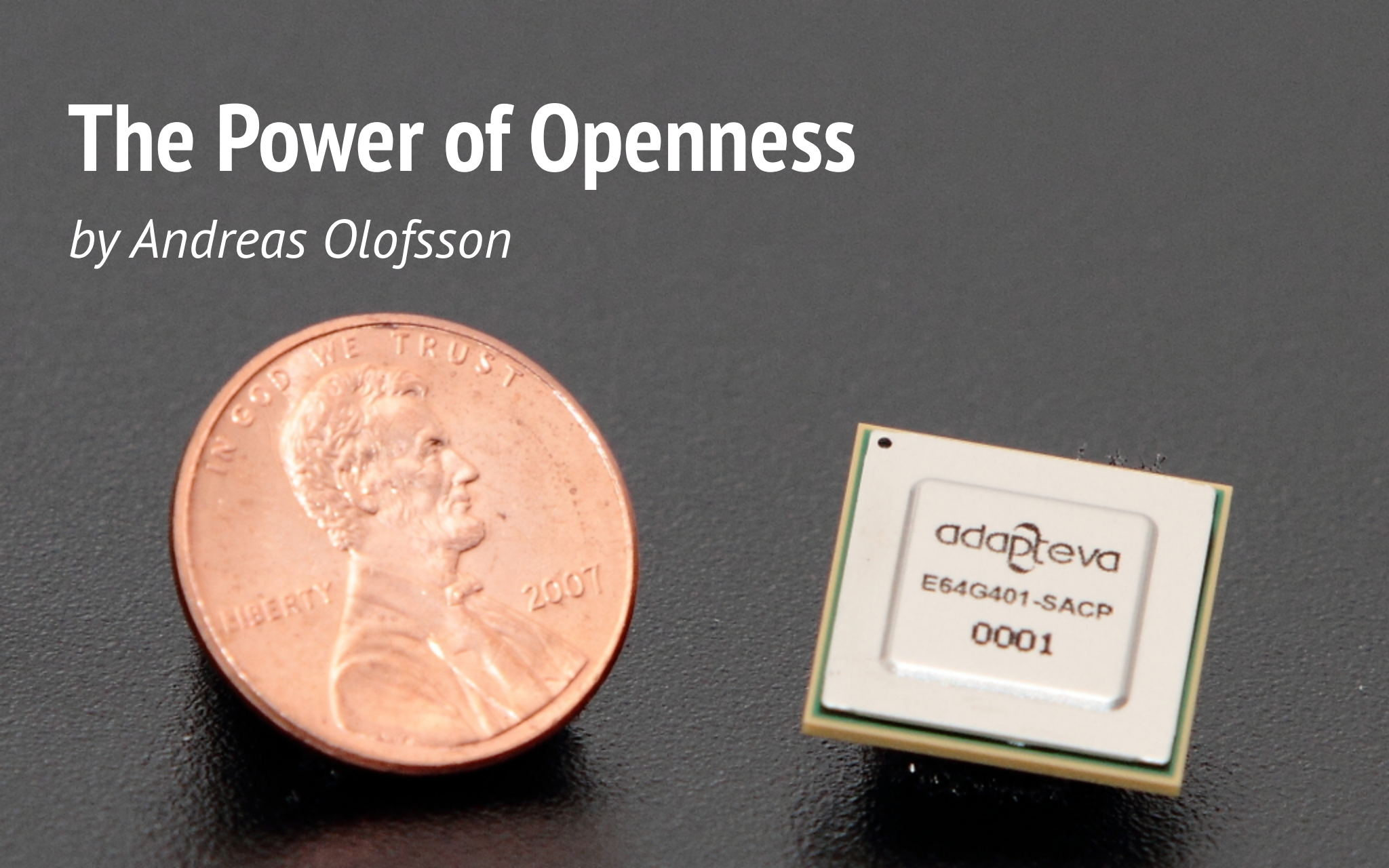
The Power of Openness

by Andreas Olofsson



Adapteva History

- 2008: Semiconductor company founded in Lexington, MA
- 2010: 16-core 65nm processor (25GFLOPS/W)
- 2011: 64-core 28nm processor (50GFLOPS/W)
- Accomplished with 3 engineers and $5M

But it wasn't enough!

$2B+ of parallel architecture R&D

Achronix	Brightscale	Cradle	Mathstar	Sandbridge
Adapteva	Calxeda	C-Switch	Mobileye	Silicon Sp.
Ambric	Chameleon	ElementCXI	Monarch	Stream Proc
Asocs	Clearspeed	Greenarrays	Octasic	Stretch
Aspex	Cognivue	Icera	Picochip	Tilera
Axis Semi	Coherent L.	Intellasys	Plurality	Transputer
BOPS	CELL	IP-flex	PACT	XMOS
Boston C.	CPUTech	Larrabee	Quicksilver	Zilabs

My 2012 "Epiphany"

