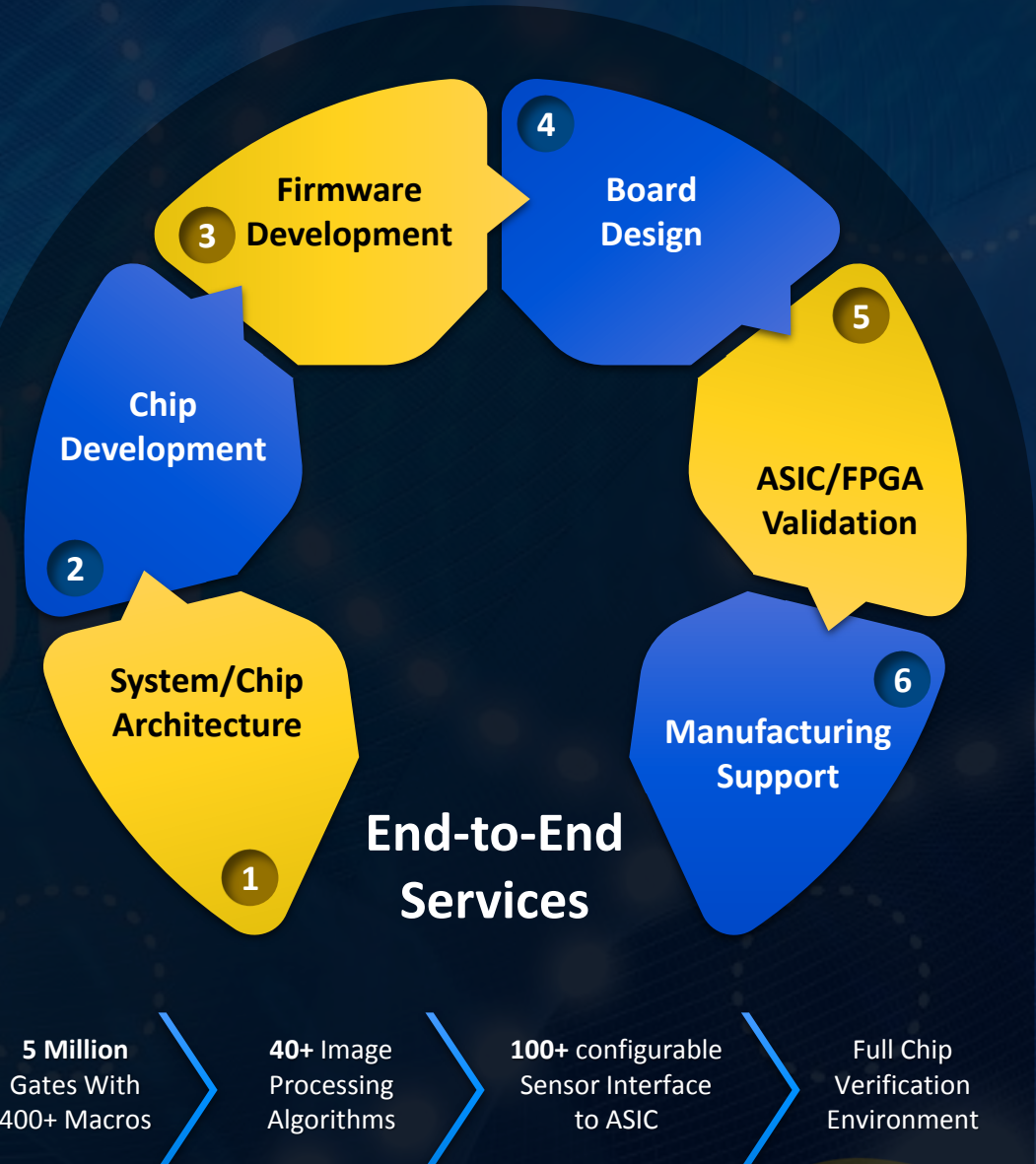
Image Processing: Turnkey SoC

Project Highlights

- Complete physical design and verification including mass production of image processing SoC
- Executed chip development plans using low power process methodology
- Achieved high chip processing efficiency by optimizing die size, pin count, and power/memory/performance/sensor requirements

