

Synopsys Investor Day

April 2, 2019

New York



AGENDA

Markets	Aart de Geus, Chairman & co-CEO
Technology	Andreas Kuehlmann, co-GM Software Integrity Group
	Graham Holmes, Sr. Director, Advanced Security Initiatives Group, Cisco
Break	
	John Koeter, VP Marketing Solutions Group
	Sassine Ghazi, co-GM Design Group
Financial Update	Trac Pham, CFO
	Panel Q&A
Lunch	

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Forward-Looking Statements

This presentation contains forward-looking statements under the safe harbor provisions of Section 21E of the Securities Exchange Act of 1934, including, but not limited to, financial targets for the second quarter and full fiscal year 2019, their comparative metrics under ASC 605, and GAAP to non-GAAP reconciliations of such targets; expected impact of ASC 606; projected financial results; long-term revenue, non-GAAP EPS and non-GAAP operating margin objectives; expected share count; revenue variability; hardware growth; industry growth rates; software trends; long-term objectives; business outlook, opportunities, and strategies; customer and market expansion; the summary of certain discrete items; and planned acquisitions and buybacks. These statements involve known and unknown risks, uncertainties and other factors that could cause actual results to differ materially from those expressed or implied. Accordingly, we caution stockholders and prospective investors not to place undue reliance on these statements. Such risks include, but are not limited to: uncertainty in the growth of the semiconductor and electronics industries; consolidation among our customers and our dependence on a relatively small number of large customers; continued uncertainty in the global economy; fluctuation of our operating results; increased variability in our revenue due to the adoption of ASC 606, including the resulting increase in recognizing upfront revenue as a percentage of total revenue; our highly competitive industries and our ability to meet our customers' demand for innovative technology at lower costs; risks and compliance obligations relating to the global nature of our operations; cybersecurity threats or other security breaches; our ability to protect our proprietary technology; our ability to realize the potential financial or strategic benefits of acquisitions we complete; and others. More information on potential risks, uncertainties and other factors that could affect Synopsys' results is included in filings it makes with the Securities and Exchange Commission from time to time, including in the sections entitled "Risk Factors" in its Annual Report on Form 10-K for the fiscal year ended October 31, 2018 and in its latest Quarterly Report on Form 10-Q. The information provided herein is as of April 2, 2019. Synopsys undertakes no duty, and does not intend, to update any forward-looking statement, whether as a result of new information, future events or otherwise, unless required by law.

Regulation G

In addition to financial results prepared in accordance with Generally Accepted Accounting Principles, or GAAP, this presentation also contains certain non-GAAP financial measures. Reconciliations of the non-GAAP financial measures contained in this presentation or given verbally to their most directly comparable GAAP measures are included at the end of this presentation. Please see our Current Report on Form 8-K filed with the SEC on February 20, 2019 and available at http://www.sec.gov for the reasons why Synopsys believes that the presentation of the non-GAAP financial measures included in this presentation provides useful information to our shareholders regarding our financial condition and results of operations, and the purposes for which management uses such non-GAAP financial measures.

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Why Synopsys?

Aart de Geus
Chairman and co-CEO

Synopsys: The Market & Technology Leader

Uniquely Positioned for Growth and Stability

- Dynamic markets and electronics complexity
- Clear technology leadership
- Financial strength & growth



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Synopsys: The Market & Technology Leader

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From Silicon to Software
Synopsys is at the Heart of Innovations
in the new era of Smart, Secure Everything

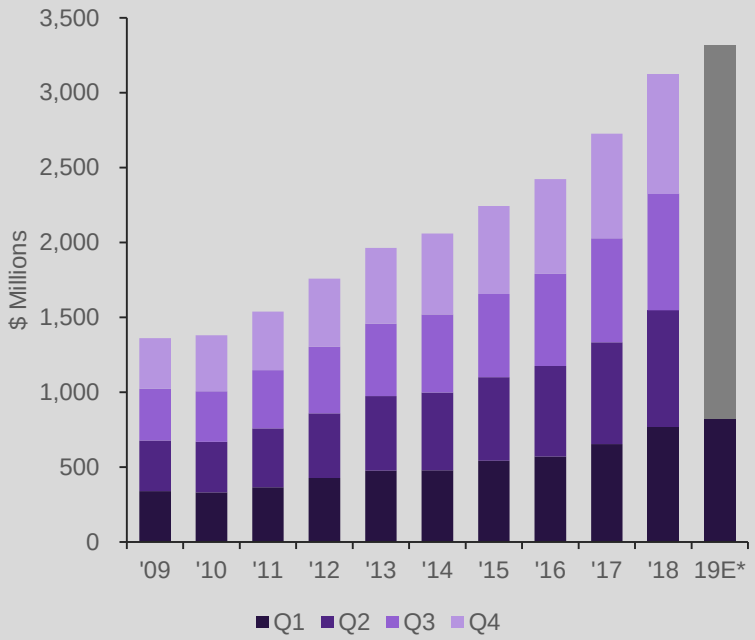
Synopsys Today

FY18 Revenue: $3.121B

Employees: ~13,500

Patents: ~3,100

Offices: ~120





#1 Electronic Design Automation tools & services

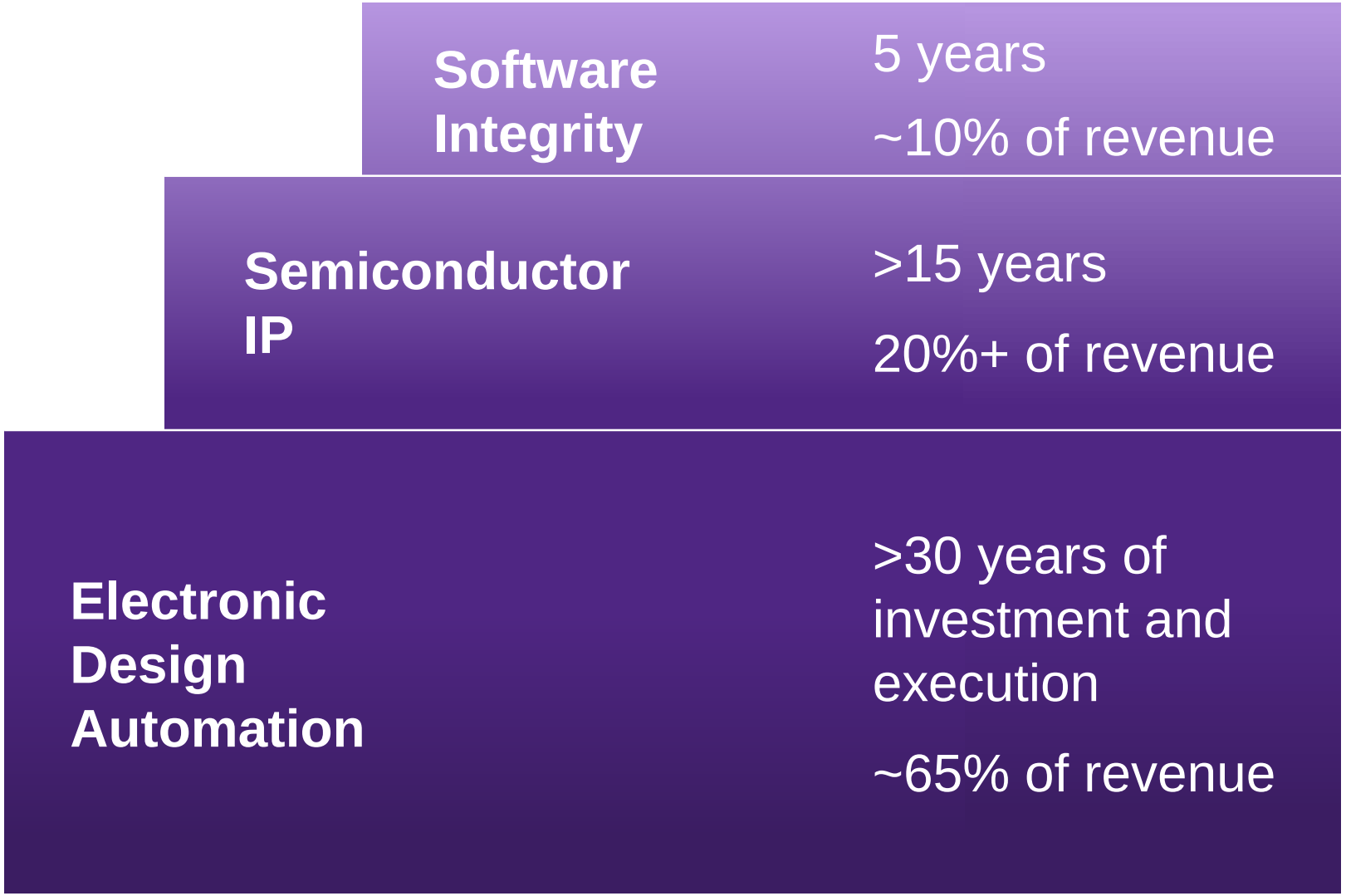
Broadest IP portfolio and **#1** interface, analog, embedded memories & physical IP

'Leader' in Gartner's Magic Quadrant for application security testing

* Midpoint of FY19 guidance under ASC 606 provided February 20, 2019

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Synopsys: The Market & Technology Leader



Emerging Leader, Broadest Portfolio

Growth: ~20%

#2 IP Vendor

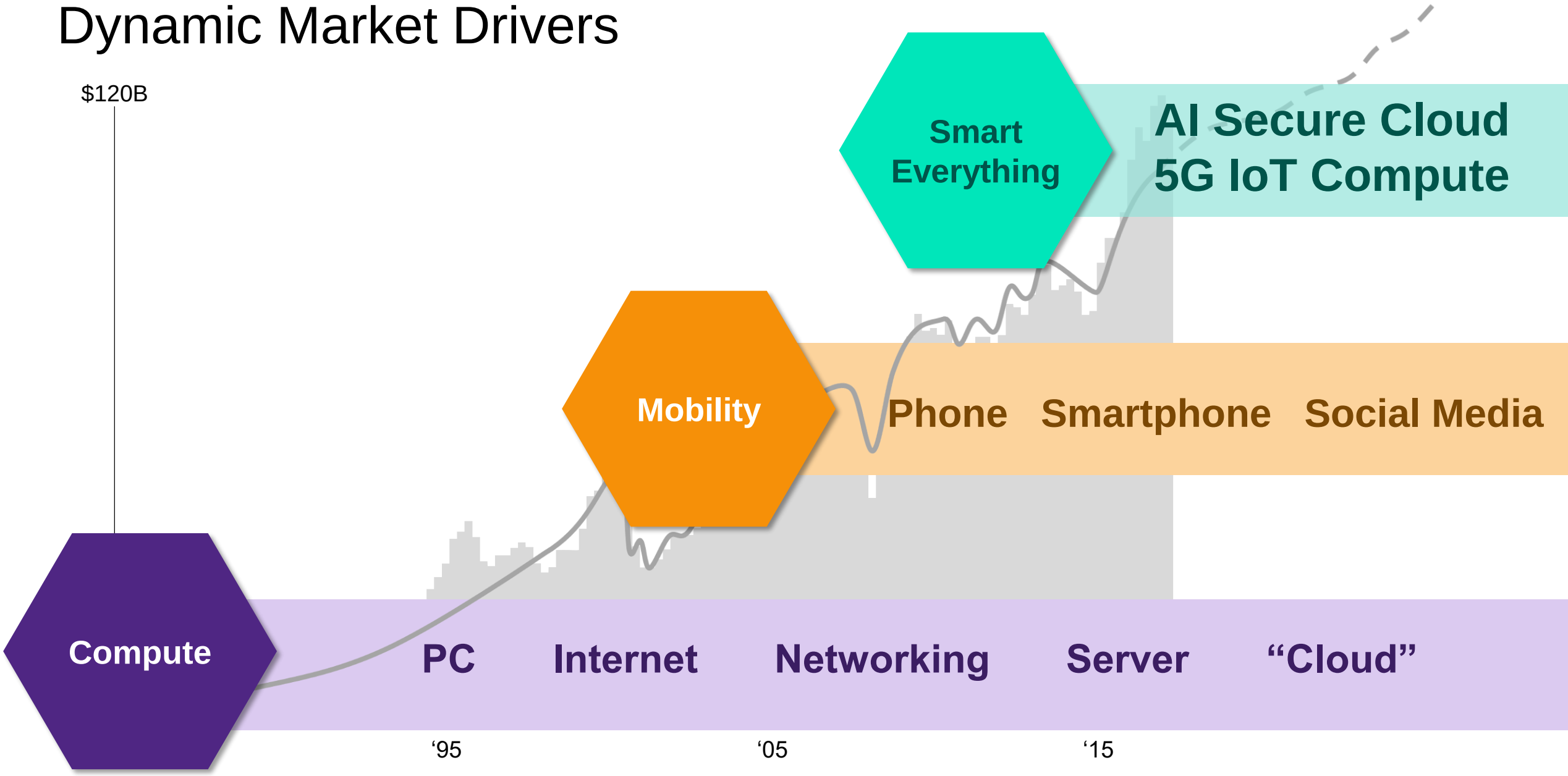
Growth: low double digits

Market Leader

Growth: mid-high single digits

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Dynamic Market Drivers

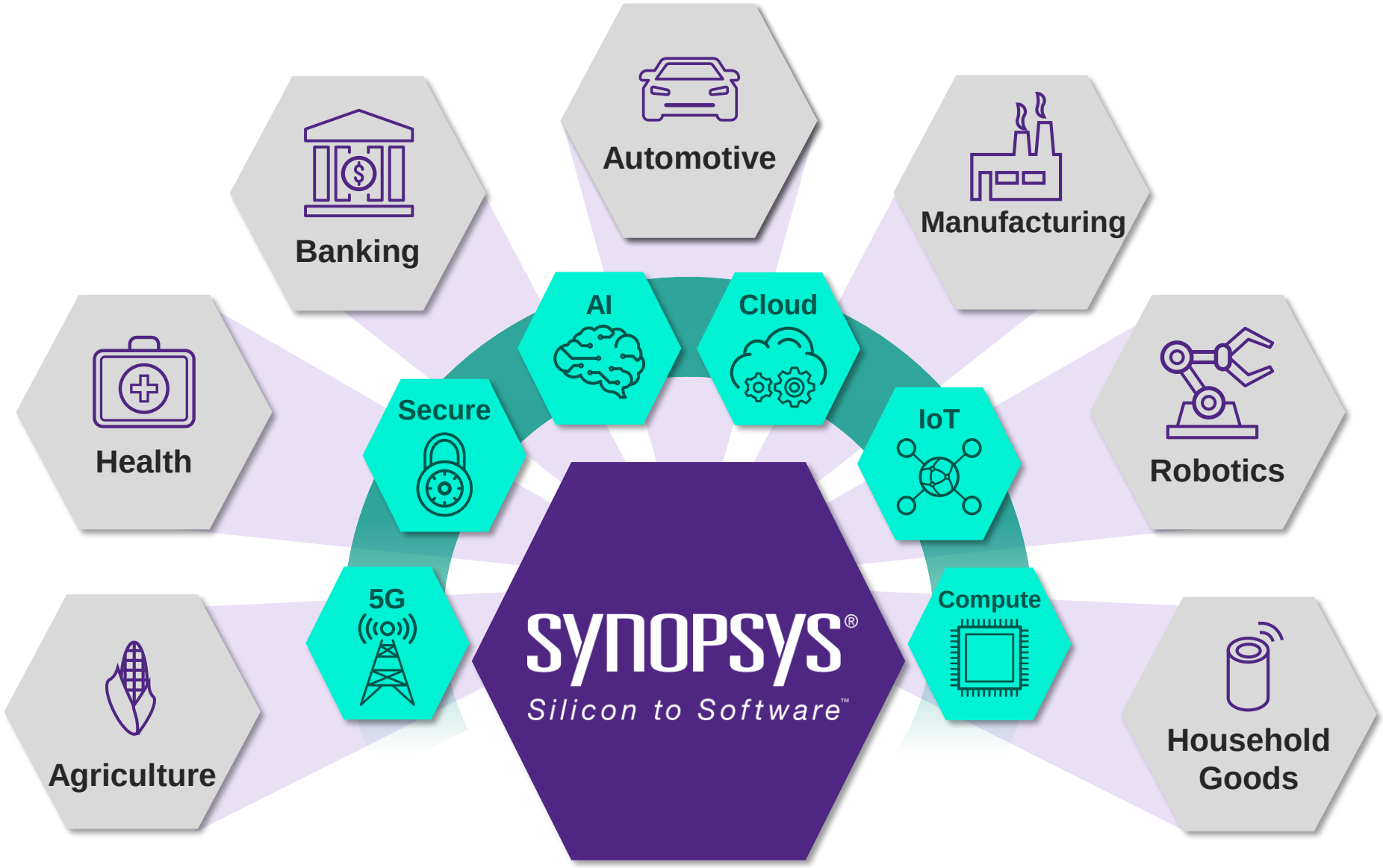


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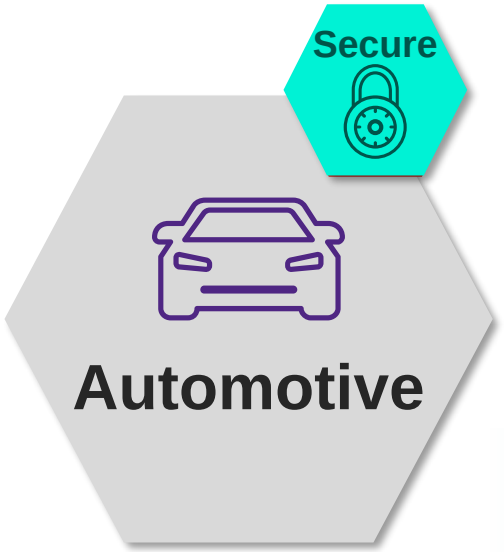


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New Technology is Impacting Every Vertical



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OWNERSHIP & INFRASTRUCTURE
Entire Ecosystem

AUTONOMOUS DRIVING
Systems of systems

ARTIFICIAL INTELLIGENCE
Big Data, Capture, Analyze, Decision Making

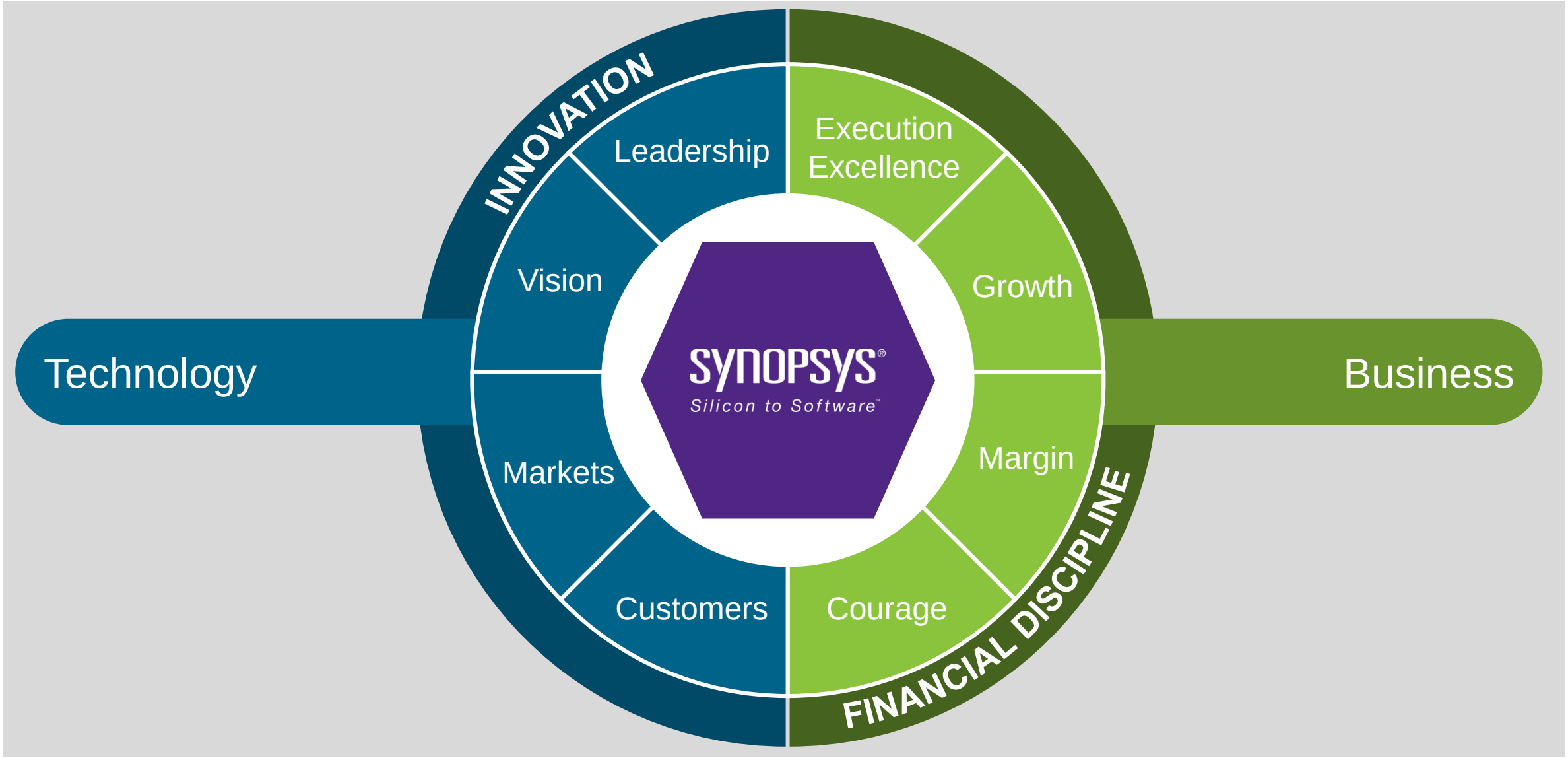
SOFTWARE
>150M Lines of Code per vehicle

SYSTEMS
Infotainment, GPS, Drivetrain, Sensors

CHIPS
4 Billion transistors

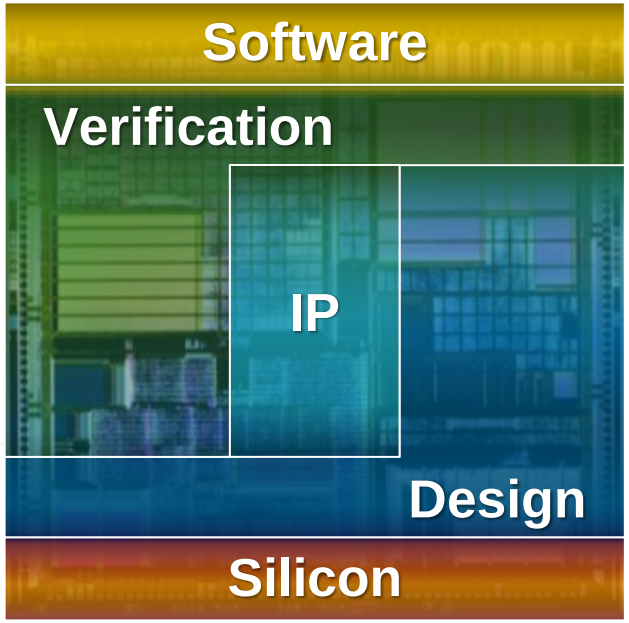
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Strategy Principles



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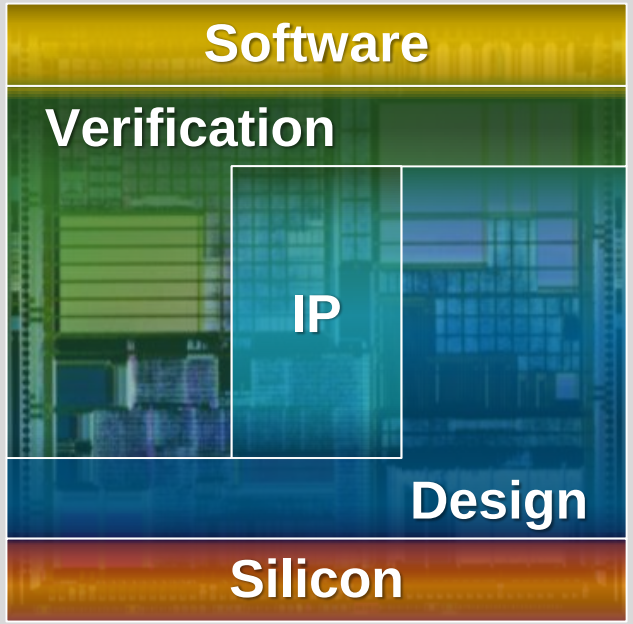
SOFTWARE



SILICON

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Synopsys: Silicon to Software



Software • Polaris Software Integrity Platform™

Verification • HW/SW Verification

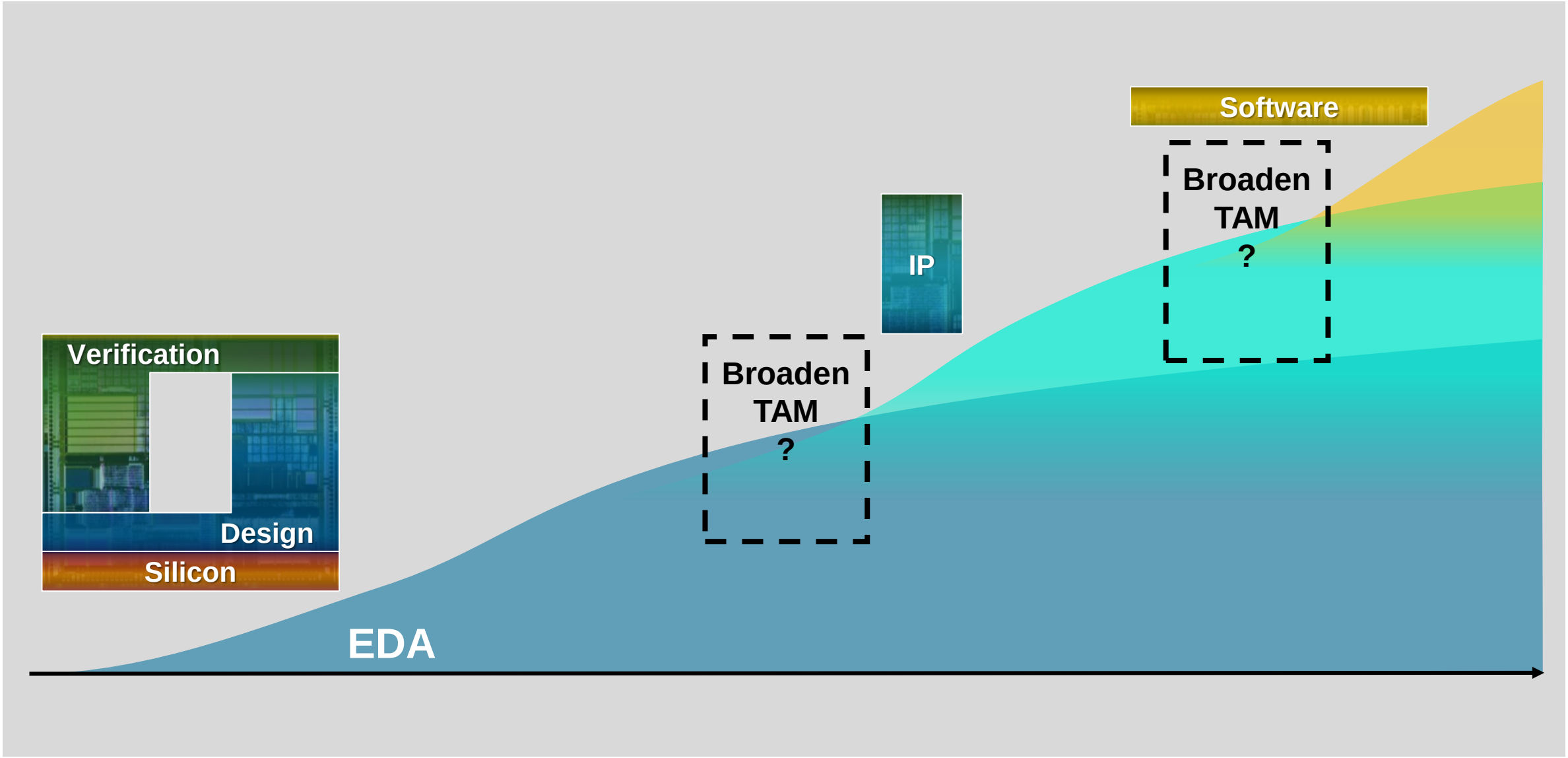
IP • Sophisticated Blocks & Subsystems

Design • Fusion Design Platform™

Silicon • Atomic Level Simulation

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Investing for the Long-Term



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Synopsys: The Market & Technology Leader

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- Dynamic markets and electronics complexity
- **Clear technology leadership**
- Financial strength & growth



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Software Integrity

Andreas Kuehlmann
Co-GM, Software Integrity Group

Software Integrity

TOOLS

To test software code – as it's being written – for known security vulnerabilities and quality defects.

