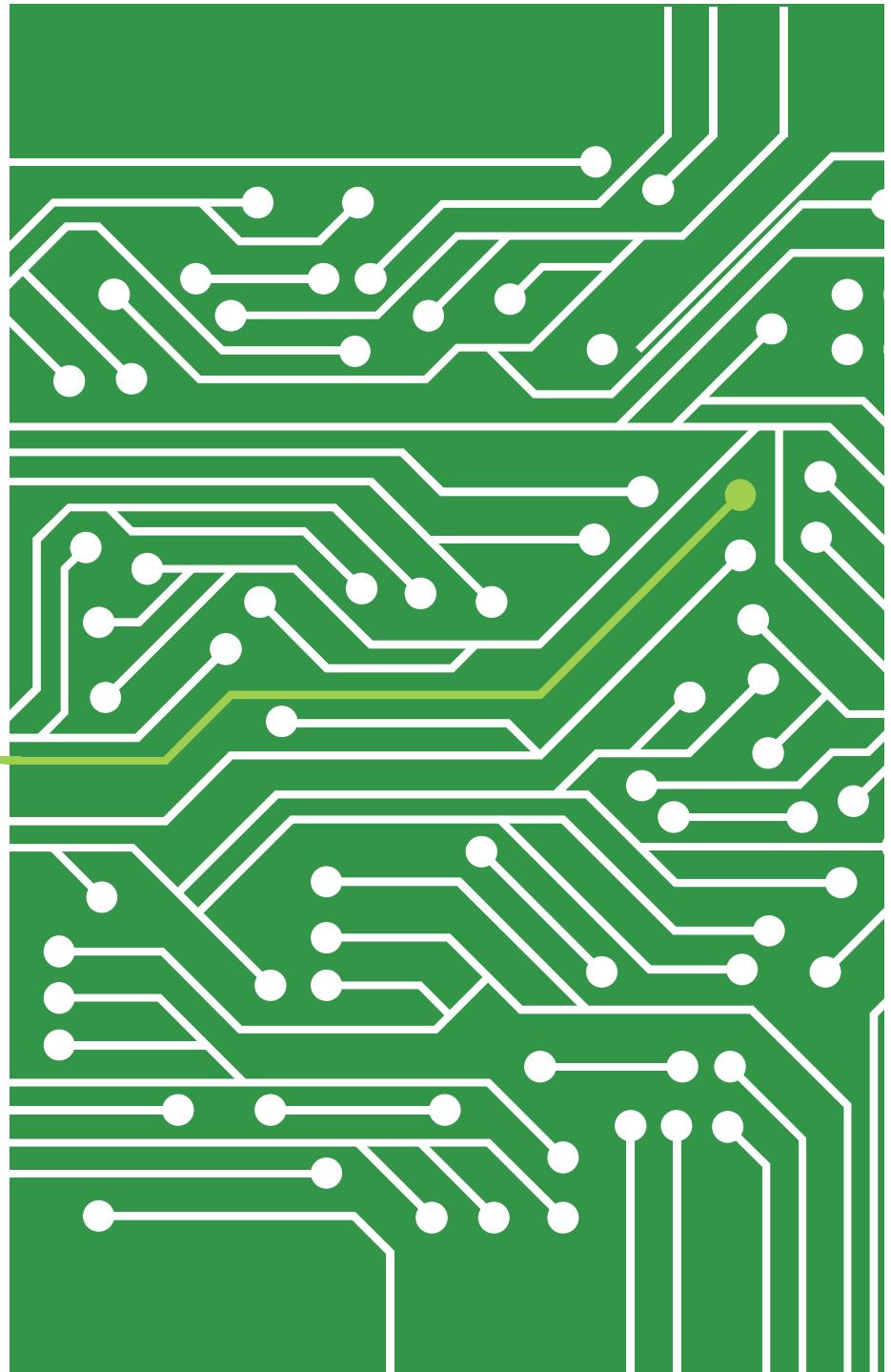




Vodafone CrowdCell Course:

Introduction to Lime

Lime Microsystems | FPRF company
Guildford, Surrey, United Kingdom



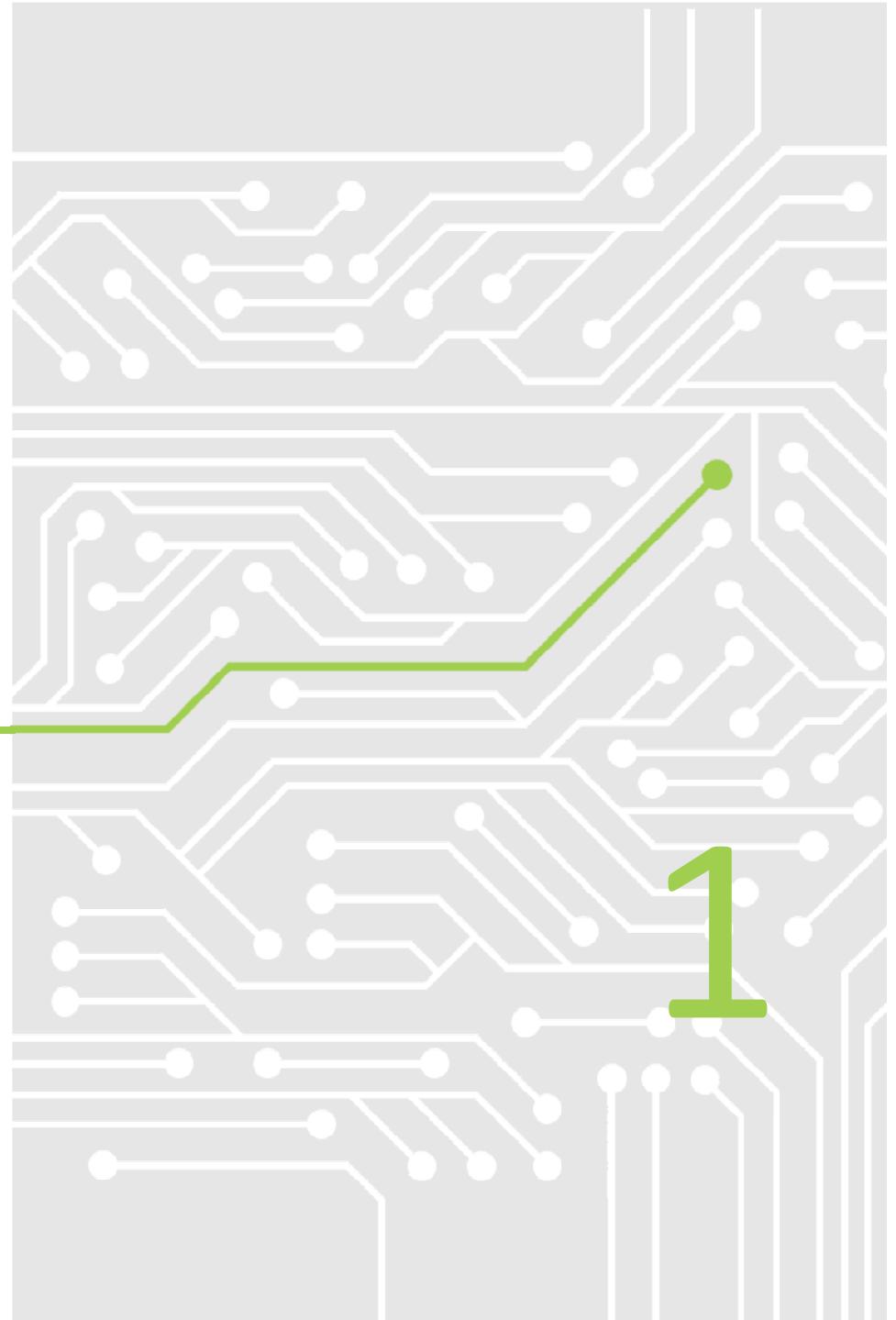
Introduction



- 1. Our Technology**
- 2. Our Products**
- 3. Our Customer Applications**
- 4. Our Collaborators and The Open Source Community**
- 5. Summary**



Technology

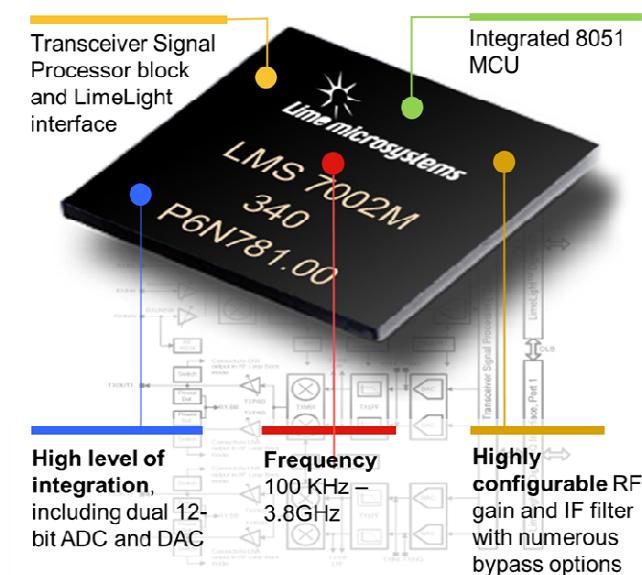


Lime Technology Overview

Lime brings the programmability of digital to RF and Wireless with its integrated FPRF solution



- Lime's **FPRF** solutions replace multiple chipsets and can be configured as basic digital, analogue and RF functions all the way to a complete transceiver for wireless systems
- Highly integrated and capable of serving a wide range of applications, standards and frequency bands from Bluetooth to 5G
- Can be programmed over the air in real-time similarly to FPGA chipsets in the digital domain

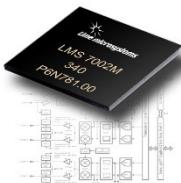


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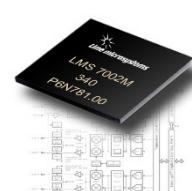
Radio Roadmap for universal connectivity



• Sub 10GHz



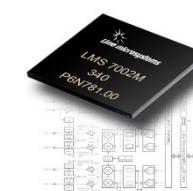
January 2016
LMS7002M FPRF
Frequency Range: 100KHz to 3.8GHz
RF BW: 60MHz MIMO mode



