



# Connecting, extending and assuring the cloud

Investor presentation

FSE: ADV

July 19<sup>th</sup> 2018

# Disclaimer

## FORWARD-LOOKING STATEMENTS

This presentation contains forward-looking statements with words such as “believes”, “anticipates” and “expects” to describe expected revenues and earnings, anticipated demand for optical networking solutions, internal estimates and liquidity. These forward-looking statements involve a number of unknown risks, uncertainties and other factors that could cause actual results to differ materially. Unknown risks, uncertainties and other factors are discussed in the ‘risk report’ section of ADVA Optical Networking’s annual report 2017.

## CONSOLIDATED PRO FORMA FINANCIAL RESULTS

ADVA Optical Networking provides consolidated pro forma financial results in this presentation solely as supplemental financial information to help investors and the financial community make meaningful comparisons of ADVA Optical Networking’s operating results from one financial period to another. ADVA Optical Networking believes that these pro forma consolidated financial results are helpful because they exclude non-cash charges related to stock compensation programs and amortization and impairment of goodwill and acquisition-related intangible assets, which are not reflective of the Group’s operating results for the period presented. This pro forma information is not prepared in accordance with IFRS and should not be considered a substitute for historical information presented in accordance with IFRS.



# Company

## Overview

# Who we are

Global provider of equipment for next-generation high-speed networks

## Our technology

### Cloud interconnect

- Open optical networking (WDM)
- 70% of revenue



### Cloud access

- Carrier Ethernet and NFV
- 25% of revenue



### Timing excellence

- Synchronization delivery and assurance
- 5% of revenue



## Our customers

### Private enterprises

- 20 of top 50 banks (revenue)
- 25% of revenue

### Internet content providers

- 3 of top 5 global ICPs
- 15% of revenue

### Communication service providers

- 17 of top 25 global CSPs,
- 5 of top 6 global Ethernet service leaders
- 60% of revenue

## Our strengths

### Innovation power

- >900 engineers
- >230 granted patents, >50 pending

### Speed for customers

- Responsive team
- Customer-centric solutions

### Trusted partner

- >50% net promoter score
- Operational excellence

Transition to the cloud → networking dominated by data centers → ADVA's DNA

# Our history

## Founding of the company



## Going public

- FSE: ADV  
Frankfurt stock exchange



## Going global

- Expansion in North America
- Revenue >USD 250 million



## Scaling the business

- >1800 employees
- Revenue >USD 500 million
- Award winning supply chain



1994

1999

2000

2006

2010

2013

2016

2020



## First product launched

- Metro-WDM<sup>1</sup> for enterprise DCI<sup>2</sup>

1) Wavelength division multiplexing  
2) Data center interconnect



## Adding Ethernet

- First fiber-based Ethernet services



## Portfolio expansion

- Optical+Ethernet
- Network automation



## Strategic acquisitions

- Synchronisation
- Software and virtualization

The original DCI<sup>2</sup> company – open connectivity solutions for a connected world

# ADVA Optical Networking today

## Our NUMBERS

€514.5 million revenue<sup>1</sup>

>1,800 employees<sup>2</sup>

## Our CUSTOMERS

Hundreds of carriers

Thousands of enterprises

## Our LEADERSHIP

#1 DCI<sup>3</sup> enterprise, top 3 metro ICP/CNP\*

#1 Ethernet access devices<sup>4</sup>

#2 Network synchronization<sup>5</sup>

\* Internet Content Provider and Carrier Neutral Provider

1) Annual 2017 IFRS; 2) Dec 31, 2017; 3) Data Center Interconnect – Source: Ovum; 4) IHS 2016, 5) ADVA internal estimates



Network innovator – speed for customers – trusted partner

# Our broad customer base

Hundreds of carriers, thousands of enterprises

## Industries

### Private enterprises

- Financial services institutions
- Research and education
- Healthcare, media, utilities



## Business characteristics

- Limited project volume
- + Premium quality
- + Customer loyalty and trust

### Internet and cloud

- Internet content providers
- Carrier neutral providers



- Aggressive pricing
- Limited visibility and stickiness
- + Volume and growth potential

### Communication service providers

- Wireline operator
- Wireless operator
- Multiservice operator (cable)



- Long sales cycle (RFPs)
- + Volume
- + Longevity (stickiness)

Diverse global customer base drives growth and profitability

# Acquisition of MRV Communications, Inc.

## Customers

- Expands customer base into traditional underserved market segments – regional service providers and carrier neutral provider
- Diversifies revenue – reduces European revenue concentration

## Products

- Further solidifies and strengthens our position in the cloud access market
- Increased cross-selling opportunities and support in the optical space

## Profitability

- Significant synergy opportunities
- Opportunity to gain economies of scale with key suppliers

## Deal highlights include

- Purchase price of ~EUR 57 million
- Annual revenues ~EUR 70 million
- Cash at time of purchase ~EUR 20 million
- Potential OPEX savings p.a. ~EUR 20 million

