CONNECTING AT THE SPEED OF LIGHT

Corporate Overview

January 2021

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Acacia Communications Overview

Coherent Optical Interconnect Provider & Innovator

Addressing Existing & Emerging Coherent Markets

Driving the Siliconization of Optical Interconnect

First to Market, Award Winning Products

Proven Management Team

Strong Balance Sheet

Mission: Deliver silicon-based interconnects that **transform cloud and communication networks** by **simplifying** these networks, **digitizing** numerous complex analog functions, and providing **significant improvements in speed, capacity and power consumption**

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Acacia Advancing Next Generation of Optical Communications

Coherent Portfolio

- Edge/Access, DCI, Metro, Long-haul and Submarine
- Capacity, flexibility, intelligence, reach, scalability
- Coherent Optics in CFP, CFP2, QSFP-DD and OSFP form factors

Key Technologies

- In-house Coherent DSP ASIC
- Highly integrated Silicon Photonics
- Advanced packaging for high-density coherent applications
- Pluggable & Embedded coherent optical modules

Proven Execution

- >500,000 coherent ports deployed
- 8 DSP ASICs developed since 2009
- Leading Silicon Photonics
- 3D Siliconization Technology

Strategic Vision:

- Address high-growth market segments based on low-power DSPs and integrated photonics
- Broaden market penetration through increased engagement with Tier-1 NEMs
- Maintain a technology leadership position with many first to market products

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Demand for Bandwidth and Network Capacity

Key applications driving global demand

Data & Video

Video accounts for over 60% of downstream traffic on the internet[1]

Mobile & 5G

Global total mobile data traffic is projected to grow by a factor of approximately 4.5 to reach 226EB per month in 2026[2]

Changing Traffic Patterns

Increased work from home putting emphasis on residential broadband with average speeds rising from 46 Mbps to 110 Mbps[3]

Cloud

Increasing cloud adoption driving hyperscale data center buildouts. By 2022, global public cloud services market revenue is forecasted to exceed 362.3 billion U.S. dollars[4]

Internet of Things

It is projected that there will be nearly 30 billion devices/connections by 2023[3]

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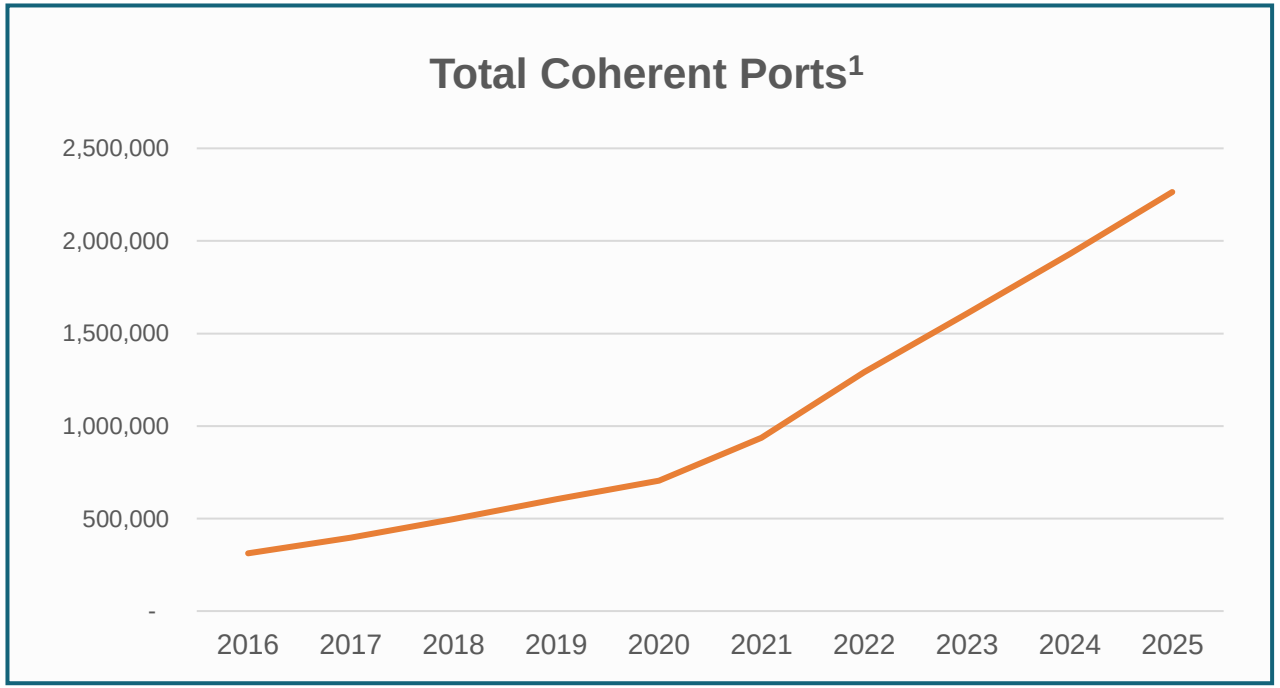
1. Sandvine Phenomena Report, May 2020
2. Ericsson Mobility Report, Nov 2020
3. Cisco Annual Internet Report, Feb 2020
4. Statista, Nov 2020

