



octoScope Introduction

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octoScope Company Summary

Company

Manufacturer of *Personal Testbeds* for Wi-Fi, LTE, IoT and other wireless markets

- Shipping the octoBox testbeds since 2013
- Serving wireless operators and their supply chain, including device and chipset vendors
- Solutions for Wi-Fi, LTE, 5G, IoT, wireless broadband, connected car, medical devices, robotics, public safety, military

Product

Compact, modular, completely isolated and controllable wireless testbed

- Automated, repeatable and accurate metrics of wireless performance & behavior
- Patented novel technology for emulating real-life RF environment
- Wireless performance, coexistence, behavior testing in controlled RF environment

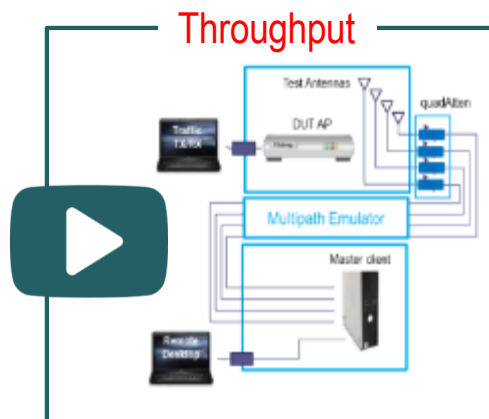
Team

Wireless test, channel emulation, wireless protocols and RF

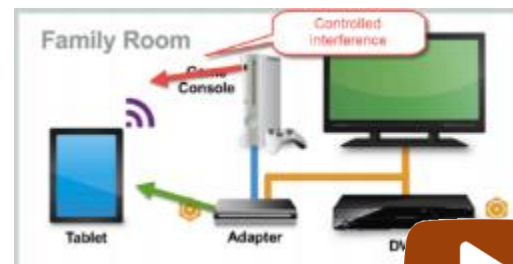
- Track record of delivering successful communications and wireless test products
- Key team members worked together going back to mid-1980s at prominent test equipment companies including Teradyne, HP/Agilent, Azimuth/Anritsu and Spirent