Acquisition allows us to drive further growth and profitability

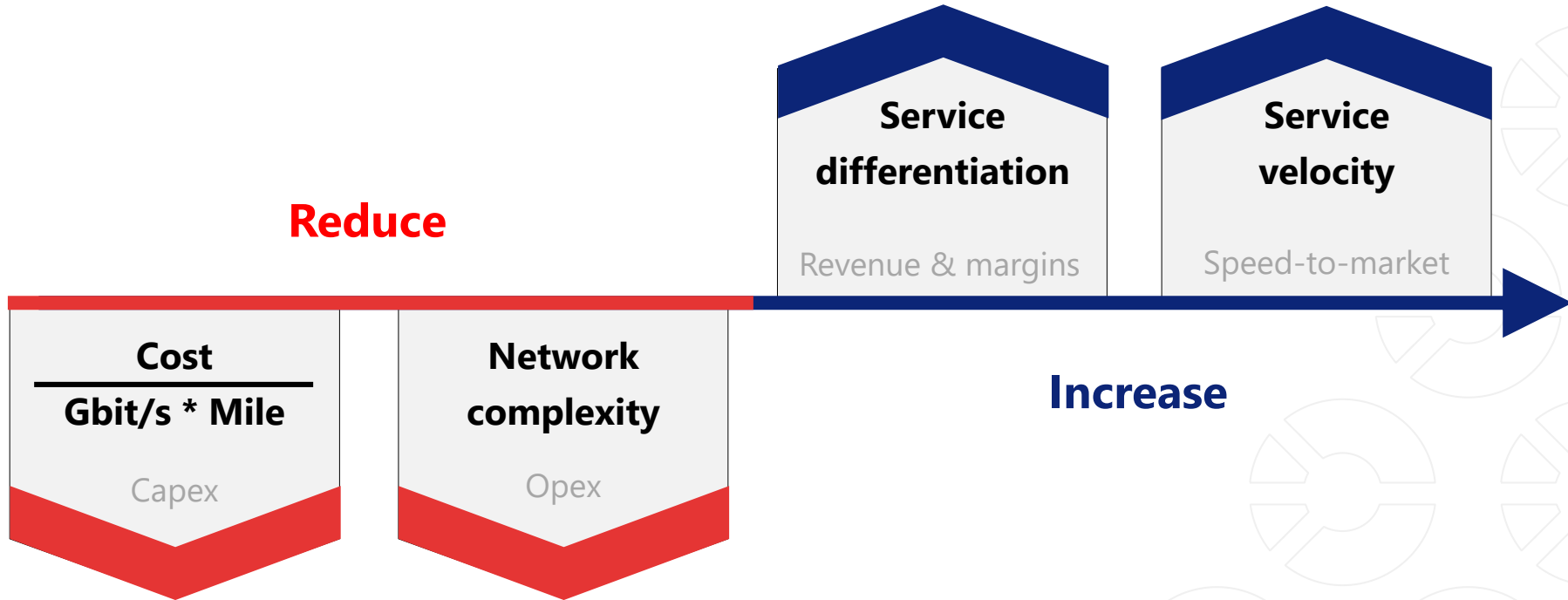




# Industry

## Overview

# What is our industry about?



Satisfying the bandwidth demand of the digital society



# Market

Products, solutions and market segments

# Product portfolio overview

## Cloud interconnect



### FSP 3000

Open optical networking solutions based on wavelength division multiplexing (WDM) technology to deliver scalable bandwidth for access, metro and long-haul networks; high levels of open interworking, programmability and ease-of-use;



## Cloud access



### FSP 150 and Ensemble

Carrier Ethernet access and network functions virtualization (NFV) solutions that enable communication service providers to deliver software-defined, differentiated and performance-assured wholesale, mobile backhaul and business services;



## Timing excellence



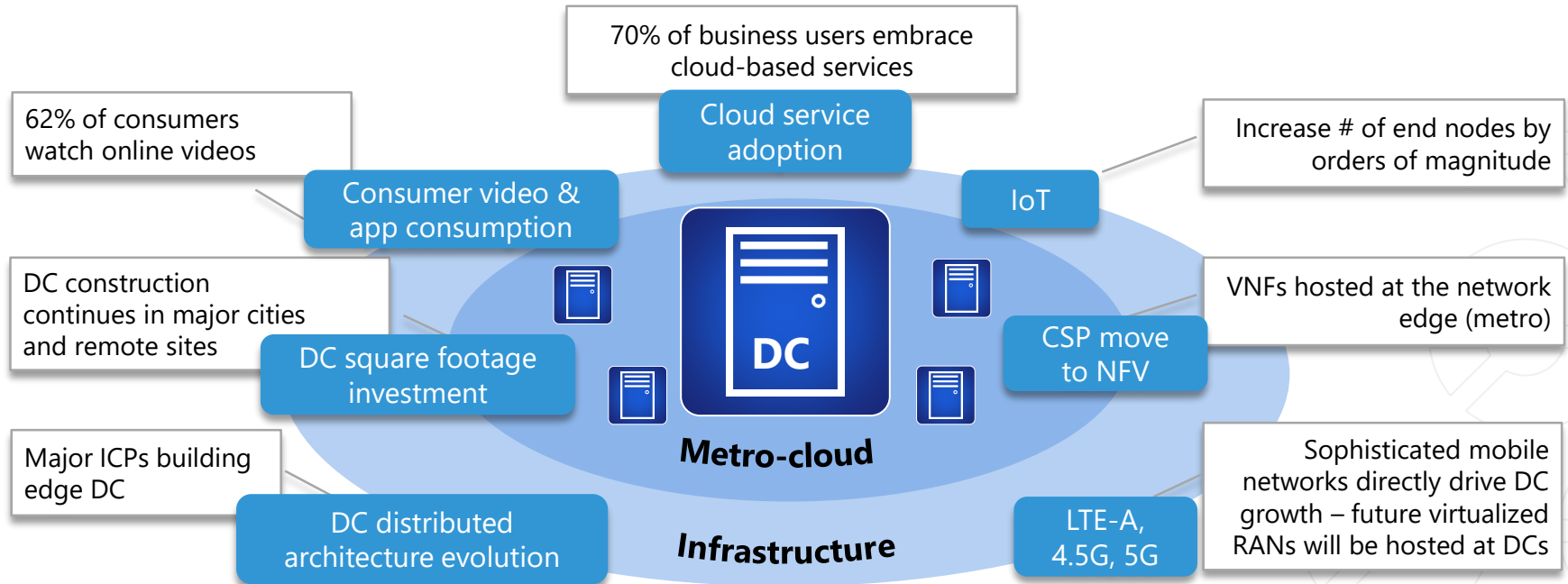
### Oscilloquartz

Primary reference sources (atomic clocks) and distribution solutions to deliver accurate and scalable time and frequency synchronization for mobile network infrastructure, utilities, financial services, distributed data bases and meteorology;



Connecting, extending and assuring the cloud

# Digitalization – the age of the data center



\*CSP: Communication Service Provider; NFV: Network Function Virtualization; VNF: Virtual Network Function; RAN: Radio Access Network

Cloud drives bandwidth, new service models and precision timing requirements

Source: Ovum, Opportunities for Optical Data Center Interconnect. August 2015.