Forecasted Coherent Module Market Size and Trends

Industry trends expected to drive increasing adoption of pluggable coherent modules



- Increasing share of coherent ports based on pluggables
- Port growth driven by 400ZR and 100G Edge/Access
- Merchant modules more widely utilized

1. Reprinted with permission: LightCounting, Oct 2020

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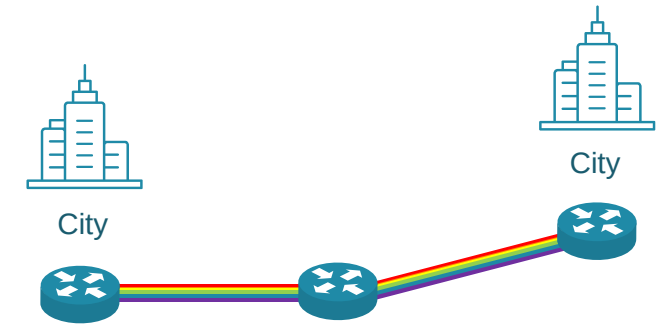
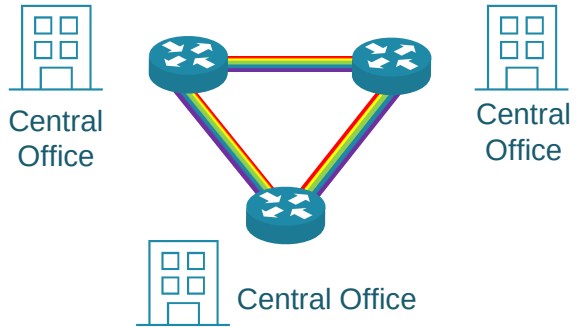
Infrastructure to Support Traffic Growth: Coherent Market Applications

