



# Connecting, extending and assuring the cloud

Investor presentation

FSE: ADV

October 25<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

- 4 of top 5 global ICPs
- 10% of revenue

### Communication service providers

- 17 of top 25 global CSPs,  
5 of top 6 global Ethernet service leaders
- 65% 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	Business characteristics
<p>Private enterprises</p> <ul style="list-style-type: none"><li>• Financial services institutions</li><li>• Research and education</li><li>• Healthcare, media, utilities</li></ul>	<ul style="list-style-type: none"><li>- Limited project volume</li><li>+ Premium quality</li><li>+ Customer loyalty and trust</li></ul>
<p>Internet and cloud</p> <ul style="list-style-type: none"><li>• Internet content providers</li><li>• Carrier neutral providers</li></ul>	<ul style="list-style-type: none"><li>- Aggressive pricing</li><li>- Limited visibility and stickiness</li><li>+ Volume and growth potential</li></ul>
<p>Communication service providers</p> <ul style="list-style-type: none"><li>• Wireline operator</li><li>• Wireless operator</li><li>• Multiservice operator (cable)</li></ul>	<ul style="list-style-type: none"><li>- Long sales cycle (RFPs)</li><li>+ Volume</li><li>+ Longevity (stickiness)</li></ul>

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

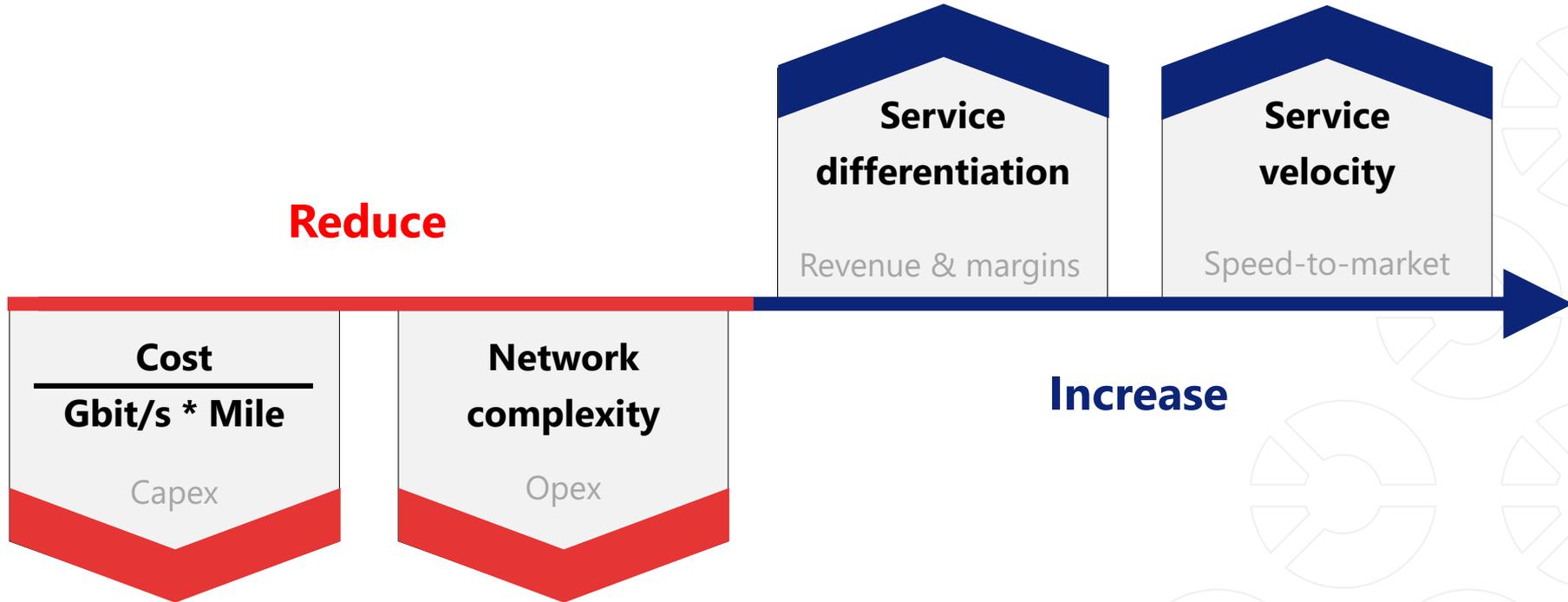
Acquisition allows us to drive further growth and profitability