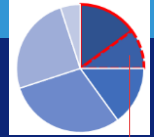
# Cloud interconnect (I): Private enterprises



## Enterprise DCI

USD 0.25 billion<sup>1</sup>  
3%

Large-scale needs for data storage,  
replication and backup



Approx. revenue contribution,  
rolling last four quarters

TAM

CAGR

ADVA  
success  
factors

- >20 years experience
- Highly differentiated feature set
- Excellent partner landscape
- Encryption creates additional differentiation and stickiness
- Market leader<sup>2</sup> (global 30%, EMEA 43%)



1/3 built and managed by CSPs



FSP 3000

1) Estimated 2016 market size and 5yr CAGR; Source: Ovum, 2016-21 Global Data Center Interconnect Forecast, published January 2017

2) 2Q 2017 market share (4Q rolling); Source: Ovum Market Share Report DCI published Sep 2017

## Private cloud infrastructure – security for mission critical data and applications



# Cloud interconnect (II): ICPs



Internet content provider – DCI

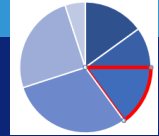
TAM

CAGR

ADVA  
success  
factors

USD 1.2 billion<sup>1</sup>  
19%

Creation, storage and dissemination  
of digital information

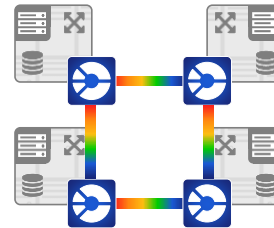


*Approx. revenue contribution,  
rolling last four quarters*

- Top 3 supplier in **metro DCI** space; 12% market share<sup>2</sup>
- ICP-tailored product with leading cost, space, power and spectral efficiency
- New operational models, favoring smaller, innovative and specialized suppliers



Cloud & OTT Services



*FSP 3000 CloudConnect™*

<sup>1</sup>) Estimated 2016 market size and 5yr CAGR; Source: Ovum, 2016-21 Global Data Center Interconnect Forecast, published January 2017

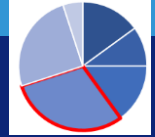
<sup>2</sup>) 2Q 2017 market share (4Q rolling); Source: Ovum Market Share Report DCI published Sep 2017

## Public cloud: content and X-as-a-Service for the digital age

# Cloud interconnect (III): CSP



## Communication service provider infrastructure



TAM

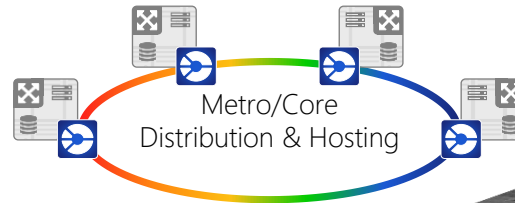
CAGR

ADVA  
success  
factors

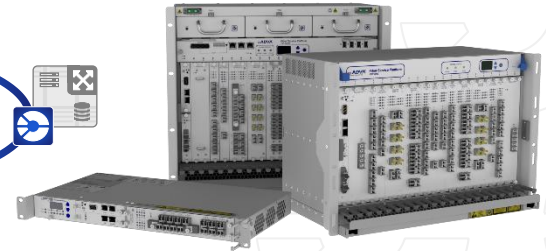
USD 8.7 bn<sup>1</sup>  
5%<sup>2</sup>

Own fiber plant; experience in design,  
building and operation of optical networks;

- Trusted metro supplier for many Tier 1, 2, 3 operators
- Compelling and proven metro core offering
- Preferred choice for many end users



*Approx. revenue contribution,  
rolling last four quarters*



FSP 3000

1) Estimated 2016 market size and 5yr CAGR; Source: Ovum, 2016-21 Optical Networks Forecast, published January 2017

## Central offices turning into data centers – investment focus in the metro



# Cloud access – the network edge



## Communication service providers – (Ethernet) Access

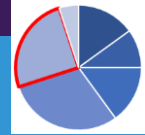
TAM

CAGR

ADVA  
success  
factors

USD ~ 0.9 billion<sup>1</sup>  
11%

Business Ethernet, wholesale  
and mobile backhaul services



*Approx. revenue contribution,  
rolling last four quarters*

- Most comprehensive portfolio in the market
- Security suite
- Future-proof (NFV-optimized)
- 15 years experience



<sup>1</sup>) Estimated 2016 market size and 5yr CAGR for access switching & routing;  
Source: Ovum, Service Provider Switching & Routing Forecast, published January 2017



FSP 150

## Upgrade cycle at the network edge to simplify and future-proof cloud access

# Cloud access – transition to NFV



## Communication service providers – network function virtualization

TAM

CAGR

ADVA  
success  
factors

### Delivering differentiated services

- Shift towards software-driven service creation and delivery (VNF)<sup>1</sup>
- Tapping into layer 3 access and edge routing market
- Most comprehensive NFV architecture providing choice of hardware, software and location
- New strategic division with experience and market credibility

1) virtual network function

2) virtual customer premise equipment

*"Service providers globally will spend over \$1.5B in 2020 to deploy vCPE<sup>2</sup> use case services"*

NFV Report, IHS Markit, 2016

 **Ensemble**  
A Division of ADVA Optical Networking

New service delivery model turning IT-budgets into service provider revenue

# Cloud access & extension: Why Ensemble?

## Extending the cloud to the edge of the network

Cloud-native hosting of VNFs – anywhere

Based on choice, openness, security and assurance

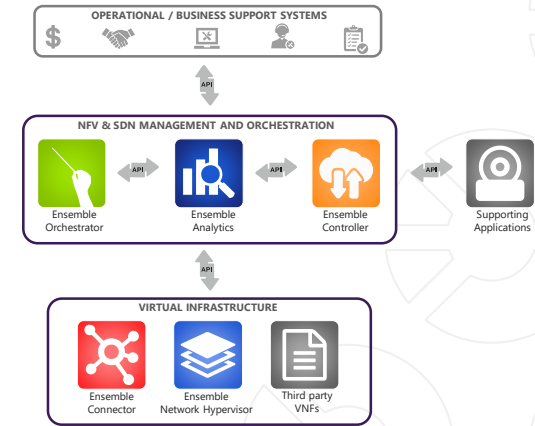
Scalable operations with automation and zero touch

## Key applications

uCPE and SD-WAN: uniting virtual networking with COTS servers

IoT and mobility: distributed hosting to minimize latency

Secure cloud networking: secure access to public and private clouds



**Ensemble**  
A Division of ADVA Optical Networking

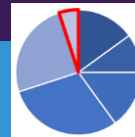
Proven pure-play NFV for enterprise, mobile and IoT

