IP Status 2010-2019
IP Forecast 2020-2030

Eric Esteve IPnest Founder
(Semiwiki blogger)
IP Market Status (Design IP Report 2019)

DESIGN IP By Category 2018 (source: IPnest - Sept 2019)

- CPU: 37.9%
- Interface: 20.3%
- GPU/ISP: 10.5%
- DSP: 5.1%
- Mem Comp: 5.3%
- Interface: 20.3%
- I/O & Library: 4.8%
- GP Analog: 2.7%
- Wireless I/F: 1.6%
- Infrastructure: 2.7%
- Misc. Digital: 5.5%
- OTP, MTP, Flash, Etc.: 3.5%
2017-2018 Evolution

Processor, Wired Interface, Oth. Physical IP, Oth. Digital IP

IP Category Evolution 2017-2018 (source: IPnest Sep 2019)

- Processor; 53.5%
- Other Physical; 18.0%
- Digital Other; 8.2%
- Interface; 20.3%
- Other Digital IP; 6.9%
- Other Physical IP; 18.0%
2016-2018 Evolution

3 years evolution confirm the trend!

IP Category Evolution 2016-2018 (source: IPnest Sep 2019)

Processor 60% → 53,5%
Interface 16% → 20,3%
Physical 15% → 18%
Digital 5% → 8%
License 2012-2018

Design IP - 2012 (Gartner)  2 140,6
License revenue  1 072,9
Royalty revenue  933,4
Service and maintenance  134,3

4 out of 5 Processor IP vendors in 2012

Design IP - 2018 (Ipnest)  3 635,8
License Revenue  1 885,8
Royalty Revenue  1 750,0

2 out of 5 Pure Processor IP vendors in 2018
2 being “one-stop-shop” IP vendors

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Royalty 2012-2018

2018 Royalty based model is no more the only way to success...

Synopsys & Cadence revenue growth is linked with high count of license sales in many segments

IMG vs Apple story illustrate the risk to focus on 1 segment/customer only...

2020 decade

Strong focus on a single product: eNVM, NoC, RISC-V or PCIe (eMemory, Arteris, SiFive, PLDA)

Diversified (One-stop-shop) IP offer, being able to be leader (#1 or #2) for each product (Synopsys, Cadence)

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IP Drivers in 2010’s

Smartphone Application Processor (A10 from Apple)
- CPU (2 large, 2 little), multiple GPU
- SRAM compiler, Std Cell Library, I/Os
- LPDDRn memory controller
- USB 2, USB 3,
- HDMI, MIPI CSI, DSI, UFS
- Total IP > 100

Set Top Box (STM devices) → Consumer
- Very similar except MIPI

Networking
- Ethernet, PCIe, SAS, DDR controller
- TCAM compiler
IP Drivers in 2020’s

Smartphone Application Processor
- Still important revenue source (royalty)
- No more driver, stable at best
- Handful supplier count… and license count

Data Center (HPC, Networking, AI, servers)
- Ethernet, PCIe, SAS, C2C, DDR or HBM controller,+ 
- Data traffic growth (+40% YoY)
  - Implement more systems
  - Speed up new release adoption
  - 112G SerDes, PCIe 5, DDR5, HBM2e, 
- Impact on IP revenue?
  - New IP: C2C, HBM, GDDR
  - ASP increase ($6M for 112G)
  - License count increase (AI start-up)

Automotive and Industrial (IoT) expected to grow
Roaring IP in 2020’s

• Processor CPU, GPU and DSP – What after the peak?
  • CPU: business model to be re-invented (market requirement)
    • Traction on RISC-V (102 licenses /18 month SiFive) when ARM revenues decline
    • Outsiders in better shape (Synopsys, Andes, Cadence... )
  • GPU (Display): catastrophic! Apple (internal) and Samsung (via AMD)
  • GPU (AI): promising, IP product TBD
  • DSP: need to diversify, find other segments than wireless phone
• Traditional Interfaces: USB, SAS, SATA, HDMI... slightly growing or flat except MIPI
• High Perf Interfaces: Ethernet, PCIe, C2C, Memory Controller – Explosion!
  • PAM4 112G and NRZ SerDes support Data Center, Networking, 5G and AI growth
  • DDR5, LPDDR5, HBM2, LPDDR6 license ASP explosion (7nm, 5nm)
• Wireless Interface (WiFi, BTLE) IP sales growth (CEVA, IMG)
Roaring IP in 2020’s (2)

• Foundation IP
  • Library slightly growing
  • SRAM memory compiler – flat
  • NVM memory compiler – growing
• Analog Mixed Signal: only HE rewarding (Silicon Creations)
• Misc Digital
  • NoC is no more a concept! Duopole ARM & Arteris
  • eFPGA IP: adoption expected... when? Achronix lead the pack!
  • Image Processing IP to grow

Conclusion: Innovation, Highest Quality (SerDes)

And New Business Model (Processor) required
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IPnest is considered as the WW expert in Design IP

- **Martin Lund**: “In past I used IPnest reports covering the Interface IP markets. I found these reports helpful and insightful” (was VP of IP Group with *Cadence*)

- **Ed Bard**, Vice President of Business Operations, *Synopsys*: "Dr. Eric Esteve provides an insightful analysis of the USB 3.0 market. This report is useful to anyone…”

- **From Lluis Paris**, Director WW IP Alliance, *TSMC* “… IP Guru…”

Since 2009, IPnest deliver two main reports, plus on-demand survey

- **“Interface IP Survey & Forecast”** (USB3, PCIe, DDRn, HDMI, SATA, Ethernet, SerDes) in Q2 2020

- **“Design IP Report”**, IP market share by category (CPU, GPU, DSP, Interface, AMS, etc.) in Q1 2020


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