# Industry

## Overview

# What is our industry about?



Our industry is pivotal to the long-term success of the digital revolution



# 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



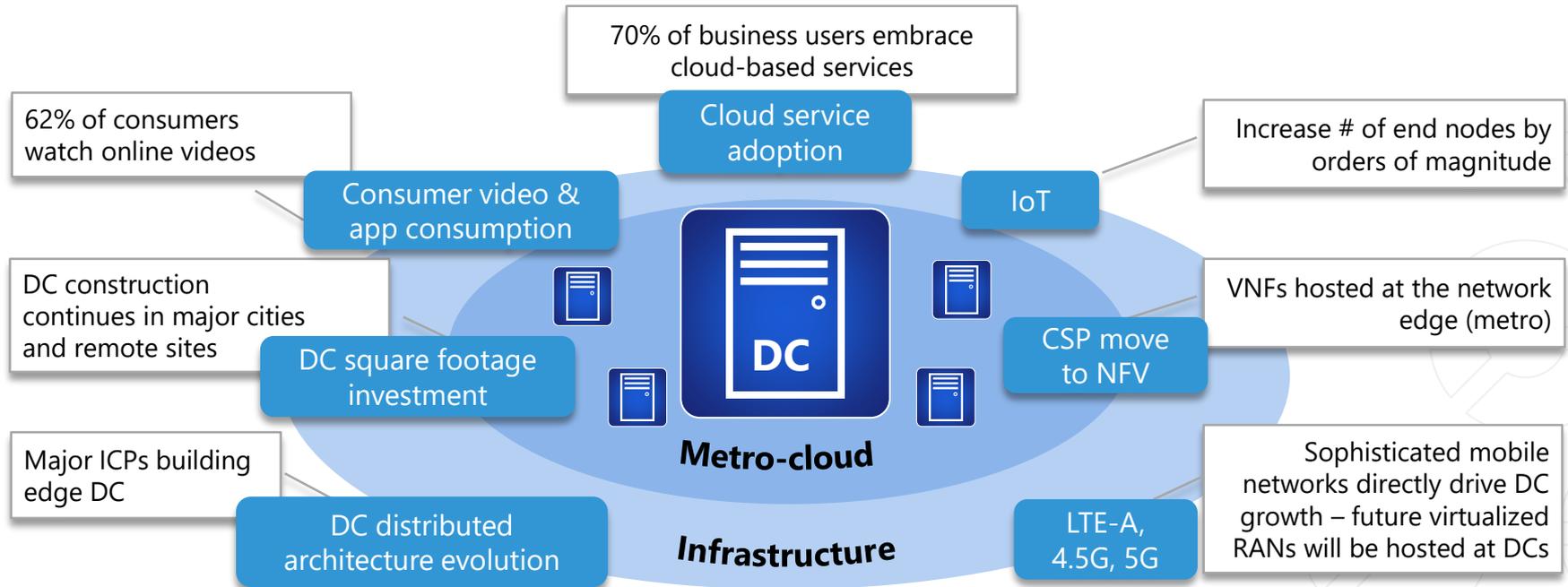
### Oscilloquartz

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

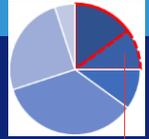
TAM

CAGR

ADVA  
success  
factors

USD 0.25 billion<sup>1</sup>  
4%

Large-scale needs for data storage,  
replication and backup



Approx. revenue contribution,  
rolling last four quarters

- >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



1) Estimated 2018 market size and 5yr CAGR; Source: Ovum, 2018-23, published February 2018  
2) 2Q 2018 market share (4Q rolling); Source: Ovum Market Share Report published August 2018

Private cloud infrastructure – security for mission critical data and applications

# Cloud interconnect (II): ICPs



## Internet content provider – DCI

TAM

CAGR

ADVA  
success  
factors

USD 1.4 billion<sup>1</sup>  
14%

Creation, storage and dissemination  
of digital information

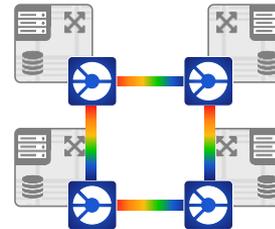


Approx. revenue contribution,  
rolling last four quarters

- 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™

1) Estimated 2018 market size and 5yr CAGR; Source: Ovum, 2018-23 forecast, published February 2018  
2) 2Q 2018 market share (4Q rolling); Source: Ovum Market Share Report published August 2018

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

# Cloud interconnect (III): CSP



## Communication service provider infrastructure

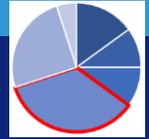
TAM

CAGR

ADVA  
success  
factors

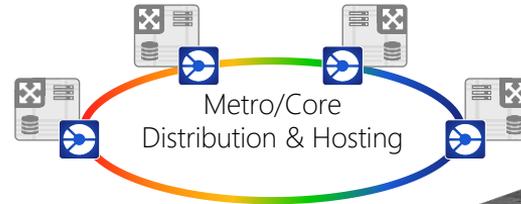
USD 11.7 bn<sup>1</sup>  
4%<sup>2</sup>