# Timing excellence



## Synchronization

USD 0.3 billion<sup>1</sup>



TAM

CAGR

ADVA  
success  
factors

- Focus and higher speed of innovation gives us a more comprehensive and competitive portfolio
- Strategically important technology and expertise could allow further expansion into mobile infrastructure
- Door opener with significant cross-selling opportunities also into ICP community

*Approx. revenue contribution,  
rolling last four quarters*



<sup>1</sup>) Estimated 2017 market size – ADVA internal estimates



OSA 5405

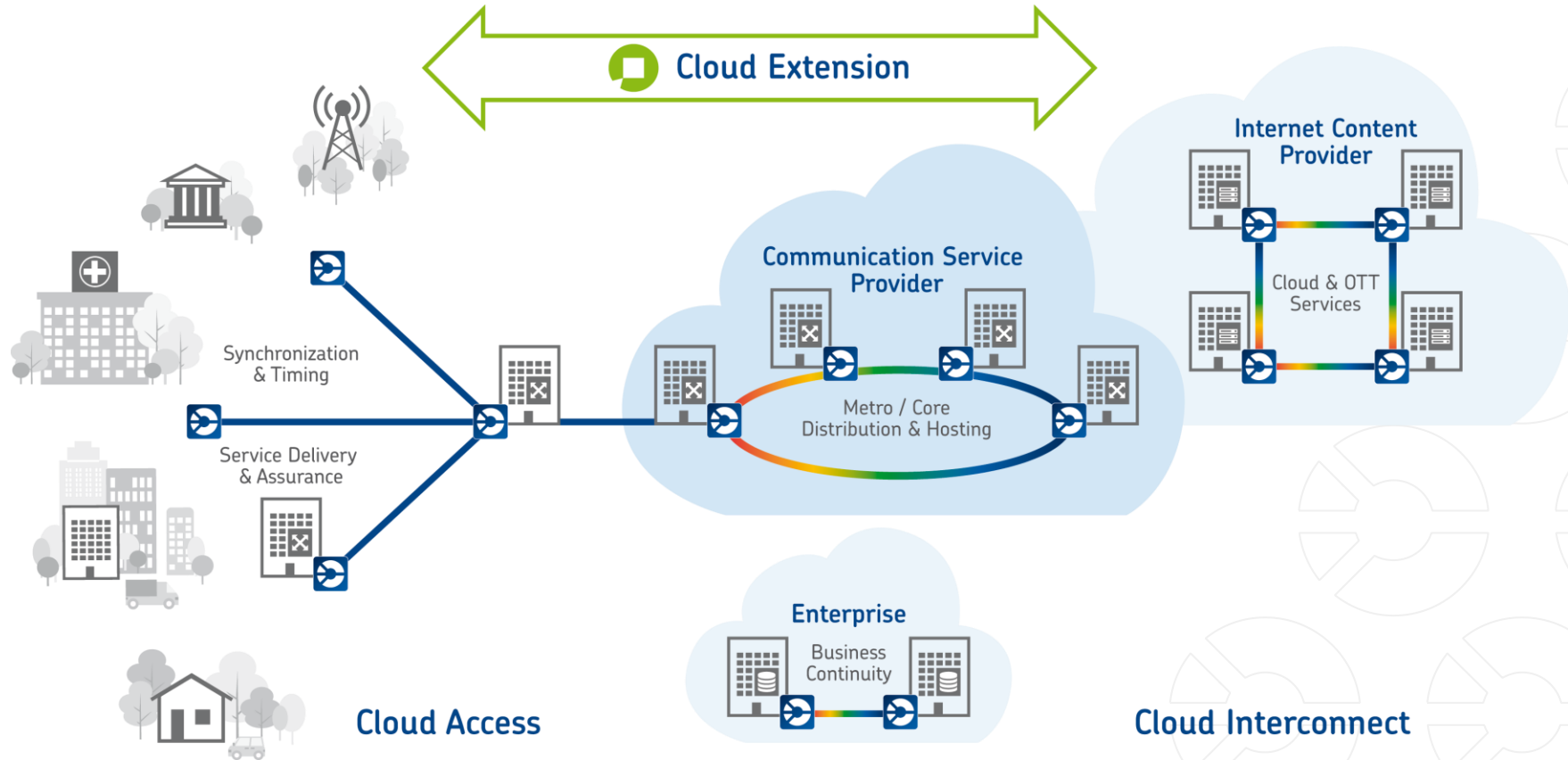


OSA 5420

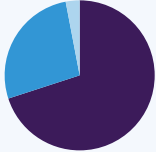








Precise timing for 4G+ and 5G mobile networks and ICP data base synchronization

# Our hardware, software and services



# ADVA portfolio drivers summarized

<p>Approximate revenue contribution</p> 	Private enterprises	Internet content provider	Communication service provider
<p>Cloud interconnect (Open optical transport - WDM)</p>	<p>Business continuity and disaster recovery</p>	<p>(Hyperscale) DCI</p>	<p>Metro upgrade for IoT, 5G and cloud services (capacity, latency, timing, security and automation)</p> 
<p>Cloud access (Carrier Ethernet and NFV)</p>	<p>Secure cloud access and SD-WAN</p>  <p><small>A Division of ADVA Optical Networking</small></p>		<p>Differentiated service delivery and assurance</p> 
<p>Timing excellence (Synchronization)</p> 	<p>MiFID II financial time stamping</p>	<p>Global database synchronization</p>	<p>Next-gen mobile (LTE-A and 5G)</p> 



# Differentiators

## Competitive landscape

# Networking industry – our ecosystem

## Components

*Opto-electronics*



## Systems

*Transport, switching, routing*



## Network operators

*Enterprises, ICPs, CSPs*



Industry leading on time-to-market, time-to-quality and time-to-cost



# Cloud interconnect: The landscape is changing



Small players disappear – large corporations lack focus and seek better profitability

# Cloud access: The network edge is changing



Layer 2 and Layer 3 access converging – NFV is disrupting the market

# Why we win



Innovation leadership

Speed for customers

Trusted partner

## Open connectivity solutions

- Differentiated technology
- Network-level applications
- Market-leading scalability and efficiency

## Operational excellence

- High quality
- Short lead times
- Award-winning sustainability focus

## Ease of doing business

- Technology and VAR ecosystems
- Broad and deep solution expertise
- Financial stability, solid balance sheet