Sep 2017 (prototype)
LMS8001 RF CMOS
Frequency range: 10GHz

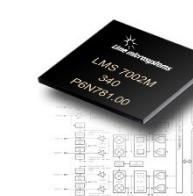
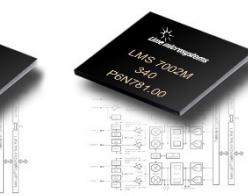


LMS7002DPP
A derivative of LMS7002M FPRF
with 400MHz RF bandwidth for
5G/carrier aggregation



LMS9000 Family of RF BiCMOS Up/Down Converter
23– 45 GHz
45 – 76 GHz
71 – 95 GHz

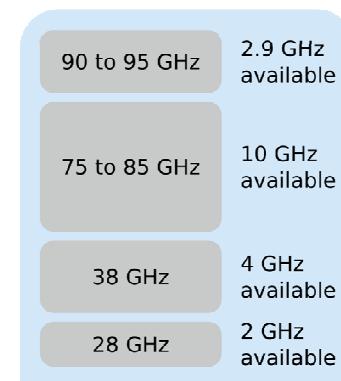
• mm Wave



- In production and shipping to numerous applications, including the Crowd

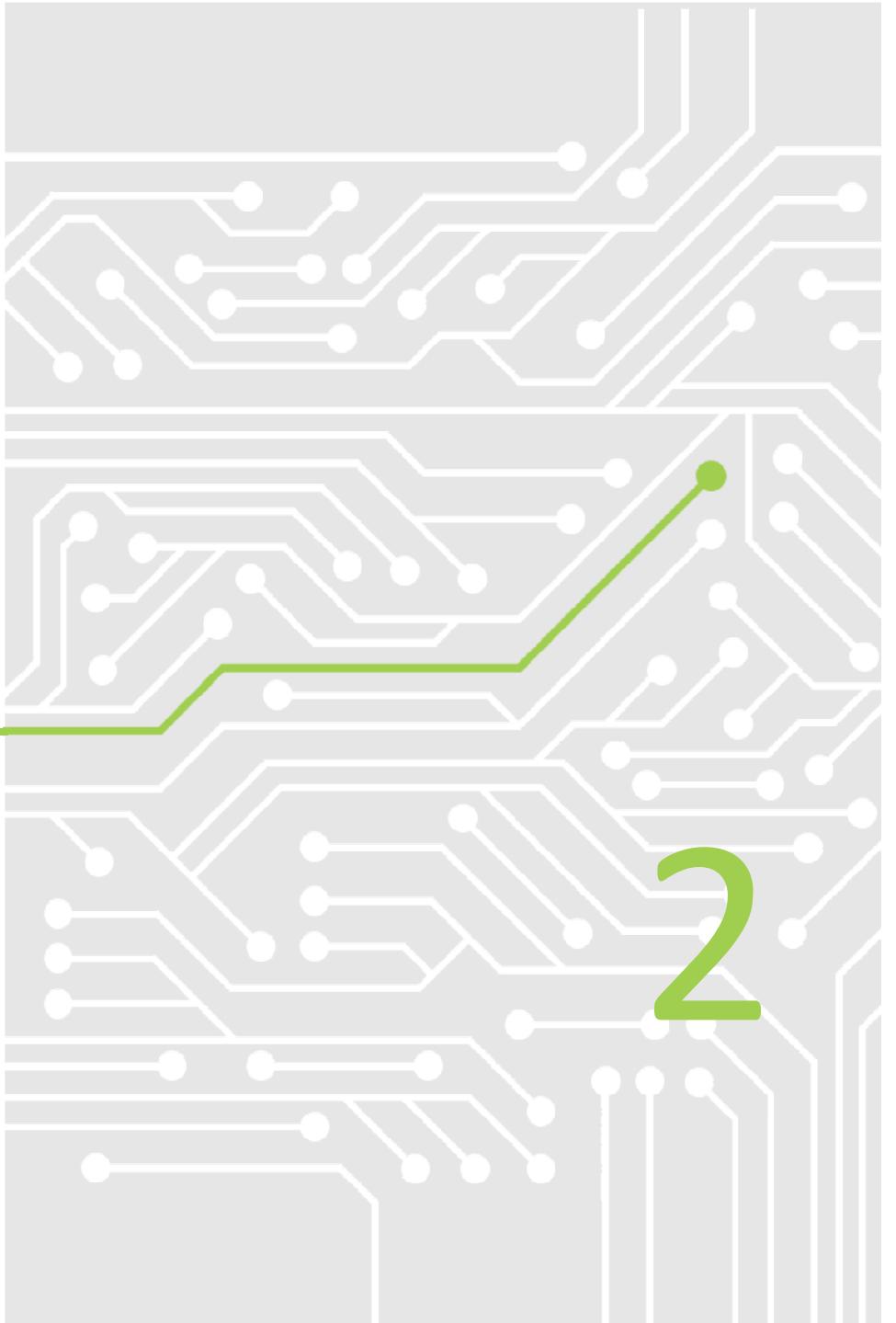
- Engineering samples have been shipped

- Roadmap/future designs

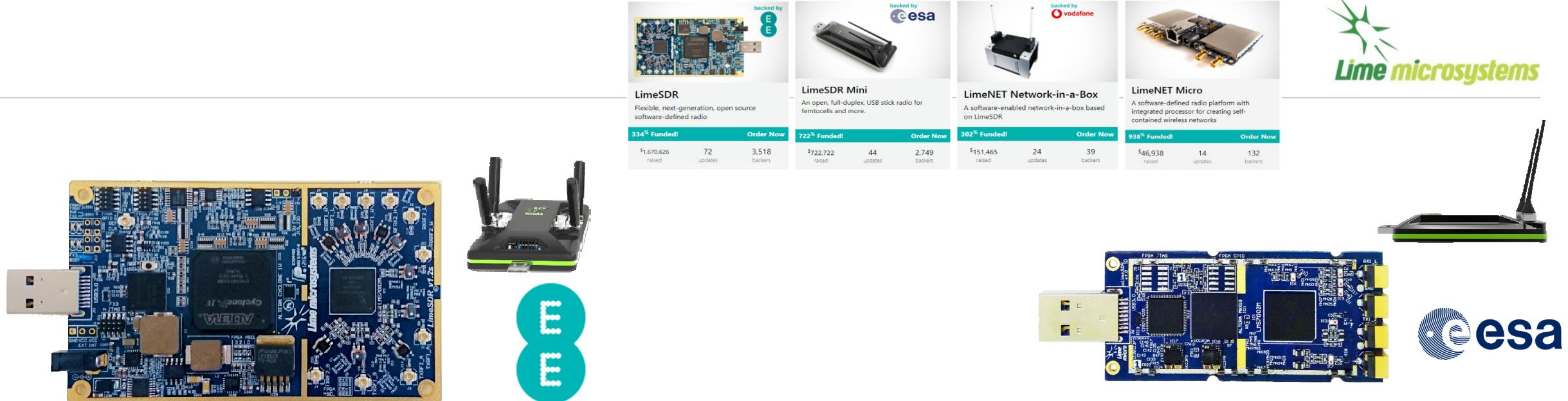




Products



Lime Software Defined Crowd Campaigns



- LimeSDR shipped about 6k units in 12 months



- LimeNet shipped about 50 units in 6 months