CONSULTING SERVICES

To help companies assess, build and implement their software security strategy



TTM Revenue: ~$299M



Customers: >4,000

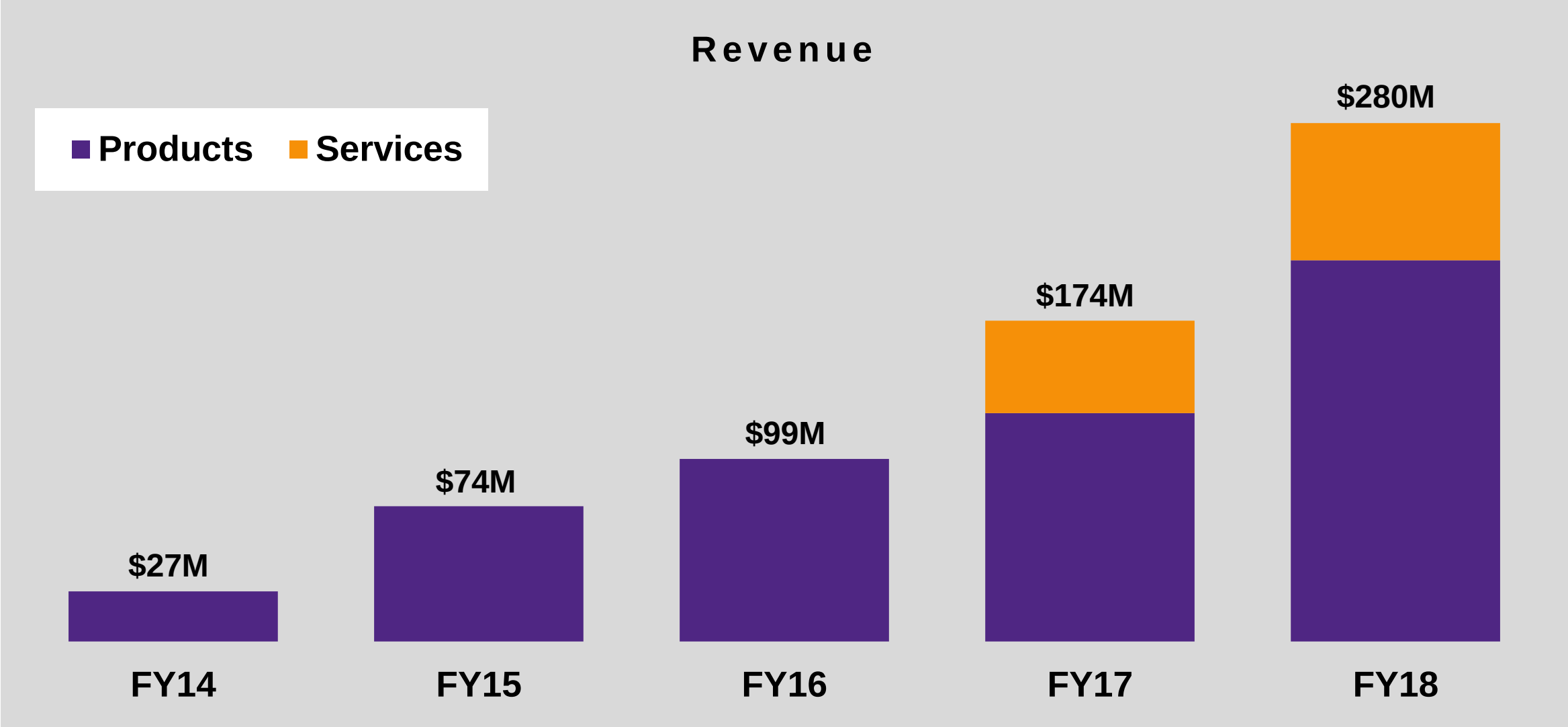


Countries: ~18*

*Office locations, including shared

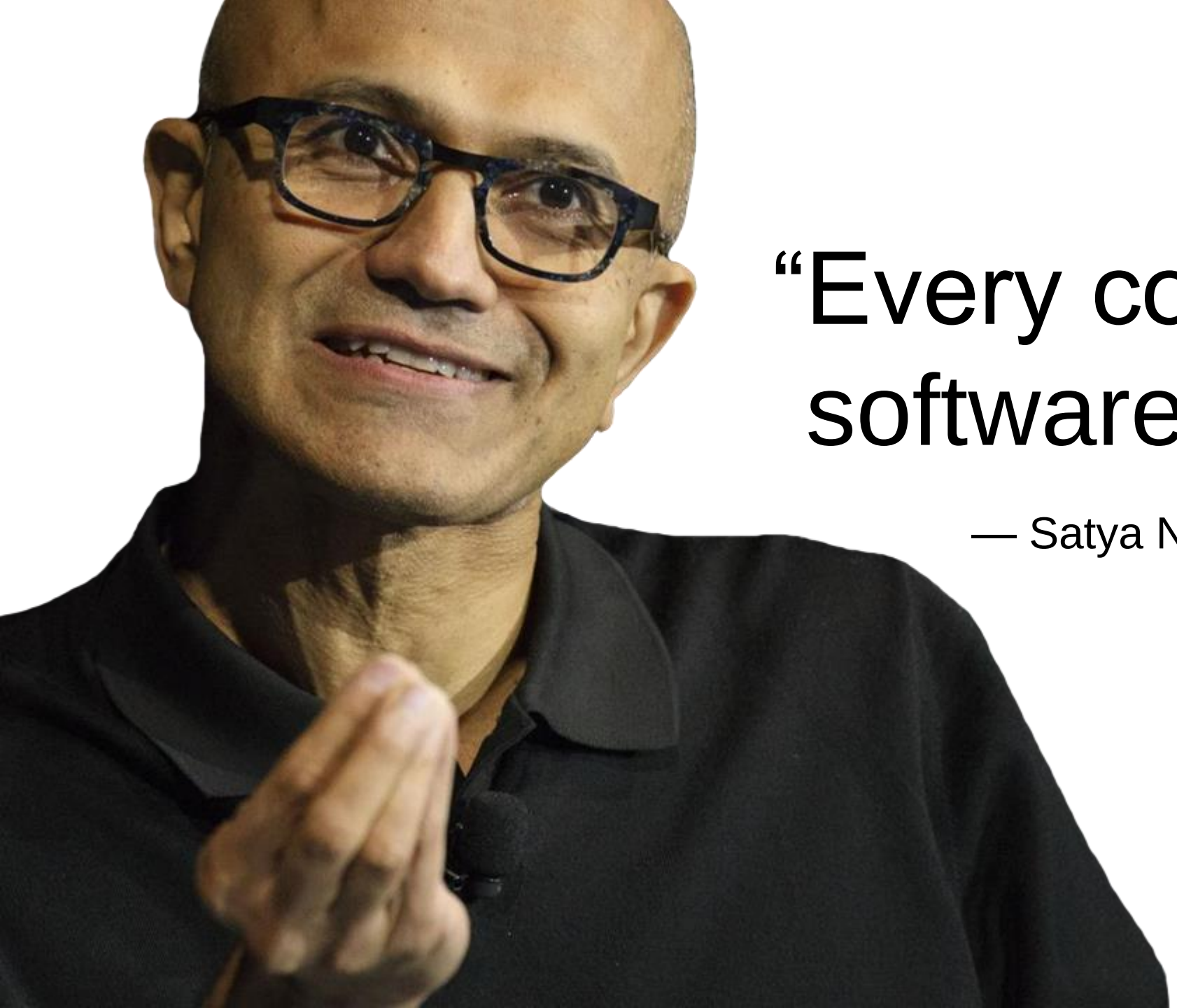
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Scaling the Business



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WHY?



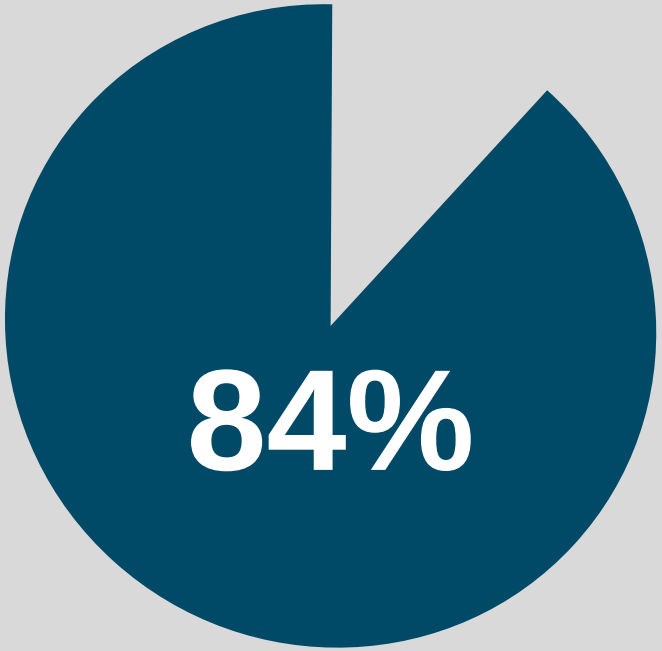
“Every company is a software company”

— Satya Nadella, CEO Microsoft

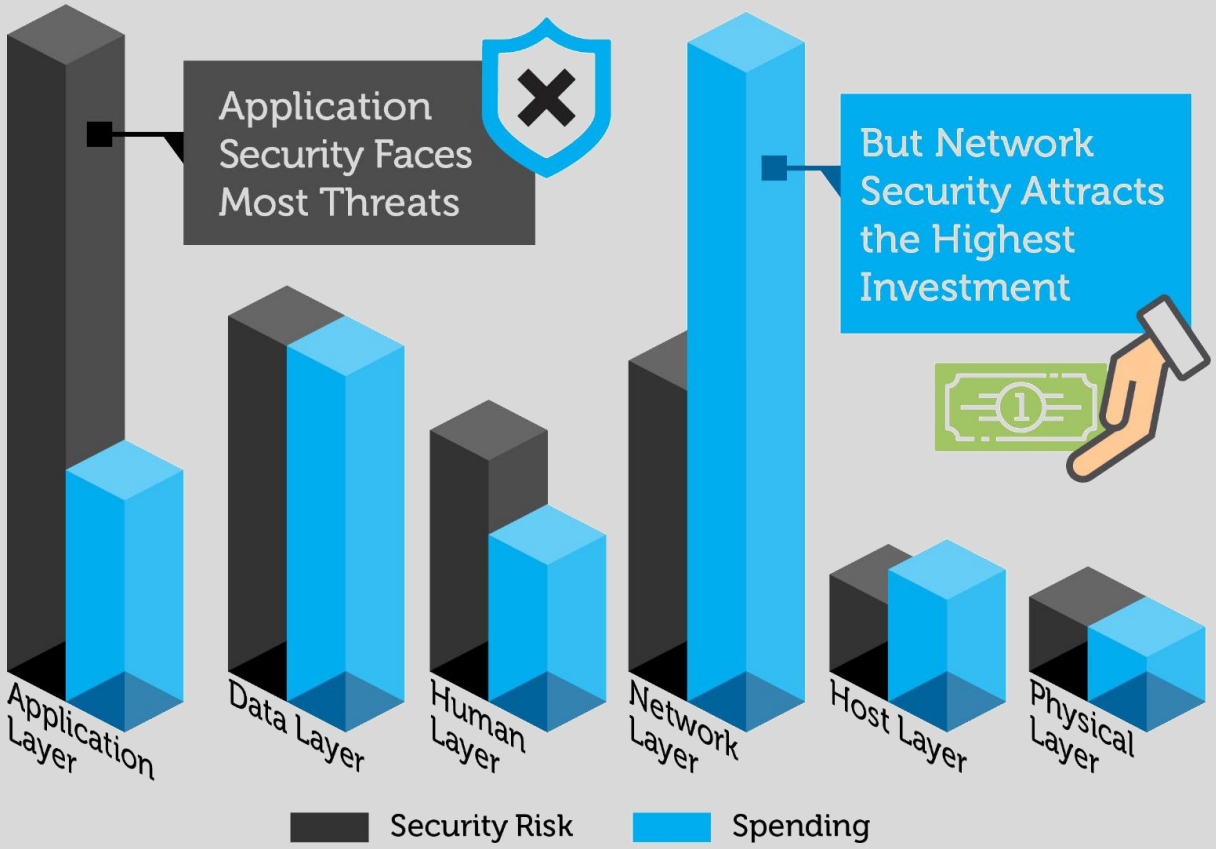
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Security Risk: Shifted from the Network to the Application

WHY?



of all cyber attacks happen on the application layer



Source: Tim Clark, SAP brand journalist (March 10, 2015)

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Yet, Getting Software Right is Challenging

WHY?





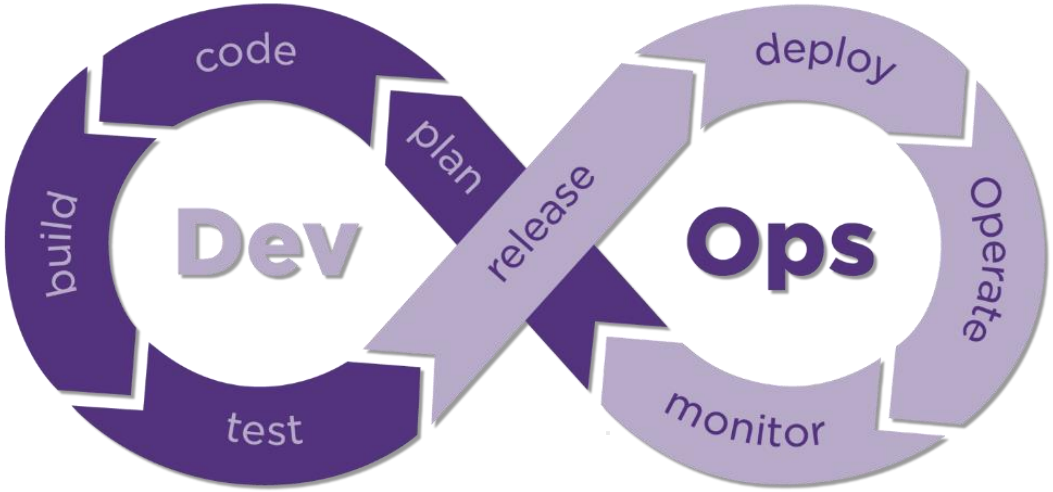




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DevOps: Fast Iterations & Automation

HOW?



Continuous feedback

Reduced friction

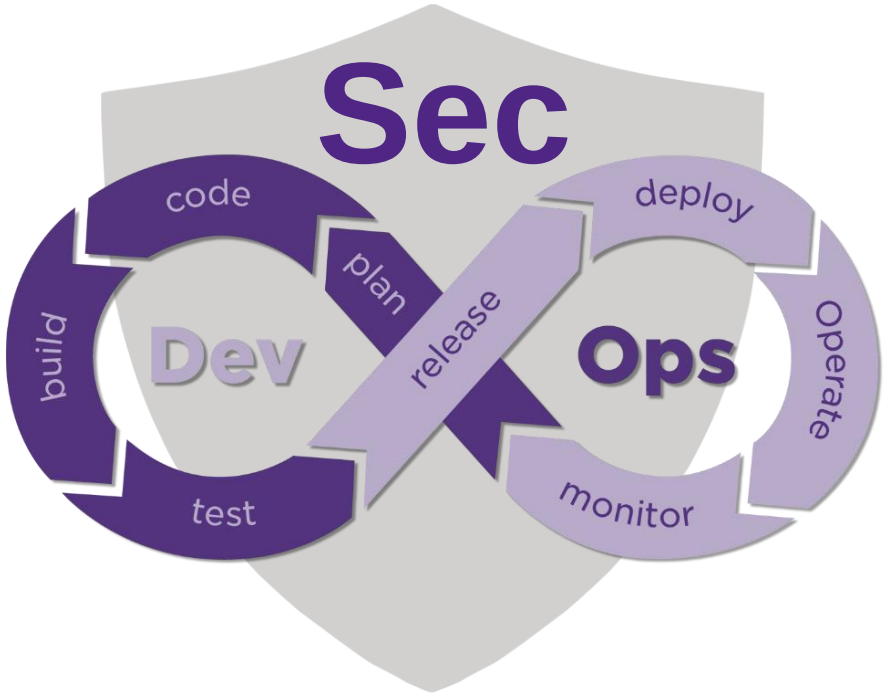
Higher speed

Lower cost

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Evolving into DevSecOps

HOW?



By 2021, DevSecOps practices will be embedded in 80% of rapid development teams, up from 15% in 2017

Source: Gartner, Integrating Security Into the DevSecOps Toolchain Nov. 16, 2017

Continuous feedback

Reduced friction

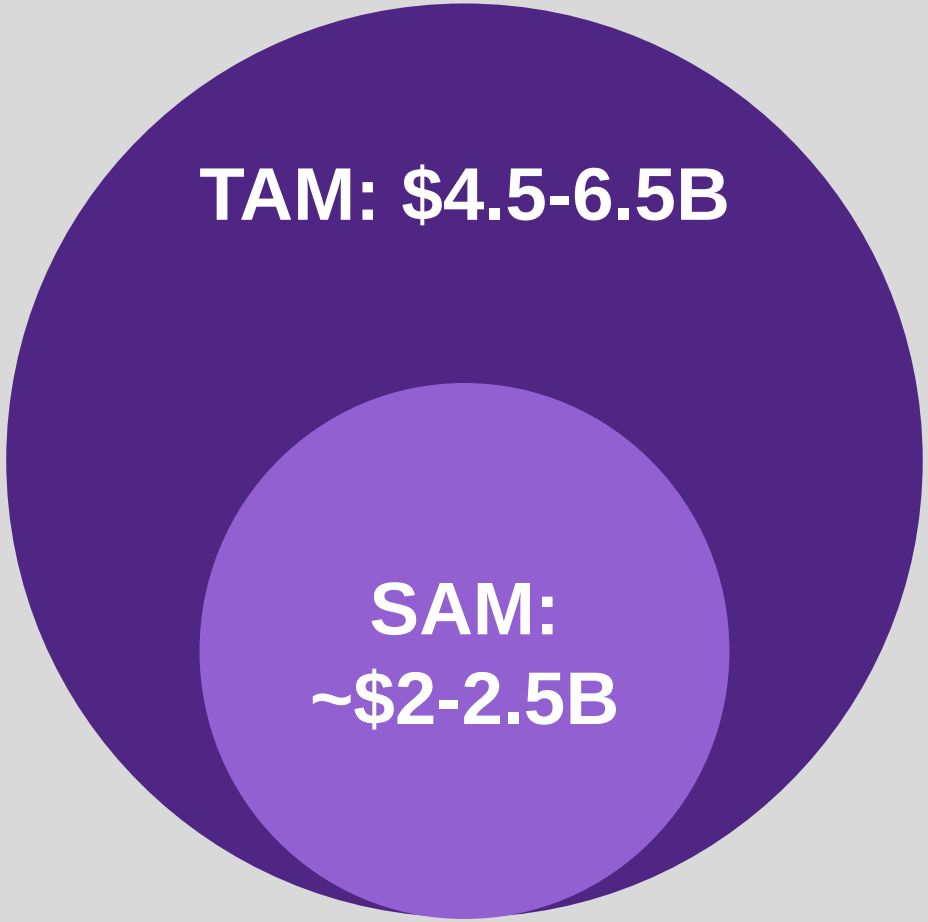
Higher speed

Lower cost

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Software Security & Quality Market

WHAT?



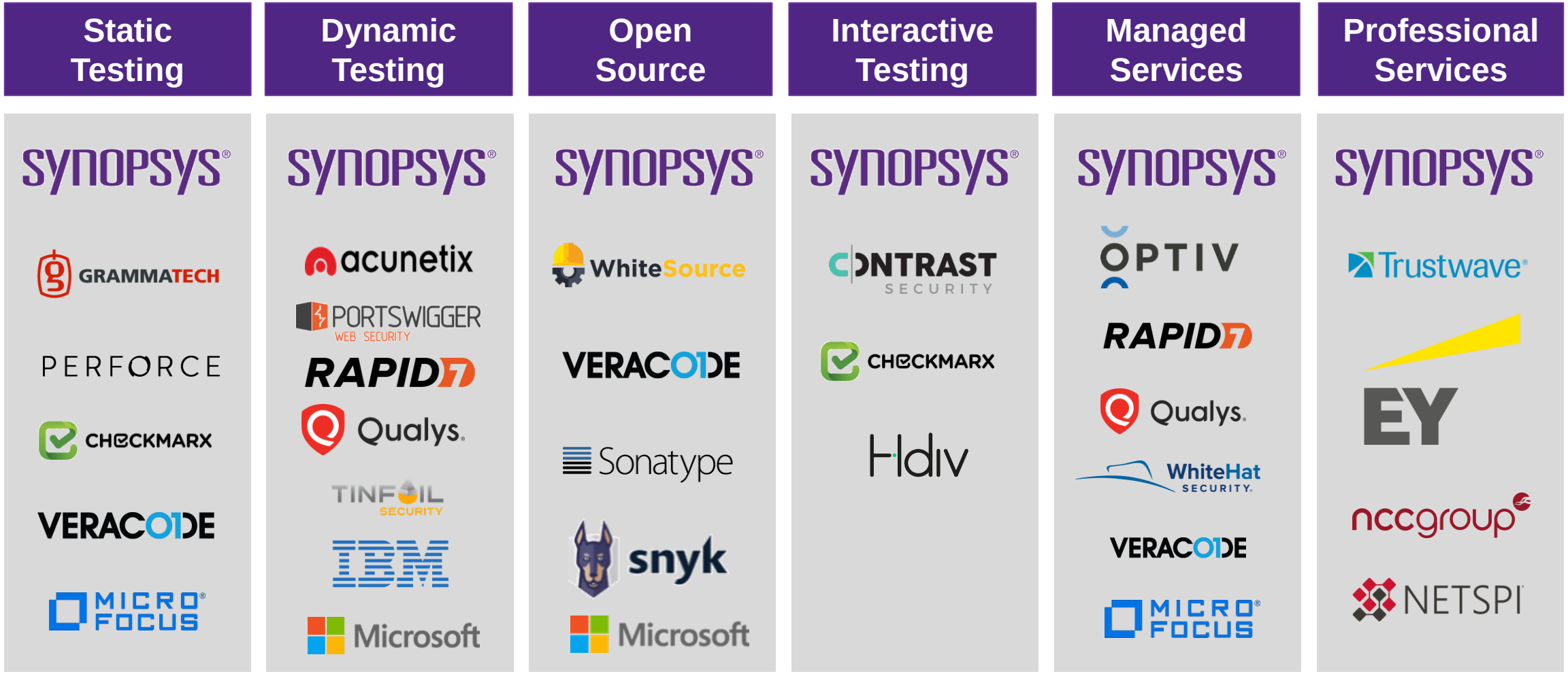
- Evolving, nascent market
- Growth drivers:
  - Omnipresence of software
  - Widespread connectivity exacerbates security issues
  - Significant business risk from breaches
  - Large development teams
- ~20% growth segment

Sources: Gartner, Forrester, IDC, other external and internal analyses

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WHAT?

Software Security & Quality Testing Landscape*

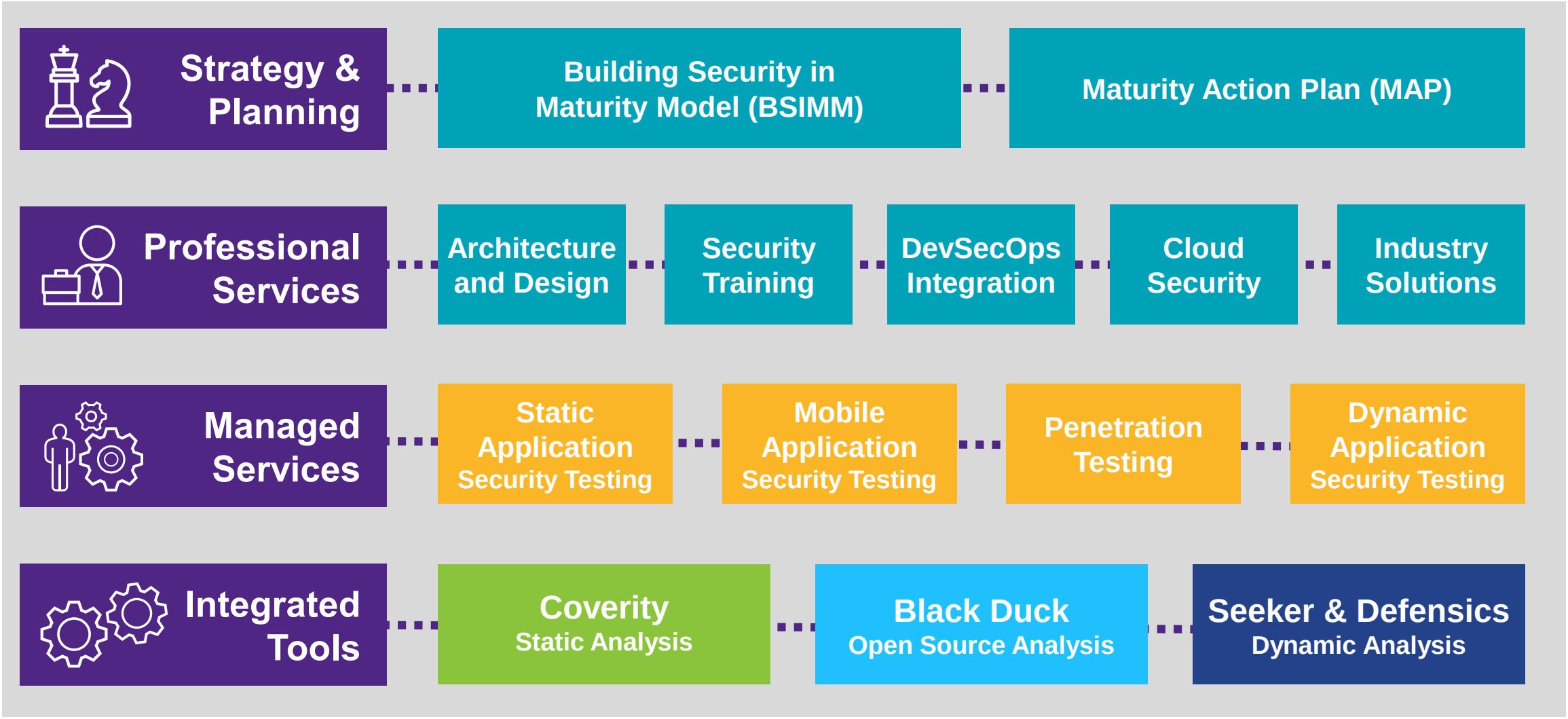


*Designed to provide an illustrative view of key market categories and a selection of vendors in each category. Sources: Gartner, Forrester, IDC, other external and internal analyses. This illustration may not reflect the views of the companies mentioned. All product and company names are trademarks™ or registered® trademarks of their respective holders. Use of them does not imply any affiliation with or endorsement by them.

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Addressing Security & Quality Holistically

WHAT?