*Award-winning factory in Meiningen, Germany*

Enabling our customers to capitalize on cloud and mobility



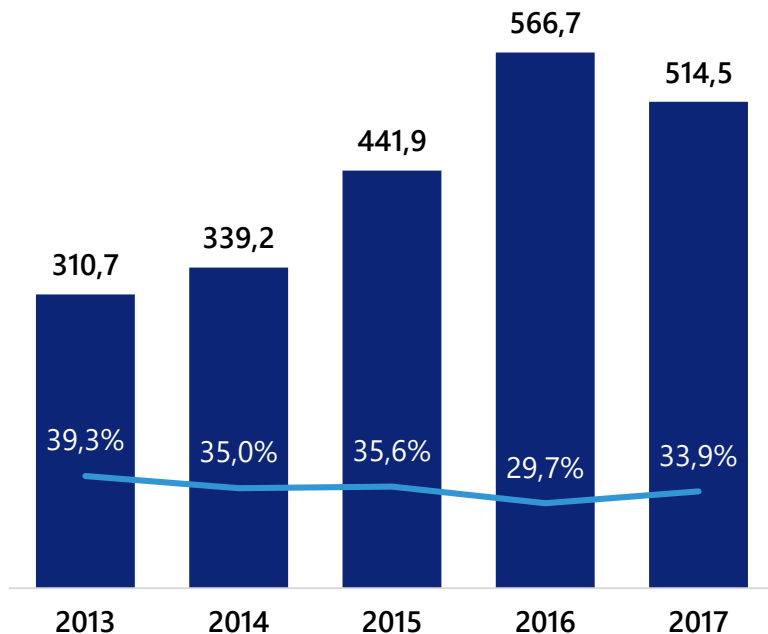
# Financials

## Overview

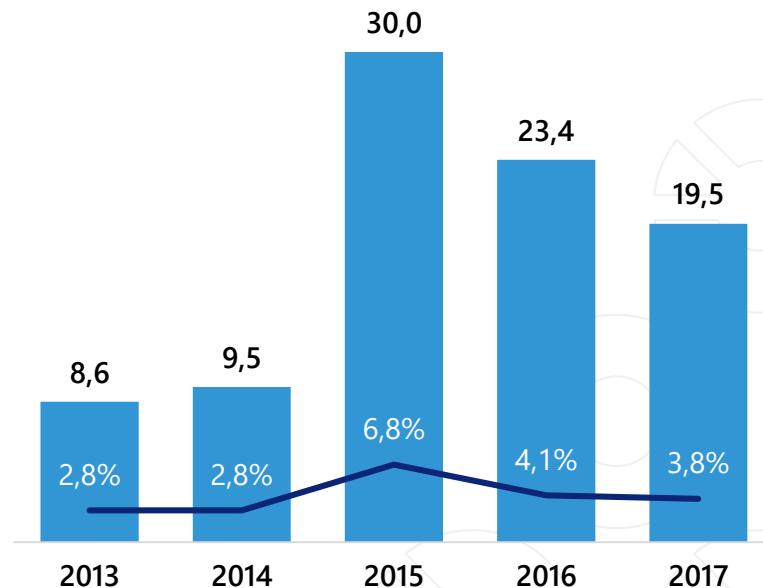
# Annual IFRS revenue and pro forma profitability

(in millions of EUR, in % of revenues)

## Revenue & pro forma gross margin



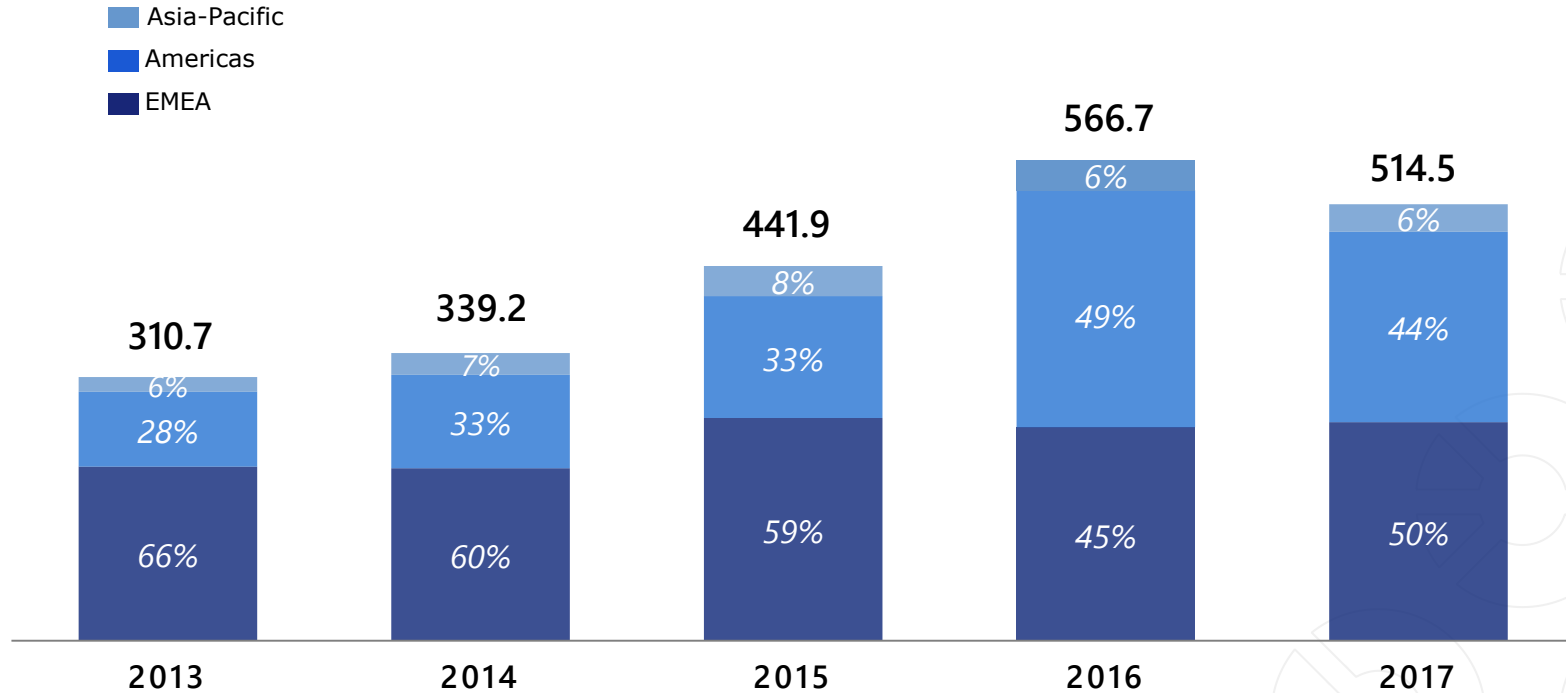
## Pro forma operating income & margin



\* Pro forma operating income is calculated prior to non-cash charges related to the stock compensation programs and amortization and impairment of goodwill and acquisition-related intangible assets. Additionally, non-recurring expenses related to restructuring measures are not included.