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- LimeSDRmini shipped about 4k units in 3 months



- LimeNET Micro (launched recently)

The first operator and developer backed wireless Network
Over 10K developers



https://www.crowdsupply.com

CROWD SUPPLY BROWSE LAUNCH ABOUT US Search

Creator Spotlight: Lime Microsystems

backed by EEA

LimeSDR
Flexible, next-generation, open source software-defined radio

Funded!	Order Now
\$1,481,577 raised	296% funded
5,901 pledges	

backed by esa

LimeSDR Mini
An open, full-duplex, USB stick radio for femtocells and more.

Funded!	Order Now
\$533,802 raised	533% funded
3,485 pledges	

backed by vodafone

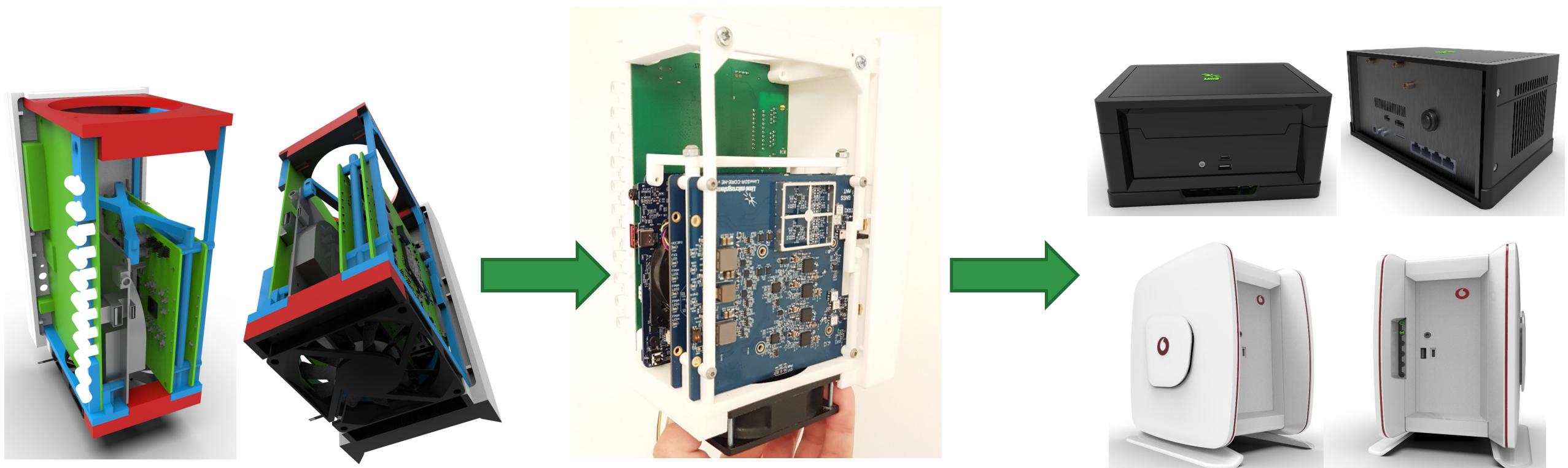
LimeNET Network-in-a-Box
A software-enabled network-in-a-box based on LimeSDR