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



Approx. revenue contribution,  
rolling last four quarters

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



FSP 3000

1) Estimated 2018 market size for access, metro and long haul WDM; Source: Ovum, 2018-23 Optical Networks Forecast, published October 2017;  
2) 5yr CAGR for access (10%), metro (6.8%) and long haul (-0.1%) WDM

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

# Cloud access – the network edge



## Communication service providers – (Ethernet) Access

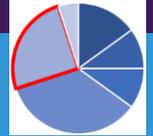
TAM

CAGR

ADVA  
success  
factors

USD ~ 1.3 billion<sup>1</sup>  
18%

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



FSP 150

<sup>1</sup>) Estimated 2018 market size and 5yr CAGR for access switching & routing; Source: Ovum, Service Provider Switching & Routing Forecast, published August 2018

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) universal customer premise equipment

*"uCPE<sup>2</sup> sector will cross \$1B threshold by 2022"*

Michael Howard, IHS Markit, Aug 2018

  
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

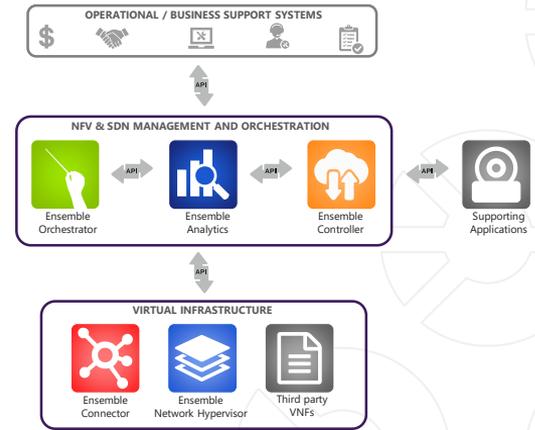
Scalable operations with automation and zero touch

## 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

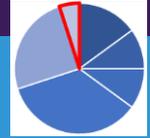
Proven pure-play NFV for enterprise, mobile and IoT

