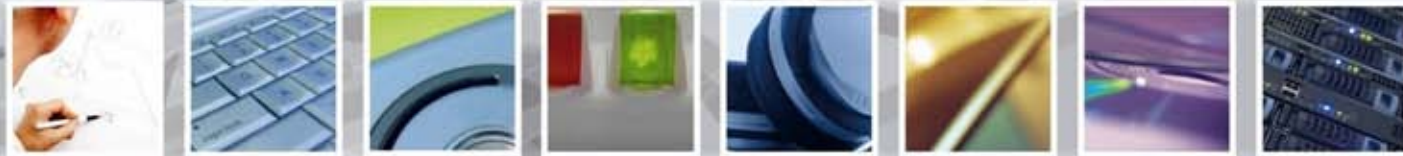


Overview of the WALTER test beds. The services WALTER offers

2009-10-07

Sophia Antipolis, France

Manuel García Fuertes (AT4 wireless)





1. Introduction

2. WALTER Test Categories

3. Testing Capabilities

4. Conclusions



Introduction

WALTER (Wireless Alliances for Testing Experiment and Research) is :

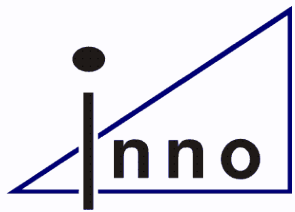
Specifying, testing and improving **interoperability** of broadband radio devices and for that will

Develop a pan-European broadband test bed, covering the needs, for research, industry and regulators



Introduction

- ✓ WALTER gets together partners from different locations and activity areas:



(Coordinator, Germany)



(SDO, France)



(Technical Direction, UK)



Institute for the Protection
and Security of the Citizen

(Test Lab, Italy)



(Test Lab, Spain)



(Test Lab, China)



(Industry, Israel)



(Industry, UK)



Introduction

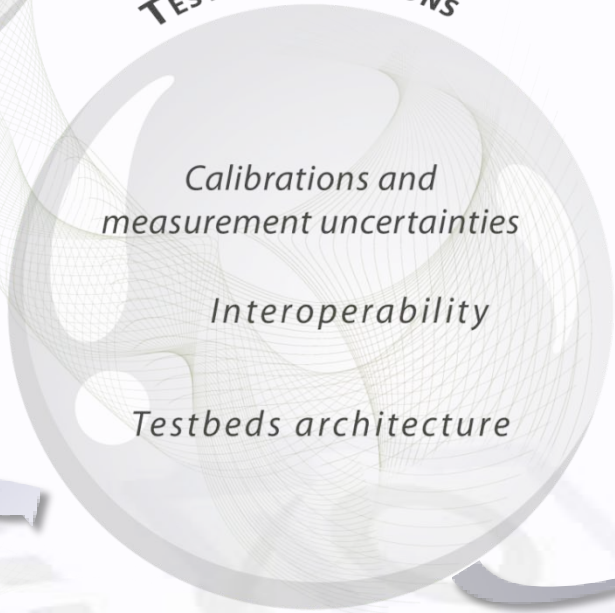
IDENTIFICATION OF REQUIREMENTS



WALTER addresses:

- Short term needs of industry and regulators
- Long term needs of research communities

TEST SPECIFICATIONS



WALTER TESTBEDS





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Test Categories

The WALTER test beds cover **8** test categories:

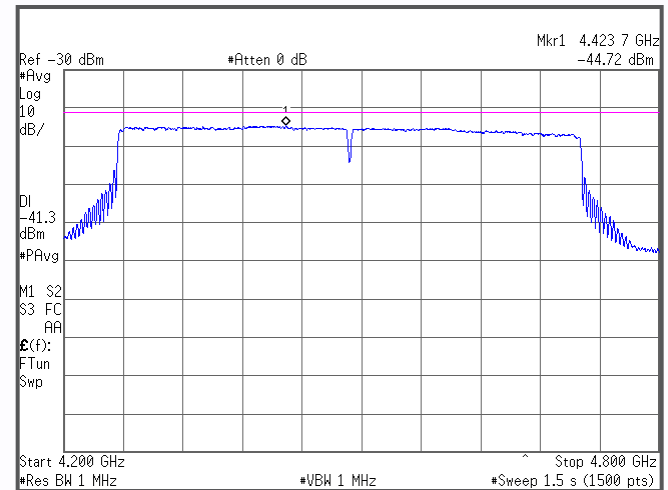
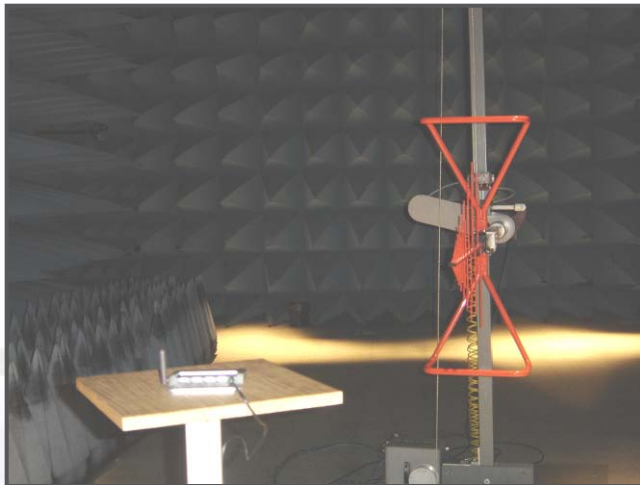
- ✓ Regulatory (**REG**)
- ✓ Conformance (**CON**)
- ✓ Interoperability (**IOP**)
- ✓ Radiated Performance Tests (**RPT**)
- ✓ Over The Air (**OTA**)
- ✓ Coexistence (**COE**)
- ✓ Performance (**PER**)
- ✓ Plugfests (**PGF**)



Test Categories - REG

The **REG** category deals with requirements such as (*focus on EN 302 065*):

- ✓ Spectrum and Power Characteristics
- ✓ Radiated Emissions
- ✓ Detect and Avoid
- ✓ Time-related Parameters
- ✓ etc...