Funded!	Order Now
\$96,679 raised	193% funded
43 pledges	

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Pre-launch of a complete Network in a box: CrowdCell

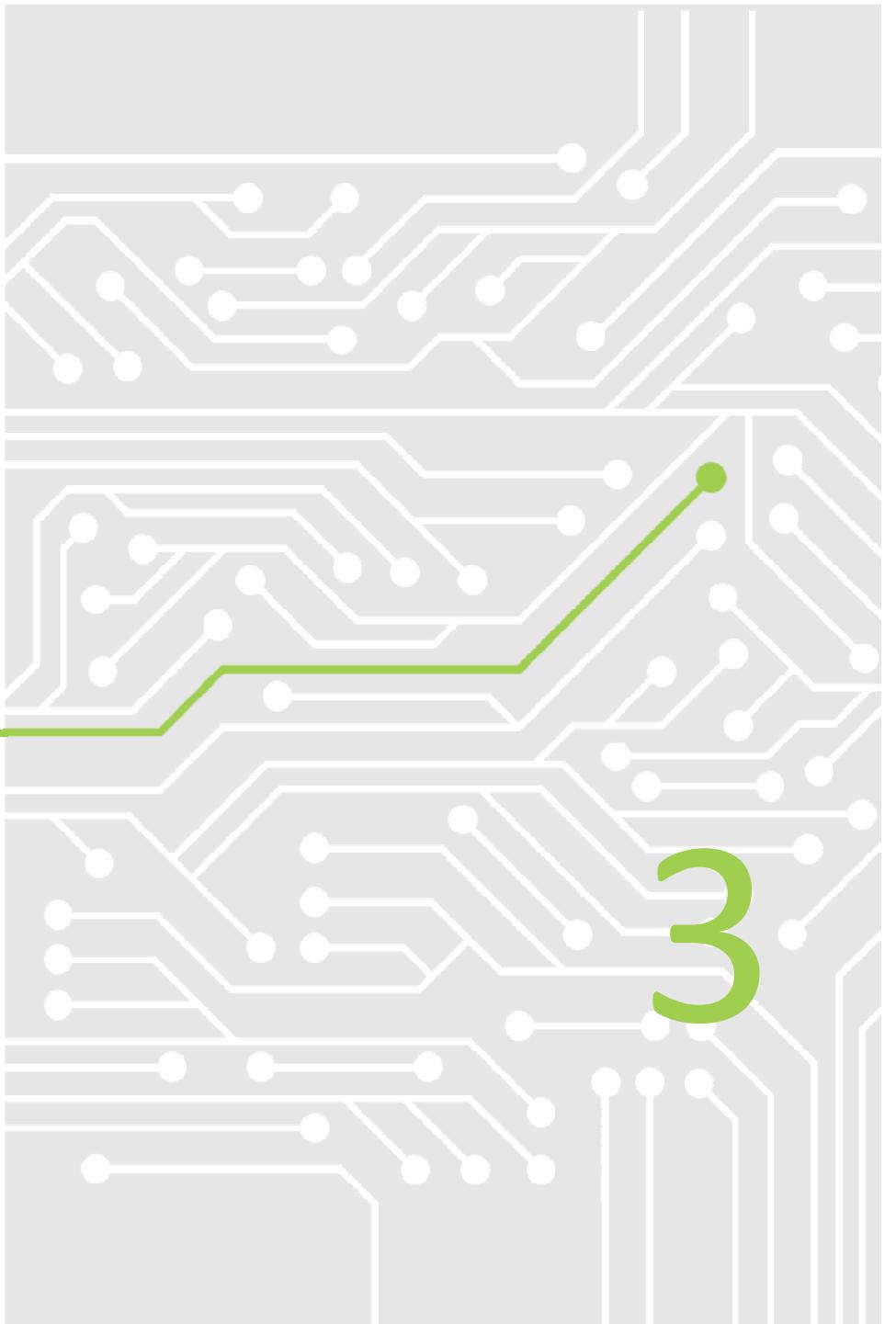
- Designed with Vodafone for a new network topology
- Delivered to numerous organizations developing Apps