# Annual revenues per region

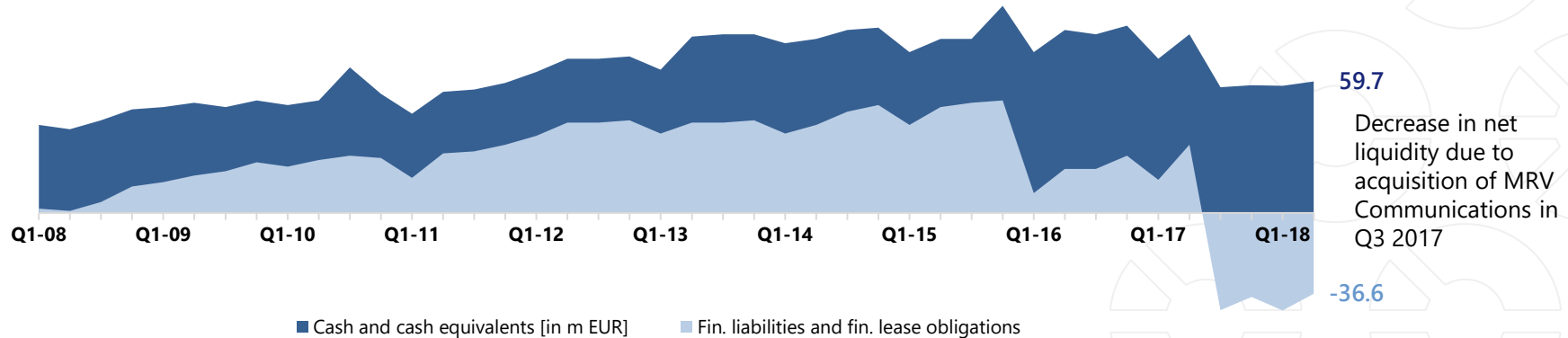
(in millions of EUR, in % of revenues)



Note: Potential differences due to rounding

# IFRS balance sheet

Assets	Mar. 31 2018	Jun. 30 2018	Equity & liabilities	Mar. 31 2018	Jun. 30 2018
Cash & cash equivalents	57.7	59.7	Accounts payable	37.4	50.4
Accounts receivable	86.9	95.9	Financial liabilities	101.9	96.3
Inventories	73.0	76.3	Other liabilities	95.5	94.8
Other assets	240.7	242.8	Equity	223.5	233.2
<b>Total</b>	<b>458.3</b>	<b>474.7</b>	<b>Total</b>	<b>458.3</b>	<b>474.7</b>



# Guidance Q3 2018

Revenues between EUR 123 million and EUR 133 million

Pro forma operating margin between 2% and 6% of revenues\*

ADVA Optical Networking will continue to perform detailed quarterly reviews of the expected business development in respect of all intangible assets, including capitalized research and development expenses; in case of highly adverse business prospects, these reviews may result in non-cash impairment charges.

\* Excluding any potential impairment charges.





# Growth

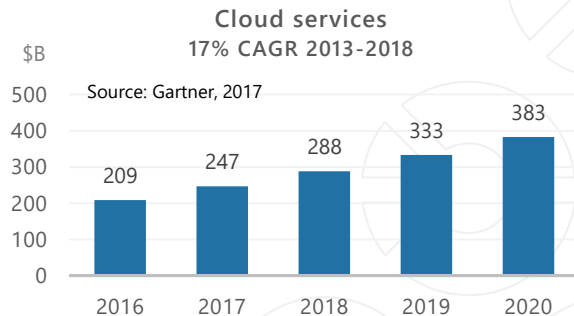
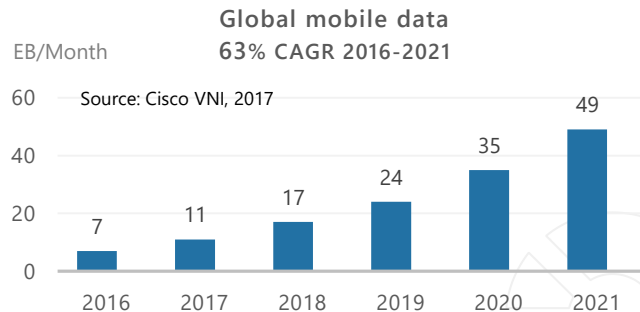
Catalysts and strategy

# Growth catalysts

## ADVA

- Optimized cost structure that is aligned with our revenue profile, and which will enable us to grow profitability in 2018 and beyond;
- More customers, better revenue diversification, and broader solutions portfolio, because of MRV acquisition;
- Focused on cloud and mobility with multiple ways to win:
  - Interconnect – supplying the industry's transition to new architecture
  - Access & extension – rapid customer expansion
  - Synchronization – increasing relevance in ever more applications and success winning new tier 1 footprint
- Stronger management team to help us successfully execute our growth strategy
- A history of always recovering quickly from setbacks

## Industry



More users – more devices that connect to networks – more data-heavy services

# Growth strategy

## 2018

**Focus:** Return to growth and increase profitability

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**Tactics:**

- Protect MRV customer base and drive cross-selling initiatives; extend customer base for cloud access solutions
- Leverage metro core upgrade cycle to drive additional optical revenue
- Utilize technology leadership in synchronization to further improve overall corporate gross margin

## 2019

**Focus:** Leverage expanded solution portfolio to increase market share and reaccelerate growth

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**Tactics:**

- Aggressively pursue more DCI opportunities with new Teraflex terminal and open line system
- Win new footprint for flexible, programmable 5G infrastructure leveraging optical, packet edge and synchronization
- Accelerate revenue contribution from Ensemble and win new designs for NFV-based service delivery