Application: Industrial Camera

LTTS proprietary VLSI IPs

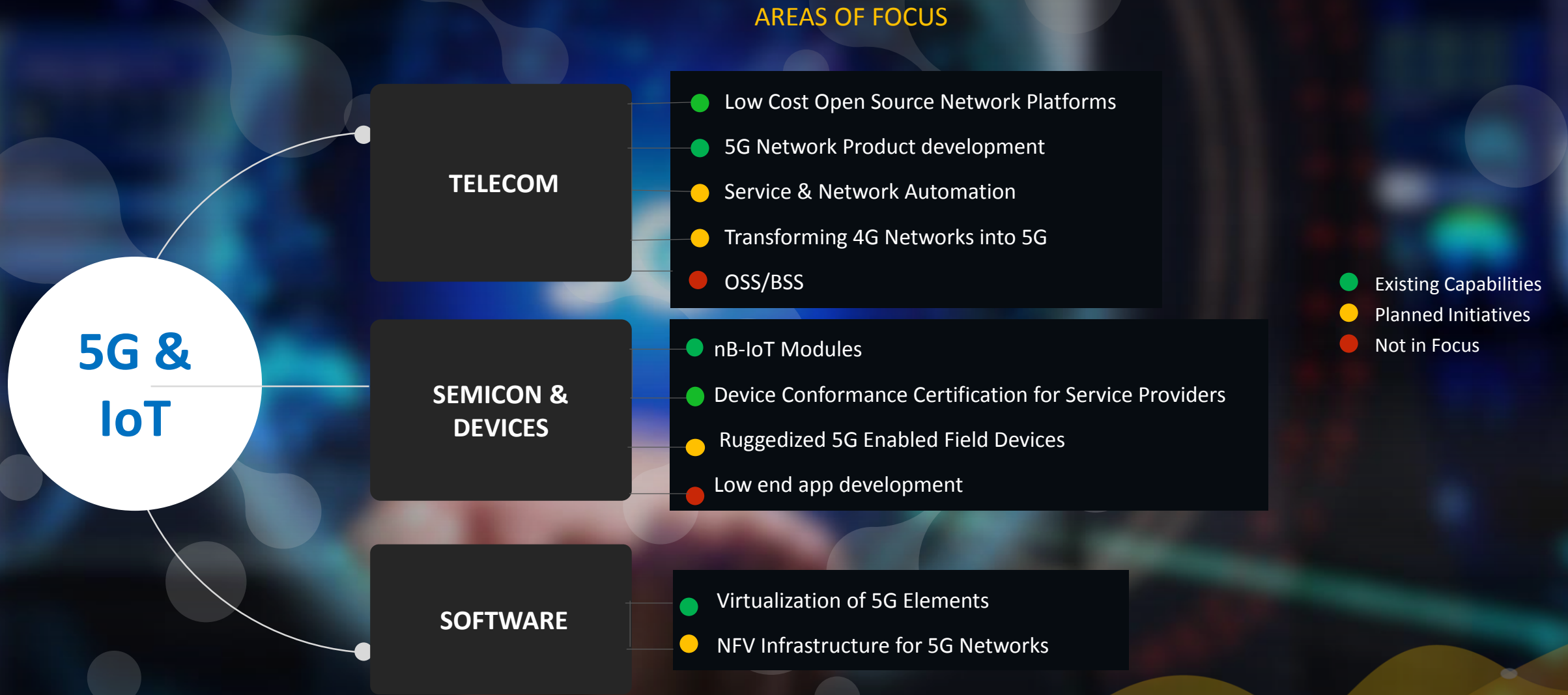


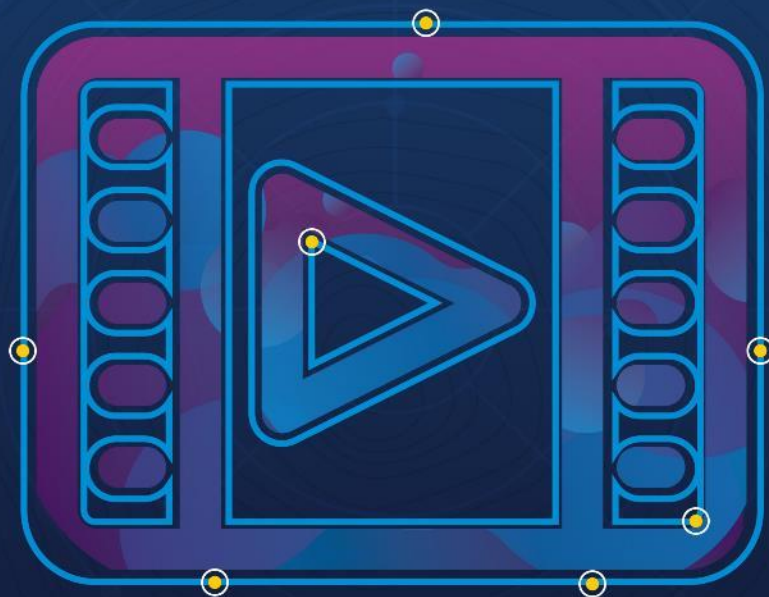
Development of Ruggedized, Smart Public Safety Device

Solution Highlights

- Supports public and private networks
- Unique configuration to support dual SI
- Specialized IMS configuration for public safety network
- Specialized audio profile and path for mission critical application
- Modem configuration and over-the-air upgrade
- Device management for both networks
- Carrier certification testing and development support

5G & IoT Solutions Roadmap





Media & Entertainment Roadmap and Investments



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M&E: From “Idiot Box” to Smart TV to Online Streaming

1980's



Era of National Channels

- **1960** : experimental telecast introduced