LONG-HAUL



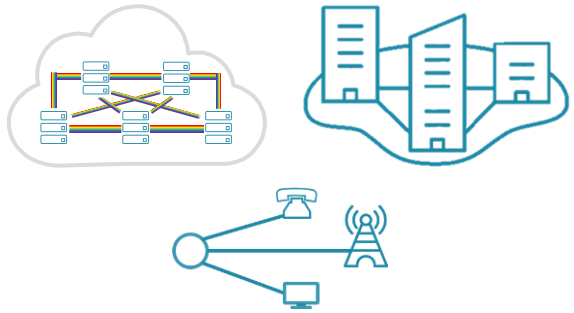
- High performance
- Fiber constrained

METRO



- Space and power constrained
- Pay as you grow model

EDGE



- Shorter product life cycles
- Cost and power sensitive

Acacia solutions designed to reduce complexity and cost of high speed networks

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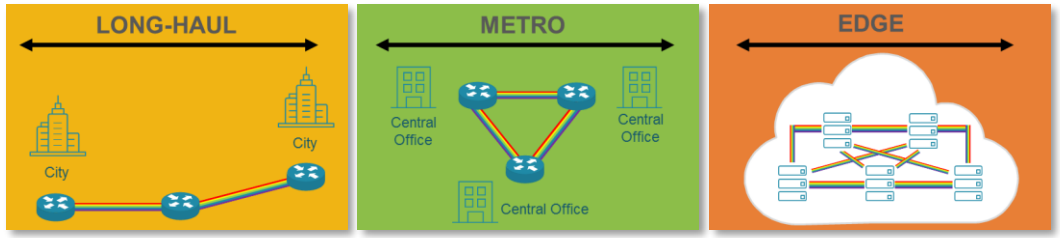
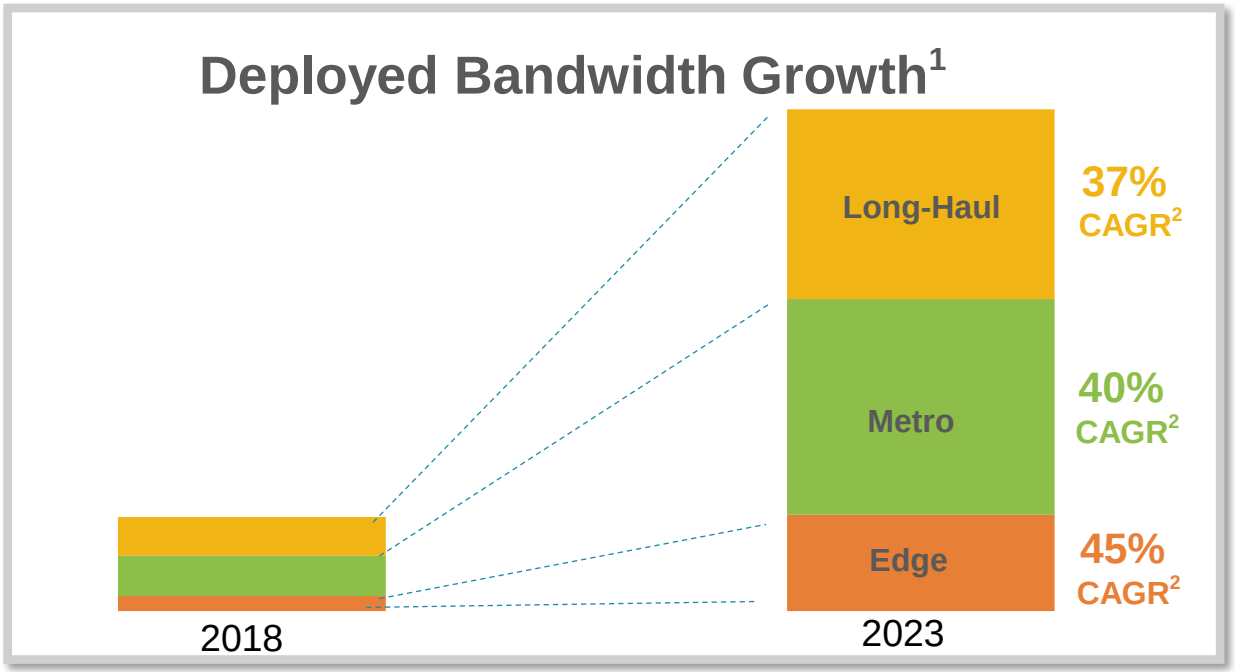
Forecasted Demand Increase in Long Haul/Metro/Edge