## 2020 and beyond

**Focus:** Capitalize on the transition to virtualized service delivery and 5G

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**Tactics:**

- Harness Ensemble software architecture and increase software revenue contribution to >10%
- Dominate market for network synchronization systems
- Continue to pursue tuck-in acquisitions or consolidate with and expand into a larger entity

Realigned model supports solid foundation for growth and increased profitability



# Summary

# Summary

Global digitalization, IoT and the preparation for 5G all require a robust and scalable infrastructure with:

1. **More fiber-based connectivity (cloud interconnect)**
2. **New models for providing communication services (cloud access)**
3. **More accurate network synchronization (timing excellence)**

Our investments and expertise position ADVA uniquely to capitalize on this transition to the cloud:

1. **A new architecture for programmable, open, optical networks**
2. **An extended customer base that we can serve with even more differentiated cloud access solutions**
3. **Technology leadership in synchronization and increasing presence among large network operators**



In our twenty-four-year history, we have had a few setbacks. However, these were mostly short-lived.

In 2018 we have more customers, fewer competitors, a broader solution portfolio and a stronger team than ever before. We have adjusted our cost structure to the new revenue profile.

In 2018 we will return to revenue growth and increase our profitability





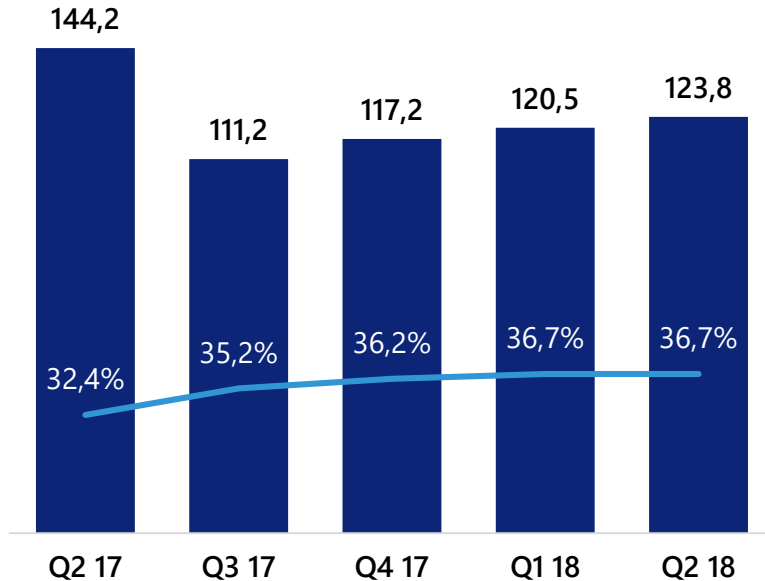
# Appendix

## Quarterly data

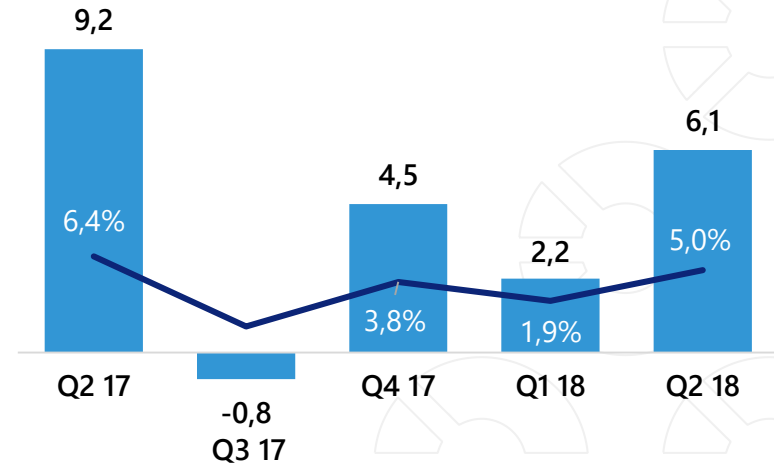
# Quarterly IFRS revenue and pro forma profitability

(in millions of EUR, in % of revenues)

## Revenue & gross margin



## Pro forma operating income & margin

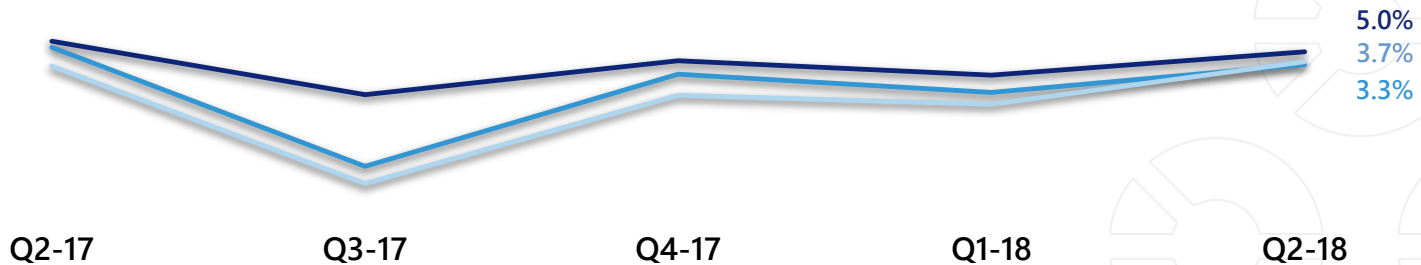


\* Pro forma operating income is calculated prior to non-cash charges related to the stock compensation programs and amortization and impairment of goodwill and acquisition-related intangible assets. Additionally, non-recurring expenses related to restructuring measures are not included.