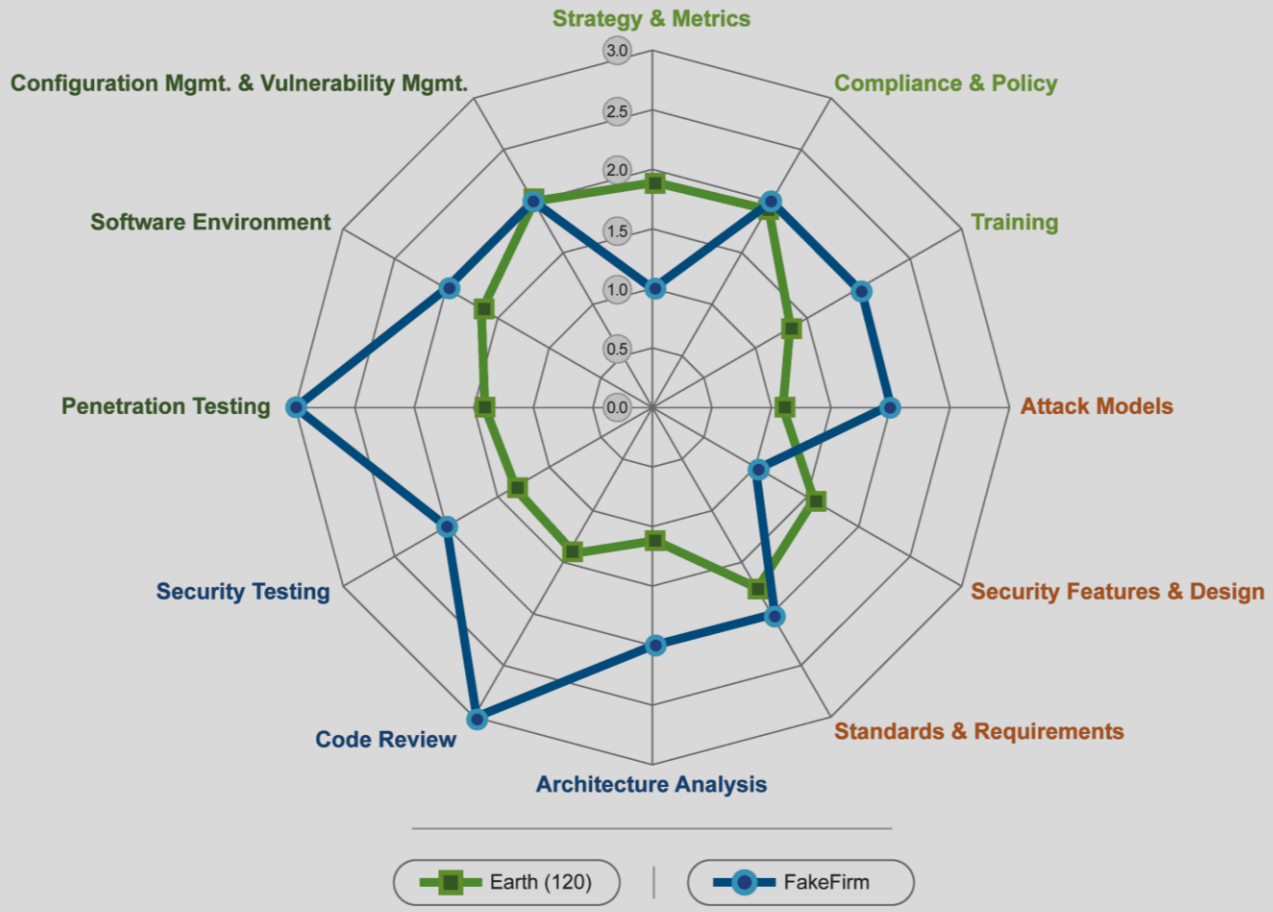


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Building Security In Maturity Model (BSIMM)

WHAT?

Assess where a company's software security initiative stands compared to peers

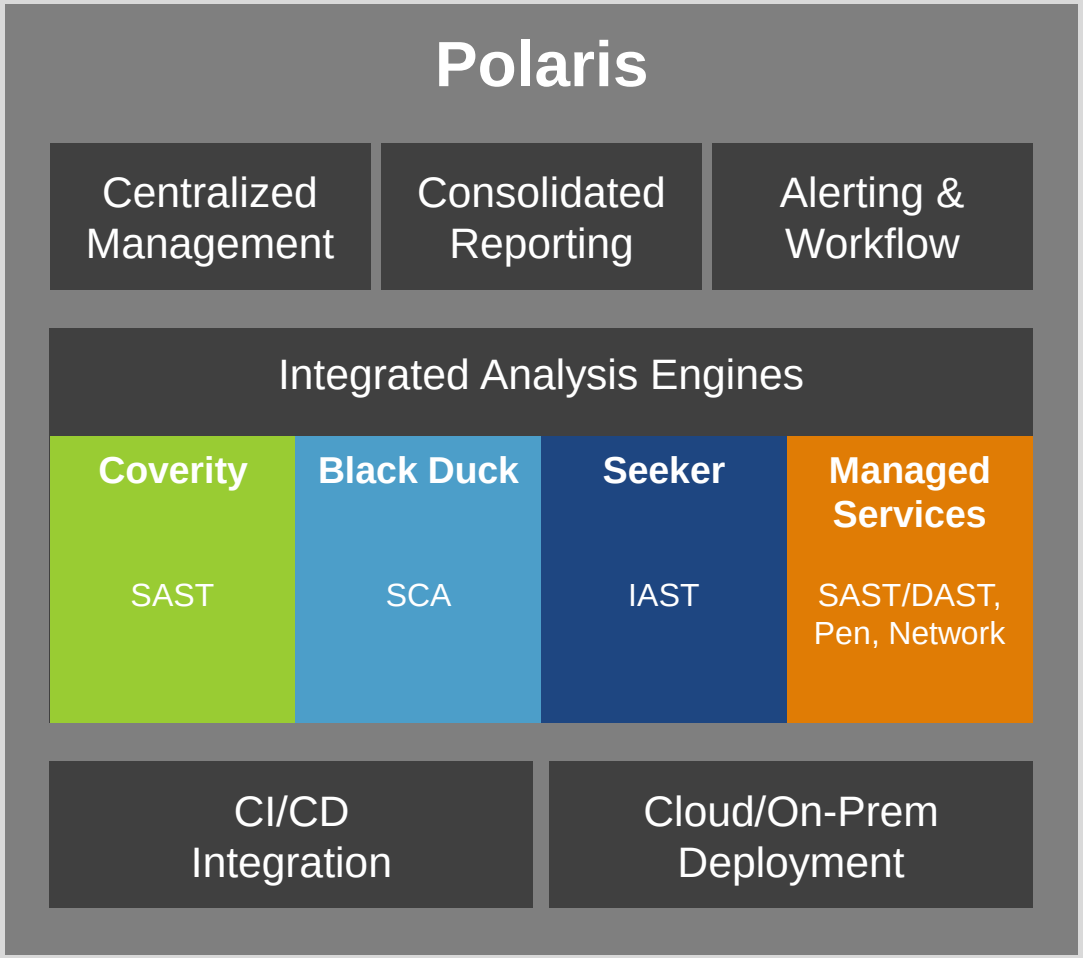


- Maturity assessment based on industry best practices
  - 100+ metrics in 12 categories
  - Report provides comparison against industry peers
- Participation in BSIMM community to learn and exchange
- Usually complemented by Maturity Action Plan – roadmap to improve

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WHAT?

Synopsys Polaris Software Integrity Platform™

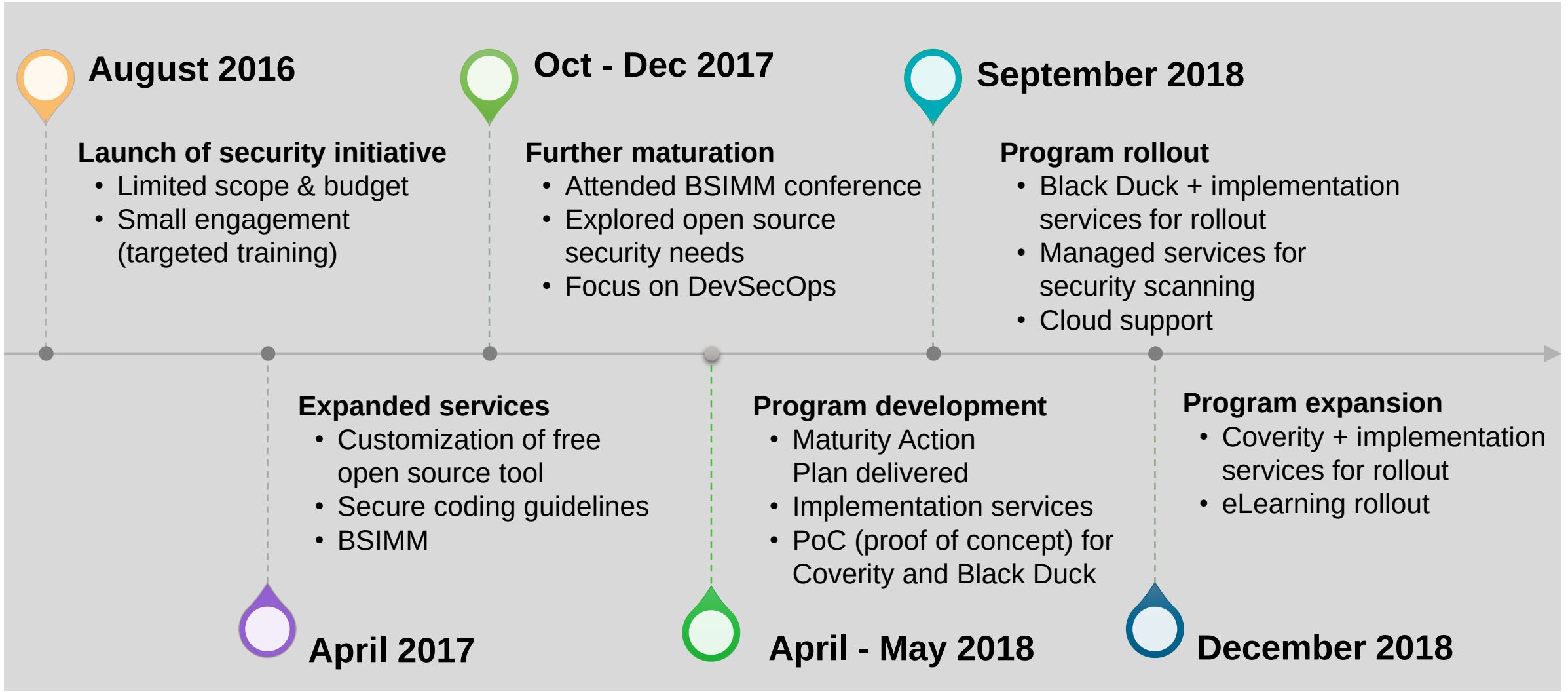


- Platform that integrates all products and managed services
  - Cloud-based
  - Enterprise scale
  - Single user interface, easy to use
  - Unified management reports
  - Allows customers to adopt small and expand when they need to
- Inaugural integration launched in March

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Customer Success Story: Very large U.S. consumer health care, medical device & pharmaceuticals company

WHO?



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WHO?

Trusted Partner to >4,000 Companies



















16 of top 20
Commercial Banks

7 of top 10
Aerospace & Defense Firms

8 of top 10
Global Brands

6 of top 10
Semiconductor Companies

9 of top 10
ISVs

























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Recognized Leader in End-to-End Application Security

WHO?

Synopsys is the only vendor recognized as the leader in both SAST and Open Source (SCA)

Gartner Magic Quadrant Application Security Testing



Source: Gartner (April 2019)

Download a free copy of the 2019 Magic Quadrant for Application Security Testing.

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Recognized Leader in End-to-End Application Security

Synopsys is the only vendor recognized as the leader in both SAST and Open Source (SCA)

WHO?

Forrester Wave Static Application Security Testing



Source: Forrester (December 2017)

Forrester Wave Software Composition Analysis

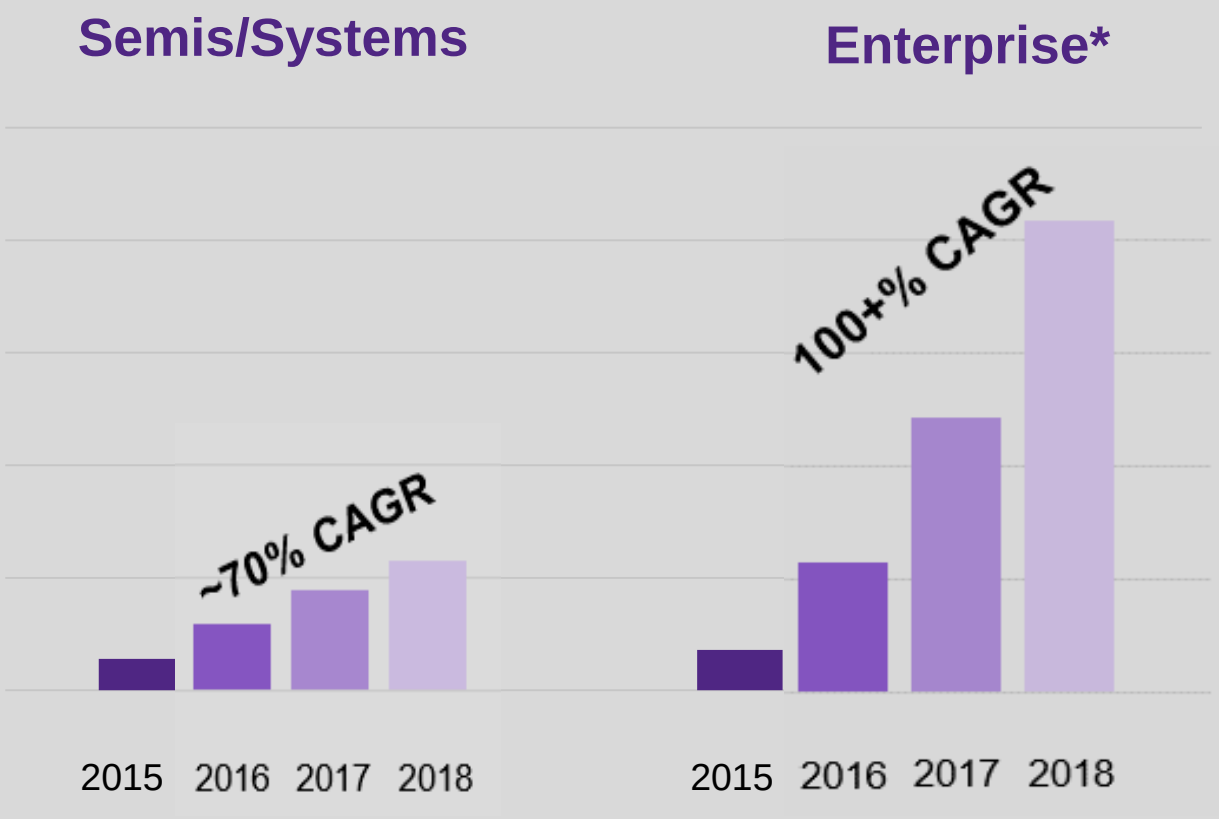


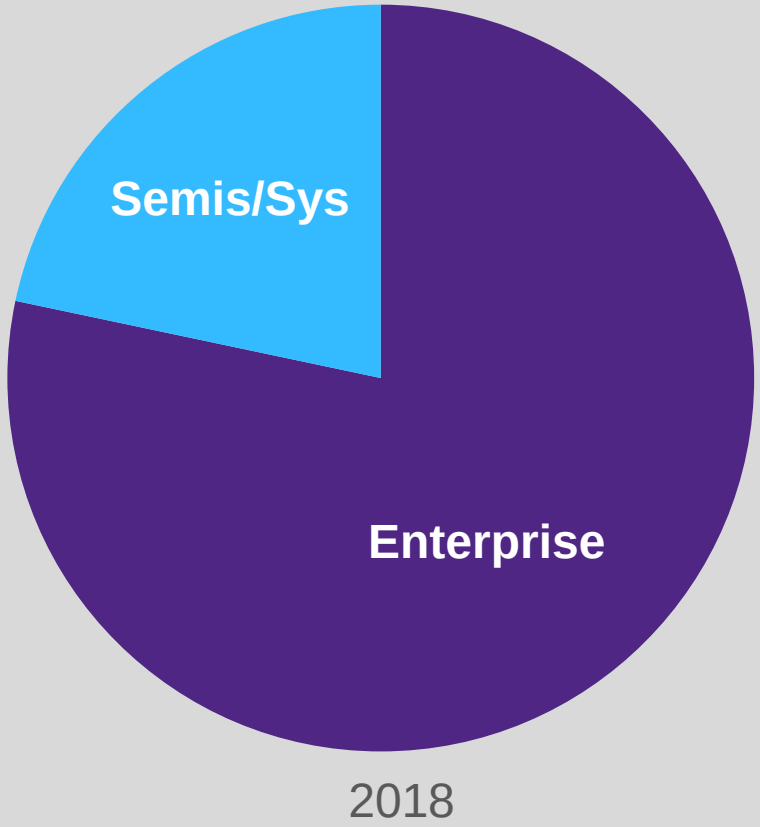
Source: Forrester (April 2019)

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Expanding Beyond Traditional Customer Base

RESULTS





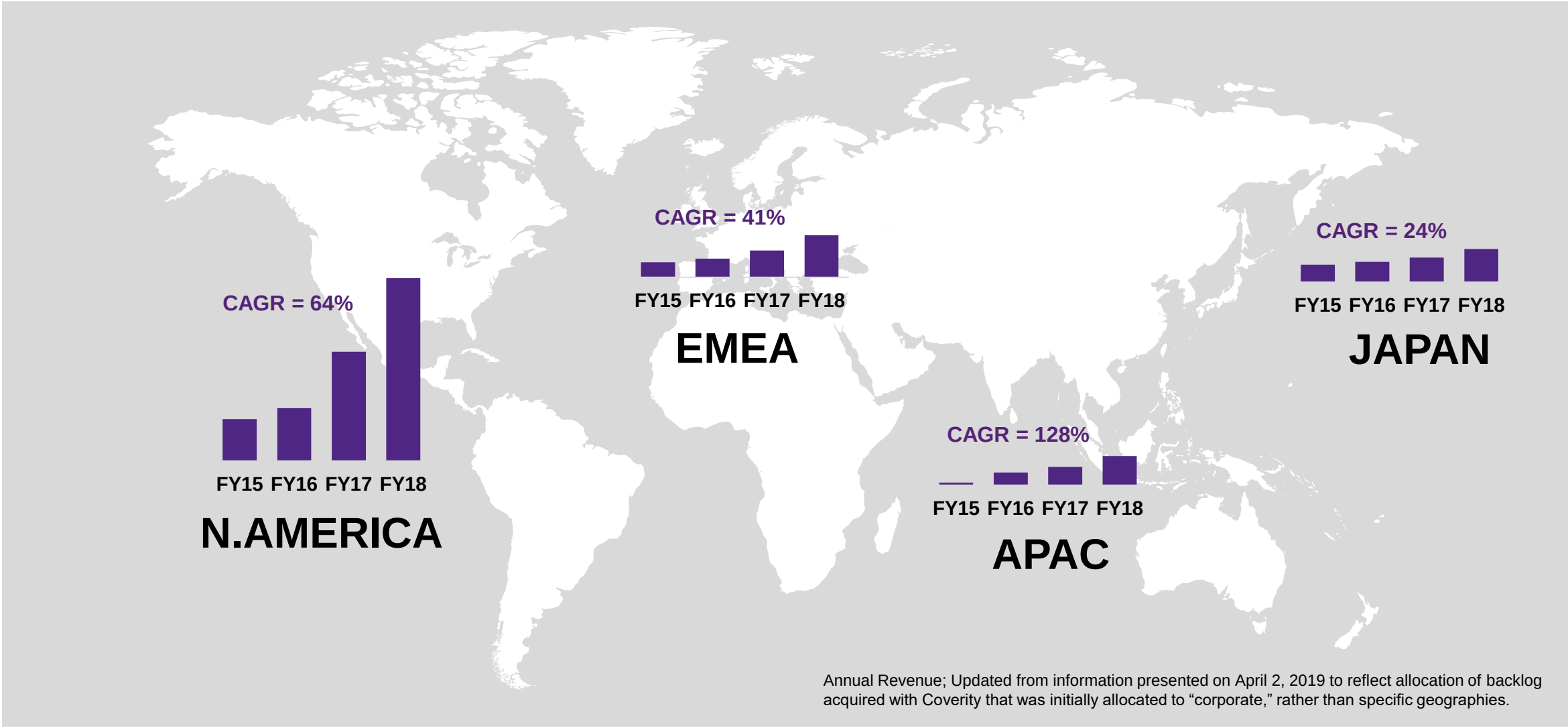
*Defined as customers beyond the historical Synopsys semiconductor and systems companies

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SYNOPSYS®

Expanding Geographically

RESULTS



Annual Revenue; Updated from information presented on April 2, 2019 to reflect allocation of backlog acquired with Coverity that was initially allocated to “corporate,” rather than specific geographies.

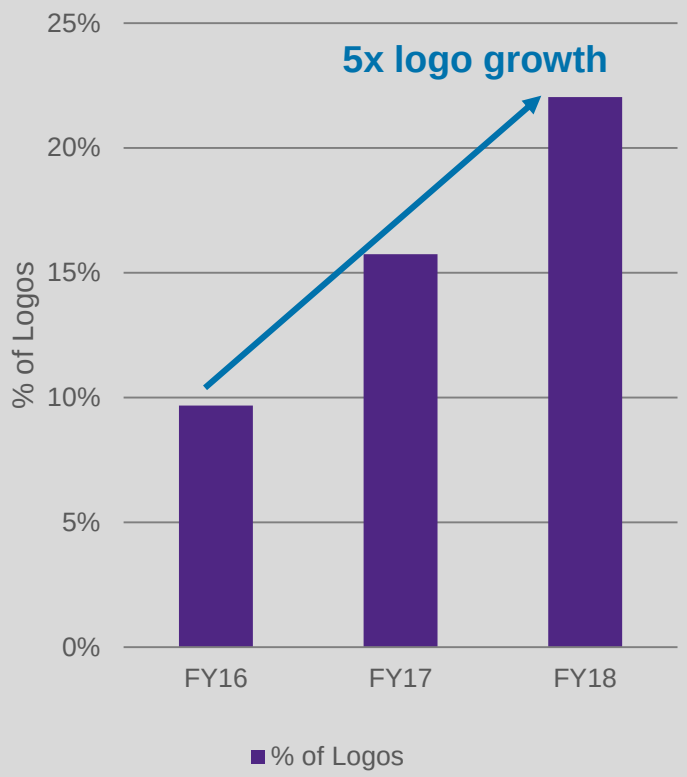
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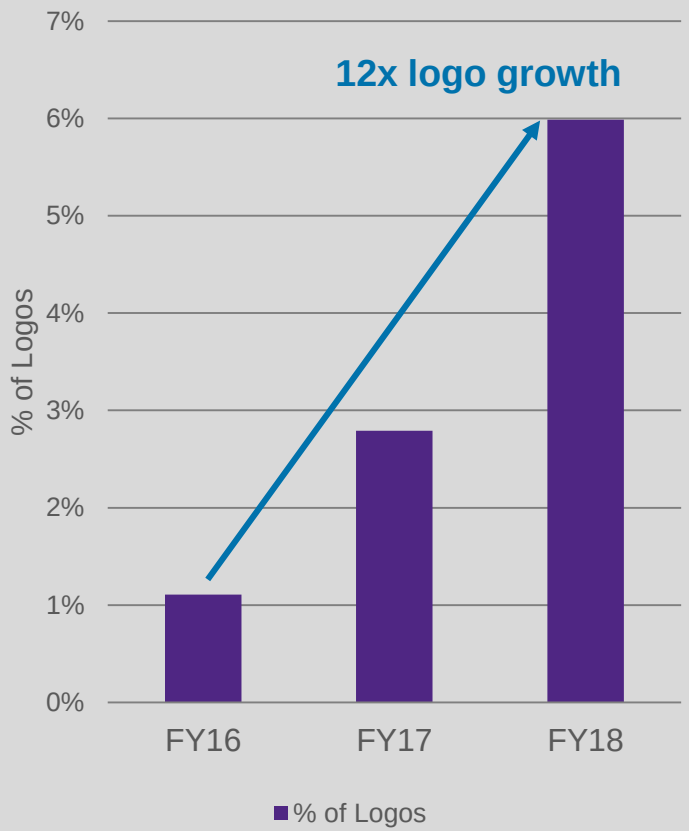
Expanding Platform Adoption: Products & Services

RESULTS

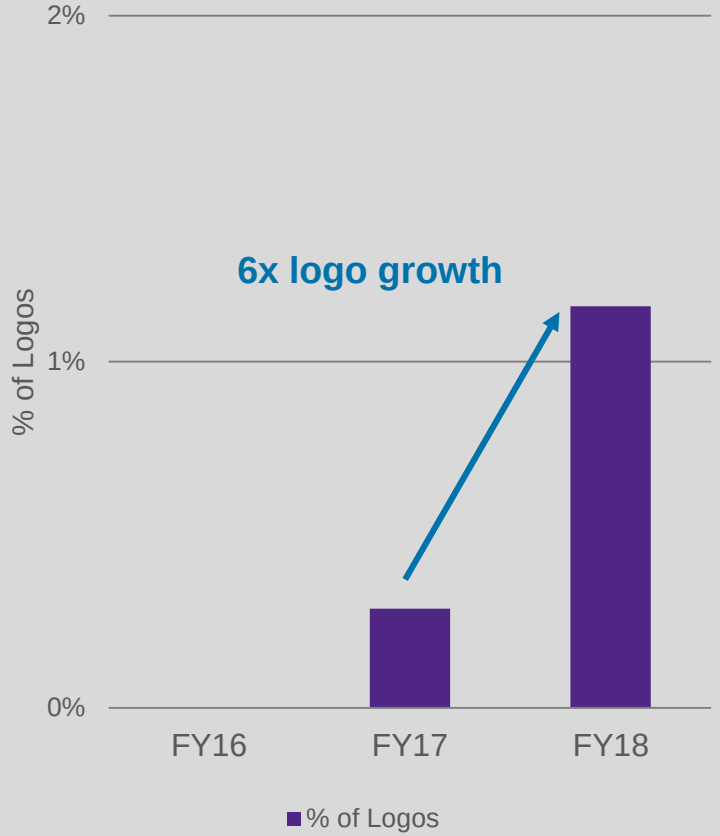
2 SOLUTIONS



3 SOLUTIONS



4 SOLUTIONS



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SYNOPSYS®

Growth Strategy



- Continue to scale business and extend our lead in this emerging market
  - *Land* in core and new verticals with best-in-class capabilities in each tool
  - *Expand* through suite of additional solutions delivered via integrated Polaris Software Integrity Platform™
  - *Leverage* existing international sales capabilities to drive global growth
- Gradually expand margins without hindering growth opportunity
  - Prudent expense management

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SYNOPSYS®



Partnerships for Secure Development

Graham Holmes
Sr. Director, Advanced Security Initiatives Group
2 April 2019

Security is a Cisco Priority



"Security is fundamental across our portfolio and business and is foundational to all we do at Cisco."