Most significant growth anticipated from Edge (<100km) applications

[1] Reprinted with permission: Cignal AI, Sept. 2020

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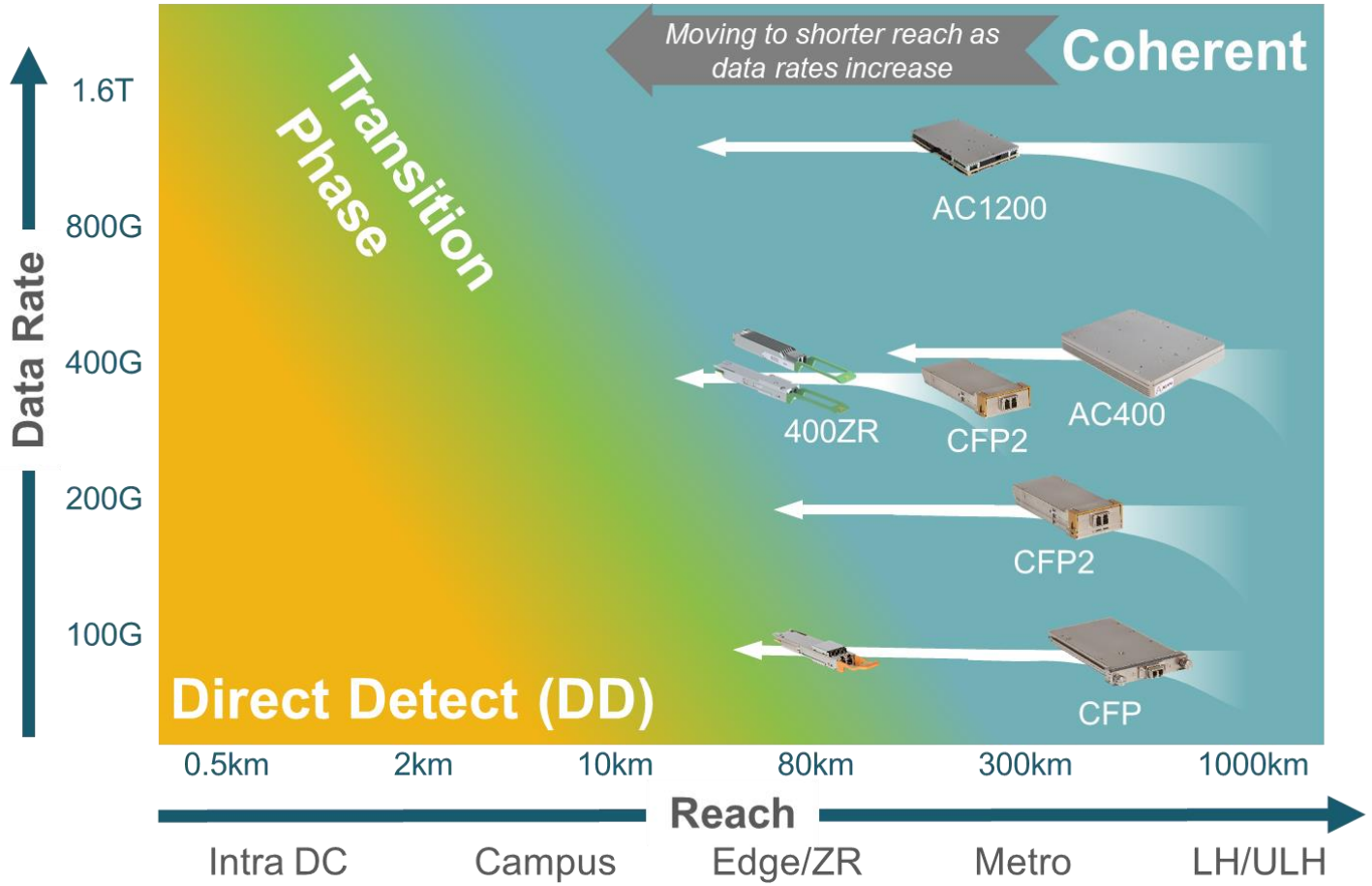
Coherent Technology Trends