# 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*

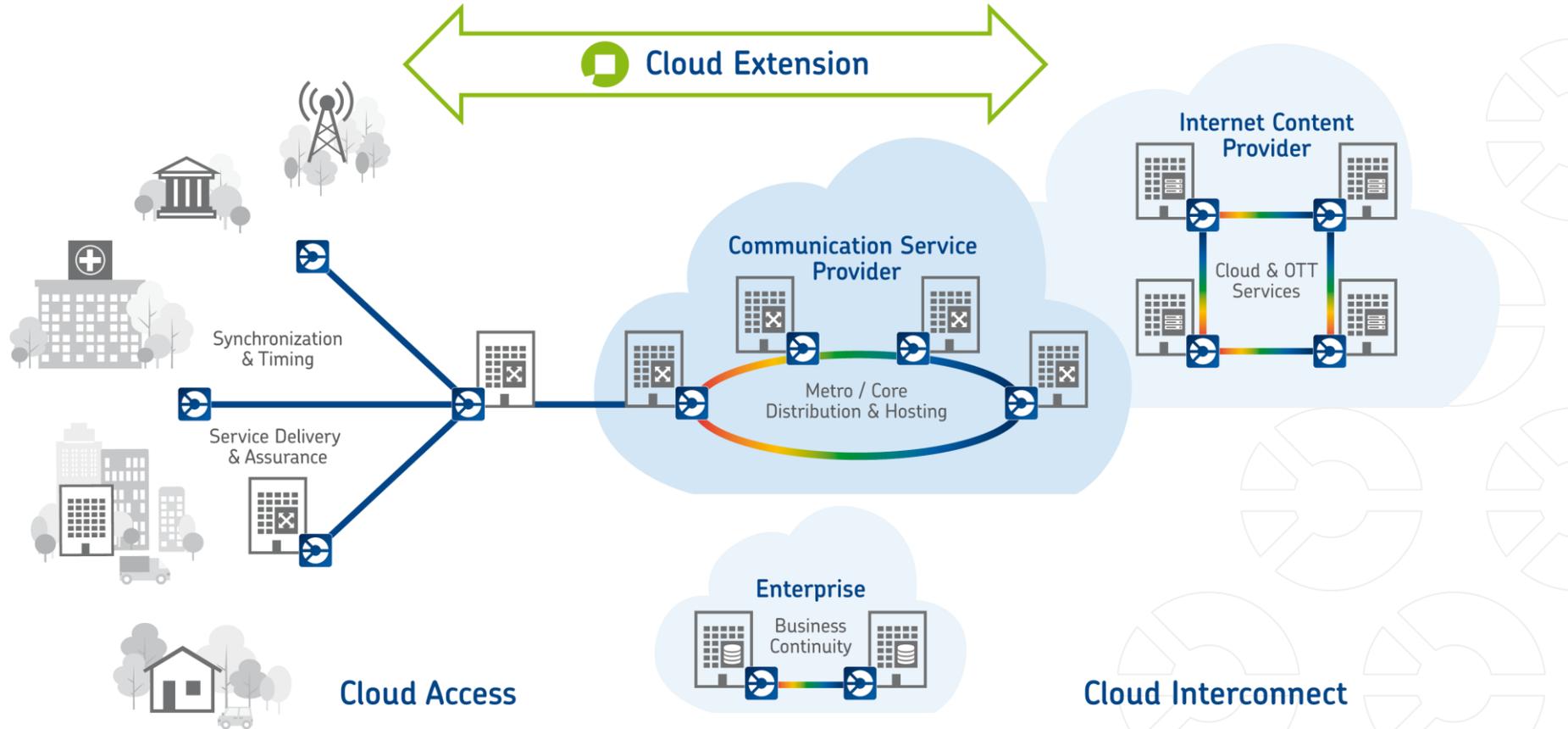


1) Estimated 2018 market size – ADVA internal estimates

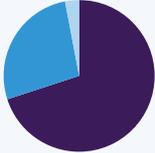


Precise timing for 4G+ and 5G mobile networks and ICP data base synchronization

# Our hardware, software and services



# ADVA portfolio drivers summarized

<p>Approximate revenue contribution</p> 	<p><b>Private enterprises</b></p>	<p><b>Internet content provider</b></p>	<p><b>Communication service provider</b></p>
<p><b>Cloud interconnect</b> (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><b>Cloud access</b> (Carrier Ethernet and NFV)</p>	<p>Secure cloud access and SD-WAN</p> 		<p>Differentiated service delivery and assurance</p> 
<p><b>Timing excellence</b> (Synchronization)</p> 	<p>MiFID II financial time stamping</p>		<p>Global database synchronization</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 networking 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 application expertise
- Financial stability, solid balance sheet

*Award-winning factory in Meiningen, Germany*

Enabling our customers to capitalize on cloud and mobility



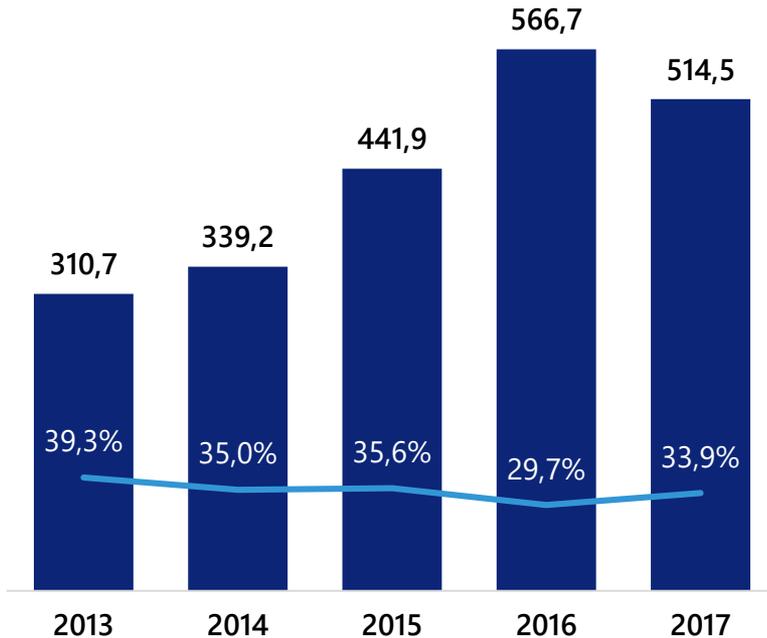
# Financials

## Overview

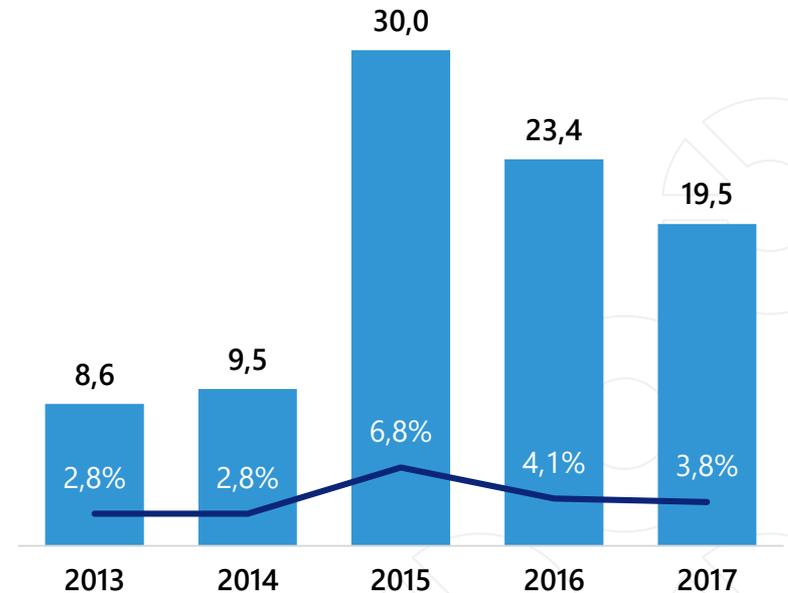
# Annual IFRS revenue and pro forma profitability