- **1980** : started National telecast
- **Colour broadcasts** and colour TVs introduced

1990's



BBC

CBS

Dawn of Cable TV & Satellite TV

- **Regional Channels**
- **Greater variety of local content** – news & entertainment
- **Mass commercialization of cable TV**

2000 - 2015



HBO

Rise of International Channels

- **Explosion of News Channels**
- **Hyper-customization of content**
- **Massive Live Content** – sports, awards
- **Record & Watch Later** – Precursor to on-demand

2015 - 2018



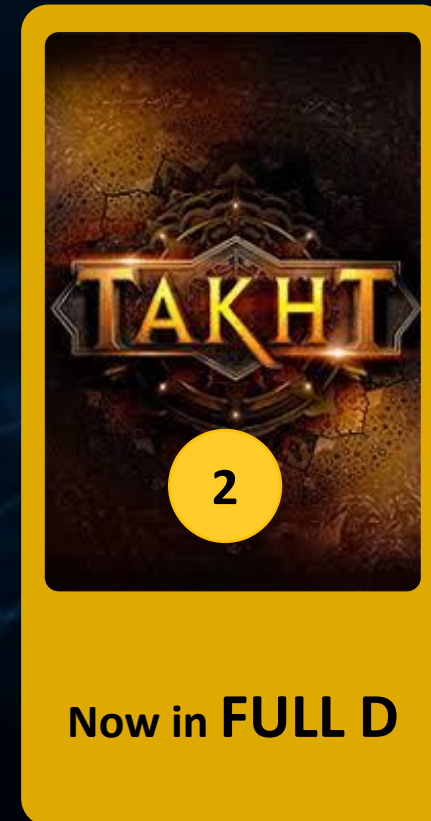
NETFLIX

hotstar

Advent of Online Streaming Services

- **Amazon.com Inc.** invested US\$ 3 billion to establish **Amazon Prime**
- **Netflix** commissions highest number of shows in India, after US, UK and Japan.
- **Hotstar** - 350 million followers