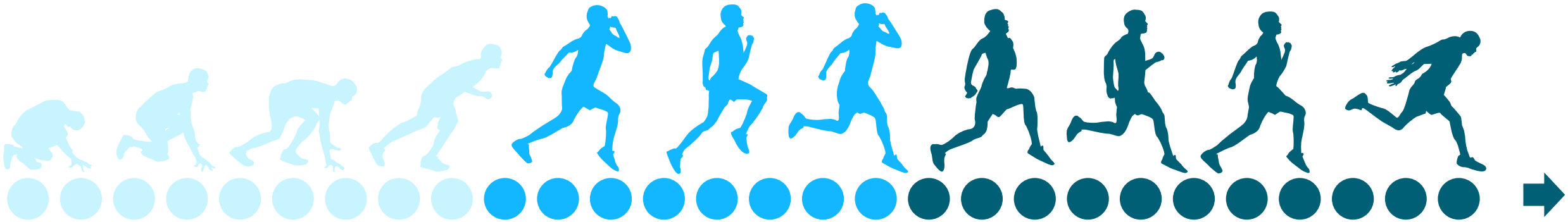
Chuck Robbins
CEO, Cisco

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Brand Promise

We securely connect everything to make anything possible

Cisco's Trust Journey



1st Gen hardware, software technologies, 2002-2005

1st Gen Product Security Requirements, 2003

Anti-counterfeit Protections, 2002

Security Ninja Education program, 2012

Cisco Value Chain Security, 2011

Cisco Secure Lifecycle Development, 2008

Snowden public disclosures, May '13

1st Transparency Report, Apr 2015

Transparency & TWS blog, Mar 2013

Cisco Trust Center, June 2015

SDL workflow automation, Jan 2015

Data Privacy Engineering, 2018

Security Release Criteria, 2018

Counterfeit Focus

Product Security Focus

Offer Security, Data Protection and Privacy Focus

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Built-in Security for our Offers



Cisco Secure Development Lifecycle

Ensure and enforce secure development practices when designing, building, and operating Cisco offers



Trustworthy Technologies

Design and implement trustworthy technologies in many Cisco products and solutions



Standards and Certifications

Align with global government and industry standards and certifications



Supply Chain Security

Enforce Cisco security policies across the Cisco supply chain



Other Secure Product Efforts

Privacy by design

Automation

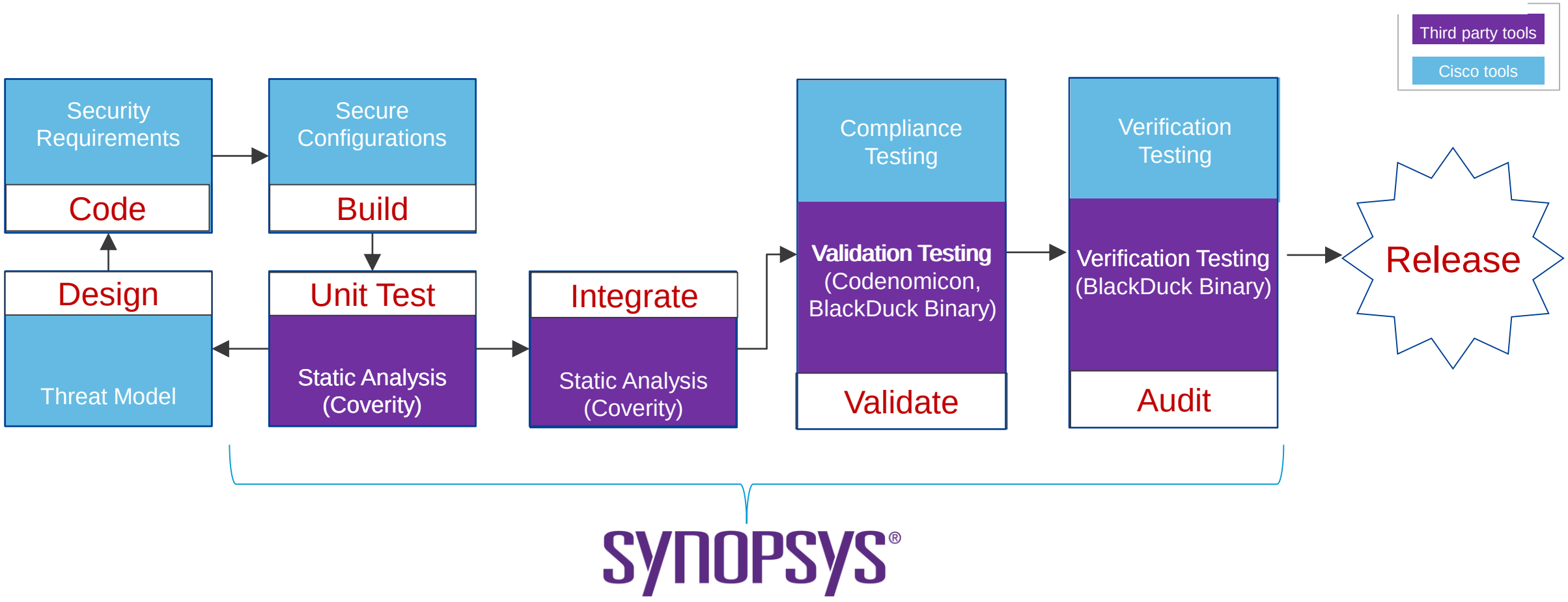
Advanced Pen Testing

Security partnerships

Digitization of Security @ Speed of business

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Partnerships in Secure Development Lifecycles



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Partnerships in Secure Development Lifecycles



CISCO

Digitization of Security @ Speed of business

SYNOPSYS®

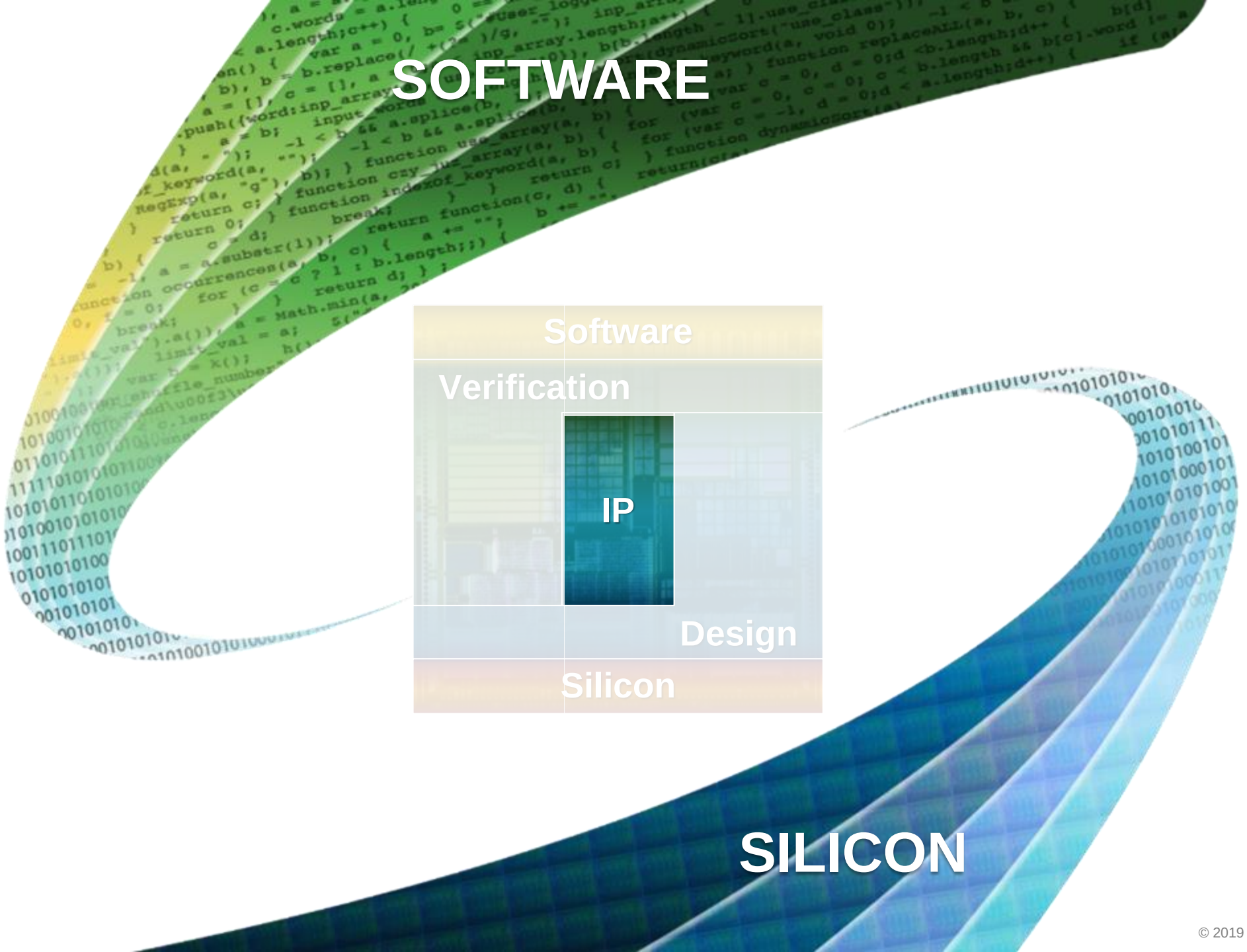
Software Security Tools	Customer Success and Professional Services	Benchmarking

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Semiconductor IP

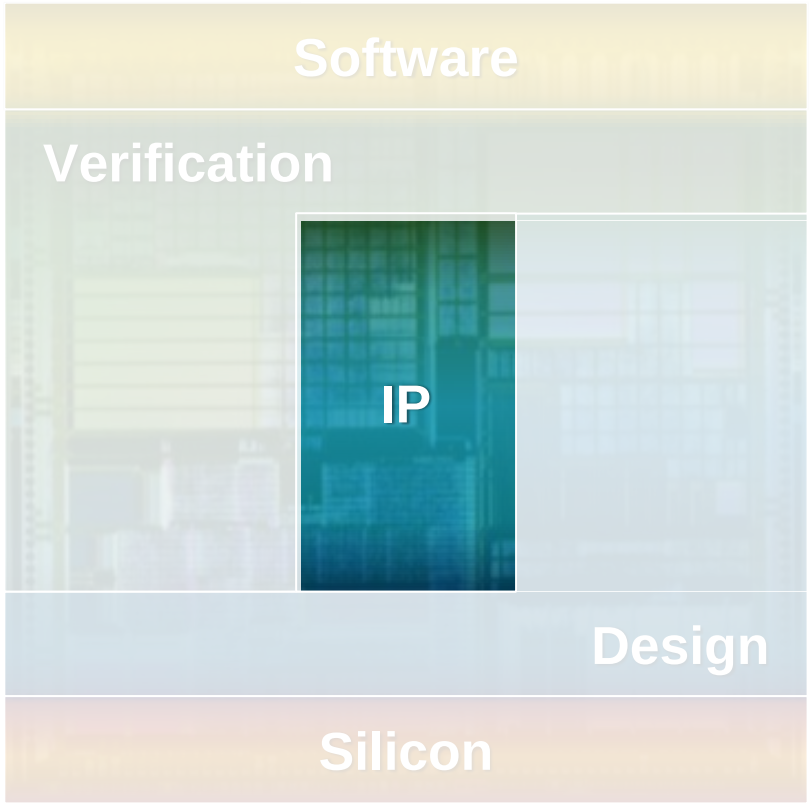
John Koeter
VP Marketing, Solutions Group



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Comprehensive Semiconductor IP Portfolio

Pre-designed functional blocks that are integrated onto larger SoCs

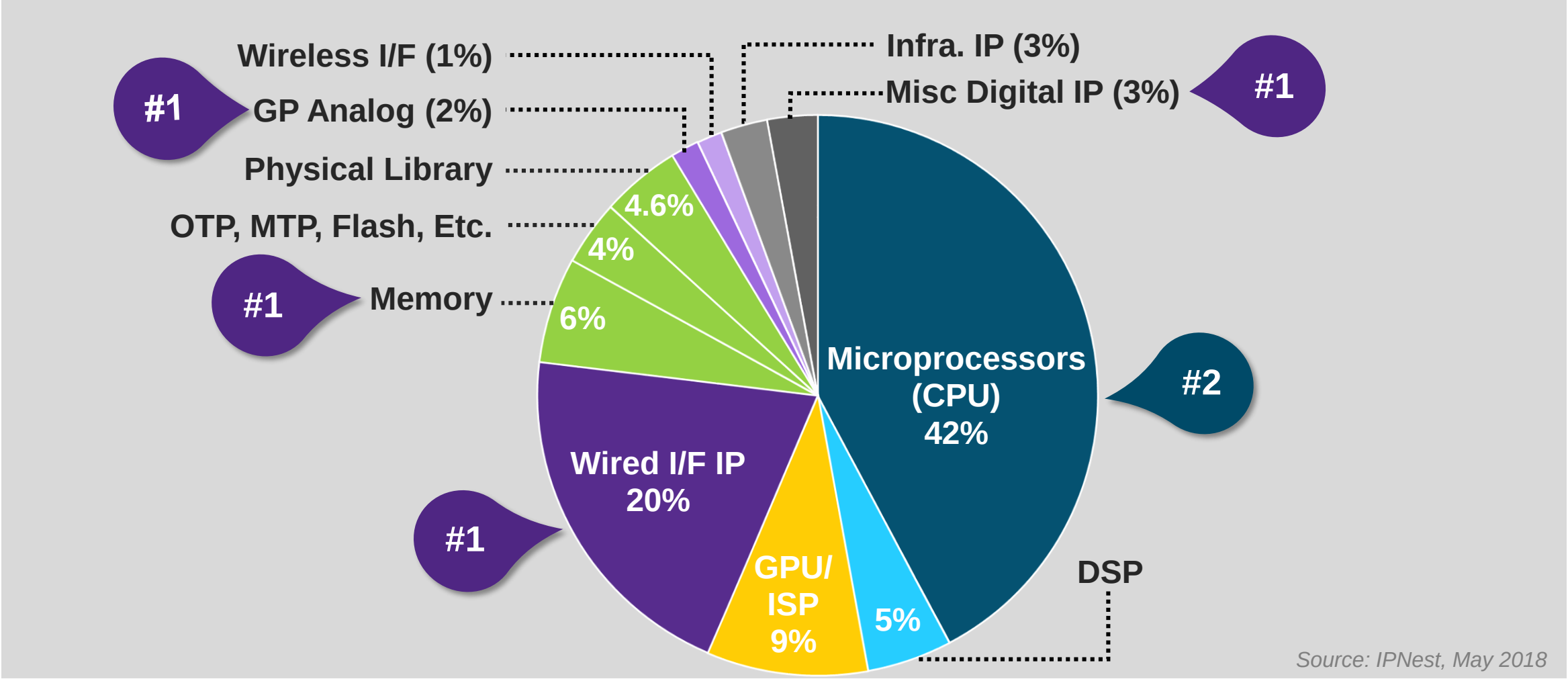


- 20%-plus of total revenue; low double-digit growth
- Market leader in interfaces, embedded memory, physical IP (foundry-specific) and analog IP
- New markets (Auto, AI, Cloud) driving additional opportunities
- Customers' demand for complete IP solutions leading to deep relationships and one-stop shopping
- Quality, track record of reliability and a broad portfolio are critical to scaling IP

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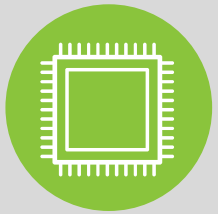
Semiconductor IP Market Segments

2018 Design IP Revenue: $3.6B



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IP Growth Drivers



Outsourcing

Design teams focused on differentiation



Complexity

Protocols are more complex; Moore’s Law, Integration

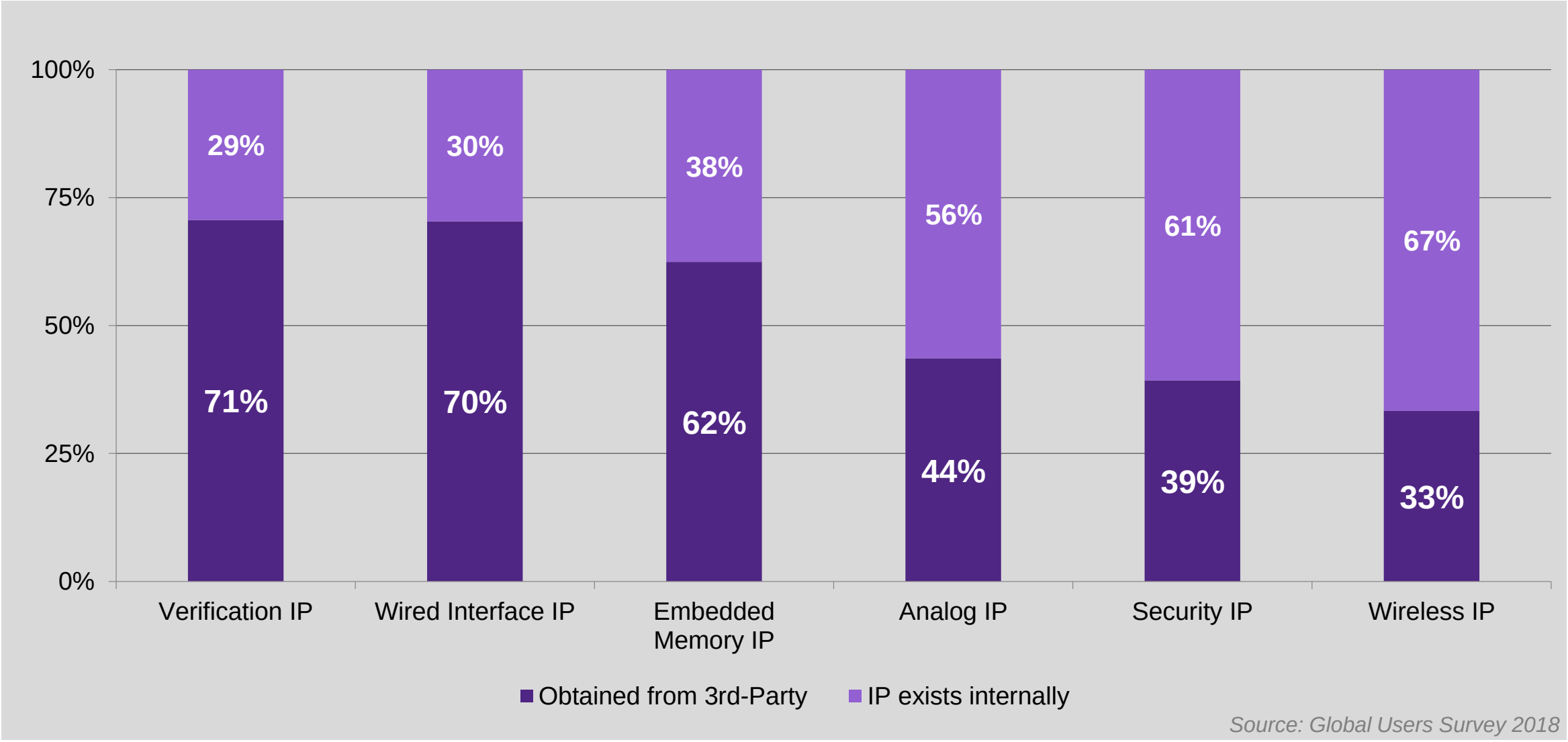


New Markets

Automotive, AI, IoT, Hyperscale computing

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Third Party IP Use Continues to Grow

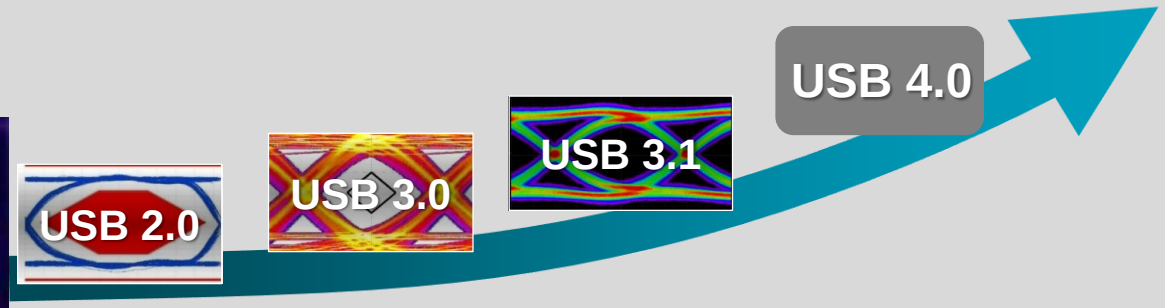


Source: Global Users Survey 2018

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Complexity: New Protocols, Integration and New Process Technologies Drive New Opportunities

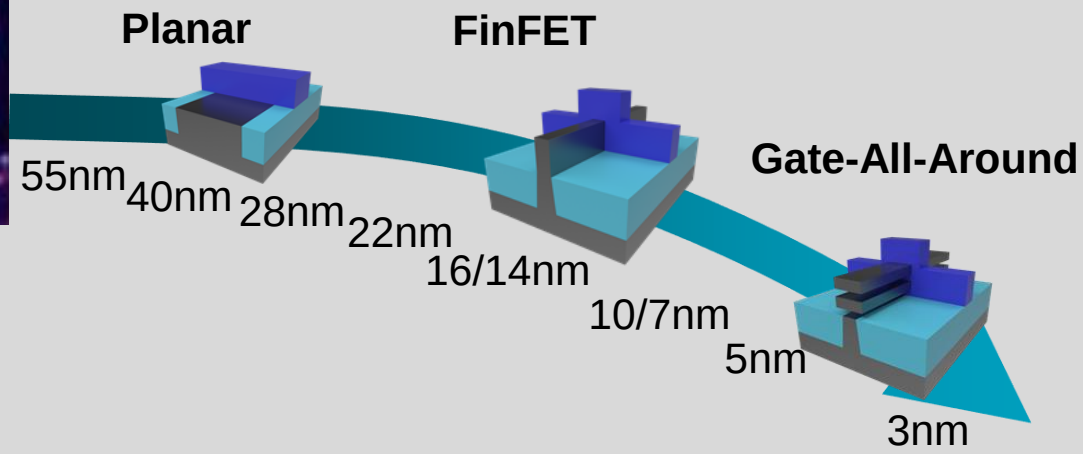




IP titles get more complex



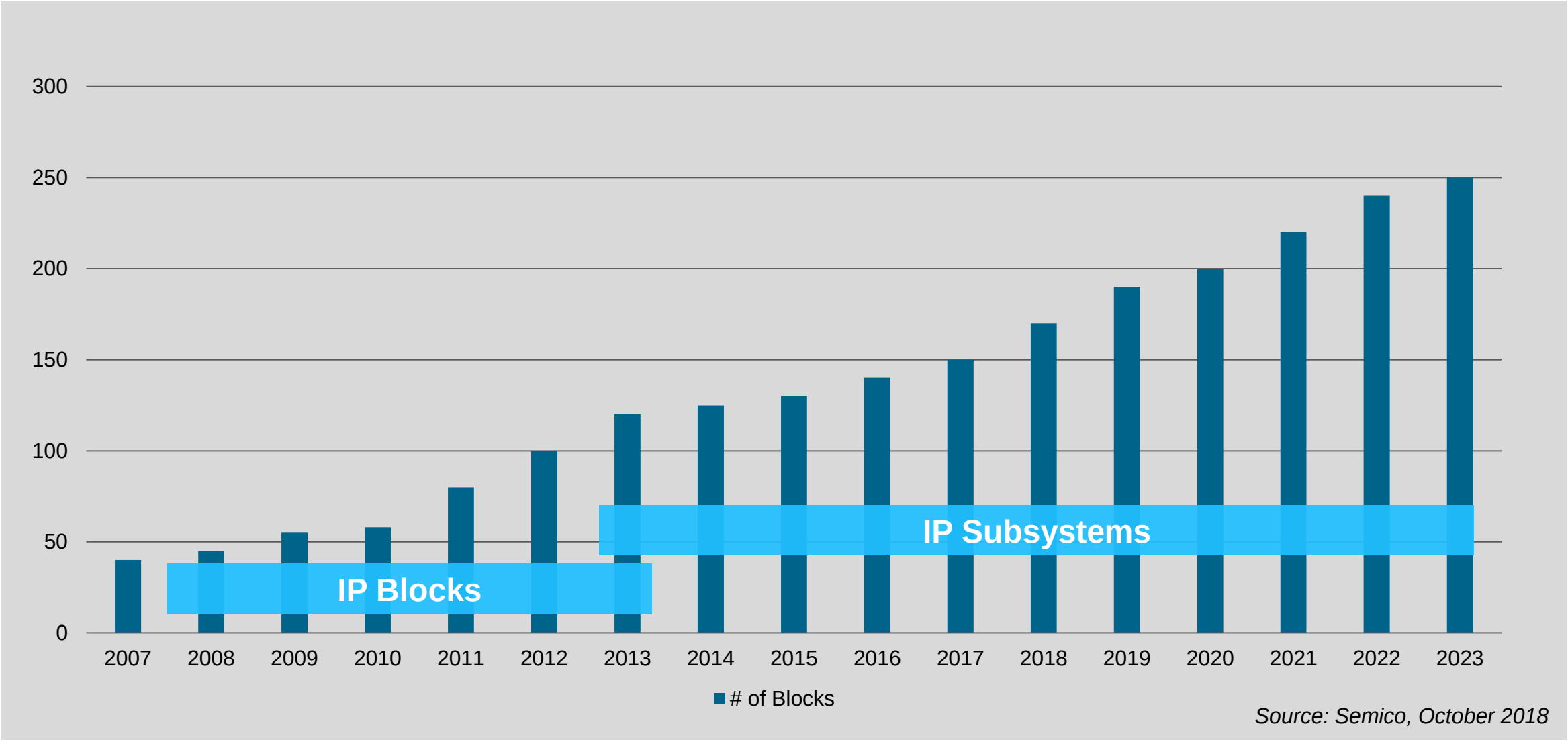
More functions integrated



Moore's law drives design complexity

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IP Moving from Blocks to Complex, Integrated IP Systems



Source: Semico, October 2018

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New Markets: More Functionality in Key Markets

Driving New Technology Requirements



AI

Machine Learning, Deep Neural Networks



AUTOMOTIVE

ADAS, Infotainment, Connected Vehicle



CLOUD

Networking, Servers AI Accelerators

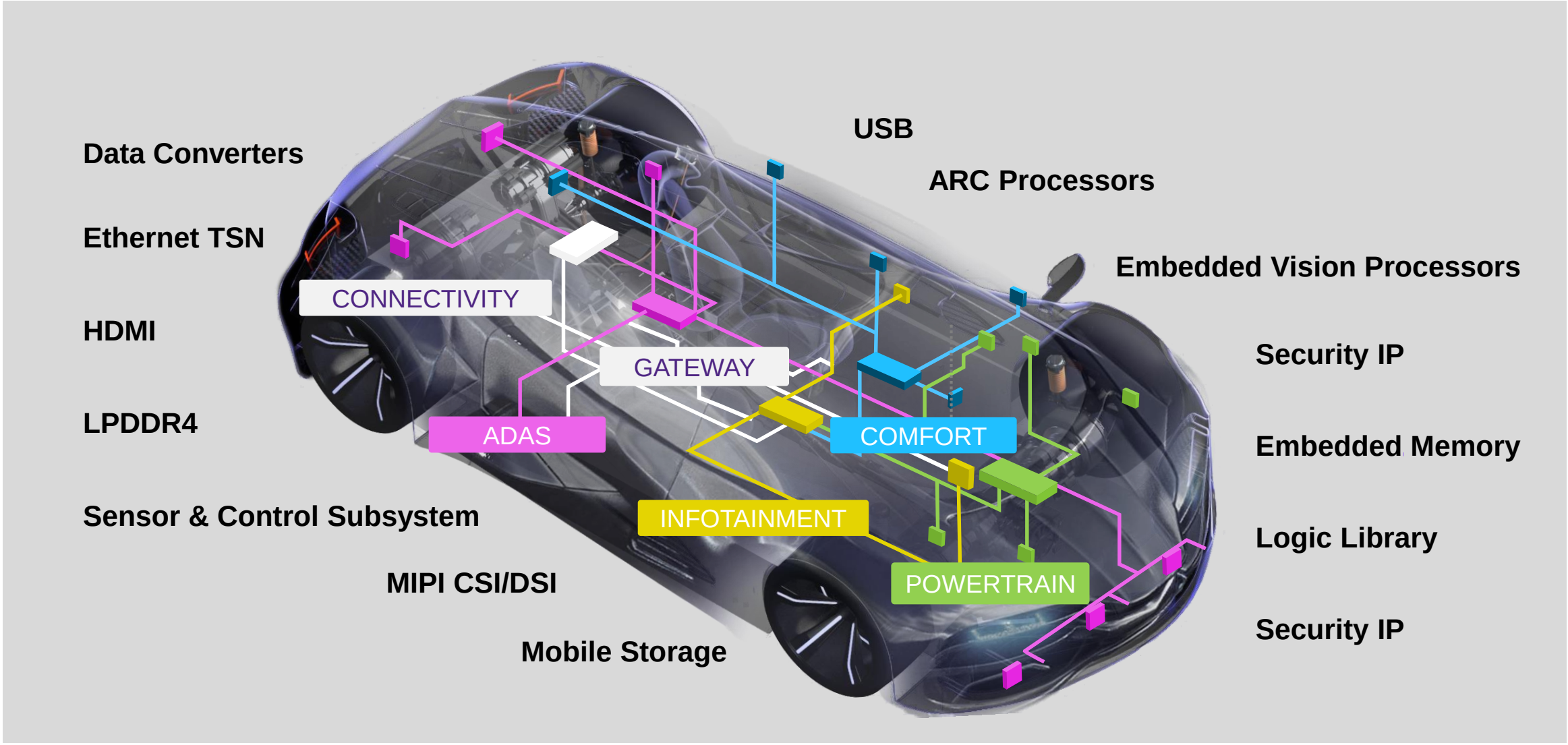


IoT

Smart Home, Industrial, Wearables

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IP Enabling Critical Functions in Automotive SoCs



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New Markets Driving Green Field Opportunities

Outsourcing IP Key To Meeting Technology Requirements

FABU Selects DesignWare® IP to Deliver Intelligence in ADAS & Autonomous Driving SoCs

"Our ADAS and autonomous vehicle chip uses DesignWare IP to help us integrate intelligent functionality into our SoC and accelerate the path to achieving system-level ISO 26262 compliance."