(in millions of EUR, in % of revenues)

## Revenue & pro forma gross margin



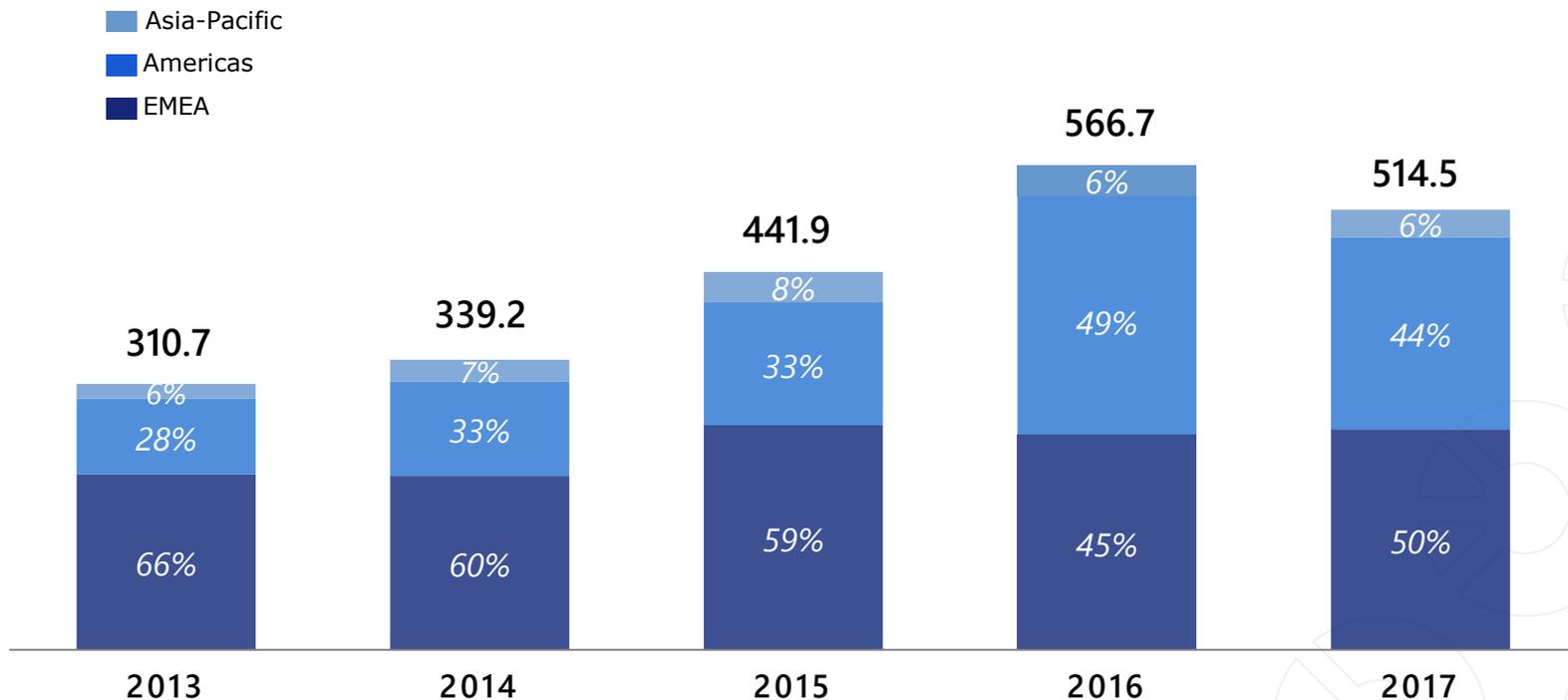
## Pro forma operating income & margin



\* 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

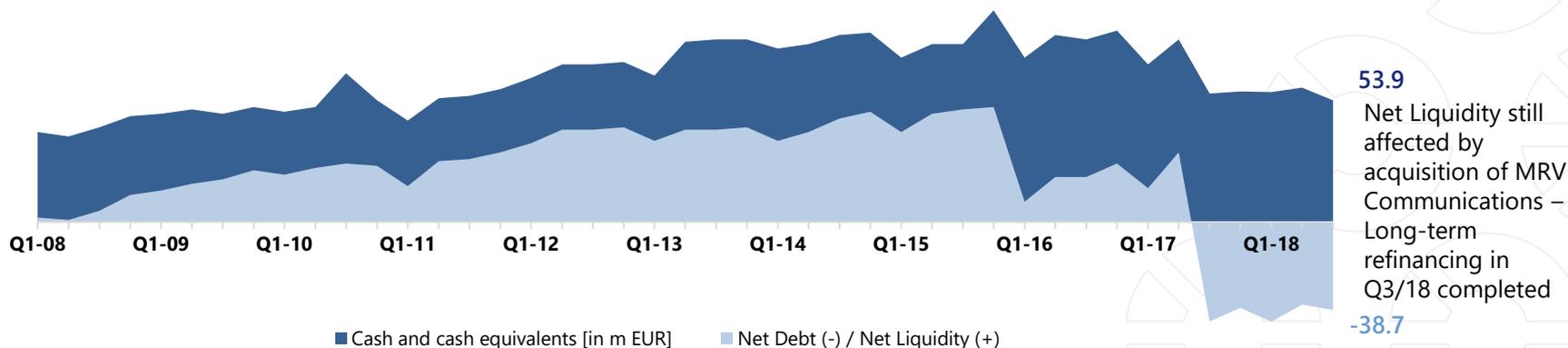
(in millions of EUR, in % of revenues)



Note: Potential differences due to rounding

# IFRS balance sheet

Assets	Jun. 30 2018	Sep. 30 2018	Equity & liabilities	Jun. 30 2018	Sep. 30 2018
Cash & cash equivalents	59.7	53.9	Accounts payable	50.4	53.1
Accounts receivable	95.9	104.0	Financial liabilities	96.3	92.6
Inventories	76.3	80.1	Other liabilities	94.8	95.8
Other assets	242.8	242.1	Equity	233.2	238.6
<b>Total</b>	<b>474.7</b>	<b>480.1</b>	<b>Total</b>	<b>474.7</b>	<b>480.1</b>



# Guidance Q4 2018

Revenues between EUR 126 million and EUR 136 million

Pro forma operating margin between 3% and 7% 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

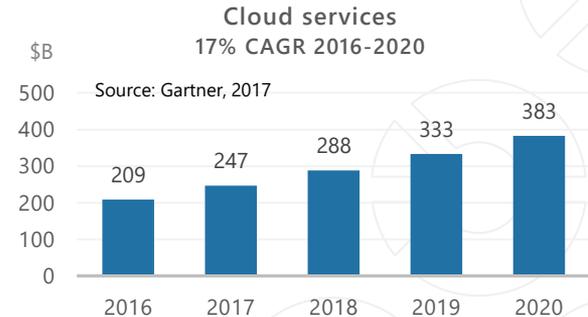
Catalysts and strategy

# Growth catalysts

## ADVA

- Cloud and mobility drive network transformation;
- Investment focus moves to the edge, where ADVA is well positioned with multiple ways to win:
  - Interconnect – scalable bandwidth on open platform supplying the industry's transition to new architecture
  - Access & extension – rapid service delivery and customer expansion
  - Synchronization – precision timing, increasing relevance in ever more applications and success winning new tier 1 footprint
- More customers, better revenue diversification, and broader solutions portfolio, because of MRV acquisition and organic R&D;
- 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)**

The investment focus moves to the network edge, where ADVA is uniquely positioned to capitalize on this shift:

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**

We're in the middle of a network transformation that is built on openness, virtualization and security.

This transformation moves the investment focus to the edge of the network.



The investment focus shifts to the edge where ADVA is well positioned to win



# Appendix

## Quarterly data

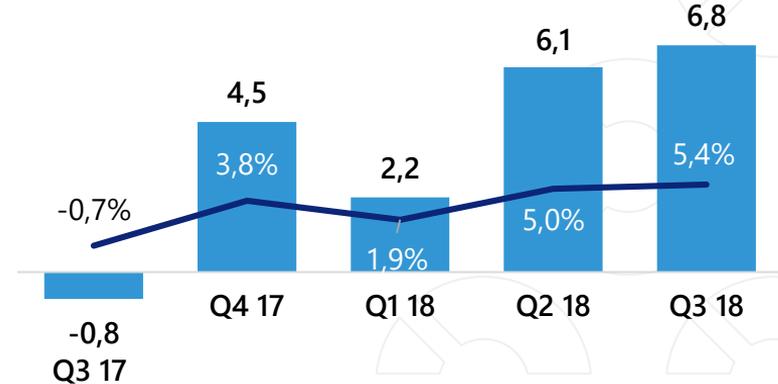
# Quarterly IFRS revenue and pro forma profitability

(in millions of EUR, in % of revenues)