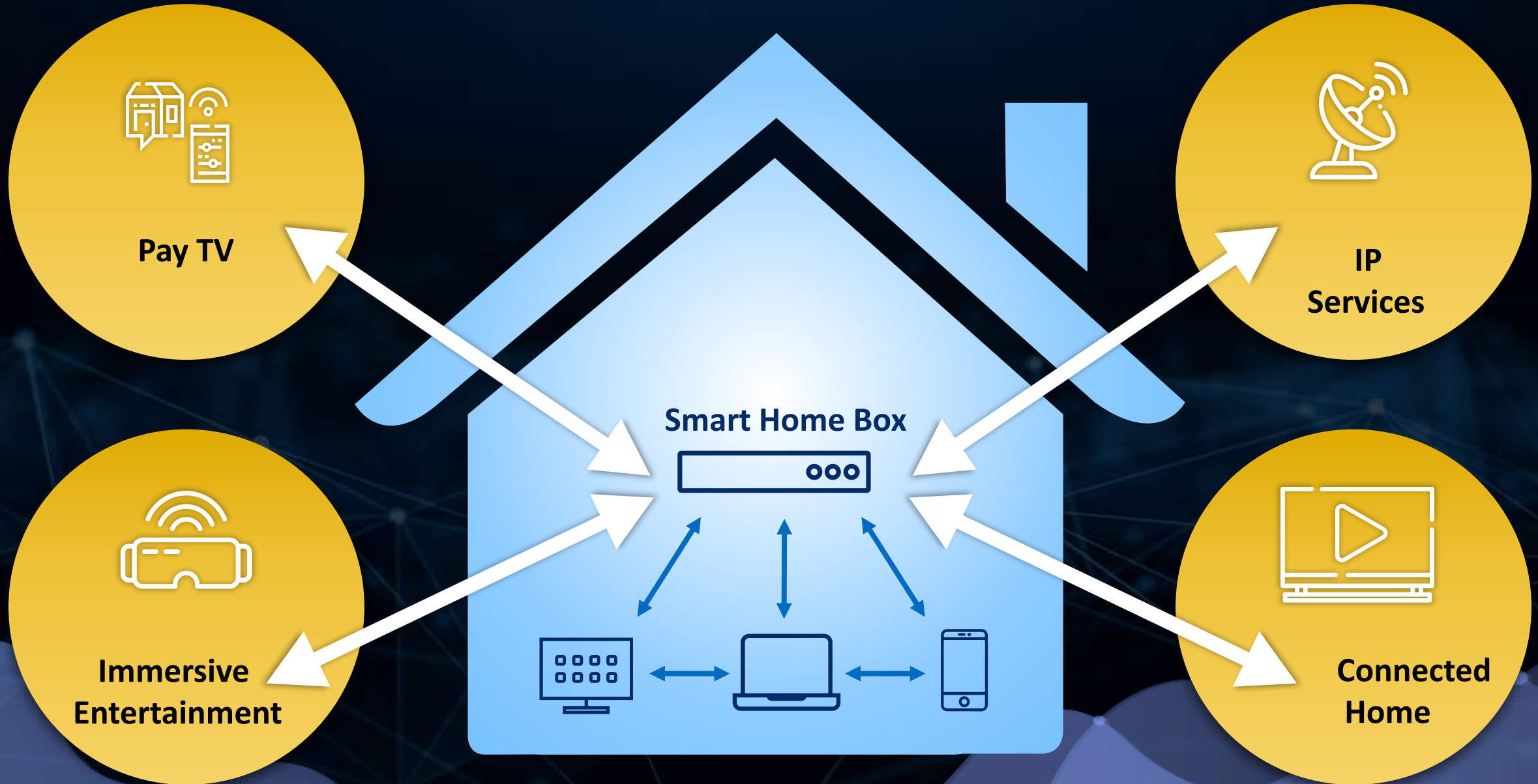
The Media & Entertainment Industry – Growing Rapidly