# Quarterly IFRS profitability

EUR Million	2017			2018	
	Q2	Q3	Q4	Q1	Q2
<b>Pro forma operating income</b>	9.2 (6.4%)	-0.8 (-0.7%)	4.5 (3.8%)	2.2 (1.9%)	6.1 (5.0%)
<b>Operating income</b>	8.1 (5.6%)	-11.5 (-10.3%)	2.3 (2.0%)	-0.4 (-0.4%)	4.1 (3.3%)
<b>Net income</b>	4.5 (3.1%)	-14.0 (-12.6%)	-0.9 (-0.8%)	-2.4 (-2.0%)	4.6 (3.7%)
<b>Diluted EPS in EUR</b>	0.09	-0.28	-0.02	-0.05	0.09

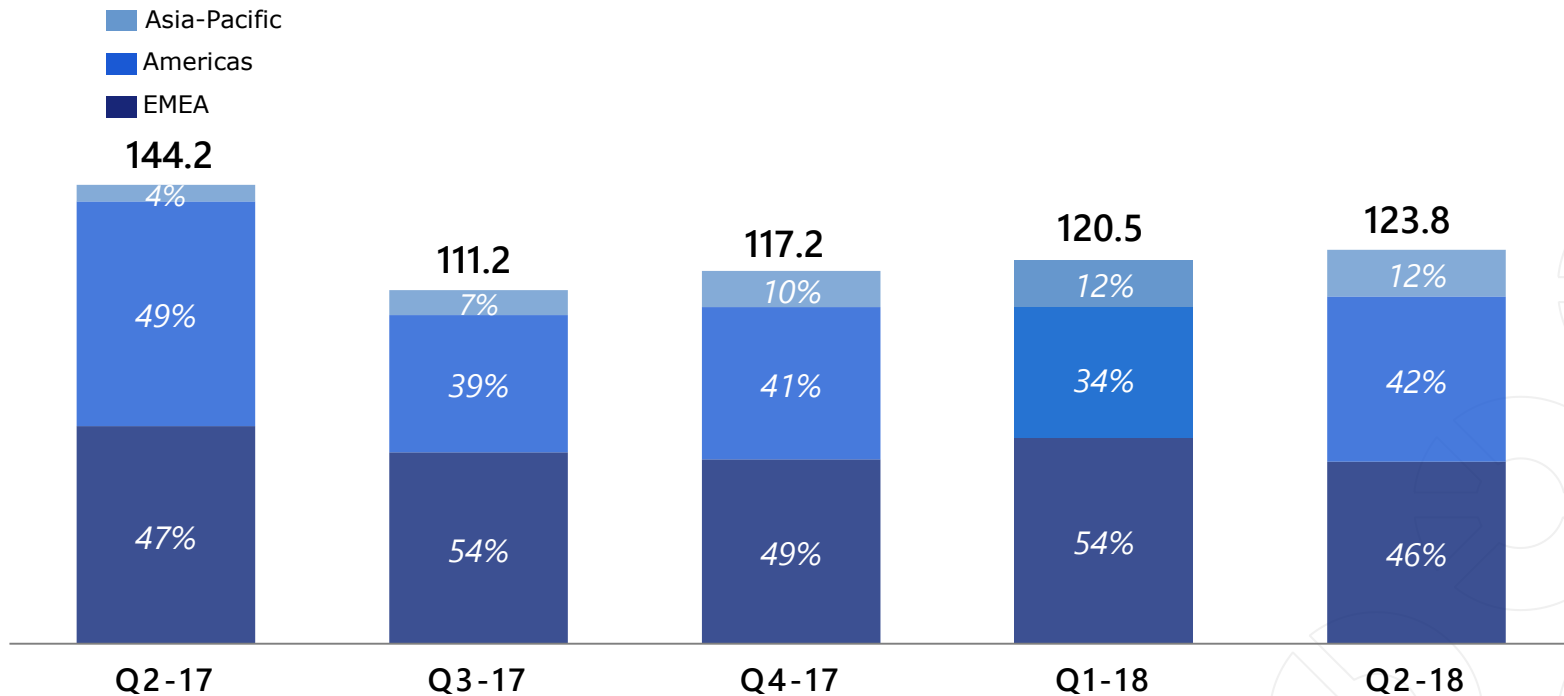
Margins, in % of revenues





# Quarterly revenues per region

(in millions of EUR, in % of revenues)



Note: Potential differences due to rounding

# Our partners

## Technology Partners



## Value-Added Resellers



Featured Elite Partners

## Ensemble Harmony Ecosystem



Featured Select Partners

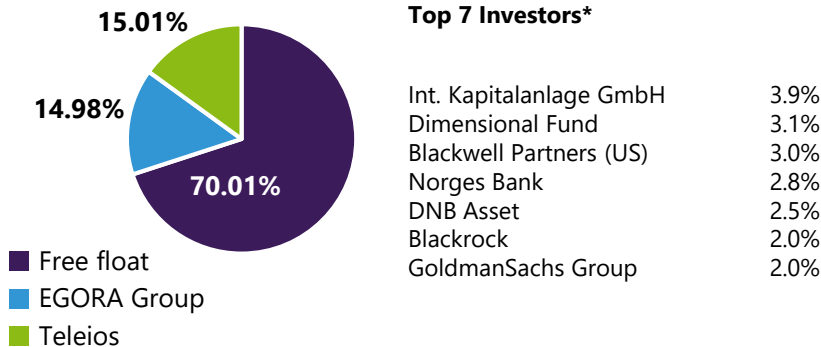
# Investor relations overview

## Recent investor activities

Conferences: Jefferies Technology Conference in L.A./May  
William Blair Technology Conference in SFO/May  
Roadshow in Chicago & Minneapolis in June

## Stockholder structure

Status: June 30, 2018: 49,774,249 shares outstanding



\*Sources: Insight Nasdaq, OddoSeydler, ADVA

## Planned investor activities

Conferences: Jefferies 2018 Investor Summit in Chicago/August  
dbAccess European TMT Conference in London/September  
Liolios Annual Gateway Conference in San Francisco/Sept.  
Dougherty & Company Conference in Minneapolis/September  
Deutsche Bank Technology Conference in Las Vegas/ Sept.  
Berenberg German Corporate Conference in Munich/Sept.

## Financial analyst coverage

As of July 17, 2018 Institution	Recommendation/ Price Target	Update	Previous Target
Deutsche Bank	Hold (€5.20)	Apr 23, 18	(€5.20)
Hauck & Aufhäuser	Hold (€5.80)	Apr 27, 18	(€6.00)
LBBW	Buy (€7.00)	Apr 27, 18	(€6.00)
Northland Capital Markets	Outperform (€8.00)	Apr 27, 18	(€8.00)
Oddo Seydler Bank	Hold (€6.30)	Jun 08, 18	(€5.50)
Ø	€6.46		



# Thank you

[Investor-relations@advaoptical.com](mailto:Investor-relations@advaoptical.com)



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