octoBox Testbed Summary



Multipath emulation



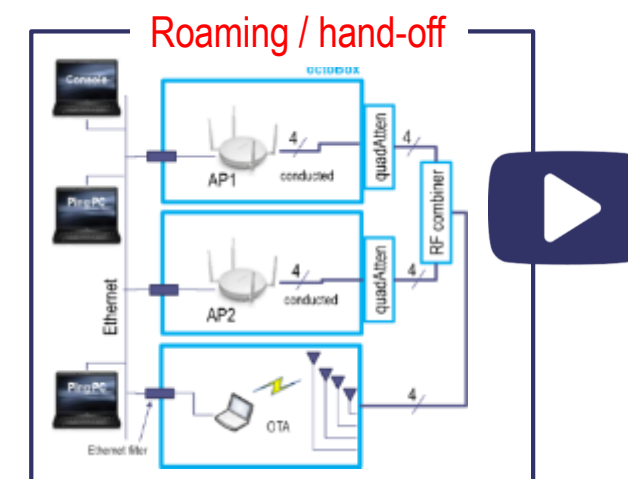
Interference generation



Traffic partner, station emulation

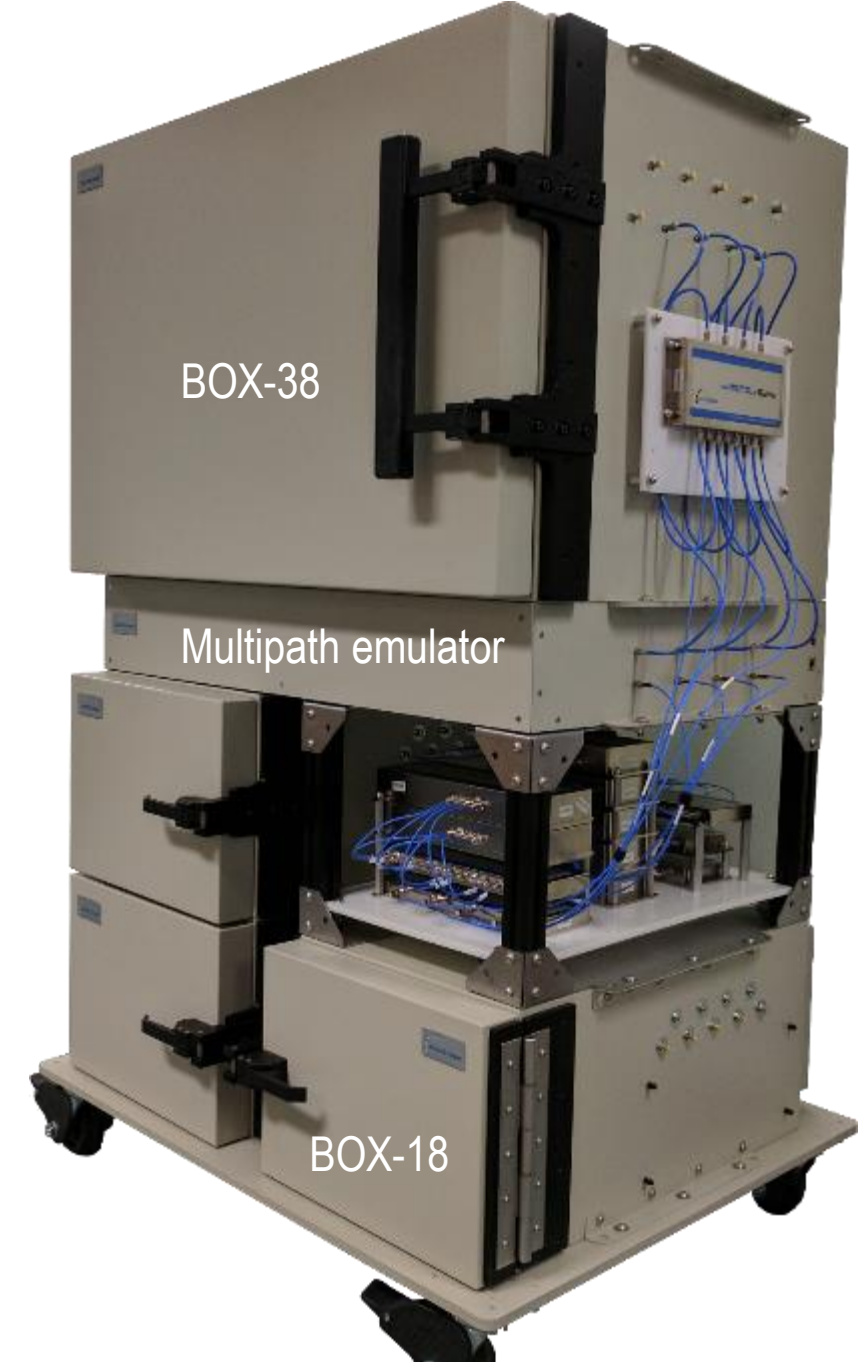


Video and multi-room emulation



octoBox Personal Testbed

- Reduce wireless test time from weeks to hours
 - Complete isolation and repeatable RF environment minimizes time-consuming open-air testing
 - Automation accelerates data collection, improves test coverage and product quality
- Demonstrate highest achievable performance
 - Ideal MIMO environment for highest possible throughput
 - Supports latest technologies, such as 160 MHz 802.11ac, 802.11ax, MU-MIMO and Beamforming
- Qualify User Experience
 - Emulate real-world challenges
 - Programmable range of condition from best MIMO environment to challenging real-life impairments