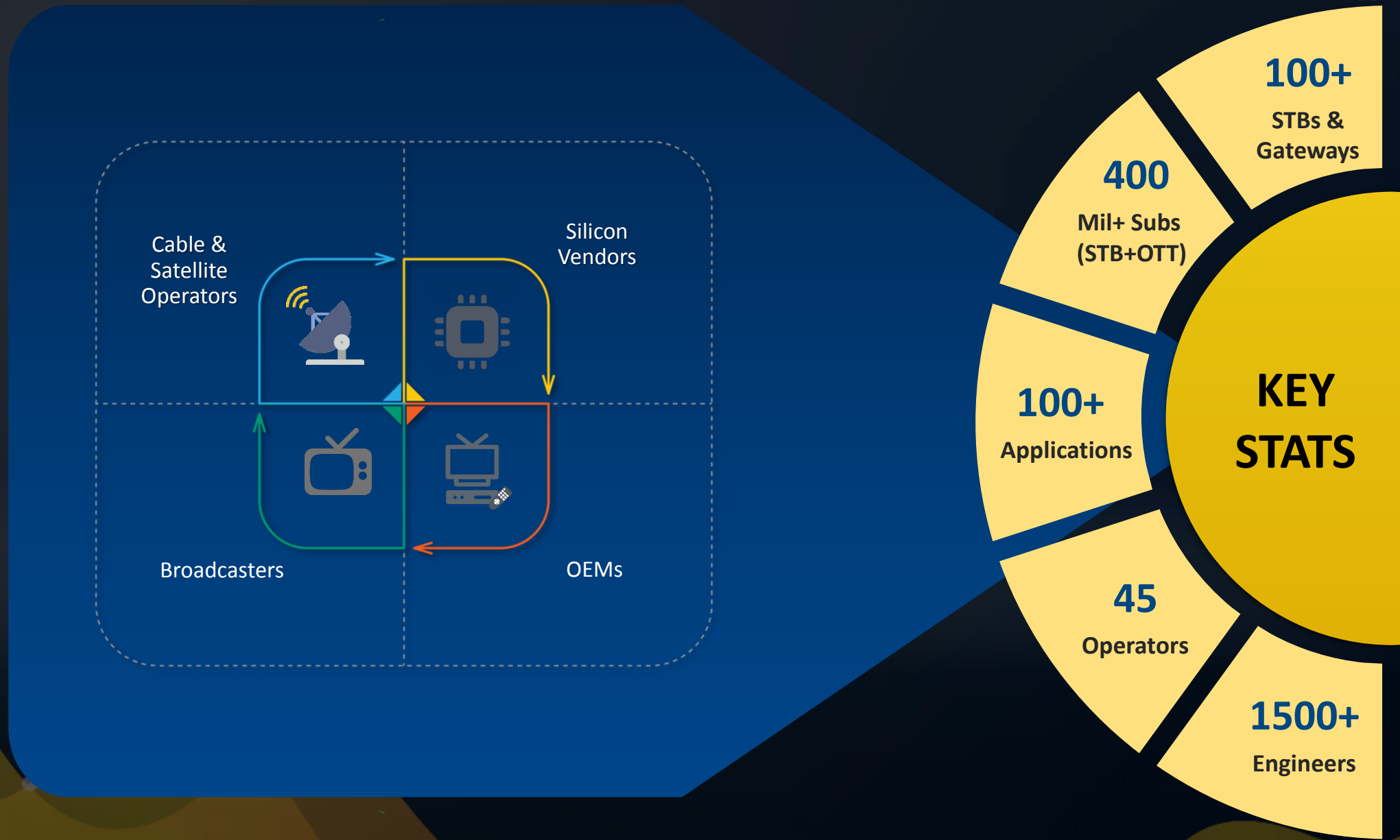
Traditional Scenario



M&E Innovation : Smart Home Box



LTTS in Media & Entertainment – A snapshot



M&E Engineering Feats ..



Live TV, VOD,
Catchup TV



Record on Box,
Power Search, Voice
Control



2nd Screen, Follow Me,



Inflight TV
Streaming



Content
Monetization



Satellite STB for
LATAM



Targeted Ads



Netflix & YouTube
on Box, Social TV



Video
Everywhere



Content Security

Key Differentiators for M&E



- Multiple OEMs
- Multiple Devices
- Multiple Industries
- Multiple Product Releases

- Holistic understanding of all sub-systems
 - Head-End
 - Middleware
 - Front End Applications

- Expertise in Multiple Platforms
- Interoperability
- User Personalization

- Vulnerability Assessment
- Video Encryption
- DRM
- Self Learning & Adaptive Algorithms

M&E Roadmap and vision

AREAS OF FOCUS

Smart
Top Box

Android

- Multiple DTV Stack integrations on Android
- Android porting on SOC platforms and operator commercialization

OTT Apps

- OTT framework development on all open platforms
- OTT Platforms integrations for content providers/ broadcasters

Connected Home

- Sensor / gateway integration
- Operator packaging / platform management