LimeNET CrowdCells to be launched on CrowdSupply

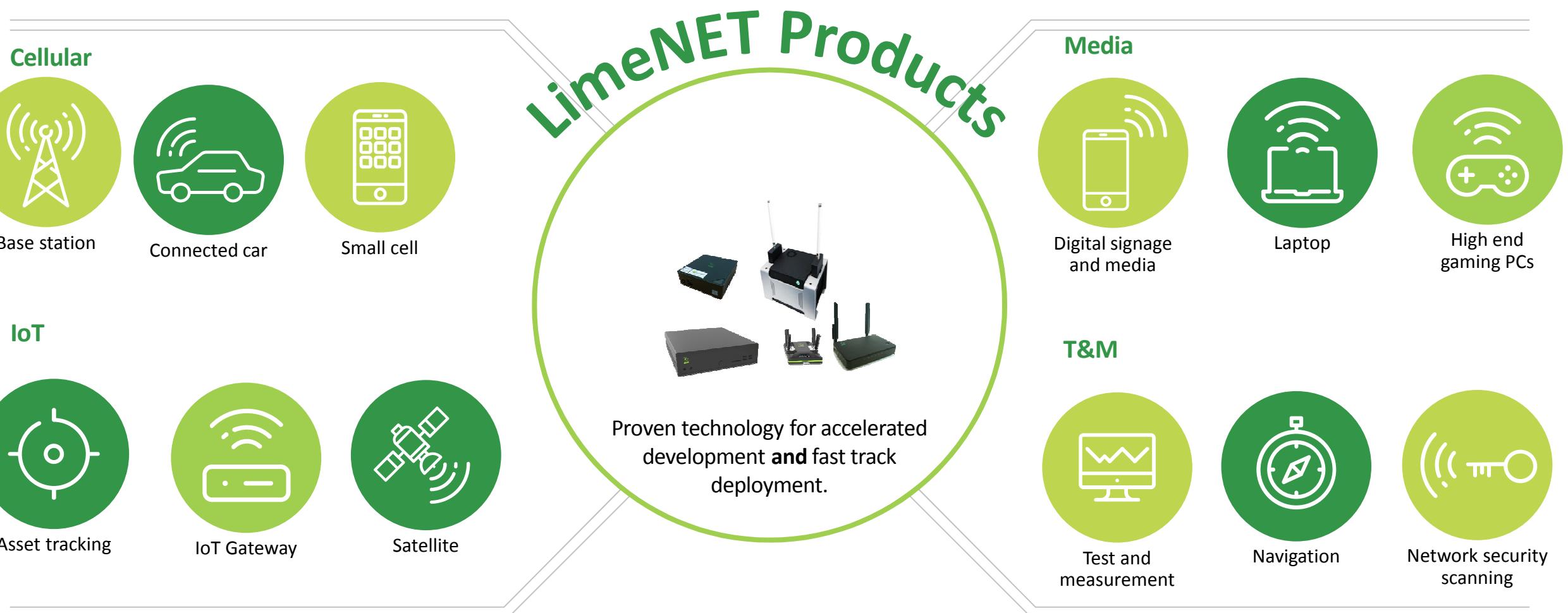
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Applications



Lime's Wireless Convergence Platform

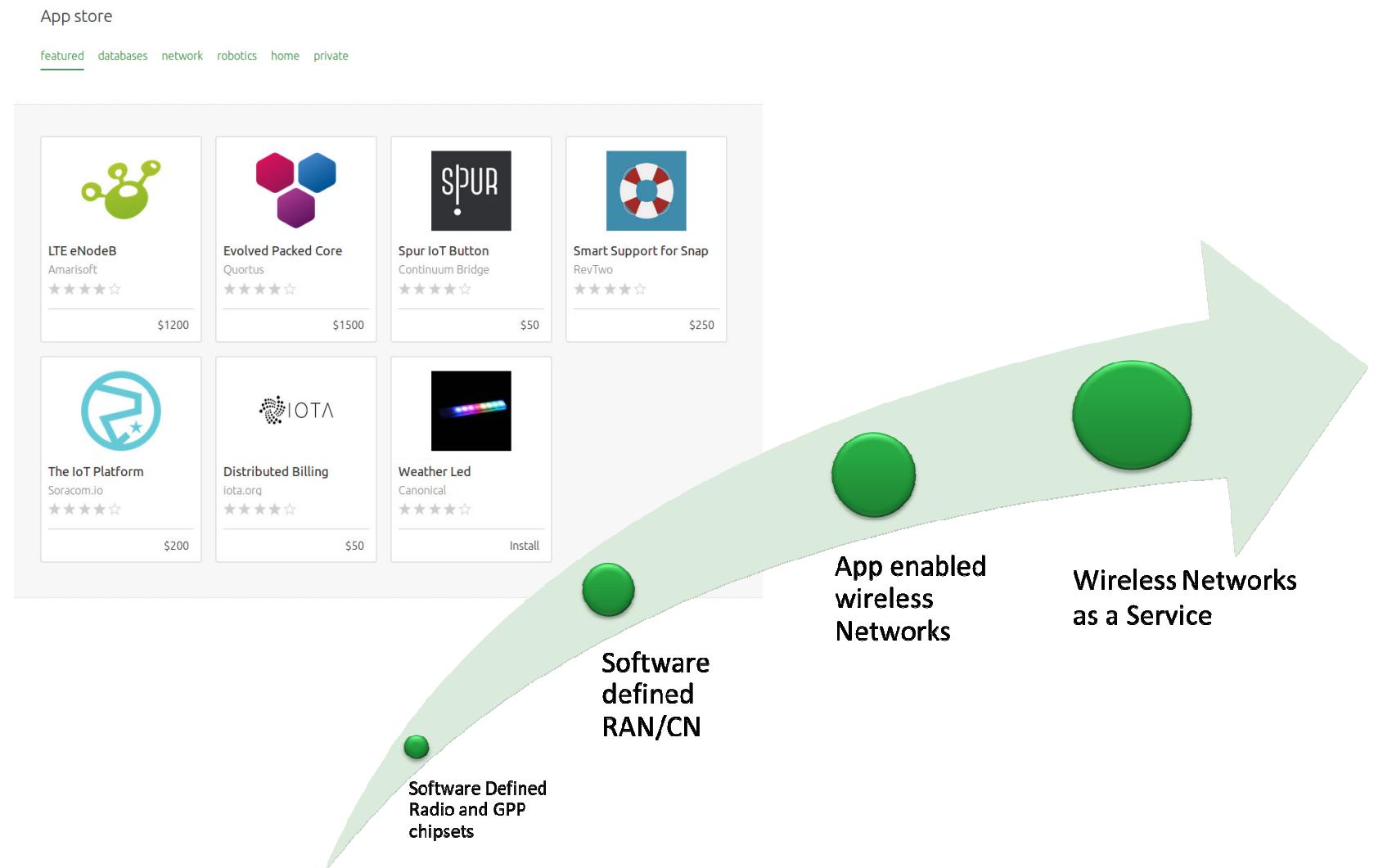
Numerous related applications, an ideal case for an IP model



