

# Open Source Chip Design: The Final Frontier

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# Kickstarting Parallel Computing

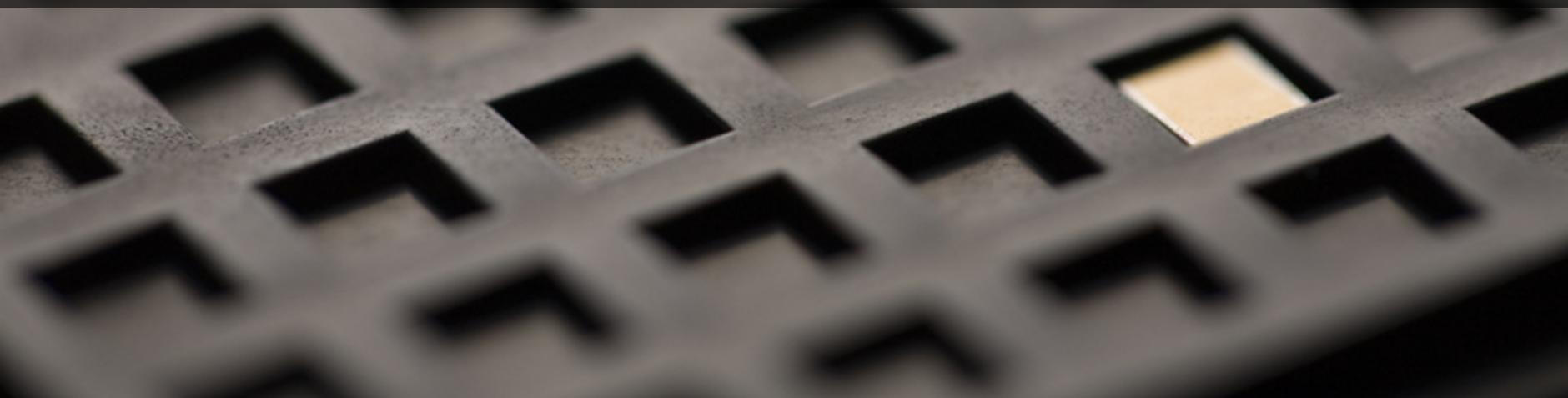
- Parallella: "The \$99 supercomputer"
- 18 CPU cores on a credit card and @ 5W
- Democratizes access to parallel computing
- \$898K raised on Kickstarter in Oct 2012
- Now generally available at Amazon, Digi-Key, RS
- Over 10,000 shipped
- Open source hardware

# Openness: Before & After

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

# Chip Design 101

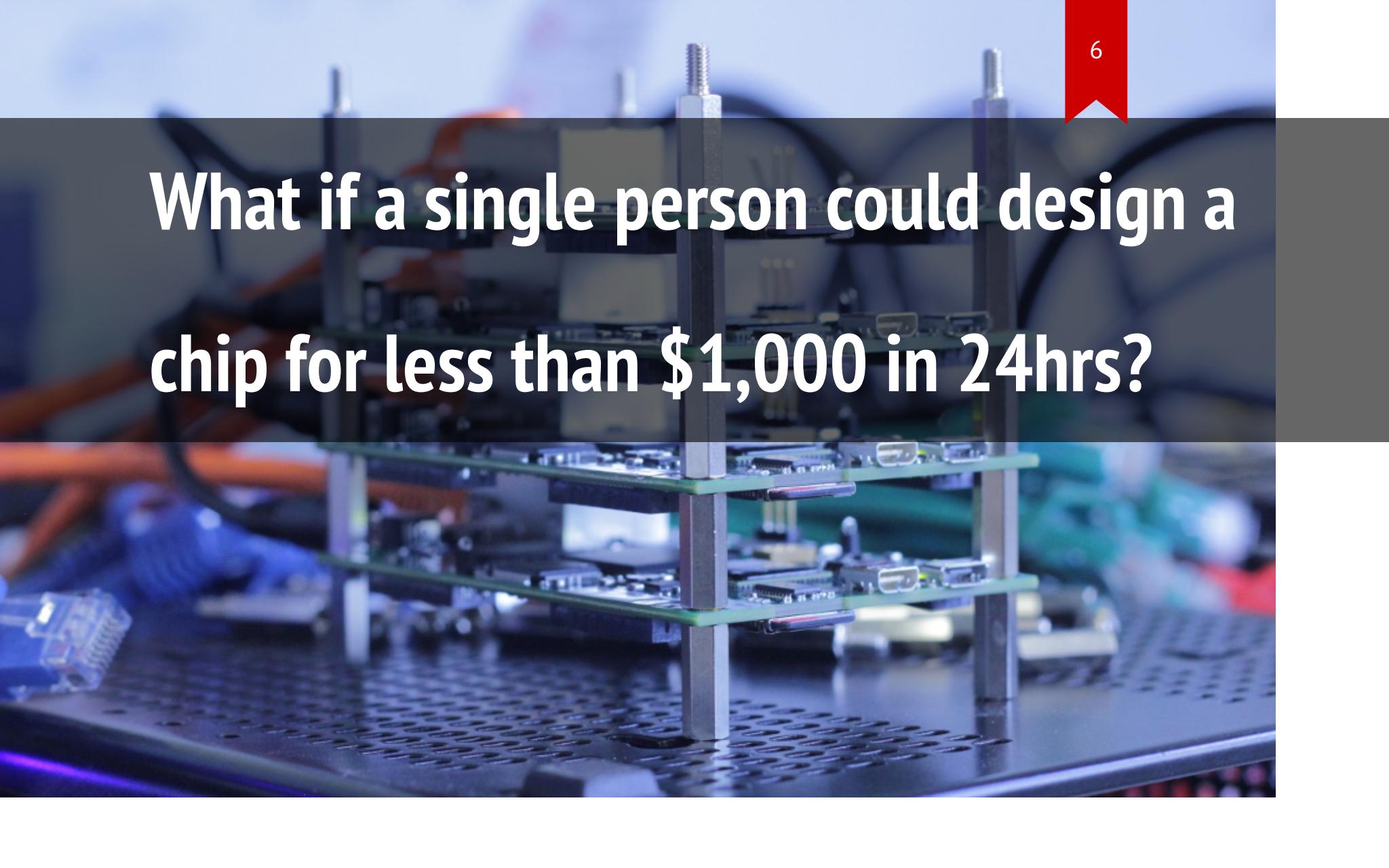
1. Write code (12 months)
2. Compile code (3 months)
3. Manufacture (4 months)
4. Test (3 months)



# Status Quo Chip Design Costs

"A System On Chip costs \$100M to develop"--industry pundit

Metric	Cost
Engineering	\$150K/eng
IP Licensing	\$1-10M
EDA Tools	\$1-10M
Tapeout	\$2M
Chip packaging	\$50K



What if a single person could design a  
chip for less than \$1,000 in 24hrs?

# Endless Possibilities for Custom Chips

- Health (diagnostics & embedded devices)
- Robotics (wicked smart)
- Communication (free and pervasive)
- Supercomputers (to answer really tough questions)



History

# Chip Design Grande Challenges

Challenge	Industry	Hurdle	Current	Future
Open source packaging	\$13B	Logistics	\$50K	0
Open source chip IP	\$5B	Time	\$1M+	0
Open source EDA	\$6B	Complexity	\$1M+	0
Engineering	--	Time	9 months	24hrs
Manufacturing	\$40B	Logistics	\$2M	\$1,000