America FABU

Hang Nguyen
CTO, R&D Division



FABU Technology Selects Synopsys' DesignWare IP Portfolio to Deliver Intelligence in ADAS and Autonomous Driving SoCs

Portfolio of Silicon-Proven IP Meets Artificial Intelligence Processing, Memory, Connectivity, and Security Requirements while Accelerating Automotive Functional Safety Assessments

MOUNTAIN VIEW, California and TEMPE, Arizona, Feb. 4, 2019 /PRNewswire/ -- Synopsys, Inc. (NASDAQ: SNPS) and FABU Technology Co., Ltd. today announced that FABU has selected a portfolio of silicon-proven Synopsys DesignWare® Interface, Security, ARC® EM Safety Island Processor, and Embedded Memory Test and Repair IP to deliver high-performance artificial intelligence (AI) system-on-chips (SoCs) for advanced automotive applications. FABU develops intelligent chips for object and lane detection, traffic light detection, vehicle localization, motion analysis, and environmental recognition that are used in advanced driver assistance

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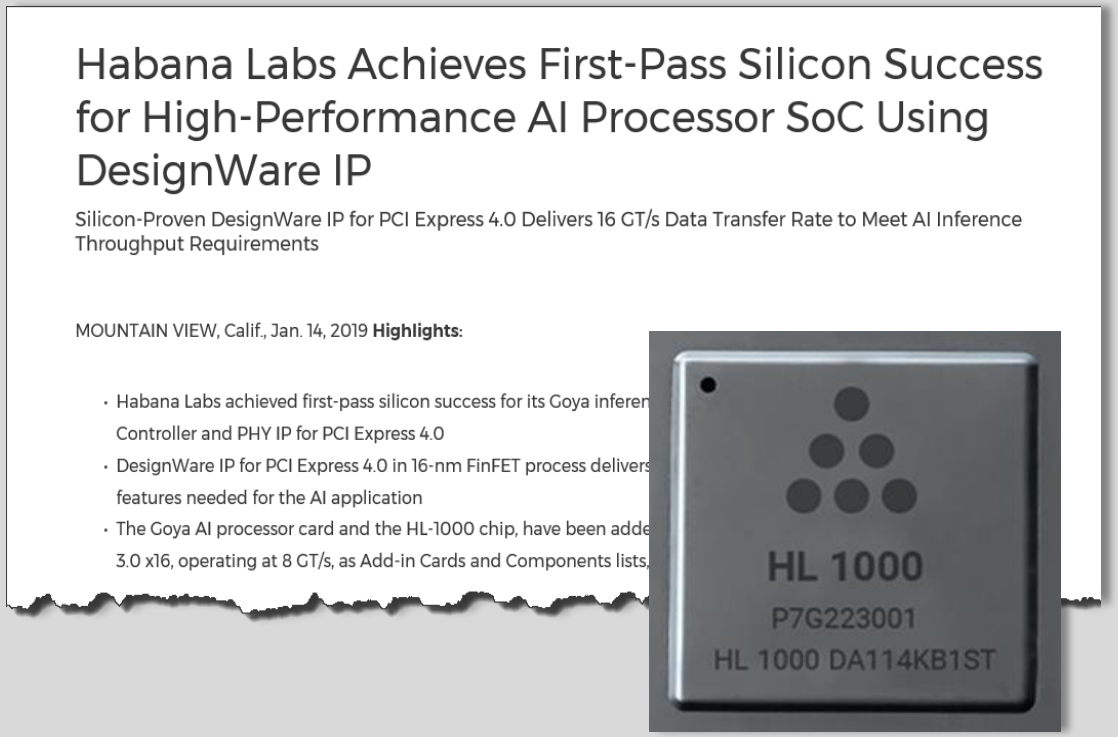
Habana Labs Achieves First-Pass Silicon Success for High-Performance AI Processor SoC Using DesignWare IP

DesignWare® for PCI Express 4.0 Delivers Required AI Inference Throughput

"After an extensive evaluation process, we selected Synopsys' leading 16 GT/s DesignWare IP for PCI Express 4.0 due to its established track record in the industry and advanced features required for the most demanding data-intensive SoCs..."

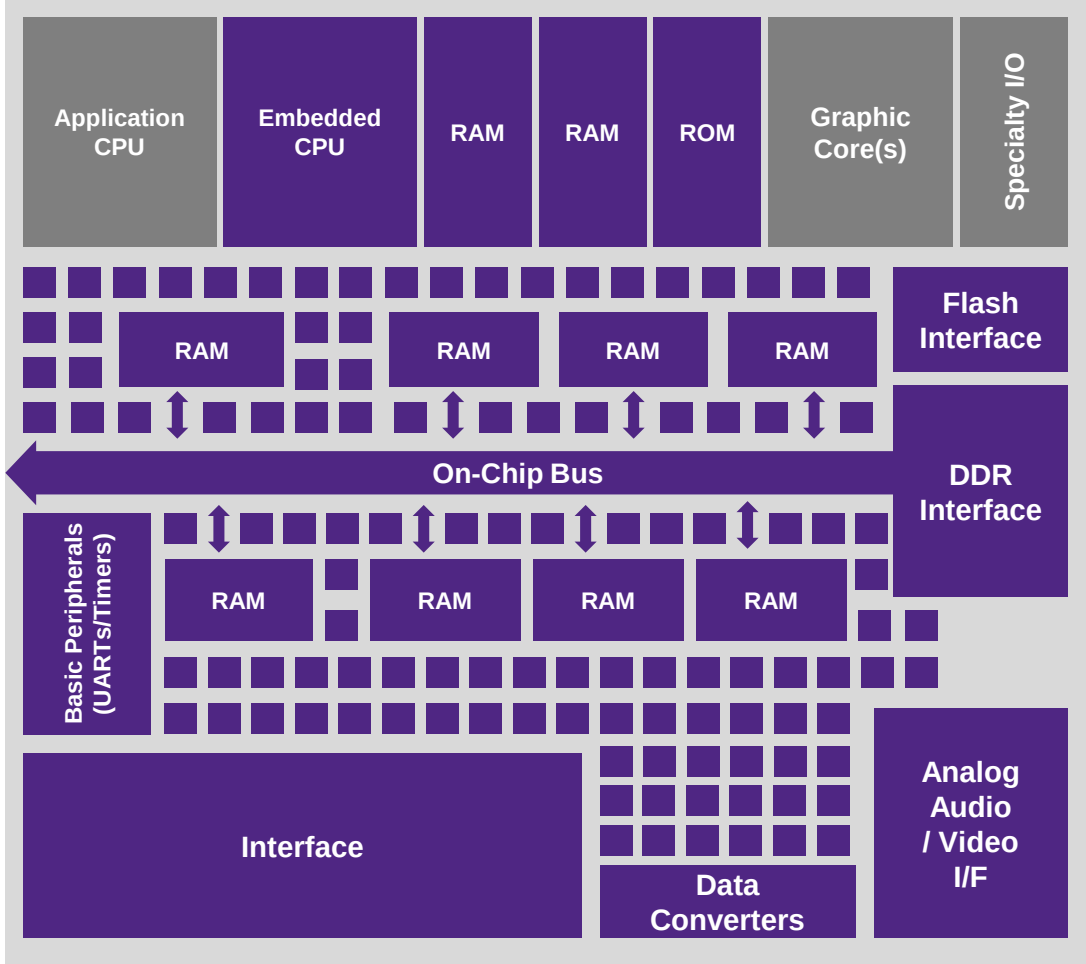
habana

Eitan Medina
Chief Business Officer
at Habana Labs



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Synopsys DesignWare® IP



* Small boxes are standard cell library elements.

- Broadest portfolio available in the market
- Covers vast majority of chip
- Growing demand for more integrated subsystems
- New markets drive new opportunities
- Customers count on us for the long haul

Synopsys Portfolio

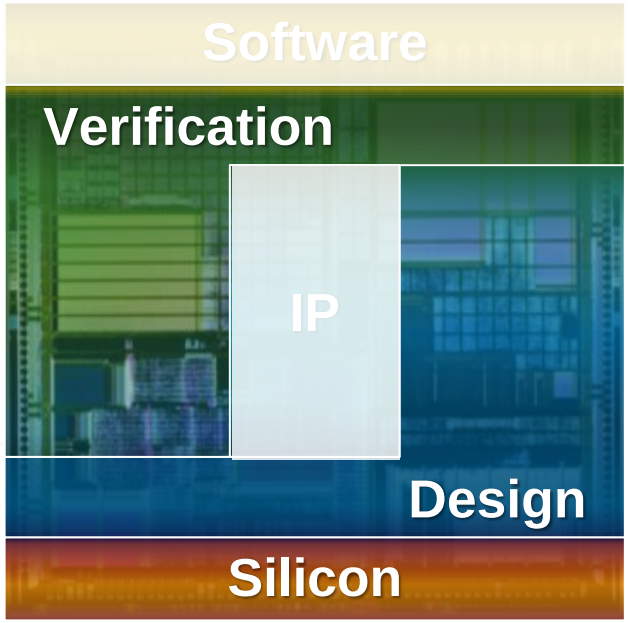
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Electronic Design Automation

Sassine Ghazi
Co-GM, Design Group

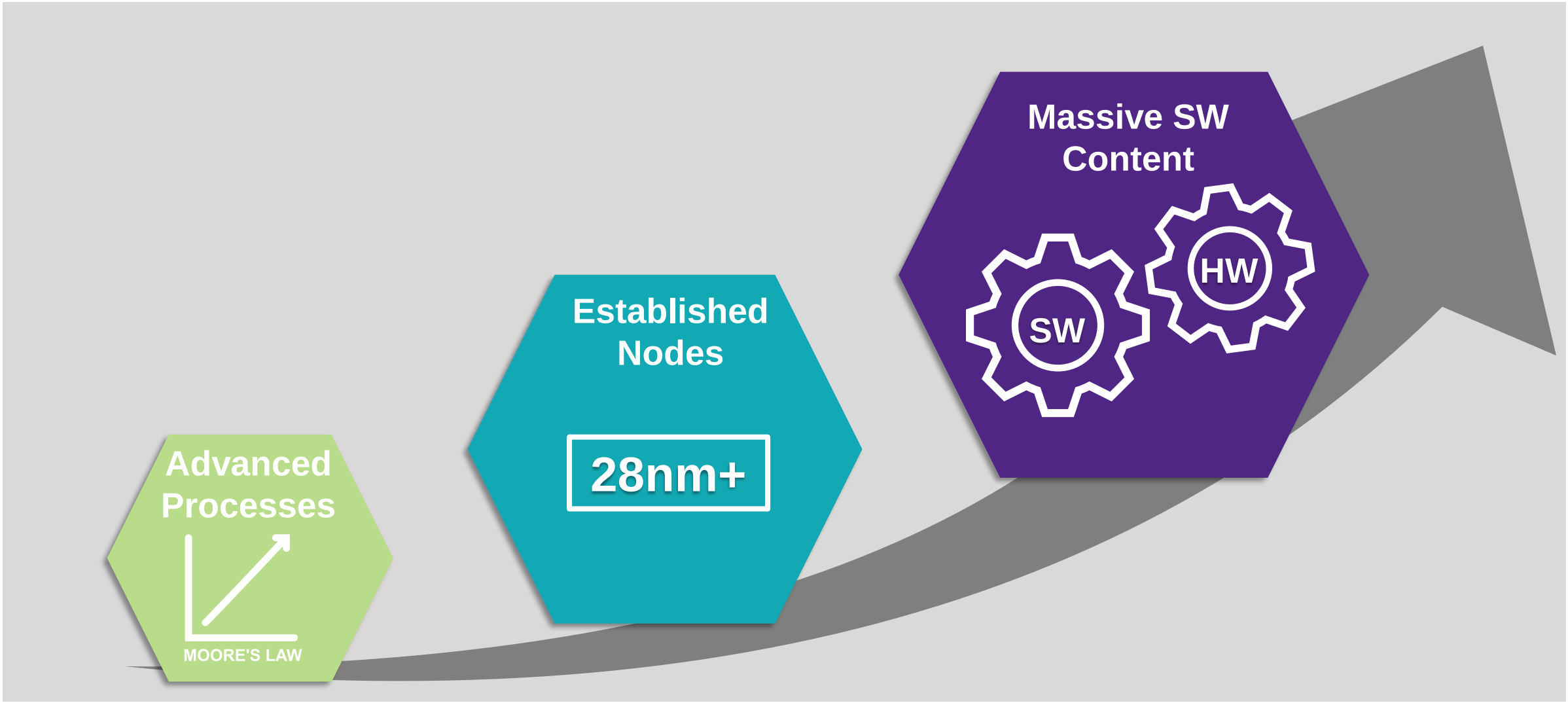
SOFTWARE



SILICON

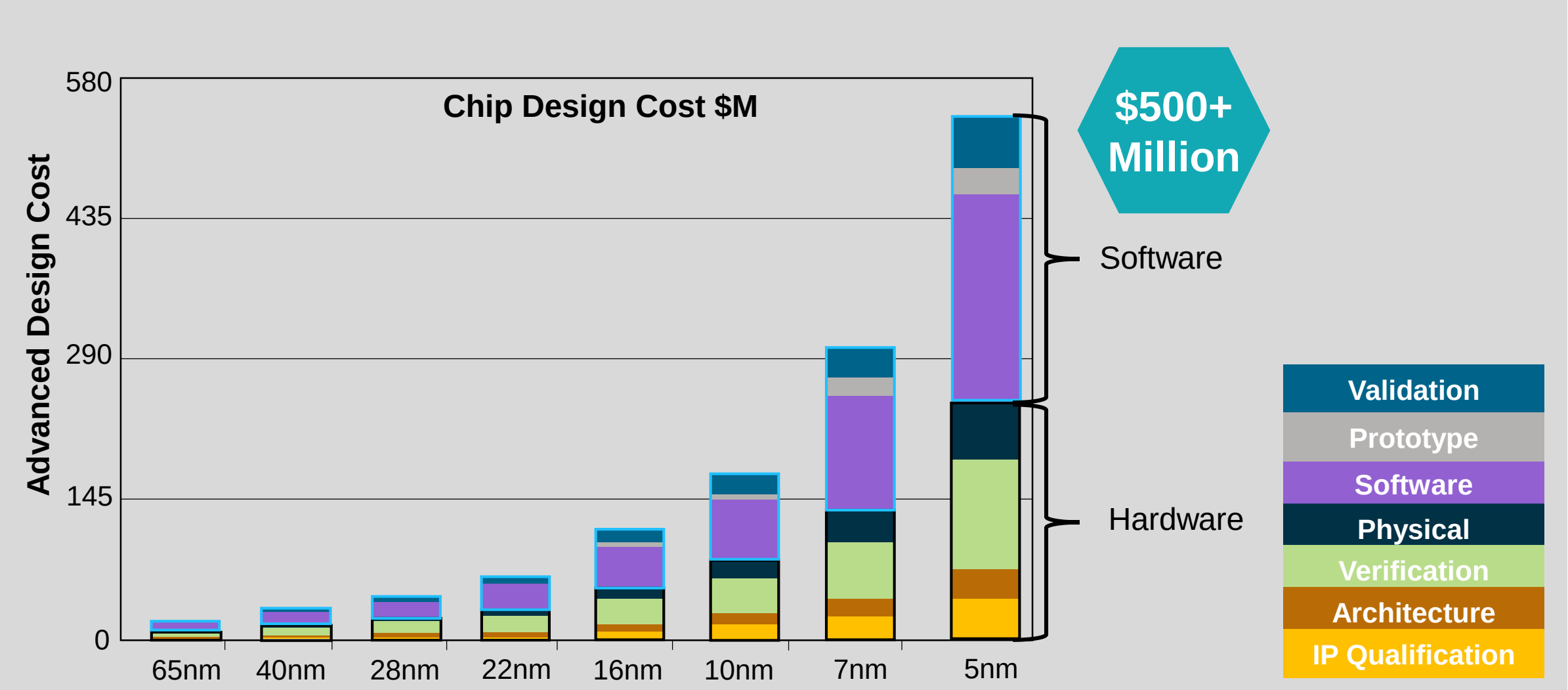
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What Drives EDA? Design Complexity



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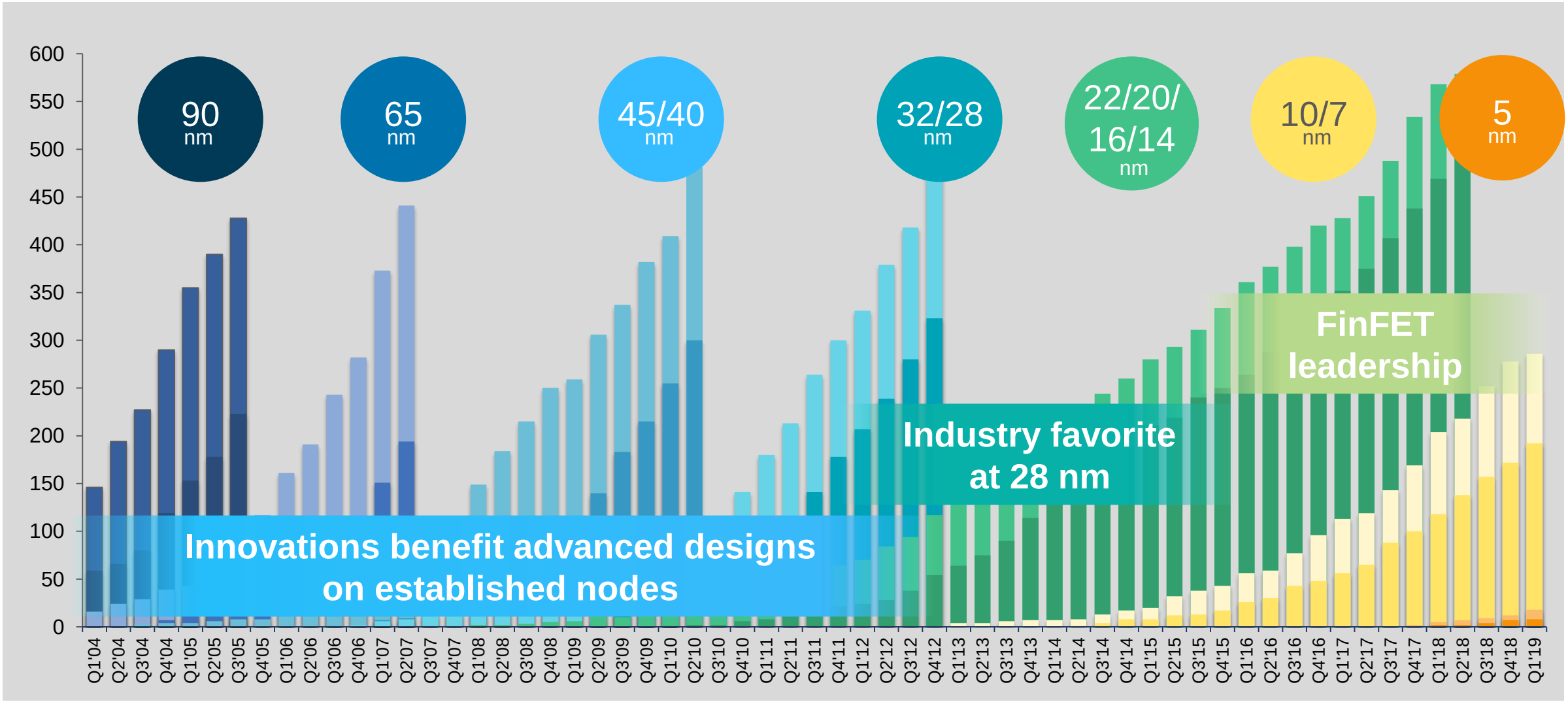
Chip Designs are Huge Investments



Source IBS, July 2018

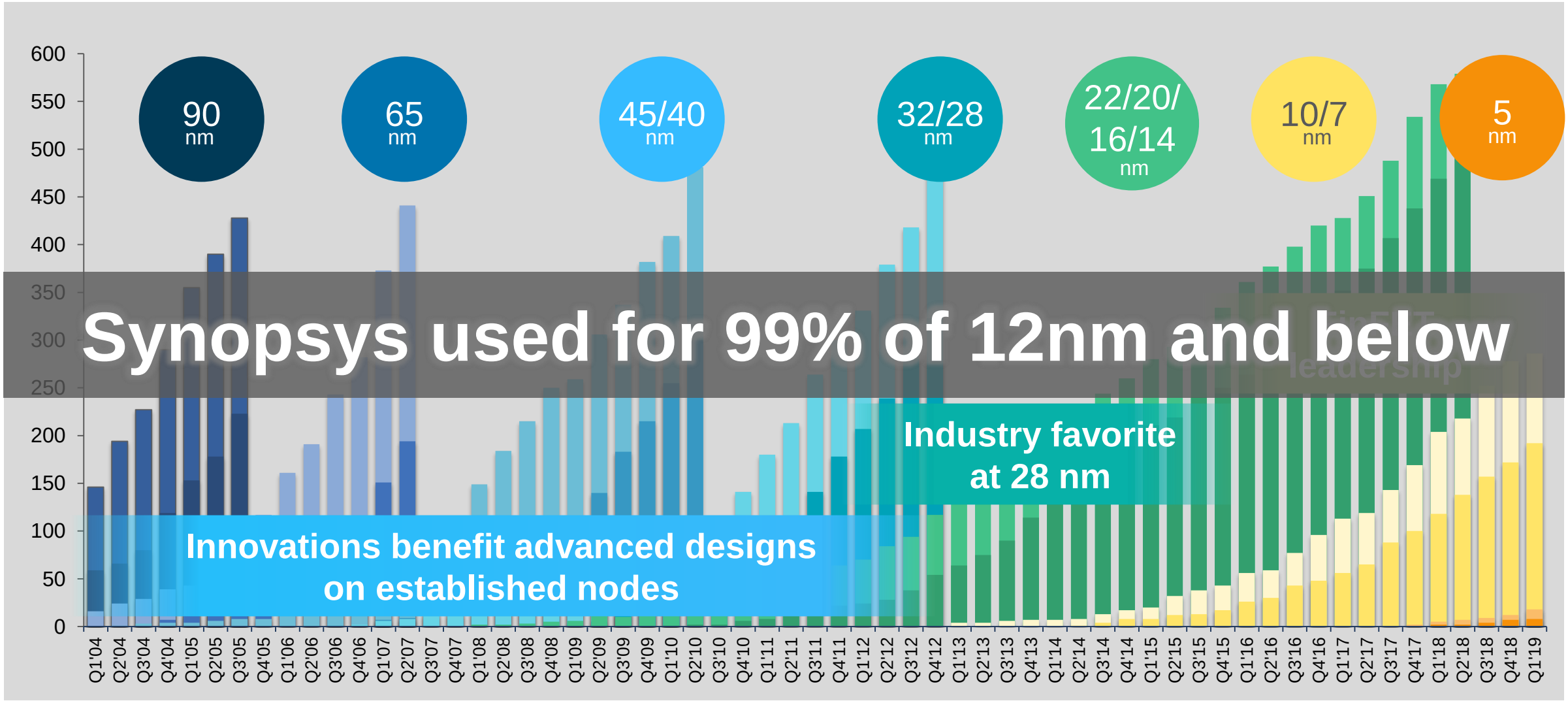
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Leader in Advanced Process Designs



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Leader in Advanced Process Designs



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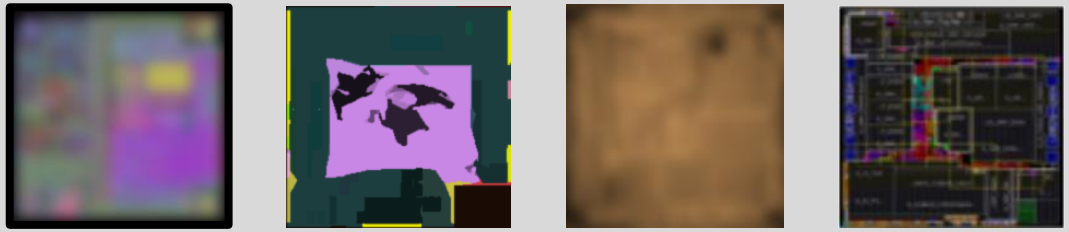
Leader in Advanced Process Designs

Industry Leader at 7nm

Early Successes Shared at SNUG and DAC



Wide Customer Deployment Across All Segments



Automotive | Networking | Server | Mobile

Highly Advanced GAA Design

World's First Advanced Gate-All-Around Tape-out

SAMSUNG

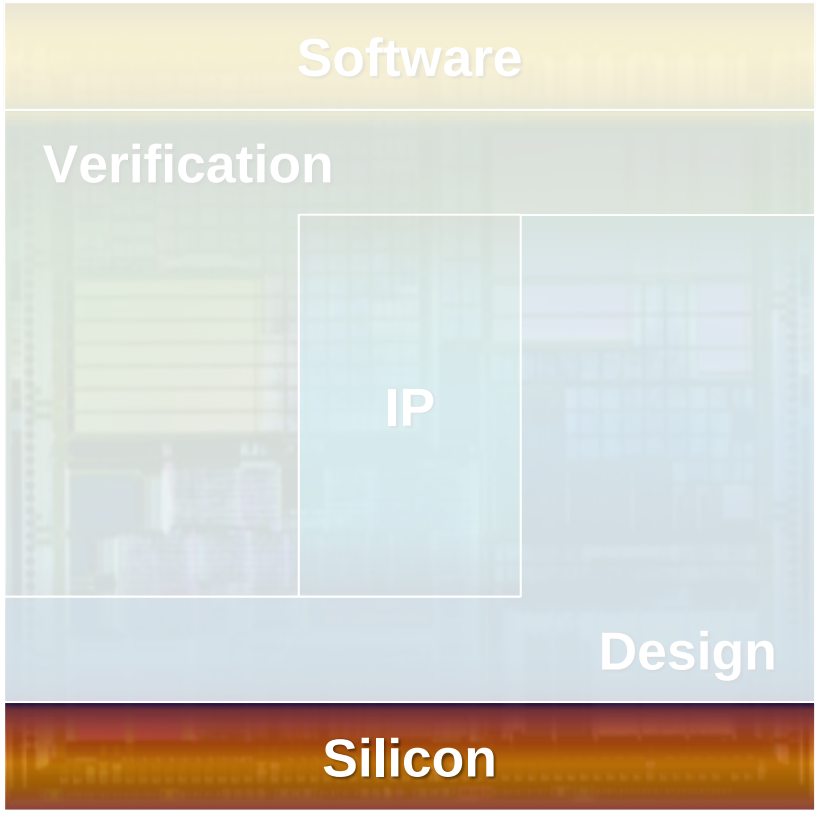
- Fusion Design Platform™
- Extensive collaboration with Samsung Foundry
- Full-flow validation of target power, performance, area

DC | ICC II | PT | Star RC

Source: Press Release Feb. 20, 2019

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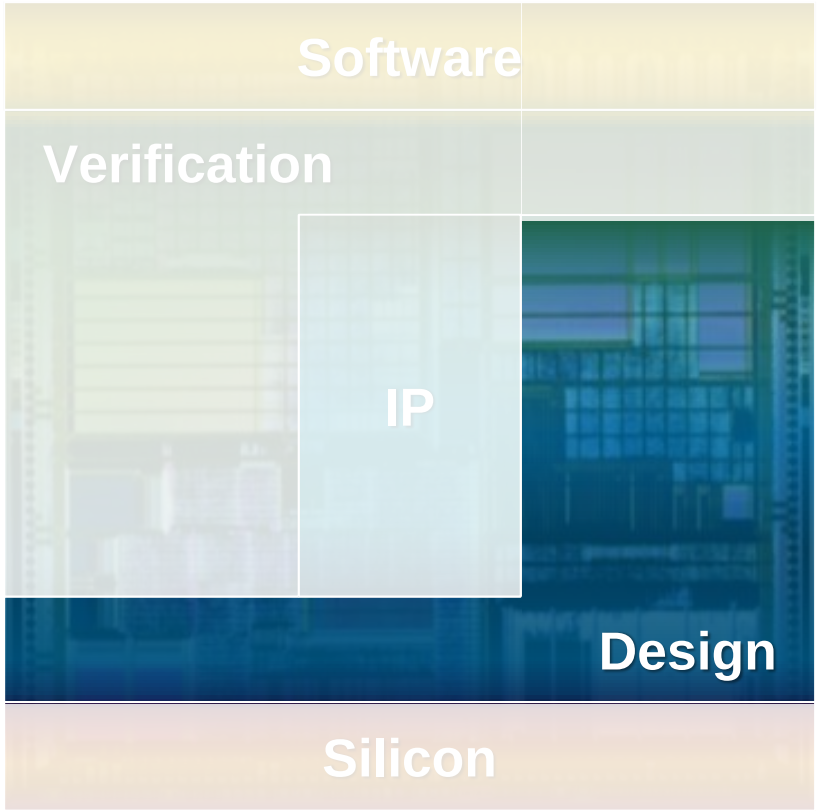
#1 in Silicon Manufacturing Solutions



- Synopsys TCAD tools used by virtually all major semiconductor manufacturers
  - Earliest access to critical process models
- Synopsys OPC used
  - to generate 80% of logic foundry revenues
  - at all top memory fabs
- Yield management solution reduces time to production yield

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#1 in Design Solutions



- Market and technology leader
- 14 of top 15 semiconductor companies use Synopsys as their primary digital design solution
- Growing adoption of custom/analog design solution

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From Position of Strength . . .