App enabled through CrowdCell Edge Cloud



Commodity hardware hosting AP software



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App enabled networks, a feature rich network for all addressable markets



Lime in collaboration of Canonical are setting up Network centric App store where Radio modem is presented as an APP

App store

featured databases network robotics home private

The screenshot shows a grid of app icons and details:

Icon	Name	Developer	Rating	Price
	LTE eNodeB	Amarisoft	★★★★★	\$1200
	Evolved Packet Core	Quortus	★★★★★	\$1500
	Spur IoT Button	Continuum Bridge	★★★★★	\$50
	Smart Support for Snap	RevTwo	★★★★★	\$250
	The IoT Platform	Soracom.io	★★★★★	\$200
	Distributed Billing	iota.org	★★★★★	\$50
	Weather Led	Canonical	★★★★★	Install

Below the grid, there are two images: a smartphone and a tablet displaying the Lime App Store interface, and a hand holding a small electronic device (likely a LimeSDR Mini) surrounded by various connectivity icons.

• Sample Apps

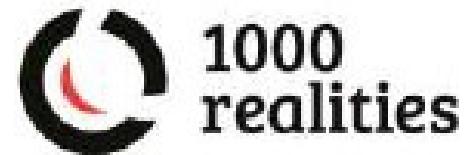
- *2G to 5G cellular Network in a box*
- *IoT gateway*
- *service steering*
- *RAN Slicing*
- *policy-based QoS*
- *traffic analysis App agents*
- *Fine motion detection and people counting*
- *LimeNET access Extends the cloud to the edge for 5G mass adoption*
- *Augmented reality App*
- *Virtual reality App*
- *secure connected healthcare monitors and wearable devices*
- *spectrum capture for a complete assessment of spectrum utilisation*

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Collaborators and Open Source Community



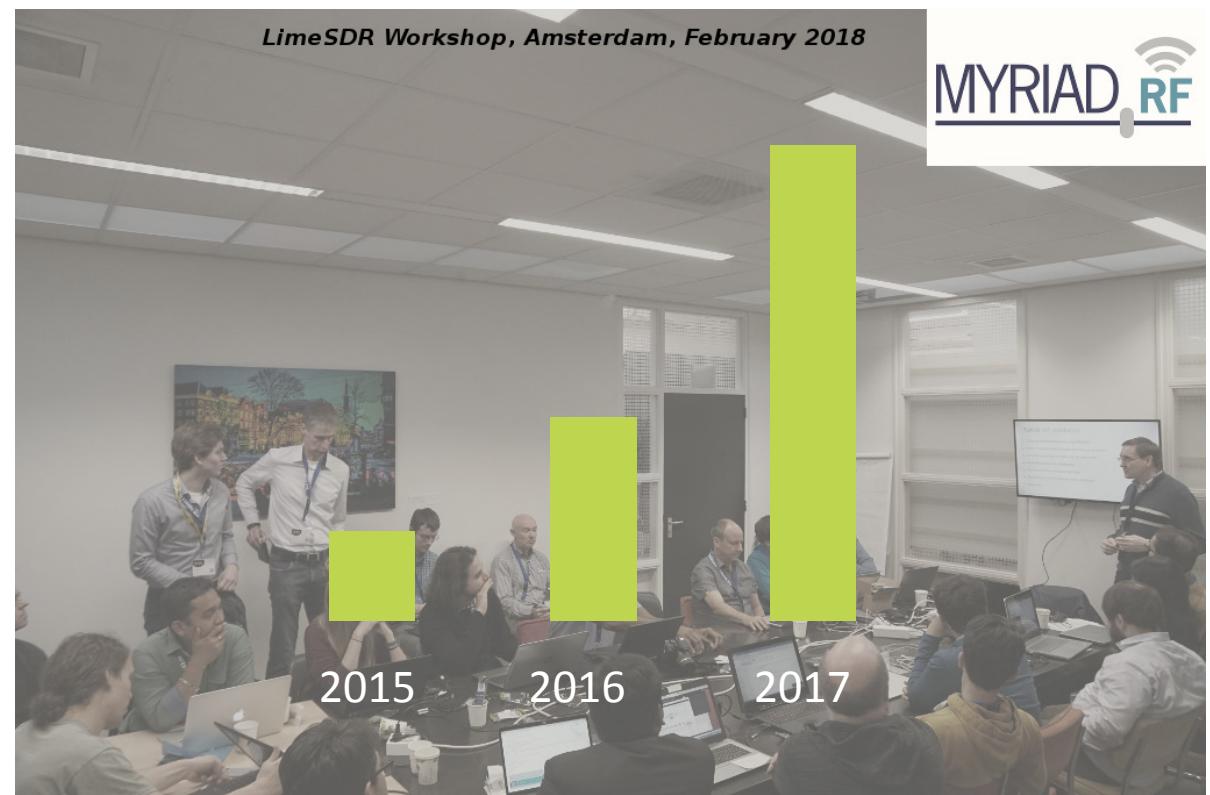
Lime has engaged the key partners for delivery of App enabled Networks