Emerging opportunities for coherent in shorter reach applications



Coherent Benefits

- Higher speeds
- Operational simplicity
- Network resilience

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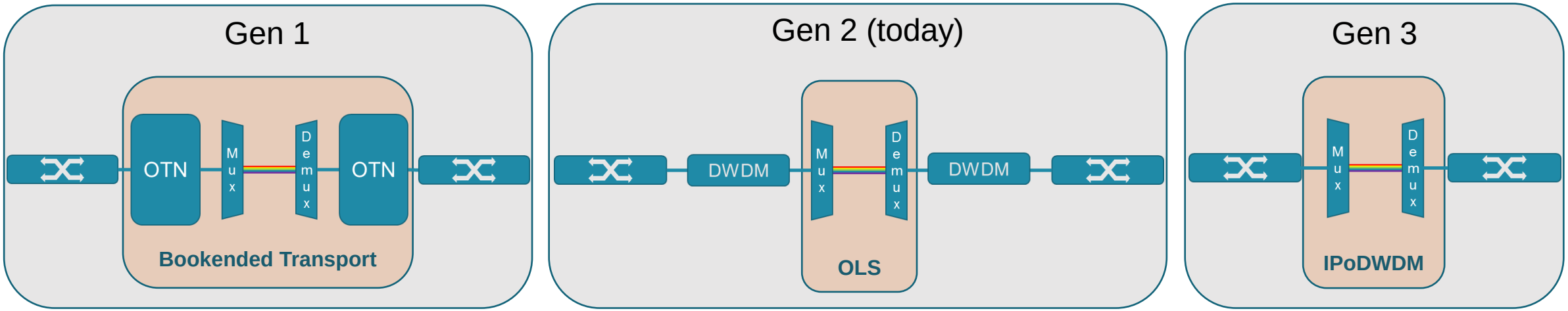
Trending Toward Disaggregation and IP over DWDM



Accelerating adoption of new technology

- Traditional telecom systems
- Vendor lock-in
- Longer product lifecycles

- Open Line Systems (OLS)
- Compact DCI transport equipment
- Alien wavelengths

- 400ZR optics in switch
  - No external transport box
- IP over DWDM
- Interoperability

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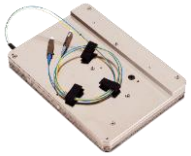
Acacia Products: Rapid Pace of Innovation

2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020

Modules

AC100

AC100S


AC40S

CFP-DCO

AC400

CFP2-ACO

CFP2-DCO

AC1200

Access/400G Pluggables

DSP ASICs:

- Everest 100G LH
- Mauna Kea 100G LH
- K2 40G ULH

40 nm

- Sky 100G Metro
- Denali 400G ULH/Metro • Multi-core

28 nm

- Meru 200G Metro
- Pico 1.2T DCI/Metro/LH • Multi-core

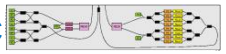
16 nm

- Greylock 400G Metro

7 nm

Silicon PICs

>500PICs on single wafer

PIC 

32GB SiPh PIC 1.5 Inch^2

45GB SiPh PIC 0.4 Inch^2

70GB SiPh PIC 0.4 Inch^2

3D Siliconization

Strong and diverse portfolio of patents and intellectual property

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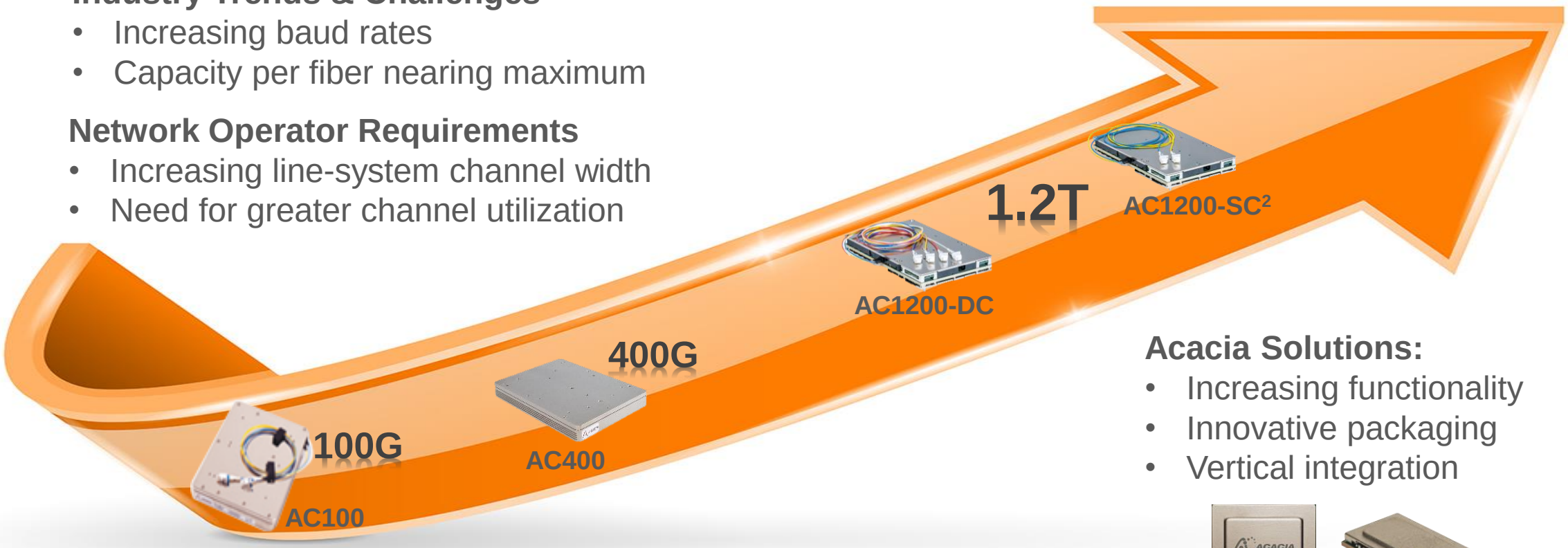
Coherent Embedded Modules Evolution

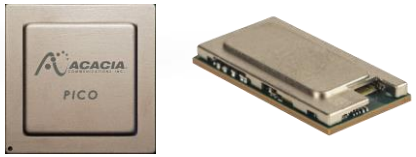
Increasing performance and functionality while leveraging integration to improve cost per bit

Industry Trends & Challenges
- Increasing baud rates
- Capacity per fiber nearing maximum

Network Operator Requirements
- Increasing line-system channel width
- Need for greater channel utilization



Acacia Solutions:
- Increasing functionality
- Innovative packaging
- Vertical integration