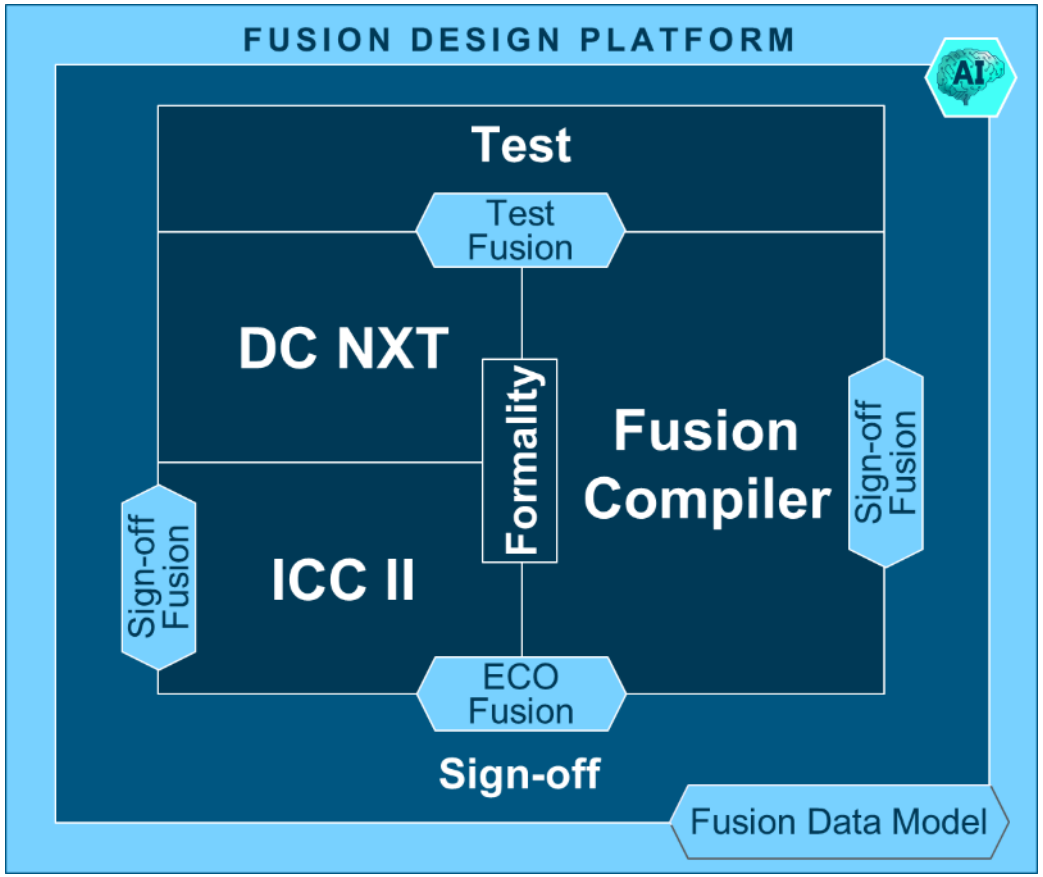


. . . To Next Level of Impact

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Synopsys Fusion Design Platform™

Trusted Anchor Products, Correlated Platform with Synergistic Value Links



Trusted Anchor Products

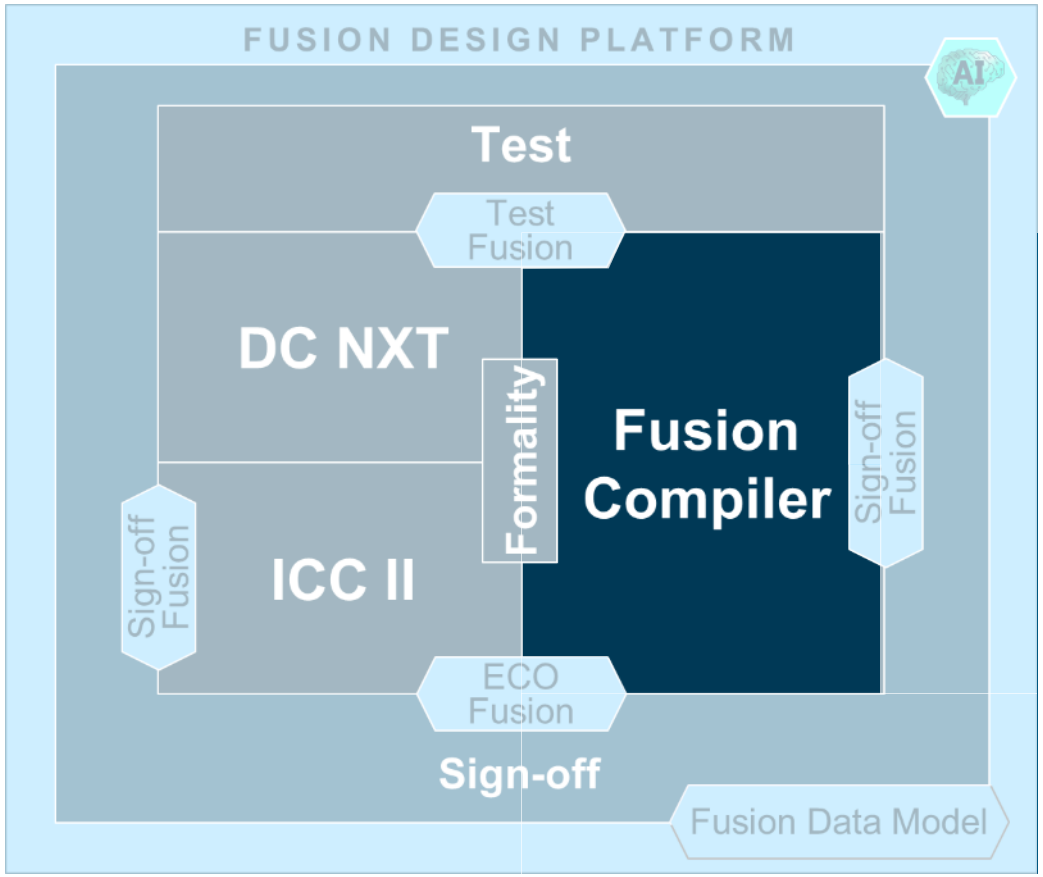
- #1 Synthesis, #1 P&R, #1 Signoff
- Machine Learning Technologies
- Massively Parallel Architecture

Correlated Platform with Value Links

- Deep Integrations Across Platform
- In-Design Physical Signoff
- Co-Design Custom Implementation

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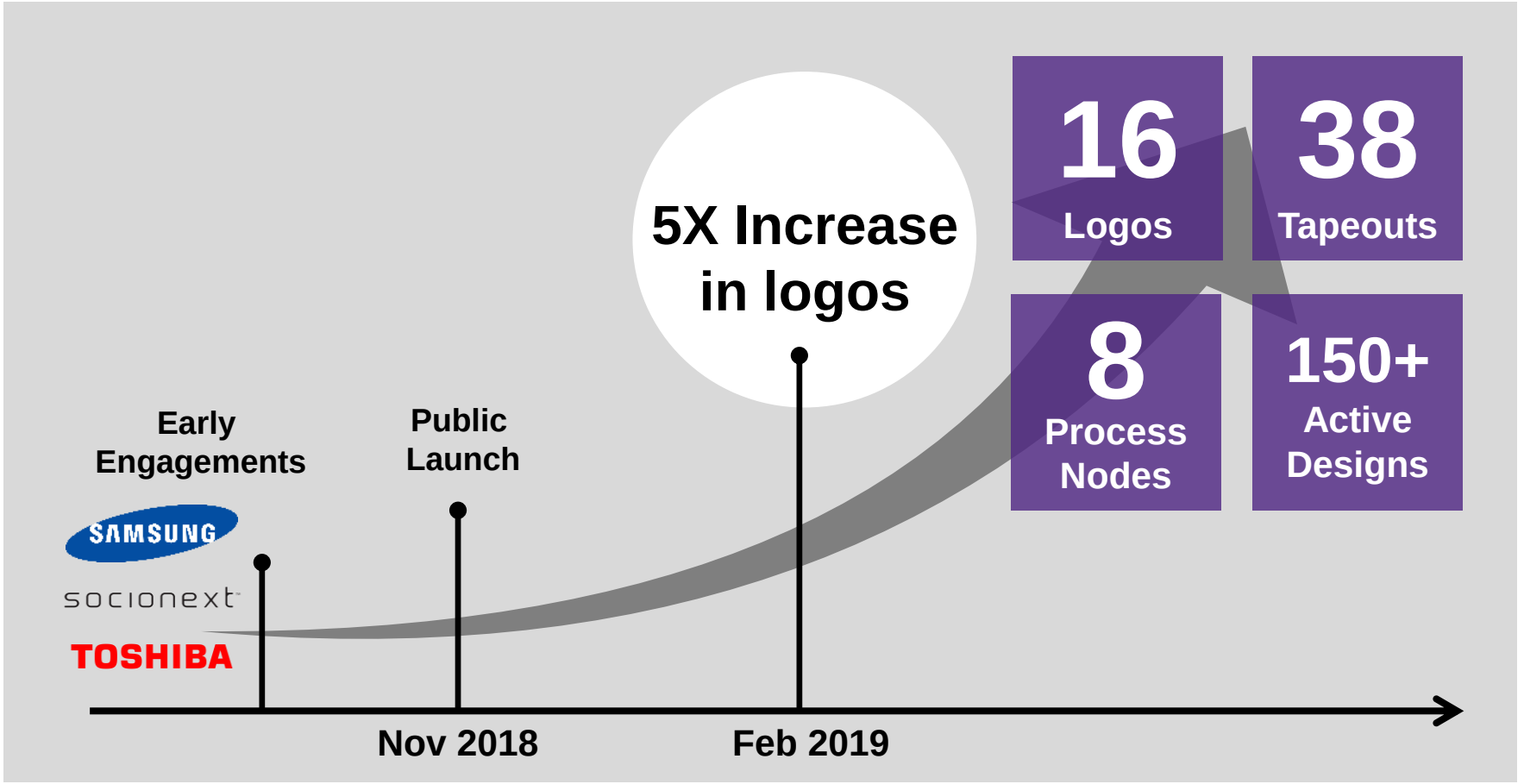
Introducing Synopsys Fusion Compiler™

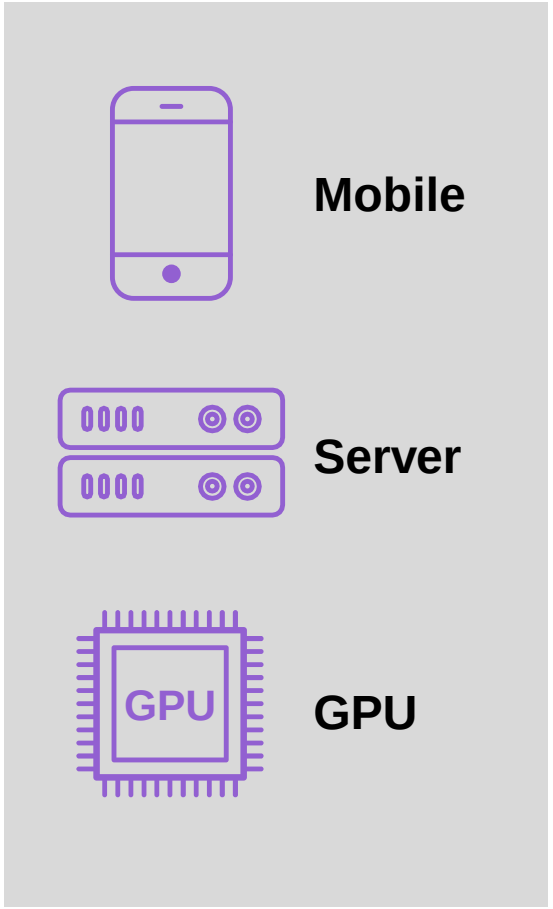


- Only single product on market that integrates synthesis, place & route and key signoff technologies
- Built with market-leading products
- Redefines conventional product boundaries; sharing of algorithms, code and data model
- New synthesis engine, developed from ground up for significantly higher capacity & performance
- Additional capabilities over next year

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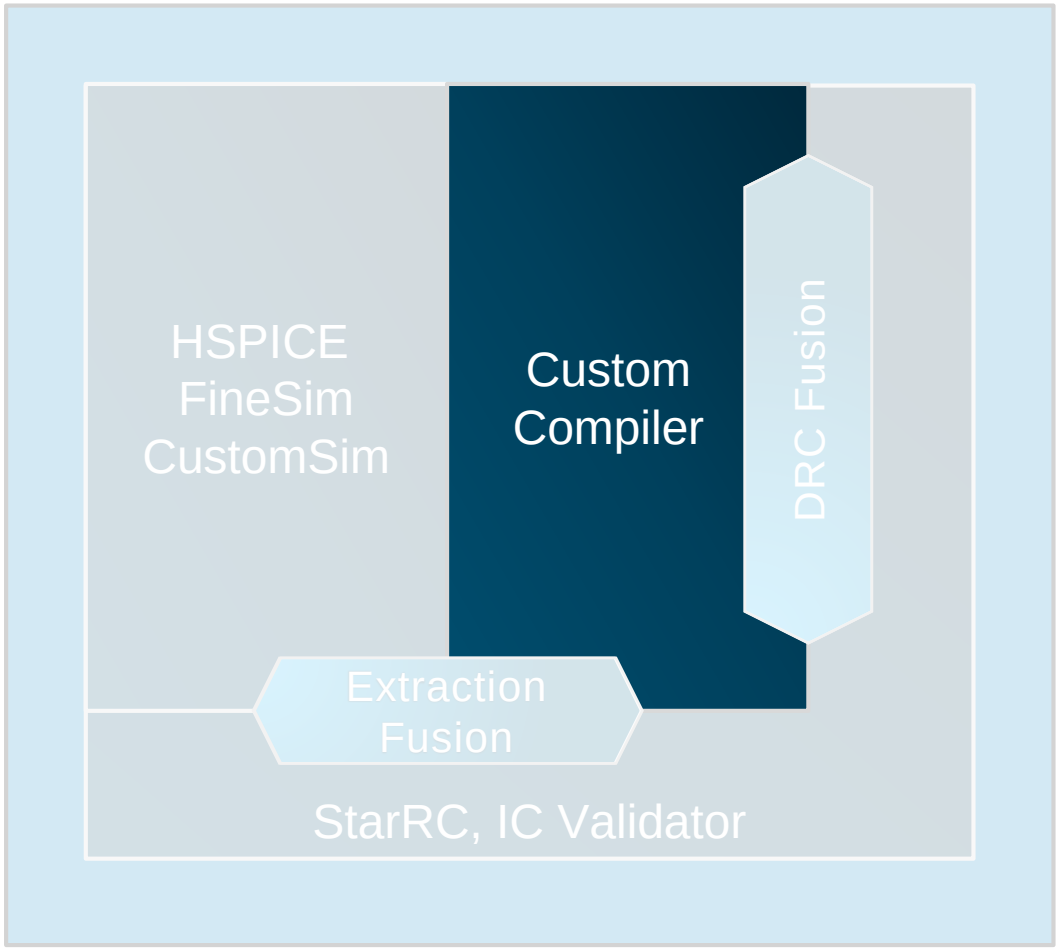
Fusion Compiler™: Unprecedented Customer Ramp-up

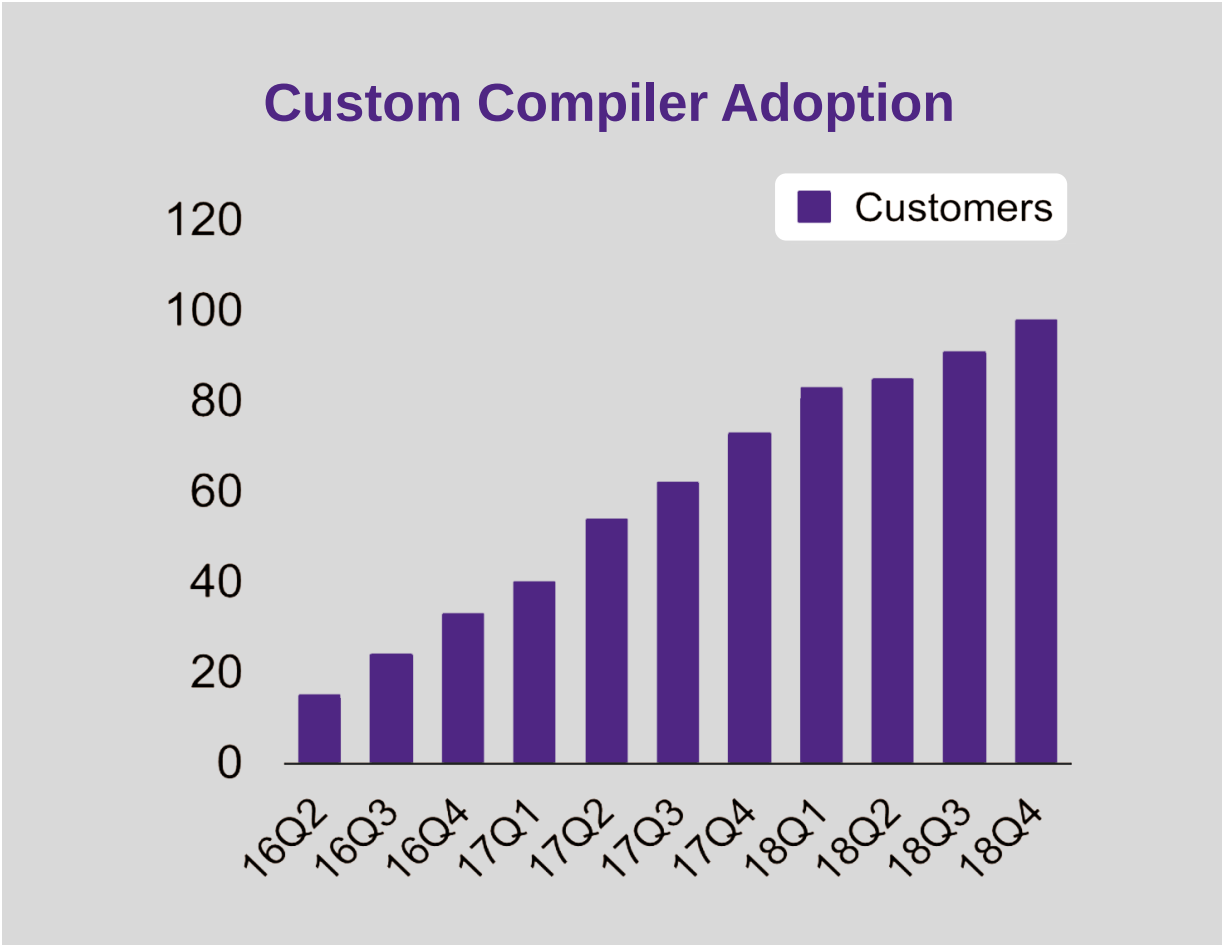




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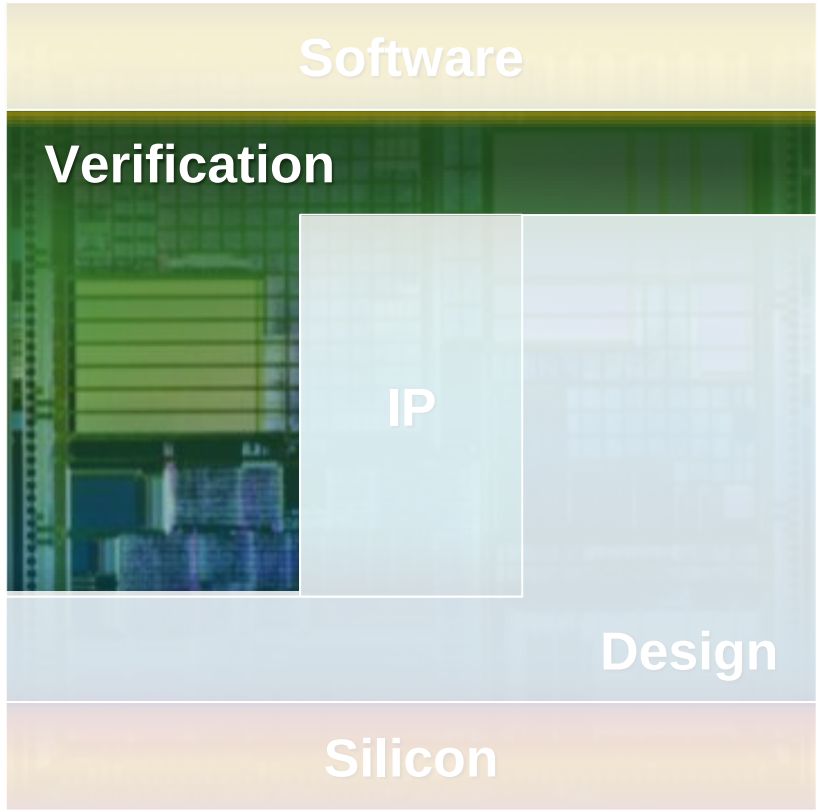
Synopsys Custom Compiler™ Adoption Growing





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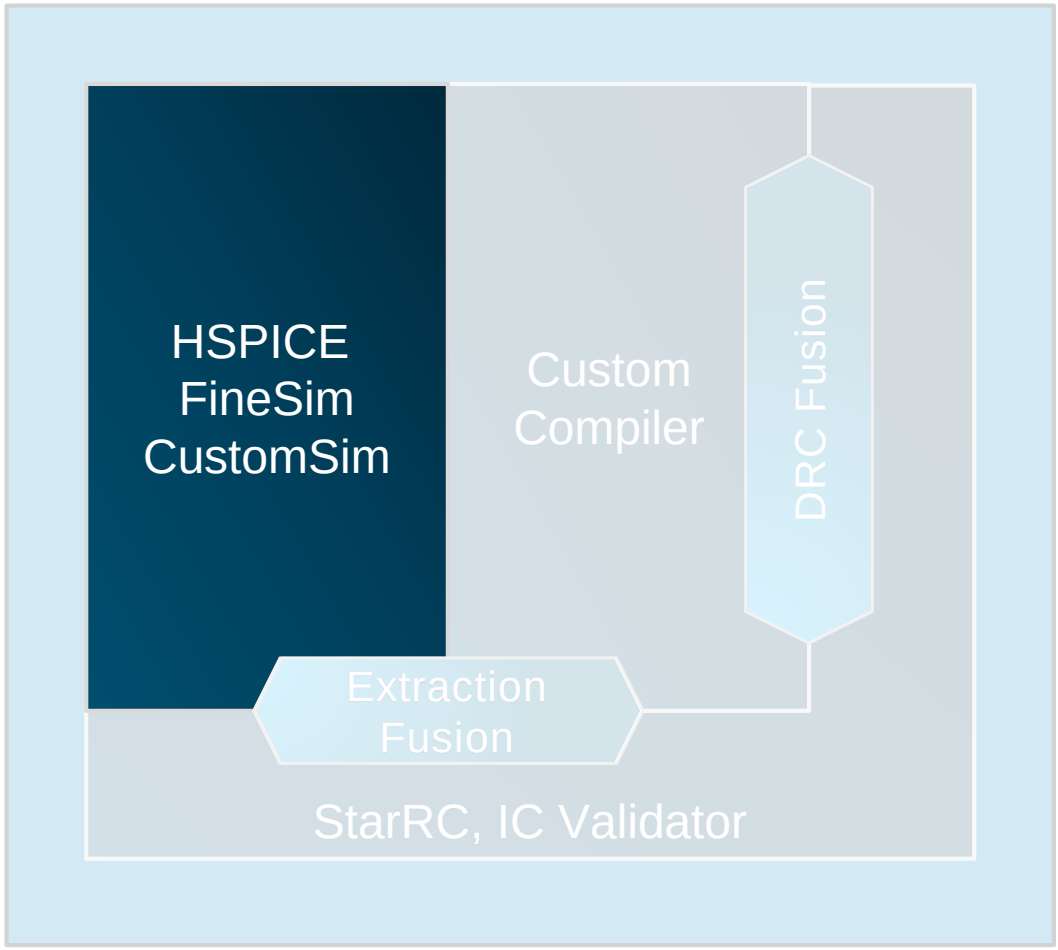
#1 in Verification Solutions



- Verifying most complex SoCs in the world
- Clear market leader in digital and analog/mixed signal
- Market leader in verification software since 2008
- Market leader in verification hardware since 2016
- 12 of top 15 semiconductor companies use VCS® as their primary verification solution
- CustomSim™ deployed at 14 of top 15 semi companies
- HSPICE® : Golden reference at 9 of 10 top foundries

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#1 in Analog/Mixed Signal Simulation



Circuit Simulation Leadership

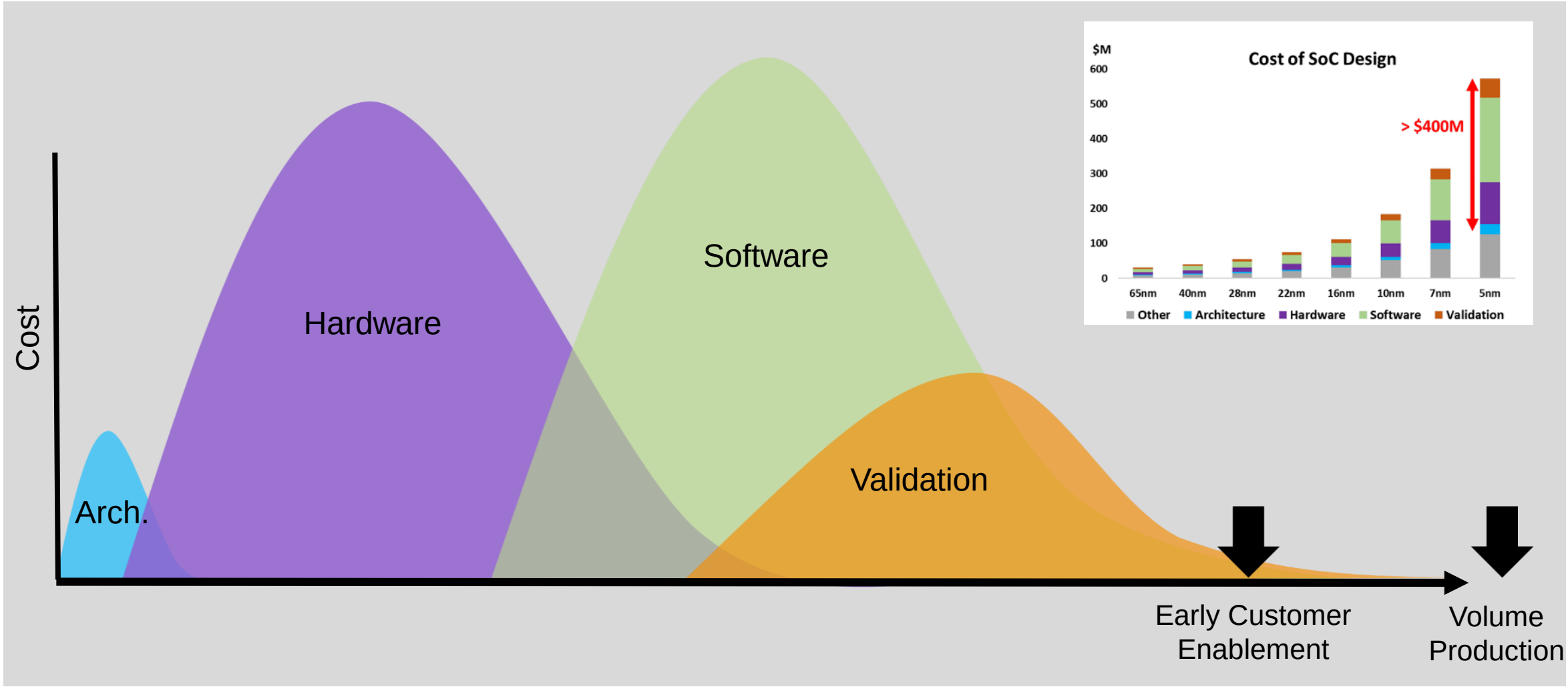


- Market leader for >20 years
- Close collaboration with leaders in memory, automotive IC and high-performance computing