Myriad RF Drives Open Source Development

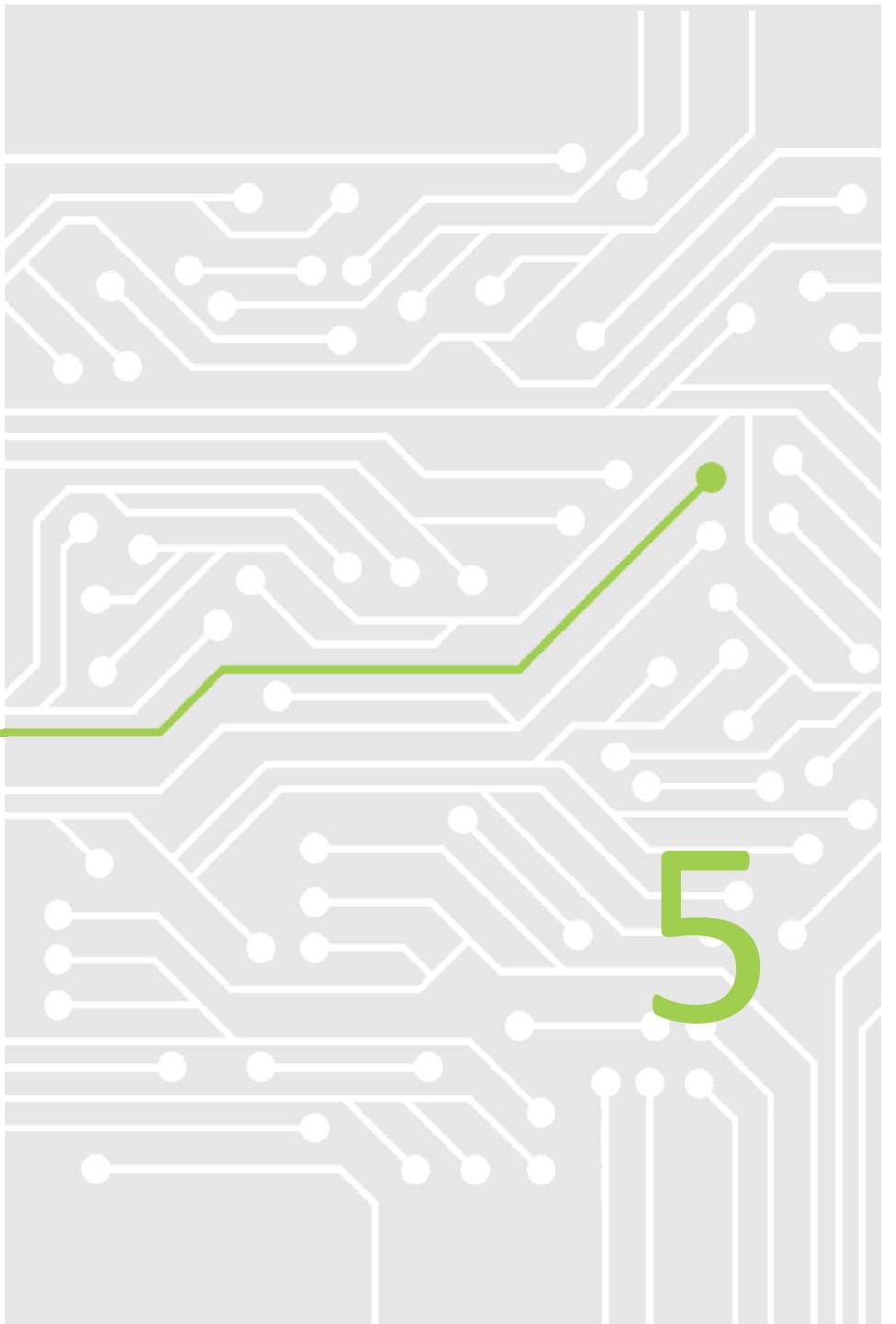


- Open Source SDR adoption is increasing
 - From enthusiasts to commercial users
 - Growth in advanced implementations
 - Stacks are maturing
- Myriad RF is an Open Source initiative founded by Lime Microsystems to accelerate adoption of field programmable platforms
- Working with the open source community, Lime has established a network of system developers that are designing hardware and software solutions
- Success of these open source platforms is made possible by the configurability and ease of use of Lime's FPRF



Open Source Projects

Summary



Summary



Heart of Lime is Field Programmable RF Technology from VHF to mmW frequencies.

Lime's chips have been incorporated into a number of successful products

Lime's products are relevant to a wide range of telecommunications and networking applications

Products are increasingly defined by selectable Apps on top of our Field Programmable Technology

Lime has embraced open source philosophy, leading to many successful collaborations.