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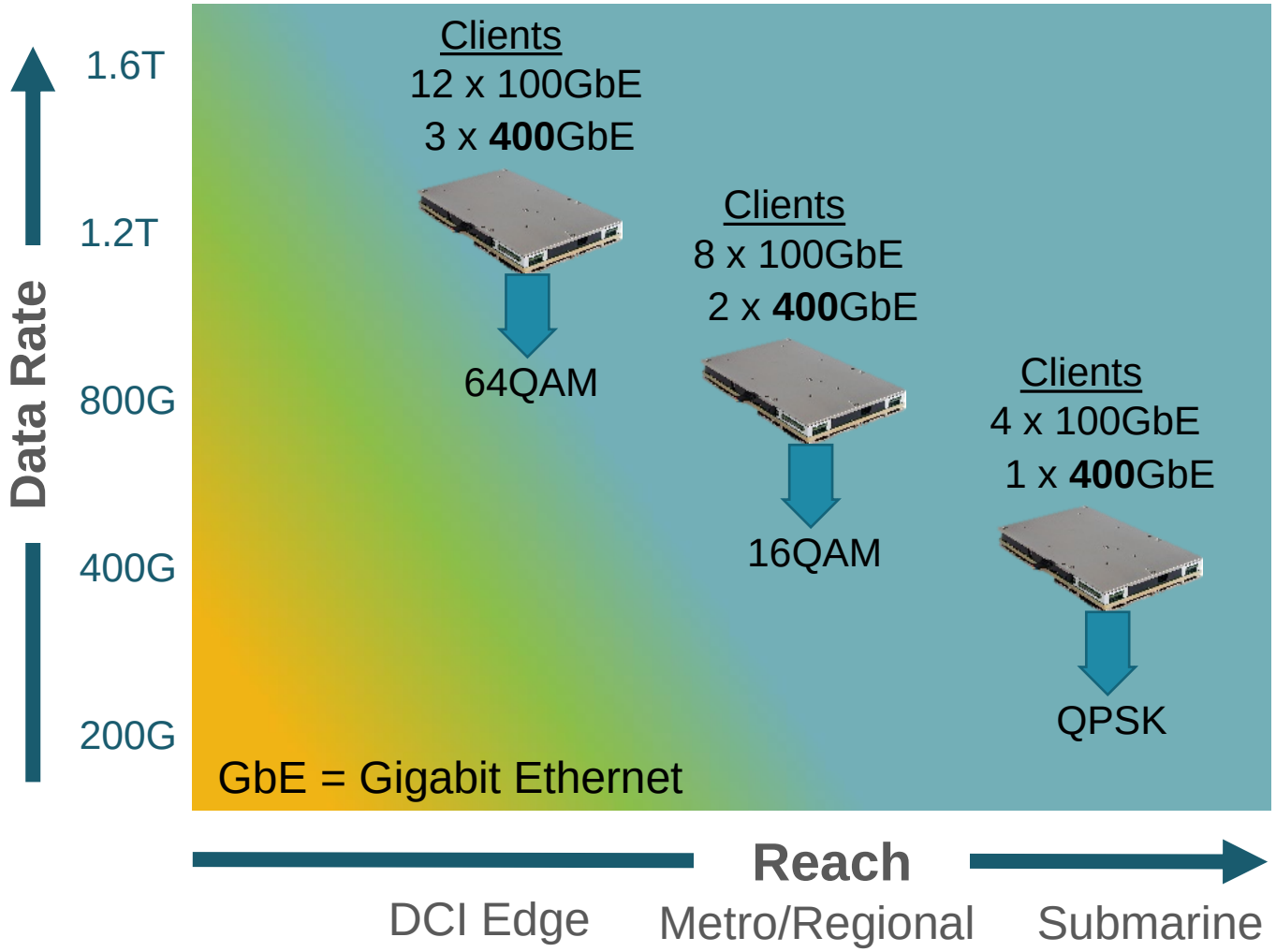
AC1200: “Future Proof” Architecture for Transporting 100/400GbE

Multi-haul coherent optical module designed to address network operator requirements



- Adopted by 3 of the 4 largest hyperscalers
- More than 30,000 ports shipped in 2020
- Deployed in applications from edge to submarine

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Coherent Pluggables DCO Modules Evolution

Leveraging component investments to address multiple market applications

2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020

Long Haul/Metro/Aggregation

CFP-DCO

CFP2-DCO

Long Haul

Metro/Regional

DCI/Edge

Aggregation

Access

400G Open ROADM
CFP2-DCO

400G OpenZR+
OSFP/QSFP

3D Siliconization for dense integration & high-volume manufacturing

400ZR
OSFP/QSFP

100G Access
QSFP-DD CFP2-DCO

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400ZR: Coherent Interfaces in Client Form Factors