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Complexity Driving Unsustainable Growth in Cost, Schedules

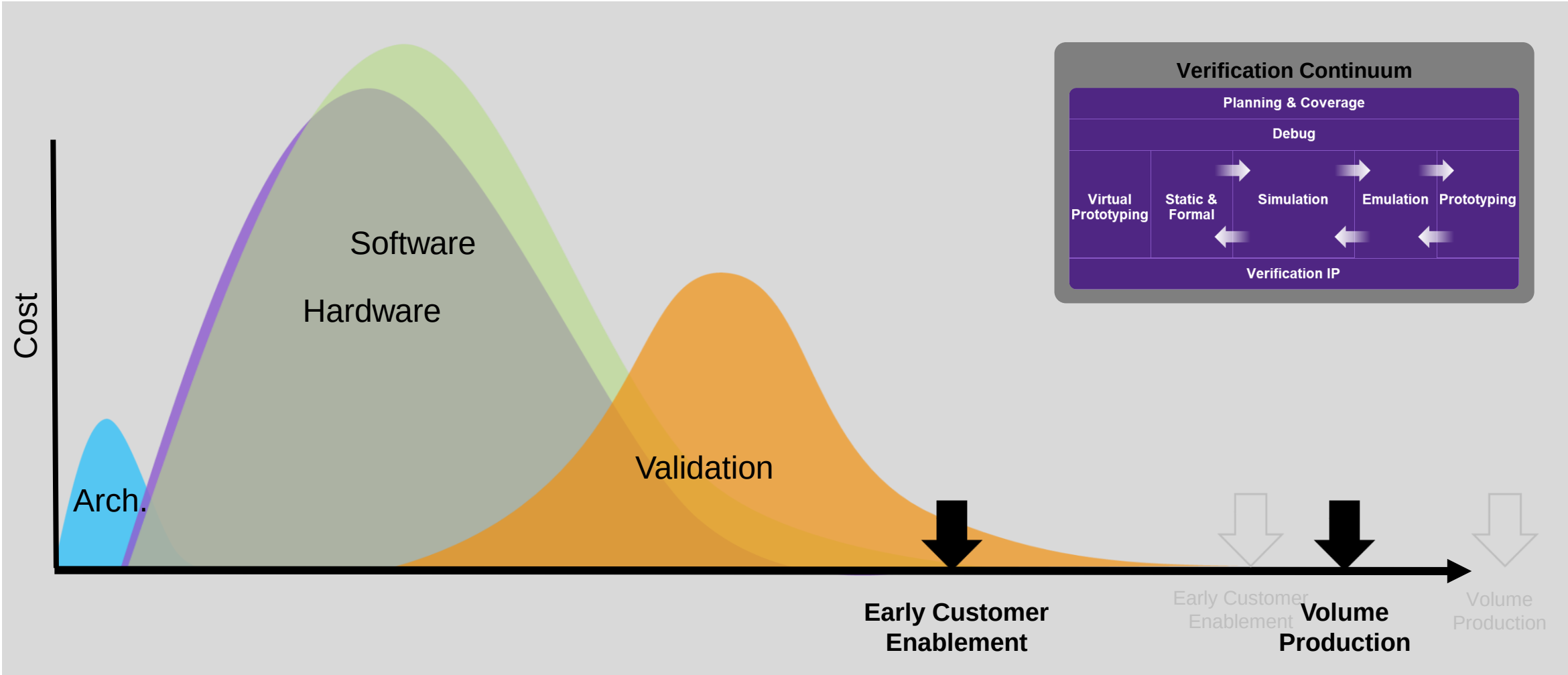
Verification complexity and growing software content driving growth in cost, schedules



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Complexity Driving Unsustainable Growth in Cost, Schedules

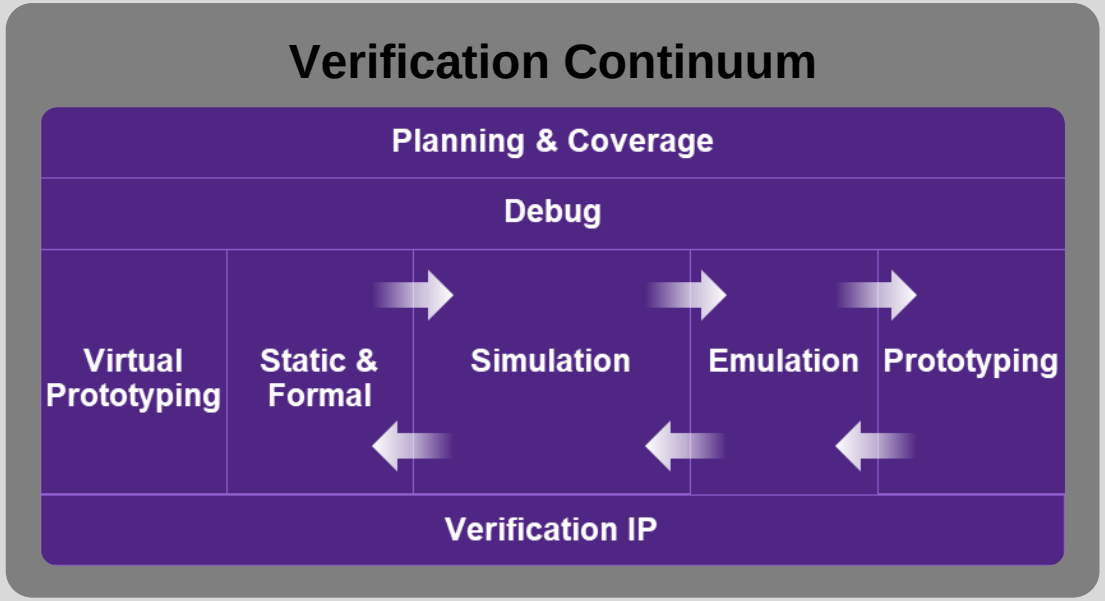
Verification complexity and growing software content driving growth in cost, schedules



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#1 in Digital/Functional Verification

Verification Continuum™ Platform



- Complete platform with #1 products in all categories
- Industry's highest-performance engines
- Uniquely positioned for early software bring-up
- Domain-specific solutions for automotive, 5G and AI designs
- Accelerating innovation with investments in cloud and machine learning technologies

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Verification Software Customer Successes

Synopsys and NXP Extend Multiyear Automotive Center of Excellence Collaboration for NXP S32 Automotive Processing Platform
New Virtualizer Design Kits Enable Automotive Tier 1 and OEM Companies to Start Software Development, Integratic and Test Before Silicon

Synopsys Announces Verification IP and Test Suite for Arm AMBA ACE5 and AXI5

STMicroelectronics Standardizes on Synopsys VC Formal for Faster Verification Closure of Leading Microcontroller Designs

Synopsys Awarded DARPA Electronics Resurgence Initiative Contract for Advanced Emulation Technology
Expertise and Market-Leading Position in Emulation Being Brought to Bear, in Partnership with Lockheed Martin and Analog Devices

Toshiba Selects Synopsys VC Formal Verification Solution
Next-generation Formal Verification Technology Uniquely Positioned for Performance and Capacity Required for Complex SoCs

Synopsys Delivers 10X Performance in Formal Property Verification with Breakthrough Machine Learning Technology
VC Formal Regression Mode Accelerator Enables Successively Faster Formal Convergence

SiFive Selects Synopsys Verification Continuum Platform for Advanced RISC-V Processor Designs
Comprehensive Synopsys Platform Enables Accelerated Verification of High-Performance, Low-Power RISC-V Processors and SoCs

Synopsys Delivers Platform Architect Ultra to Enable the Next Wave of AI SoCs
Enables Architecture Exploration for Advanced AI SoCs to Meet Optimal Performance and Power Goals Targeted for Cloud and Edge Applications

- Top 5 mobile SoC vendors use VCS®
- 18 of top 20 semiconductor vendors use VCS®
- Top 15 semiconductor companies use SpyGlass®
- 14 of top 15 semiconductor companies use Verdi® Debug Solution

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Verification Hardware: Introducing ZeBu® Server 4

Leading system for software bring-up
Only modern system to allow software-on-hardware validation

Industry's fastest emulation system
Now 2x higher performance

Industry's largest capacity
Scalable to 19B+ gates

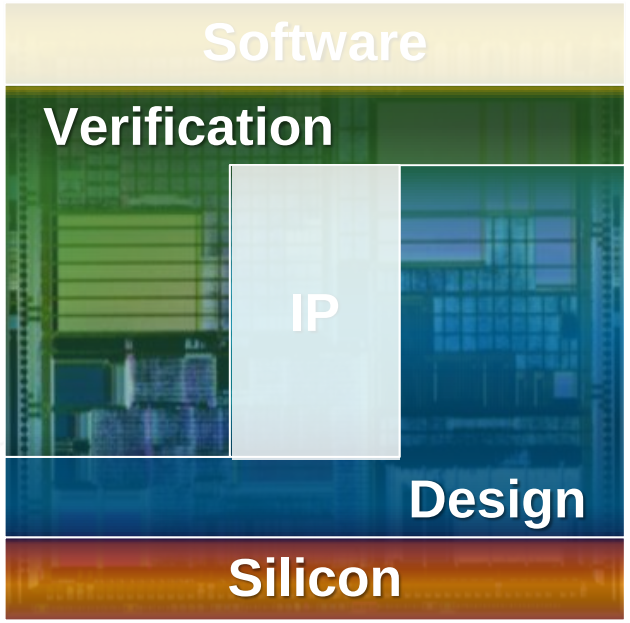
Industry's lowest total cost of ownership
5x lower power consumption, half data center footprint



ZeBu Server 4

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SOFTWARE



SILICON

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Financial Update

Trac Pham

Chief Financial Officer

Synopsys: The Market & Technology Leader

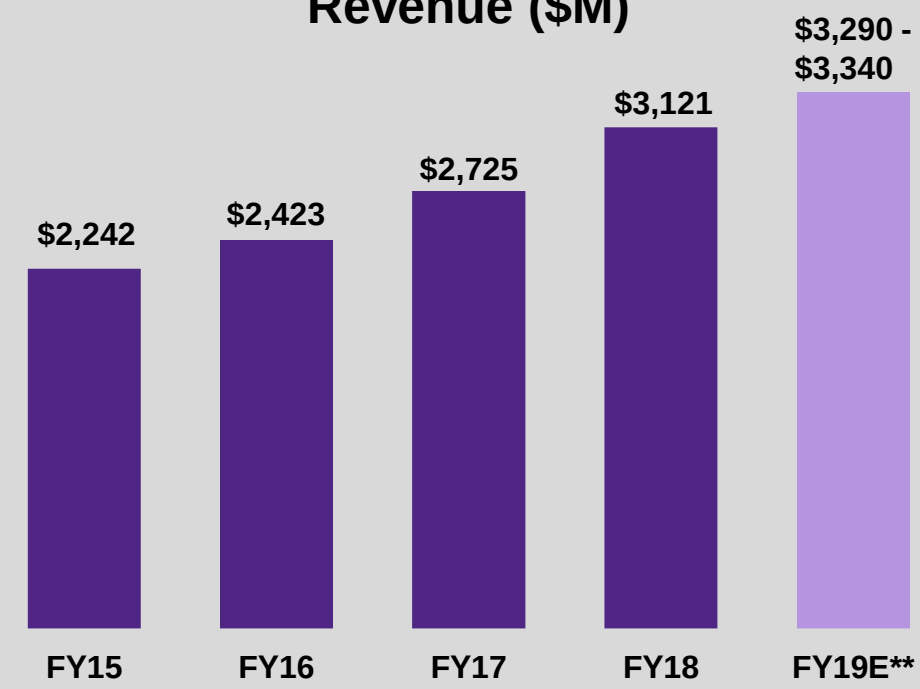
Uniquely Positioned for Growth and Stability

- Dynamic markets and electronics complexity
- Clear technology leadership
- **Financial strength & growth**

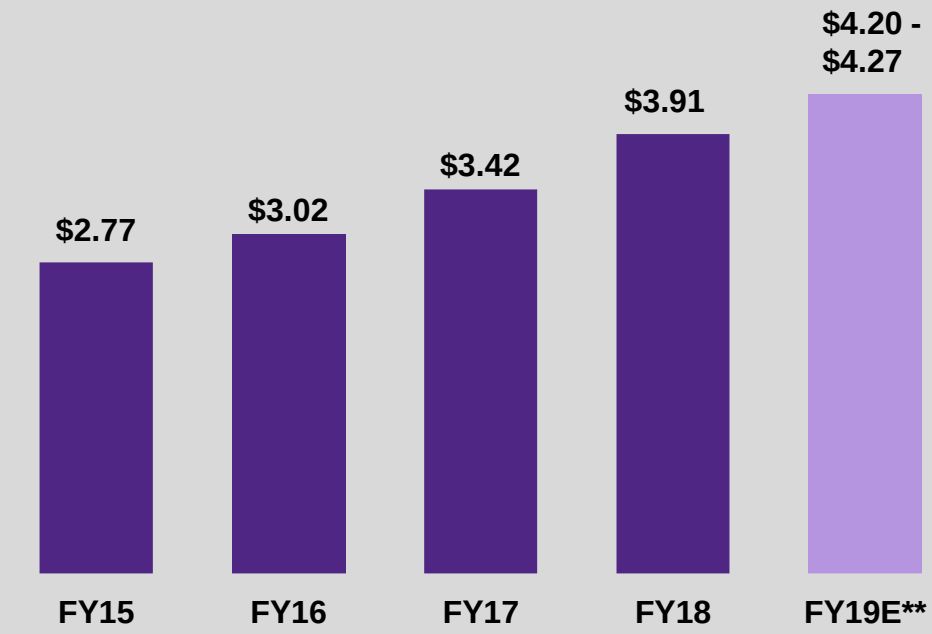


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Excellent Financial Execution



~90% recurring revenue model with $4.3B noncancelable backlog provides stability throughout the business cycle

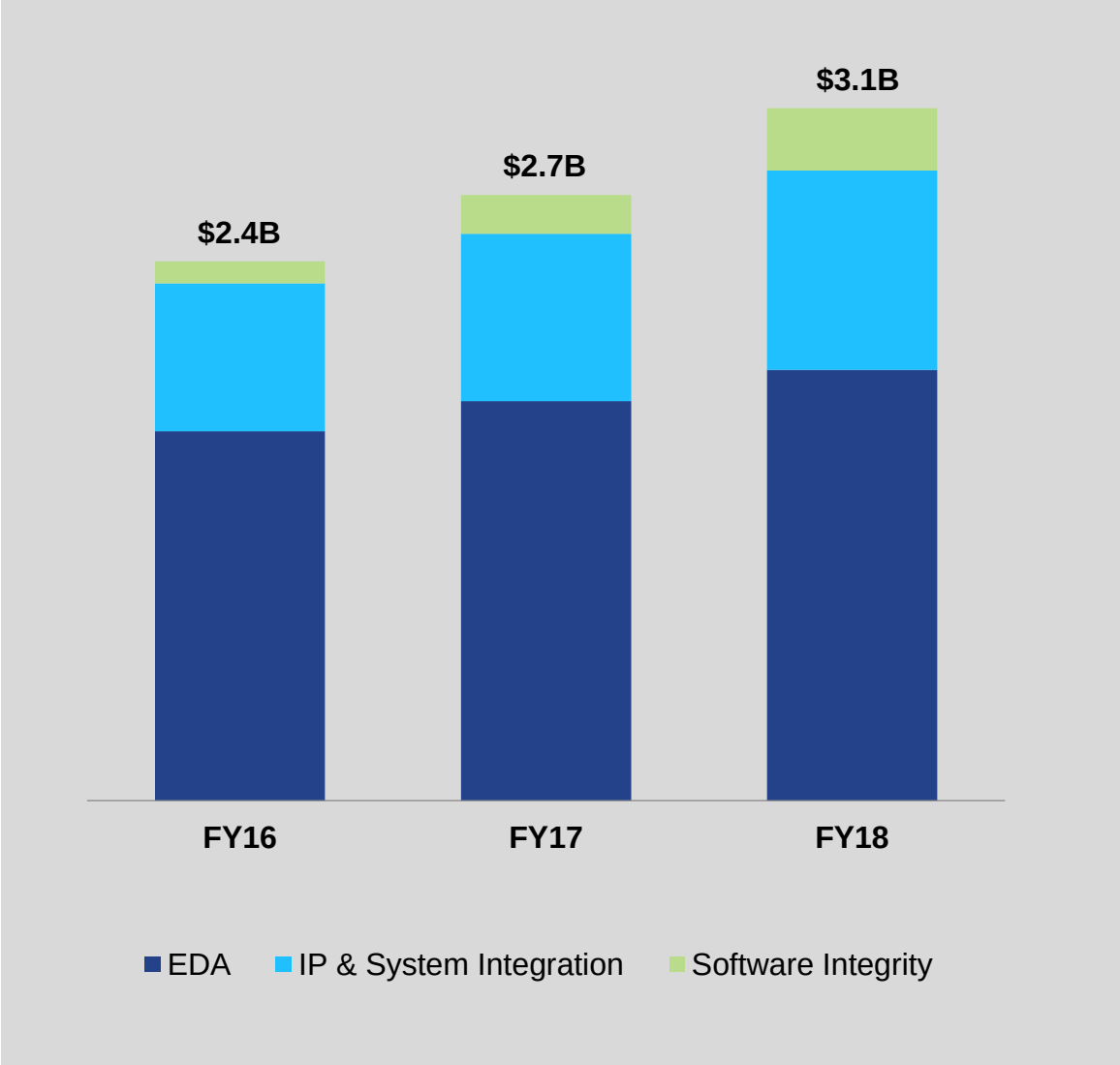


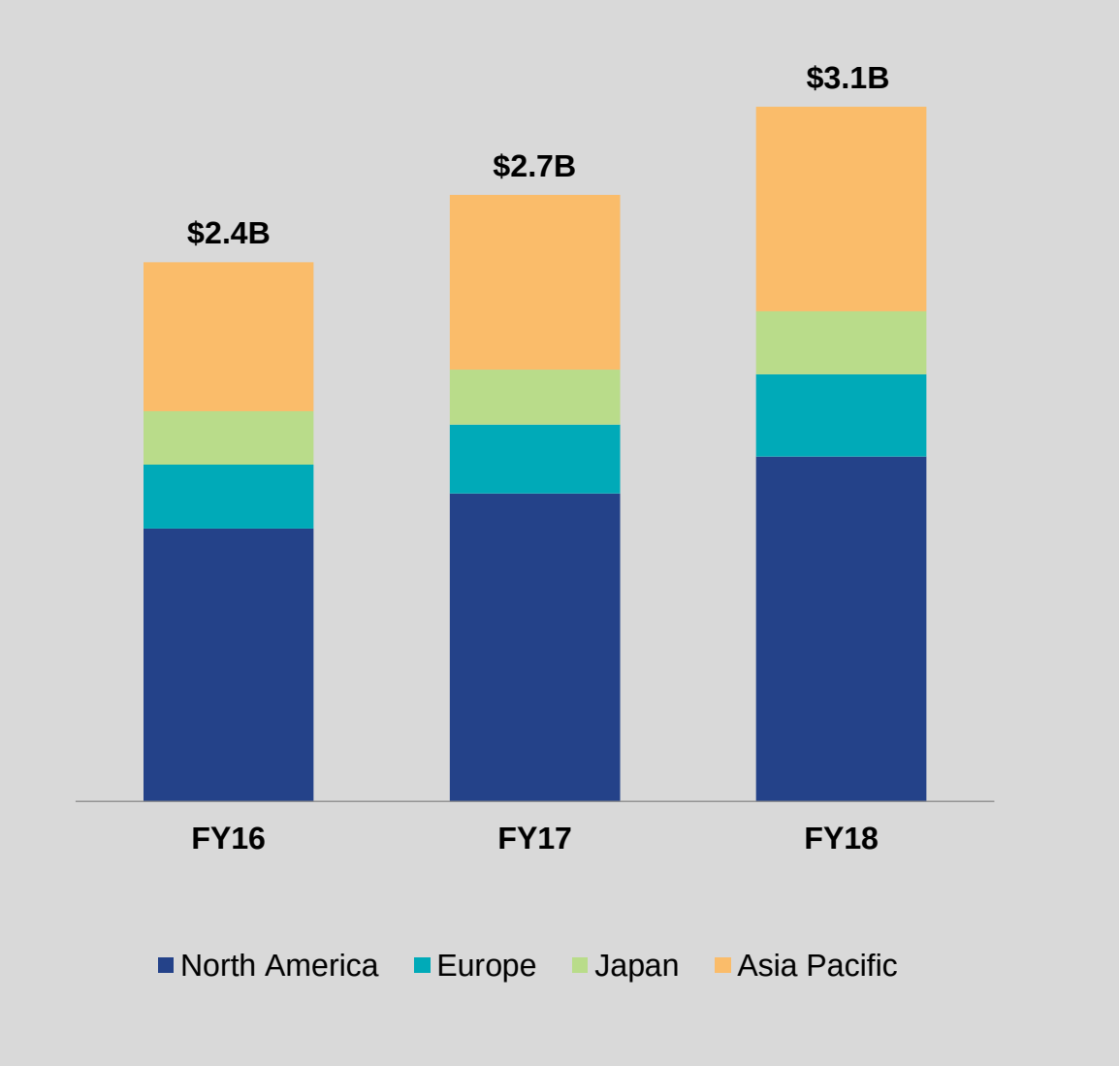
Strong financial execution while investing for long-term growth

* FY15 to FY19E GAAP to non-GAAP EPS reconciliation is included at the end of this presentation
** FY19E reflects guidance provided as of Feb 20, 2019 under ASC 606
We define recurring revenue as revenue generated from time-based products, multi-period IP contracts, and maintenance and services, for which revenue is recognized over time.

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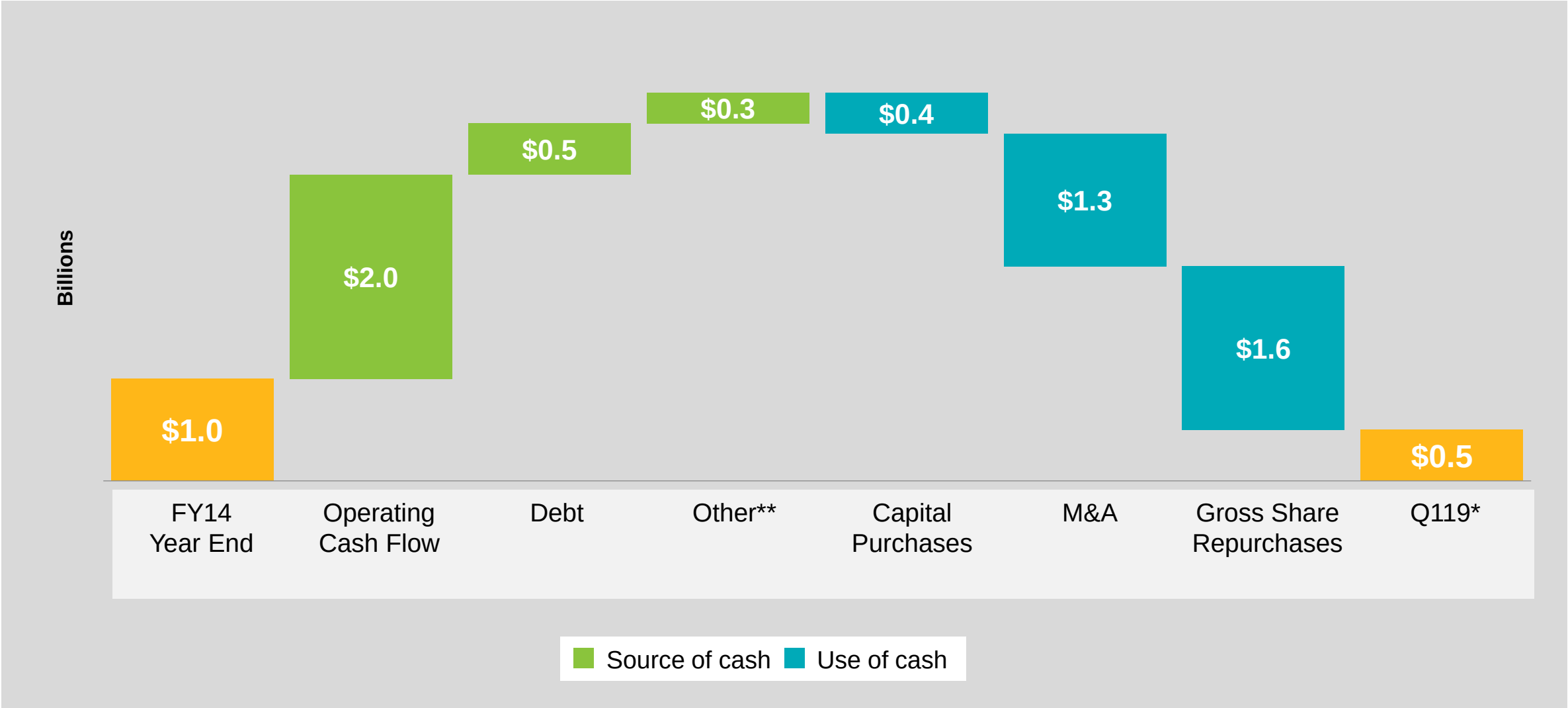
Strength Across the Board





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Cash: Invest in the Business and Return to Shareholders*

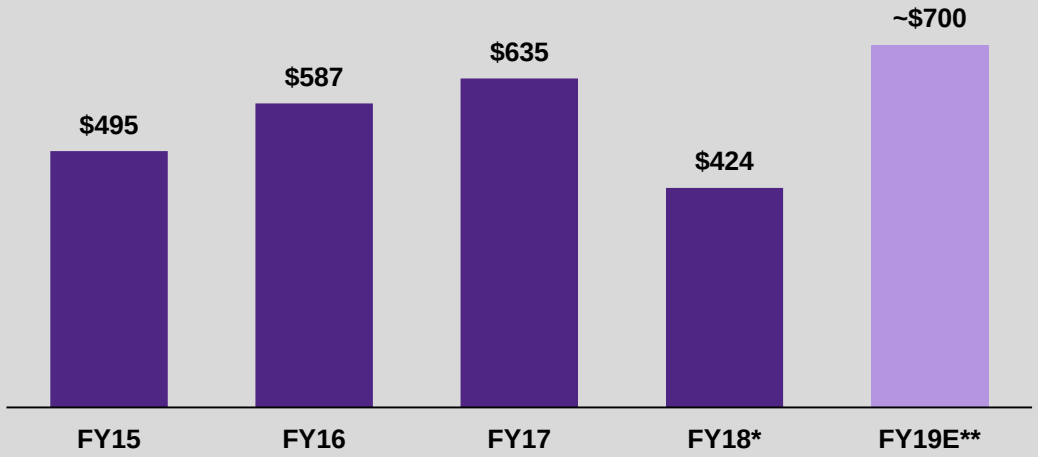


* Reflects actual results as of fiscal Q1 2019 and ASR announced on Feb. 28, 2019
** Consists primarily of proceeds from employee option exercise and employee stock purchase plan

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Cash Flow & Capital Allocation

Operating Cash Flow ($M)

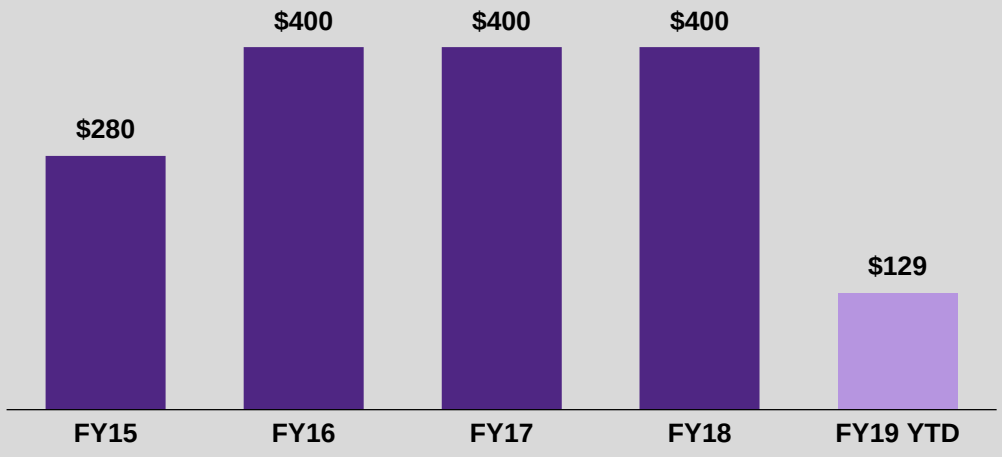


Roughly tracks EBITDA less cash taxes on multi-year basis

Variable from year to year, based mainly on timing of large contracts and one-time payments