octoScope's Customers

OperatorsLabsChipset vendorsEquipment vendors

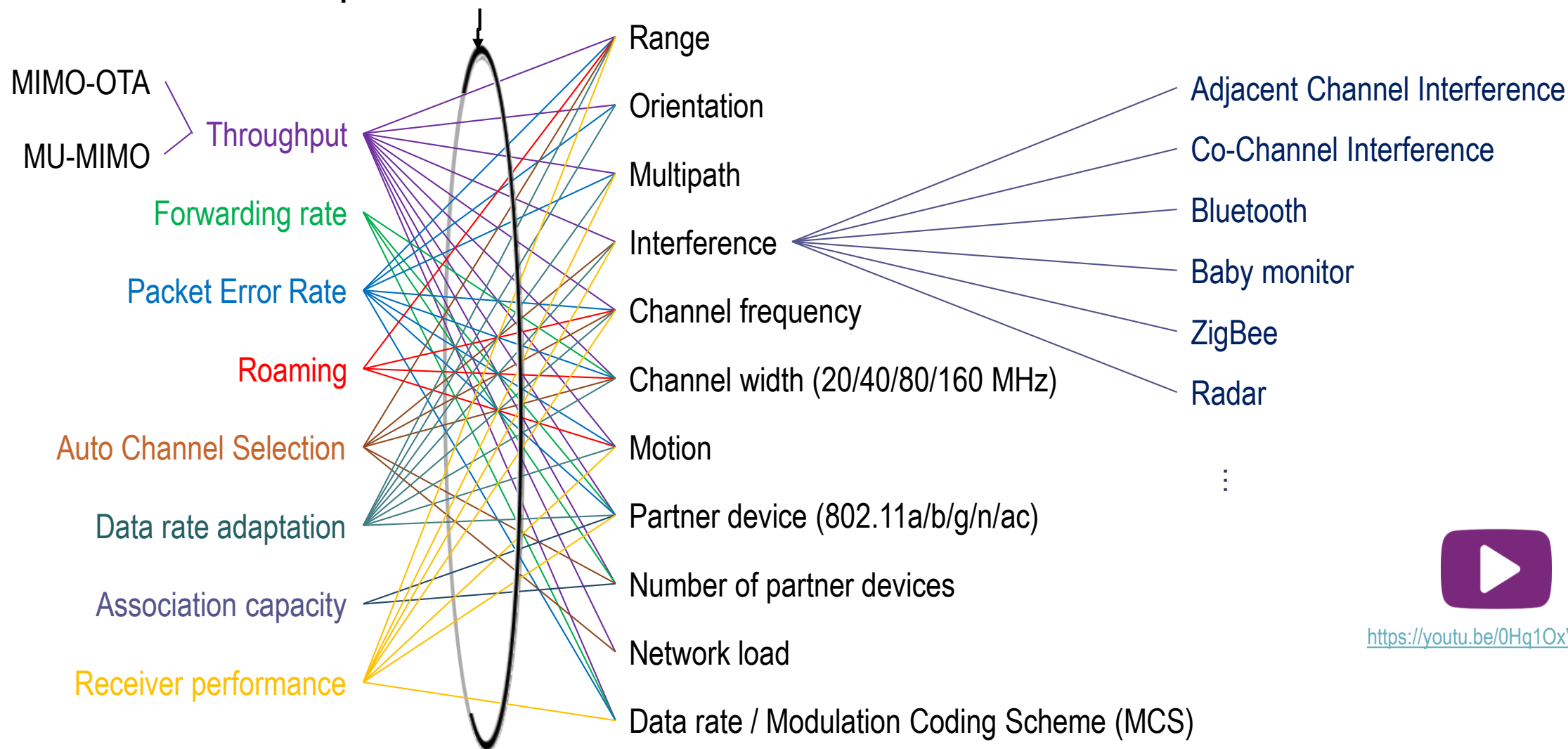
Wireless Test Applications

- Performance
 - MIMO OTA throughput
 - MU-MIMO gains
 - Load testing
 - Roaming
 - RX sensitivity
- User Experience
 - Adaptation to impairments, such as path loss, interference, multipath, load
 - Roaming behavior – find sticky clients
 - DFS (dynamic frequency selection)



Tests Supported by the octoBox Testbed

Exponential number of tests vs. variables



MIMO = multiple input multiple output
MU-MIMO = multi-user MIMO



<https://youtu.be/0Hq1OxVaAwk>



Based on the MEAN stack (Node.js, mongo.DB and Angular)

- Remote controllable via any browser
- Database for test records and testbed building blocks
- API for test automation

Autotest

Dashboard

« Collapse

Traffic

▼

Training duration

2

Step duration

10

Active	Name	From	To	Protocol	IP Streams	Offered load (kbps)	Buffer (kb)	Window (kb)		
<input checked="" type="checkbox"/>	Traffic-1	Local Traffic Endpoint	▼	tcp	▼	4	0	0	0	
		192.168.15.6@Pa2-PU	▼							

Configuration elements:

▼

Add new...

▼

Monitor

▼

Range

▼

Range (dB)

0 dB

20 dB

60 dB

Step (dB)

5

Primary quadAtten	Series quadAtten	Max attenuation	Delete
QA601010-20 @192.168.15.20	No series quadAtten	60	