1. Pricing and paranoia was killing us!
2. Openness is the "secret" to building platforms
3. Follow the leaders:

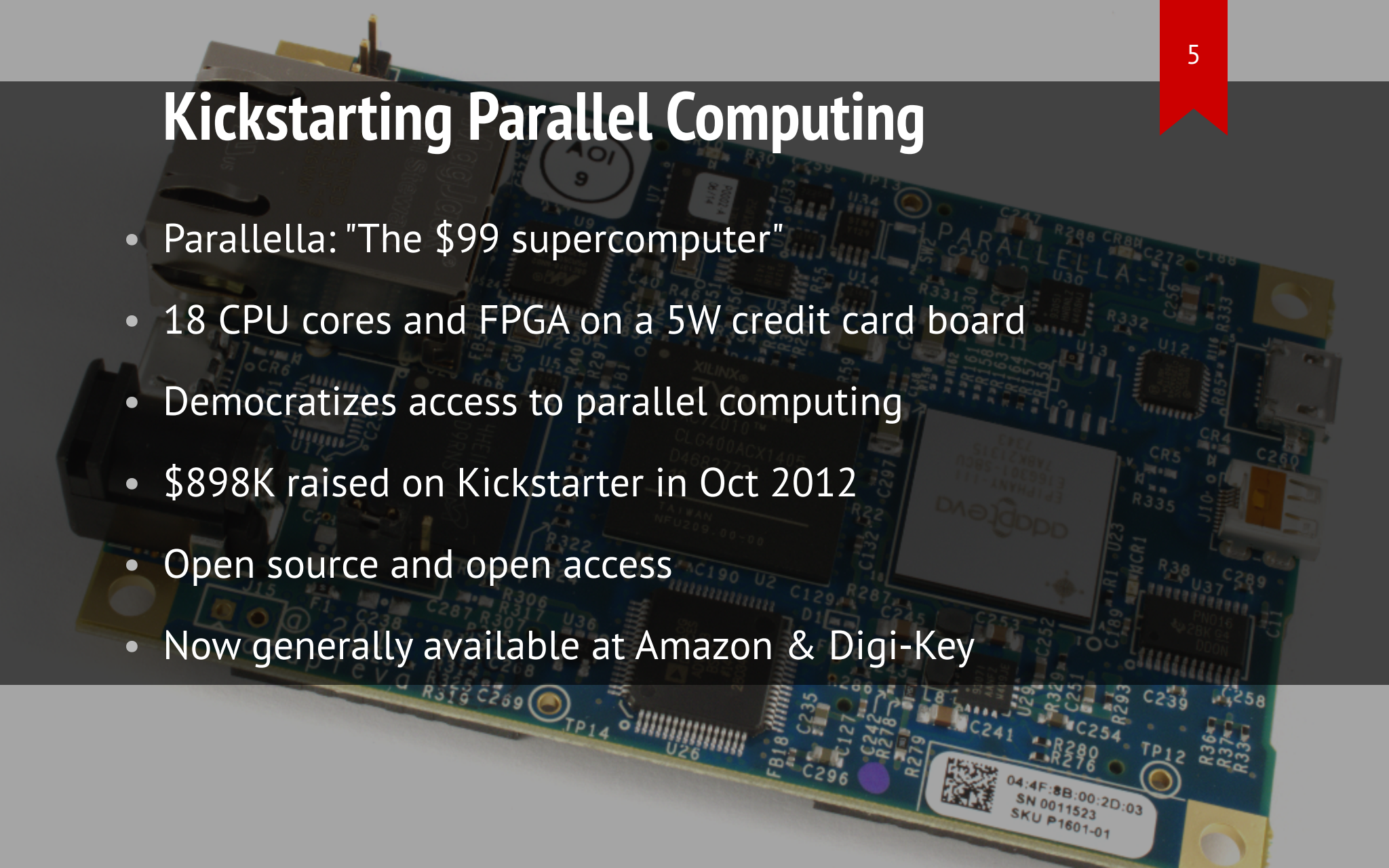
   -Arduino & Raspberry Pi --> low price breeds adoption

   -Kickstarter --> capital transparency

   -Linux --> open collaboration leadership

   -ARM --> importance of strong corporate partners

Kickstarting Parallel Computing



- Parallella: "The $99 supercomputer"
- 18 CPU cores and FPGA on a 5W credit card board
- Democratizes access to parallel computing
- $898K raised on Kickstarter in Oct 2012
- Open source and open access
- Now generally available at Amazon & Digi-Key

Openness: Before & After

Metric	Before	After	Boost
Customers	5	10,000	2000x
Universities	1	200	200x
Site traffic	20	1,000	50x
Twitter Followers	200	6,000	30x
Publications	2	30*	15x
Govt customers	2	10	5x
Yearly Sales	$45K	$1.8M	40x

Openness: Necessary but insufficient

Typical Skill	Unicorn	Researcher	Maker	Consumer
Board design	Yes	No	No	No
Software plumbing	Yes	No	No	No
System administration	Yes	No	Yes	No
Soldering, assembly	Yes	No	Yes	No
Building application	Yes	Yes	Yes	No
RTFM	Yes	Yes	Yes	?
Total Reach	10	10K	10M	1B

Conclusions

- Openness is fundamental to modern collaboration
- "Linux like" movement happening in hardware
- Adapteva prospering with unprecedented transparency

> *"There is plenty of room at the bottom" --Richard Feynman*