* Includes approximately $230M in one-time payments
** FY19E reflects guidance provided on February 20, 2019

Stock Repurchases ($M)



Repurchased ~$1.6B in stock since 2015, reducing share count by ~6M shares

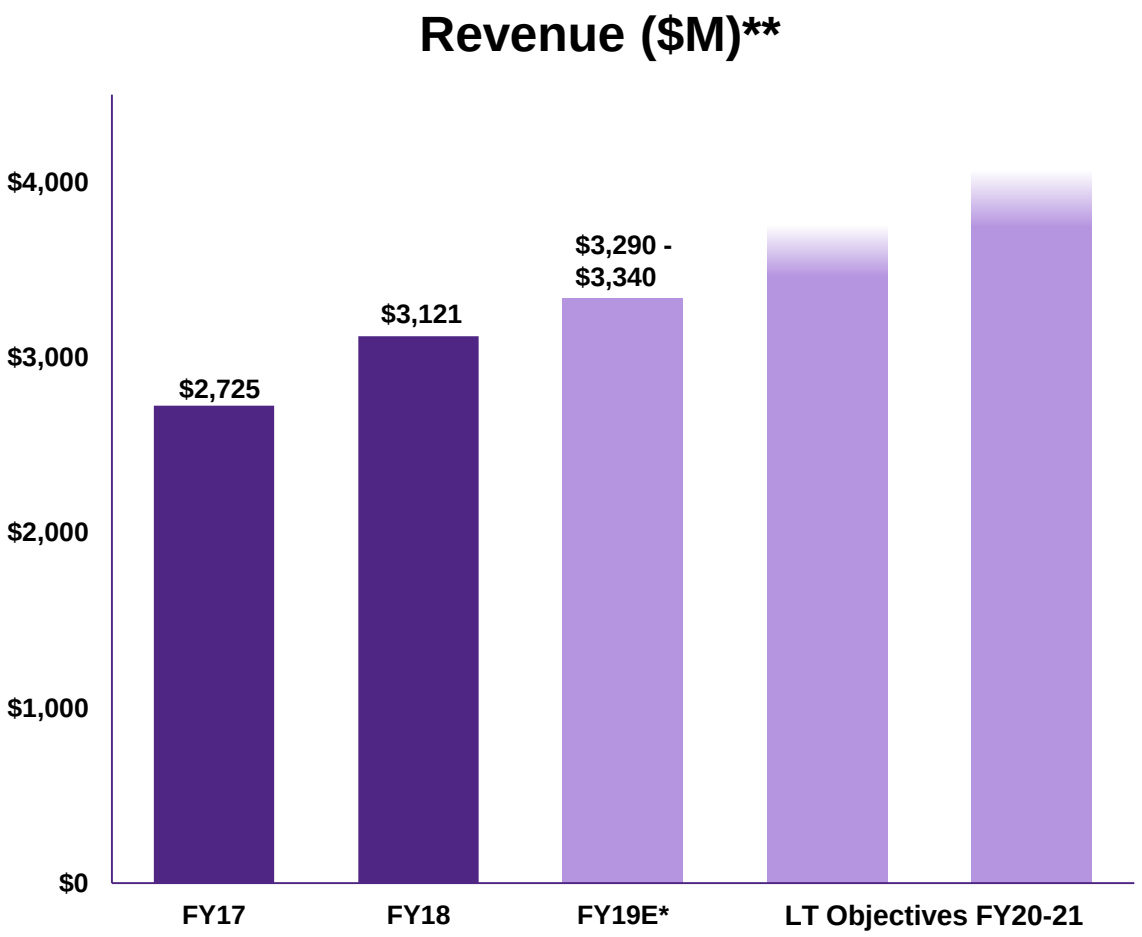
~100% of FCF returned to investors via share buybacks

Capital allocation priorities:

- Internal investments
- Buybacks and acquisitions

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Long-Term Financial Objectives

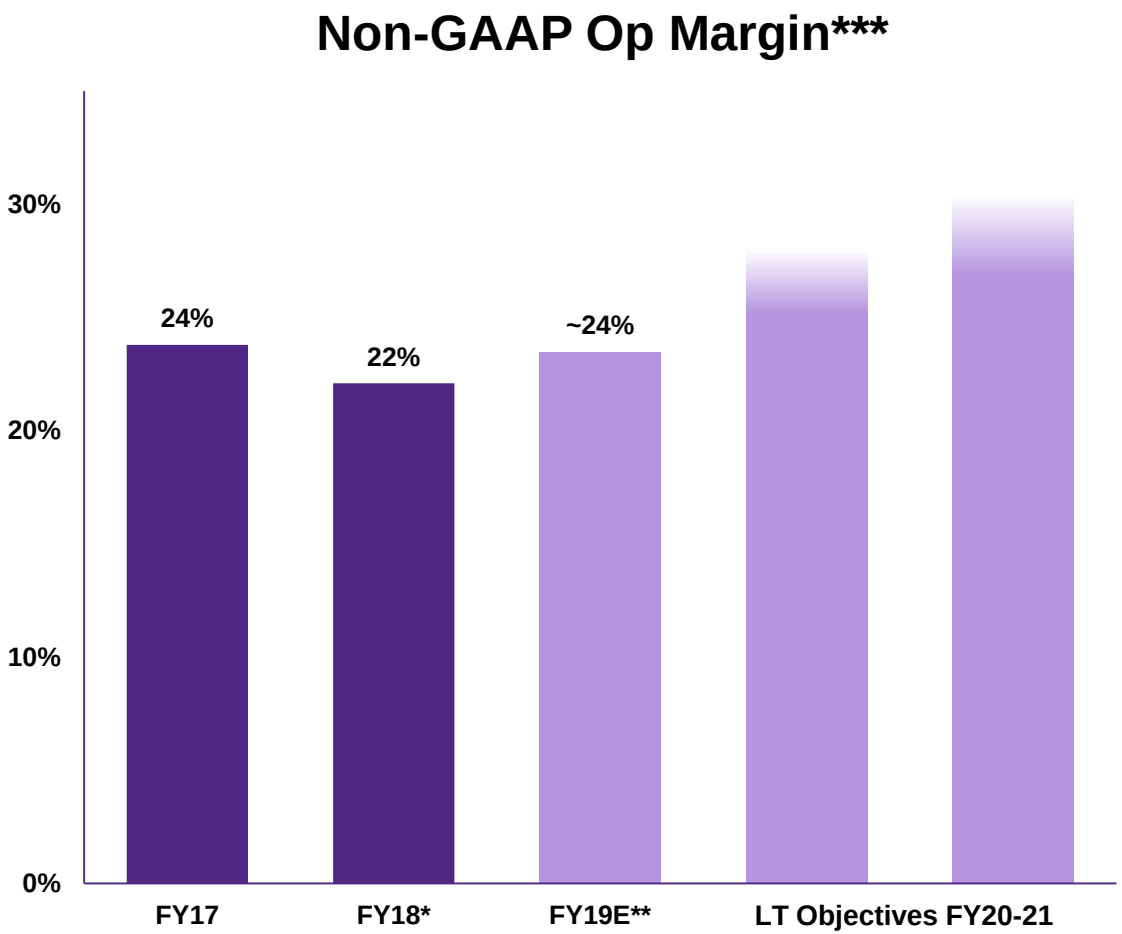


- Next milestone: **$4 billion in next few years**
- **High-single-digit revenue growth** on a multi-year basis
  - EDA mid-to-high single digits
  - IP low double digits
  - Software Integrity ~20% range

* FY19E reflects guidance under ASC 606. No change to the guidance provided on February 20, 2019
** Long-term objectives are general and multi-year in nature, and do not constitute additional guidance. Bar graphs for such periods are for illustrative purposes only and are not drawn to scale.

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Long-Term Financial Objectives



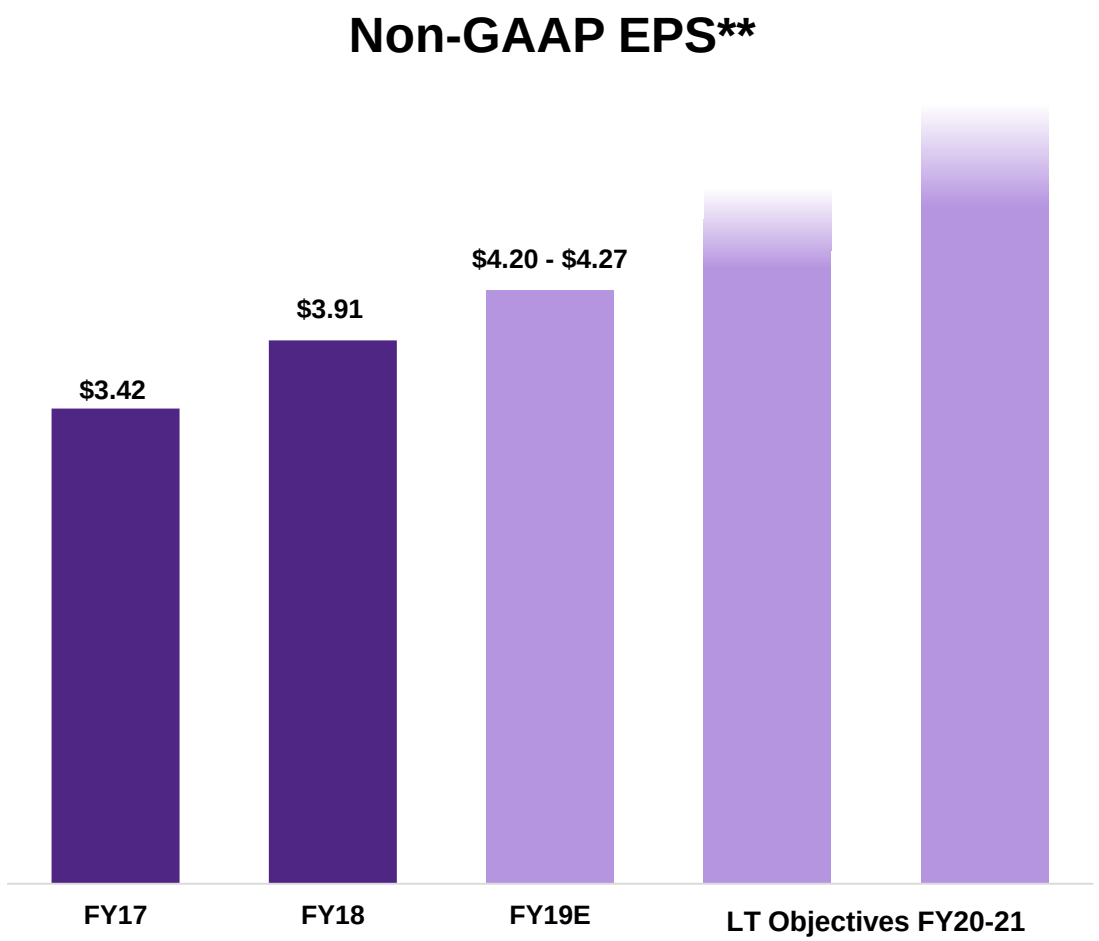
- Manage on a path to **“Rule of 40”**
- Long-term NG OM in **30% range**
- On track for **high 20s OM by 2021**

Excludes impact of any future material acquisitions

* Operating expenses affected by substantial investments in new product development and Black Duck acquisition
** FY19E reflects the midpoint of revenue/expense guidance. No change to the guidance provided on February 20, 2019
*** FY17 through FY19E reconciliation of GAAP to Non-GAAP OM provided at the end of this presentation
Long-term objectives are general and multi-year in nature, and do not constitute additional guidance. Bar graphs for such periods are for illustrative purposes only and are not drawn to scale.

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Long-Term Financial Objectives



- Sustainable double-digit non-GAAP EPS growth
- Driven by:
  - Solid revenue growth
  - Expanding operating margin
    - Operating leverage
    - Driving higher productivity and efficiency throughout the enterprise
    - Scaling of Software Integrity

* FY19E reflects guidance under ASC 606. No change to the guidance provided on February 20, 2019
** FY17 through FY19E reconciliation of GAAP to Non-GAAP EPS provided at the end of this presentation
** Long-term objectives are general and multi-year in nature, and do not constitute additional guidance. Bar graphs for such periods are for illustrative purposes only and are not drawn to scale.

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Reaffirming Q219 and FY19 Guidance

ASC 606

METRIC	Q219	FY19
Revenue (millions)	$810 - $850	$3,290 - $3,340
GAAP Expenses (millions)	$682 - $708	$2,758 - $2,788
Non-GAAP Expenses (millions)	$620 - $640	$2,520 - $2,540
OI&E (millions)	$0 - $2	($13) - ($9)
Normalized Annual Non-GAAP Tax Rate	16%	16%
Fully Diluted Outstanding Shares (millions)	153 - 156	153 - 156
GAAP Earnings Per Share	$0.71 - $0.79	$3.19 - $3.32
Non-GAAP Earnings Per Share	$1.07 - $1.12	$4.20 - $4.27
Cash Flow from Operations (millions)		~$700
Capital Expenditures (millions)		~$270
Average Renewable License Duration		~3 years
Stock-Based Compensation (millions)		~$160

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Appendix



Dr. Aart de Geus - Chairman and co-Chief Executive Officer
Since co-founding Synopsys in 1986, Aart has expanded Synopsys from a start-up synthesis company to a global high-tech leader. He has long been considered one of the world's leading experts on logic synthesis and simulation, and frequently keynotes major conferences in electronics and design automation. Dr. de Geus has been widely recognized for his technical, business, and community achievements with multiple awards including Electronic Business Magazine's "CEO of the Year," the IEEE Robert N. Noyce Medal, the GSA Morris Chang Exemplary Leadership Award, the Silicon Valley Engineering Council Hall of Fame Award, and the SVLG Lifetime Achievement Award. He serves on the Boards of the Silicon Valley Leadership Group, Applied Materials, the Global Semiconductor Alliance, and the Electronic System Design Alliance.

Dr. Andreas Kuehlmann - co-General Manager Software Integrity Group
Andreas is co-general manager of the Software Integrity Group at Synopsys. In this role, he is responsible for leading the company's software quality and security solutions business, which is focused on products and services for ensuring the security and improving the quality of all software that is omnipresent in our lives. Prior to joining Synopsys in 2014 as part of the Coverity acquisition, Andreas served as senior vice president of research and development at Coverity, where he was responsible for global R&D activities. From 2003 to 2010, he served as Fellow and Director of Cadence Research Laboratories, where he led the company's advanced research and development including systems and software verification technologies. Prior to Cadence, he was part of the IBM T.J. Watson Research Center. His work on functional equivalence verification was key to the development of IBM's high-end processors and was later broadly adopted by the industry. Andreas has served as an adjunct professor at University of California, Berkeley, and as President of the IEEE Council on Electronic Design Automation (CEDA). He received the Dipl.-Ing. degree and the Dr.-Ing. habil degree in Electrical Engineering from the University of Technology at Ilmenau, Germany, and he is an IEEE Fellow.



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Graham Holmes - Senior Director, Advanced Security Initiatives Group
Cisco Systems, Inc.
Graham Holmes joined Cisco Systems in 1997 and has had a distinguished career with over twenty-five years of technical management experience as an officer in the US Navy and with industry in product management, university relations, sales, and engineering leadership positions. As Senior Director of the Advanced Security Initiatives Group, Graham currently leads Cisco product security efforts. His teams are focused on identifying product security weaknesses, developing exploits to guide mitigation strategies, and defining secure development requirements, practices, and process that result in secure offers. He authored and introduced the Cisco Secure Development Lifecycle: a product development methodology used throughout Cisco. Graham has also been the Director of the Cisco Research Center, led Business Development efforts focused on National Research Networks, ran the global University Relations organization, and was a Product Line Manager for enterprise network management products.
After graduating from Purdue University with a Bachelors of Science in Political Science he was commissioned as a naval officer and served 9 years on active duty. He completed his Masters degree in Systems Technology (Space Operations) from the Naval Postgraduate School.

John Koeter - Vice President of Marketing, Solutions Group
John Koeter joined Synopsys in 1998 and is currently vice president of marketing for the Solutions Group. In that capacity, he is responsible for the marketing of Synopsys' DesignWare IP products. Before coming to Synopsys, Mr. Koeter held marketing, engineering, and corporate application engineering positions with Texas Instruments and Advanced Micro Devices. Mr. Koeter holds a BSEE degree from Cornell University.



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Sassine Ghazi - co-General Manager Design Group

Sassine is responsible for leading the development and deployment of the Synopsys design implementation and analog/mixed-signal product lines. He first joined Synopsys in 1998 and has held several technical and management positions in field operations. Most recently he served as VP of North America Sales, focused on building strategic business relationships to drive customer success. Prior to joining Synopsys, Sassine was a design engineer at Intel. Before that, he led a joint research project in Variable Structure Control and Reconfiguration Computing at the Oak Ridge National Lab. Sassine received his bachelor's degree in Business Administration from Lebanese American University; a B.S.E.E from the Georgia Institute of Technology in 1993; and an M.S.E.E. from the University of Tennessee in 1995.

Trac Pham - Chief Financial Officer

Trac serves as our Chief Financial Officer and is responsible for Finance, Information Technology, Business Operations, and Strategy and Corporate Business Development. Previously, he was Vice President of Corporate Finance and Vice President of Financial Planning and Strategy at Synopsys. During his tenure, Trac has helped Synopsys achieve profitable growth by developing strategic and operating plans that prioritize investments across multiple business units. Before joining Synopsys in 2006, he held leadership roles in strategy and business development and finance at Juniper Networks. Earlier in his career, Trac was sales controller, division controller, and finance and accounting manager for multiple business groups at 3Com. He holds a BA, Economics from UC Berkeley and an MPIA from UC San Diego where he was a Schoepflin Fellow. He is an active status California CPA.



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Software Integrity Glossary

Term	Description
BSIMM	Building Security in Maturity Model - A study of existing software security initiatives. Compiles practices of many different organizations to identify both common and unique practices.
DevOps	A development "paradigm," emphasizing rapid delivery through the adoption of agile, lean practices. DevOps seeks to improve collaboration between operations and development teams by leveraging processes and technology to shorten the development lifecycle and deliver a more accurately customized product.
DevSecOps	Integration of security throughout the DevOps framework - in contrast to previous implementations in which security sat independently as a barrier between development and general distribution of a product.
Dynamic Testing (DAST)	Scanning application source code for quality and security vulnerabilities in a running state (typically focusing on the HTTP and HTML interfaces of web-enabled applications).
Fuzz Testing	Software security test involving inputting of massive random data ("fuzz") into an application and observing the application response to identify vulnerabilities.
Interactive Testing (IAST)	Scanning application code for security vulnerabilities while the application is "interacting" with a particular application functionality. Combines elements of Static and Dynamic testing to work within the application to test a specified functionality.
Open Source Software	Software released by the copyright holder (or holders in the case of collaboratively developed software) under license allowing users to study, change and distribute the source code freely.
Penetration testing	Beyond application scanning, uses multi-vector attacks to find and exploit vulnerabilities to move deeper into the organization's infrastructure. Provides visibility into the highest risk vulnerabilities within an organization.
Software Composition Analysis	Identifies third-party and open source code that has been integrated into an application. Typically includes license, upgrade and patch information for identified code.
Static Testing (SAST)	Scanning application source code for quality and security vulnerabilities in a non-running state.
Threat Vector	A pathway of vulnerability to attack an enterprise.
Web Application Security	See: Dynamic Testing (DAST).

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Summary of Certain Discrete Items

Income Statement: Certain Discrete Operating Items

Revenue FY17-FY18	FY17A ASC 605	FY18A ASC 605
Reported results	**$2,724.9**	**$3,121.1**
Extra week in Q1'18		~+$46M
Black Duck impact (acquired Q1'18)		~+$60M

Revenue FY18-FY19	FY18A ASC 605	FY19E* ASC 606
Reported results; Guidance midpoint	**$3,121.1**	**$3,315.0**
Extra week in Q1'18	~+$46M	
ASC 606 transition year impact		~($40M)

Non-GAAP EPS FY17-FY18	FY17A ASC 605	FY18A ASC 605
Reported results	**$3.42**	**$3.91**
Extra Week in Q1'18		~+7 cents
Black Duck impact (acquired Q1'18)		~(10 cents)

Non-GAAP EPS FY18-FY19	FY18A ASC 605	FY19E* ASC 606
Reported results; Guidance midpoint	**$3.91**	**$4.24**
Extra Week in Q1'18	~+7 cents	
ASC 606 transition year impact		~(20 cents)

Cash Flow Statement: Certain Discrete Items

Operating Cash Flow One-time Items	FY18A	FY19E
Reported results; Guidance	**$424.2**	**~$700M**
Hungary tax dispute (Q1'18) (1)	~($66M)	
Repatriation tax (Q2'18) (2)	~($33M)	
Siemens/Mentor litigation settlement (Q3'18) (3)	~($65M)	
IP transfer tax (Q4'18) (4)	~($67M)	
Litigation settlement (Q1'19) (5)		~$18M

(1) Outstanding dispute with Hungarian tax authorities; payment required in order to appeal ruling

(2) Tax on 4Q'17 repatriation of ~$825M in offshore cash

(3) Conclusion of all outstanding patent litigation with Siemens/Mentor

(4) One-time tax payment on transfer of IP resulting from tax restructuring due to US tax reform

(5) Receipt from litigation settlement

Capital Expenditures 2019 Capital Projects	FY19E
Guidance	**~$270M**
Wuhan facility (5)	~$50M
Infrastructure (6)	~$110M
SV office consolidation (7)	~$110M

(5) Development costs associated with Wuhan, China facility

(6) IT and facility infrastructure upgrades to support growth

(7) Relocation of several Silicon Valley corporate offices to single location

* Midpoint of FY19 targets

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Forward-Looking Statements

This presentation contains forward-looking statements within the meaning of Section 21E of the Securities Exchange Act of 1934. Any statements that are not statements of historical fact may be deemed to be forward-looking statements. Forward-looking statements include, but are not limited to, statements regarding Synopsys' short-term and long-term financial targets, expectations and objectives such as our financial targets for the second quarter and full fiscal year 2019, long-term revenue, non-GAAP EPS, non-GAAP operating margin objectives, and the summary of certain discrete items in fiscal year 2019, business objectives and outlook, future acquisitions, customer demand, strategies related to our products and technology, our planned stock repurchase activity, our expected tax rate, and the expected impact resulting from our adoption of Accounting Standard Topic 606. These statements involve known and unknown risks, uncertainties and other factors that could cause our actual results, time frames or achievements to differ materially from those expressed or implied in our forward-looking statements. Accordingly, we caution stockholders and prospective investors not to place undue reliance on these statements. Such risks, uncertainties and factors include, but are not limited to: uncertainty in the growth of the semiconductor and electronics industries; consolidation among our customers and our dependence on a relatively small number of large customers; uncertainty in the global economy; fluctuation of our operating results; increased variability in our revenue due to the adoption of ASC 606, including the resulting increase in recognizing upfront revenue as a percentage of total revenue; our highly competitive industries and our ability to meet our customers' demand for innovative technology at lower costs; risks and compliance obligations relating to the global nature of our operations; cybersecurity threats or other security breaches; our ability to protect our proprietary technology; our ability to realize the potential financial or strategic benefits of acquisitions we complete; our ability to carry out our new product and technology initiatives; investment of more resources in research and development than anticipated;

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Forward-Looking Statements (continued)

increased risks resulting from an increase in sales of our hardware products, including increased variability in upfront revenue; changes in accounting principles or standards; changes in our effective tax rate; liquidity requirements in our U.S. operations; claims that our products infringe on third-party intellectual property rights; litigation; product errors or defects; the ability to obtain licenses to third-party software and intellectual property on reasonable terms or at all; the ability to timely recruit and retain senior management and key employees; the inherent limitations on the effectiveness of our controls and compliance programs; the impairment of our investment portfolio by the deterioration of capital markets; the accuracy of certain assumptions, judgments and estimates that affect amounts reported in our financial statements; and the impact of catastrophic events. More information on potential risks, uncertainties and other factors that could affect Synopsys' results is included in filings it makes with the Securities and Exchange Commission from time to time, including in the sections entitled "Risk Factors" in its Annual Report on Form 10-K for the fiscal year ended October 31, 2018 and in its latest Quarterly Report on Form 10-Q.

Effectiveness of Information

Unless otherwise indicated, the information provided herein is as of April 2, 2019. Although this presentation is expected to remain available on Synopsys' website for an extended period of time, its continued availability does not mean that Synopsys is reaffirming or confirming its continued validity. Synopsys does not currently intend to, and assumes no obligation to, report on its progress or comment to analysts or investors on, or otherwise update, the information contained in this presentation.

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GAAP to Non-GAAP Reconciliation

EPS – Actuals

	ASC 605 FY 2015	ASC 605 FY 2016	ASC 605 FY 2017	ASC 605 FY 2018
GAAP net income per share	$ 1.43	$ 1.73	$ 0.88	$ 2.82
Adjustments:				
Amortization of intangible assets	0.86	0.84	0.70	0.82
Stock compensation	0.54	0.63	0.70	0.91
Acquisition-related costs	0.10	0.07	0.06	0.14
Inventory fair value adjustment				
Restructuring	0.10	0.06	0.24	0.08
Legal and tax matters	(0.04)		0.05	0.17
Income tax related to transition tax				0.41
Income tax related to tax rate change				0.33
Income tax related to tax restructuring				(1.12)
Tax impact of repatriation			1.07	
Tax adjustments	(0.22)	(0.31)	(0.28)	(0.65)
Non-GAAP net income per share [(1)]	**$ 2.77**	**$ 3.02**	**$ 3.42**	**$ 3.91**

(1) may not foot due to rounding

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GAAP to Non-GAAP Reconciliation

EPS – Targets

	ASC 606 Q2 FY 2019*	ASC 606 FY 2019*
GAAP net income per share	$0.71 - $0.79	$3.19 - $3.32
Adjustments:		
Estimated impact of amortization of intangible assets	0.18 - 0.16	0.67 - 0.64
Estimated impact of stock compensation	0.26 - 0.24	1.04 - 1.01
Legal matters		(0.12)
Estimated impact of tax adjustments	(0.08) - (0.07)	(0.58) - (0.58)
Non-GAAP net income per share [(1)]	**$1.07 - $1.12**	**$4.20 - $4.27**

(1) may not foot due to rounding

* Targets as provided in Q1'19 earning release on February 20, 2019

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GAAP to Non-GAAP Reconciliation

Total Expenses – Targets

(Thousands)	**ASC 606 Q2 FY 2019***	**ASC 606 FY 2019***
Target GAAP expenses	$682,000 - $708,000	$2,757,562 - $2,787,562
Adjustments:		
Estimated impact of amortization of intangible assets	(25,000) - (28,000)	(99,000) - (104,000)
Estimated impact of stock compensation	(37,000) - (40,000)	(156,000) - (161,000)
Acquisition-related costs		(597)
Restructuring		35
Legal matters		18,000
Target non-GAAP expenses[(1)]	**$620,000 - $640,000**	**$2,520,000 - $2,540,000**

(1) may not foot due to rounding

* Targets as provided in Q1'19 earning release on February 20, 2019

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GAAP to Non-GAAP Reconciliation

Operating Margin – Actuals and Targets

	ASC 605 FY 2017	ASC 605 FY 2018	ASC 606 FY 2019*
GAAP operating margin	12.8%	11.5%	16.3%
Adjustments:			
Amortization of intangible assets	3.9%	4.0%	3.1%
Stock compensation	4.0%	4.5%	4.8%
Acquisition-related costs	0.4%	0.7%	
Restructuring	1.3%	0.4%	
Inventory adjustments			
Legal matters	0.3%	0.8%	-0.5%
Change in value of non-qualified deferred compensation	1.1%	0.2%	n/a
Non-GAAP operating margin [(1)]	**23.8%**	**22.1%**	**23.7%**

(1) may not foot due to rounding

* Represents the midpoint of revenue and expense targets provided in Q1'19 earning release on February 20, 2019

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