Intersection of Advanced DSP, Optics and Packaging Technology

400ZR Modules

Design requirements

- Advanced integration/packaging
- Low power DSP and module design
- 400G optics and RF electronics
- Software and module integration

Acacia Advantage

- Track record: 1st in CFP/CFP2 DCO
- 3D Siliconization
- >300,000 SiPh shipped

Disaggregation and IP-over-DWDM architectures leverage 400ZR modules

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Introduced Six Pluggable Products based on 3D Siliconization

Supporting Multiple Applications in Hyperscale and Service Provider Networks

Family	Product	QSFP-DD	OSFP	CFP2	100G	200G	300G	400G
400G	400ZR	●	●					●
	OpenZR+	●	●		●	●	●	●
	Open ROADM			●	●	●	●	●
Access	Point-to-Point	●			●			
	DWDM	●			●			
	Bi-Directional			●	●			

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Industry Awards & Accolades

WINNER MassEcon Impact Awards

2011

Inc. 5000

2014

WINNER MassEcon Impact Awards

2016

50 ON FIRE

2016 Finalist

2016 FINALIST MASSTLC LEADERSHIP AWARDS

FIERCE INNOVATION AWARDS 2016 Telecom Edition WINNER

500 Technology Fast 500 2017 NORTH AMERICA Deloitte.

EY Entrepreneur Of The Year®

2017 Award Winner

New England Region

2017 LIGHTWAVE 5.0 INNOVATION REVIEWS

Leading Lights AWARDS 2018 FINALIST

2018 Outstanding Components Vendor

NGON & Optical DCI AWARDS

Best 5G Architecture & Deep-Fiber Framework

2018

2019 LIGHTWAVE 5.0 INNOVATION REVIEWS

Leading Lights AWARDS 2020 FINALIST

2019 Outstanding Components Vendor

ECOC EXHIBITION INDUSTRY AWARDS 2020

OPTICAL INTEGRATION WINNER

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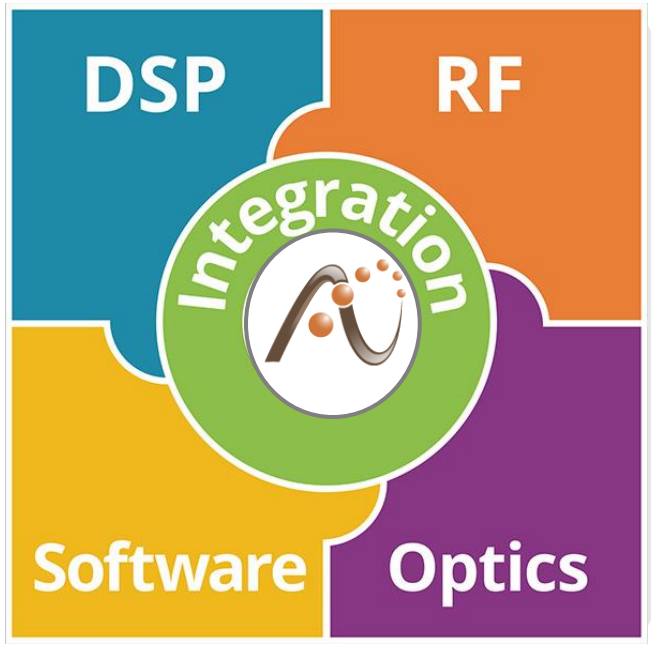
ACACIA COMMUNICATIONS, INC.

Well Positioned to Deliver Highly Integrated Interconnects

Diverse Set of Skills and Expertise Represents High Barrier to Entrance



Acacia has all the pieces of the interconnect puzzle to deliver:

- Superior performance
- Higher density
- Easy deployment and management
- Lower cost
- Lower power

We believe we were the first to introduce to the market:

1st Silicon Coherent PIC

1st Dual-core DSP >1Tb DSP

1st 100G MSA
100G CFP-DCO
400G Module
200G CFP2-DCO

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Thank you

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