Orientation

▼

Turntable

Turntable octoScope 0 [turntable] @0

▼

☐ Rotate during test

☒ Polar plot

Rotation step

30

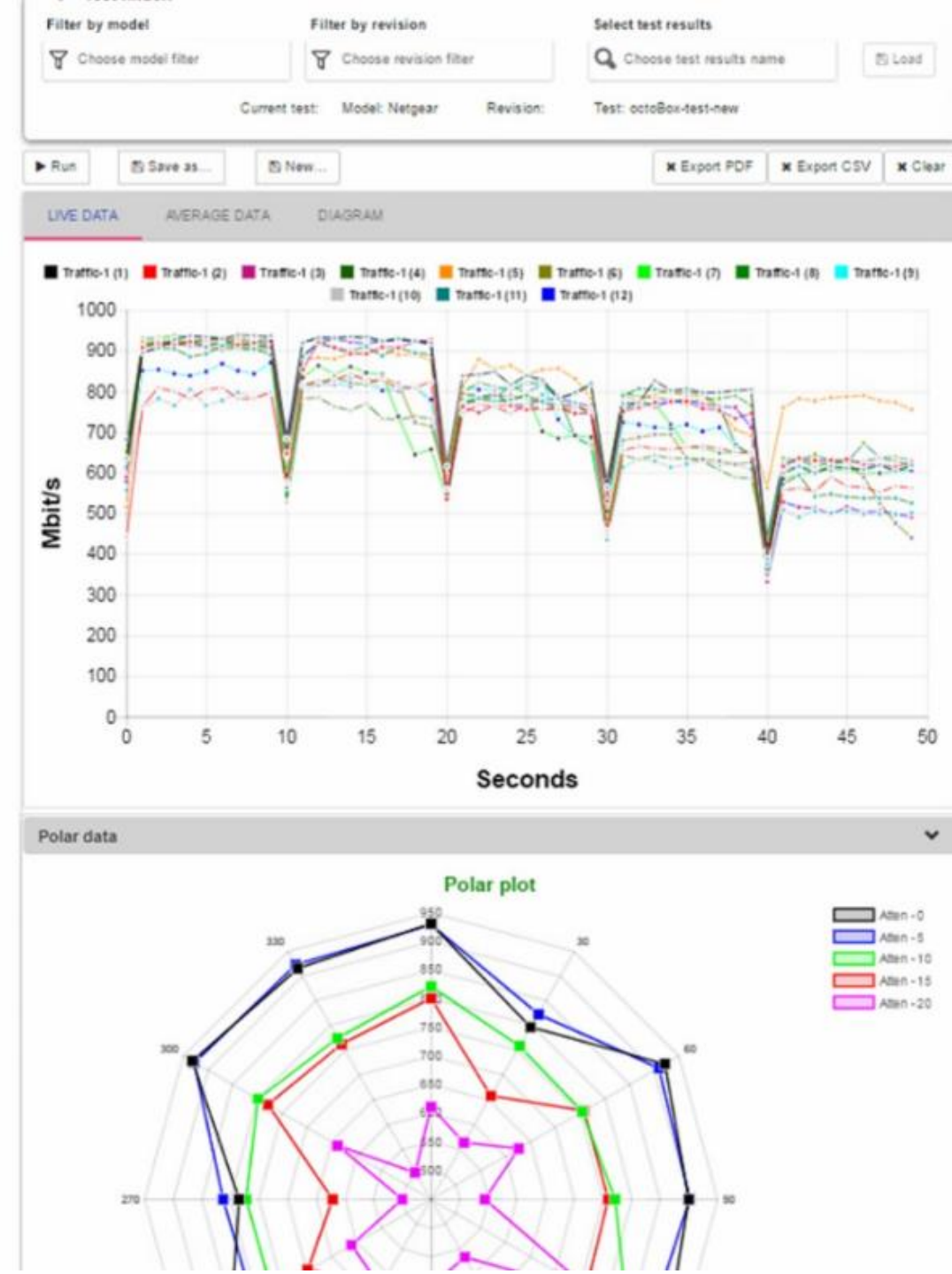
Start position (deg)

0

End position (deg)

360

Home turntable





Pal Instrument – Brain of the octoBox Personal Testbed

Pal-245

Pal-24

Pal-5

<i>Linux Yocto OS</i> <i>Quad-core 2 GHz Intel Atom</i>	2.4/5 GHz 3x3 radio <i>QCA9880 3x3 80 MHz</i>	2.4 GHz 4x4 radio (wave 2) <i>QCA9984 4x4 40 MHz</i>	5 GHz 4x4 radio (wave 2) <i>QCA9984 4x4 160 MHz</i>
MIMO-OTA	✓	✓	✓
MU-MIMO			✓
Beamforming		✓	✓
Channel width	20/40/80 MHz	20/40 MHz	20/40/80/80+80/160 MHz
AP	✓	✓	✓
STA (client)	✓	✓	✓
Virtual STA, vSTA	32	32	32
Traffic replay	✓	✓	✓
Monitoring	✓	✓	✓
Wireshark captures	✓	✓	✓
2.4 GHz	✓	✓	
5 GHz	✓		✓

Roaming, Coexistence, Mesh, Large Scale Network Testing, ...



Flexible network topology configurations are possible with octoScope's completely isolated MIMO splitters.



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