## Revenue & gross margin



## Pro forma operating income & margin

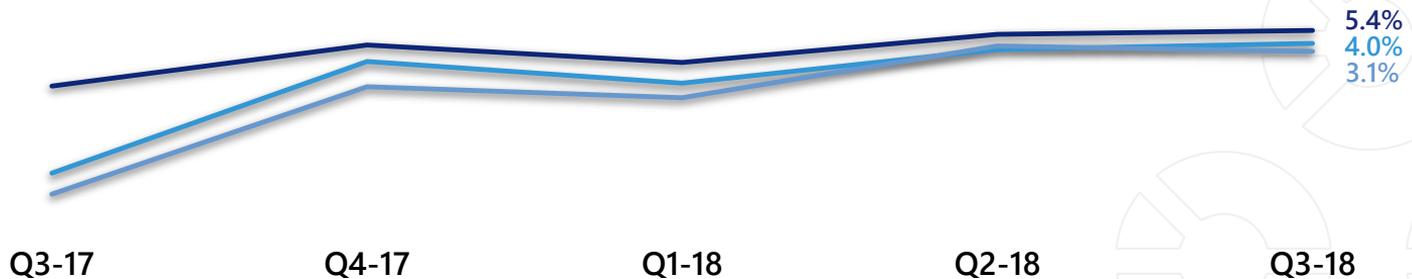


\* Pro forma operating income is calculated prior to non-cash charges related to the stock compensation programs and amortization and impairment of goodwill and acquisition-related intangible assets. Additionally, non-recurring expenses related to restructuring measures are not included.

# Quarterly IFRS profitability

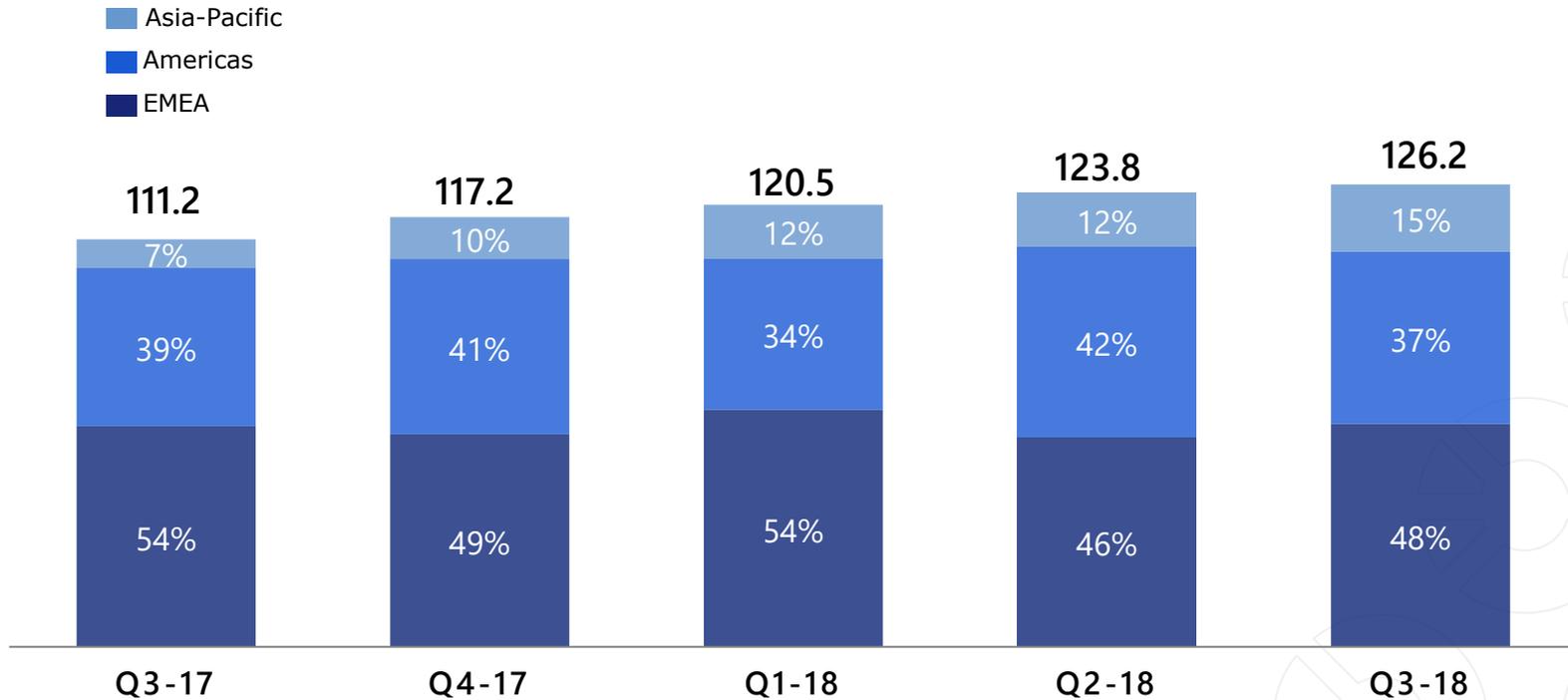
EUR Million	2017		2018		
	Q3	Q4	Q1	Q2	Q3
<b>Pro forma operating income</b>	-0.8 (-0.7%)	4.5 (3.8%)	2.2 (1.9%)	6.1 (5.0%)	6.8 (5.4%)
<b>Operating income</b>	-11.5 (-10.3%)	2.3 (2.0%)	-0.4 (-0.4%)	4.1 (3.3%)	5.0 (4.0%)
<b>Net income</b>	-14.0 (-12.6%)	-0.9 (-0.8%)	-2.4 (-2.0%)	4.6 (3.7%)	3.9 (3.1%)
<b>Diluted EPS in EUR</b>	-0.28	-0.02	-0.05	0.09	0.08

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

**PHOTONIK CAMPUS** wil sind LICHT  
**BROCADE**  
**IBM** Tivoli software  
**ARISTA** **SPIRENT**  
**atmedia** secure data communication  
**UNIVERSITY SYSTEM OF GEORGIA**  
**DELL EMC** **hp** **infovista**  
**InfoGuard** SWISS CYBER SECURITY  
**IBM** **JUNIPER** NETWORKS **VI.AVI**  
 Research alliances    Security and encryption    Data center and storage    Ethernet and IP    NMS and assurance

## Ensemble harmony ecosystem

**WIND** **ADVANTECH** **BROCADE** **CERTES** **Check Point** **DELL**  
 Building on Intelligent Planet    SOFTWARE TECHNOLOGIES LTD.  
**EDGETEAM** **FORTINET** **H-LOG** **InfoVista** **intel** **iricent** **ixia**  
 innovating networks    **GoS TELECOM**  
**JOLATA** **JUNIPER** **kapsch** **LightRiver** **Metaswitch** **MIRANTIS** **netronds**  
**Quortus** **QOSMOS** **redhat** **riverbed** **SENETAS** **silverpeak** **Sonus** **SPIRENT**  
**SUPERMICR** **transcirus** **VERSA** **veriyx** **VI.AVI** **WALKER** **WIND**  
 AN INTEL COMPANY

## Partner ecosphere members

Featured elite partners

**arcadiz telecom** **axians** **dacoso** data communication solutions  
**infoGuard** SWISS CYBER SECURITY **JASCO** INSPIRE. INNOVATE. **PSS**  
**UNIVERSAL CARD SYSTEMS** **XON** **zayo** GROUP

Featured select partners

**ISKRATEL** **IT@RATIO** **MATICMIND** makes it easy  
**NETWELL** **Shibuya** **sia**  
**telindus** Belgium ICT **TrueCom** building a connected world...

and many more Connect and Connect+ partners

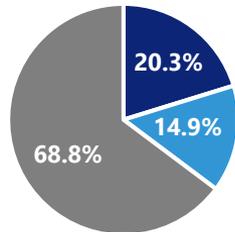
# Investor relations overview

## Recent investor activities

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

## Stockholder structure

Status: September 30, 2018: 49,899,626 shares outstanding



### Top Investors\*

Int. Kapitalanlagegesellschaft	4.9%
Morgan Stanley	3.3%
Dimensional Fund	3.1%
DNB Asset	3.1%
Blackwell Partners (US)	3.0%
Norges Bank	2.8%
Goldman Sachs Group	2.0%

- Teleios Capital Partners
- EGORA Group
- Free float

\*Sources: Insight Nasdaq, Oddo Seydler, ADVA

## Planned investor activities

Conferences: Needham Networking & Security Conference New York/Nov.  
 UBS Global Technology Conference, San Francisco/Nov.  
 Deutsches Eigenkapitalforum 2018 in Frankfurt/Nov.  
 Cowen Network & Cybersecurity Summit in New York/ Dec.  
 2019 Needham Growth Conference in New York/Jan.

## Financial analyst coverage

Institution	Recommendation/ Price Target	Update	Previous Target
Deutsche Bank	Hold (€5.20)	Oct 19, 18	(€5.20)
Hauck & Aufhäuser	Buy (€8.20)	Oct 19, 18	(€5.80)
LBBW	Buy (€8.00)	Oct 22, 18	(€7.00)
Northland Capital Markets	Outperform (€9.00)	Oct 16, 18	(€8.00)
Oddo Seydler Bank	Neutral (€6.30)	Oct 23, 18	(€6.30)

Ø

€7.34



Thank you

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



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