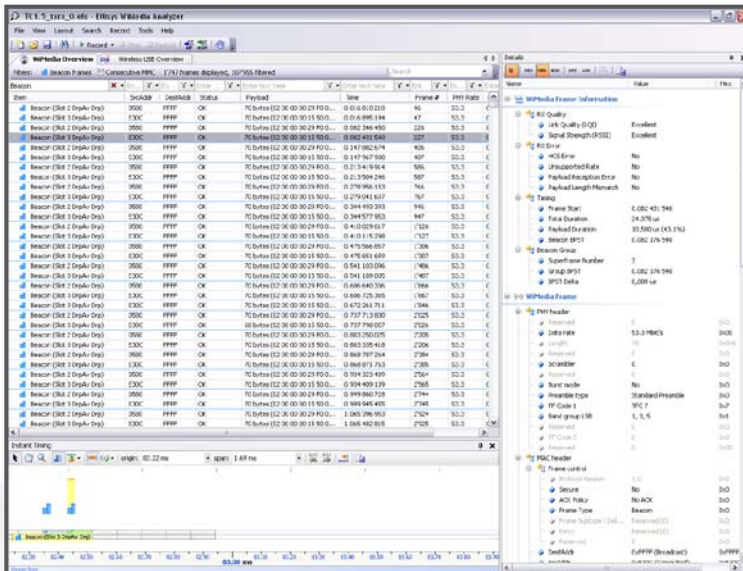
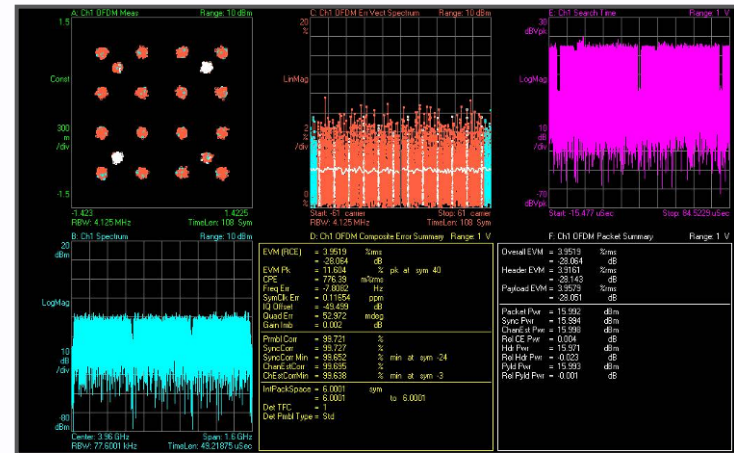




Test Categories - CON

The **CON** category deals with requirements coming mainly from WiMedia Test Specs (*protocol testing*):

- ✓ PHY
- ✓ MAC

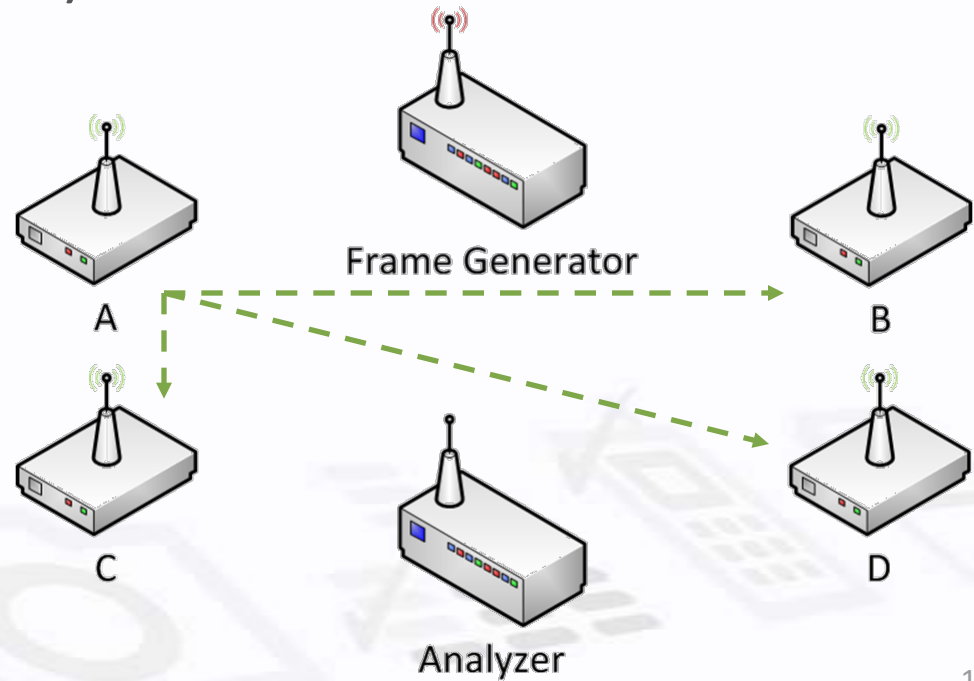




Test Categories - IOP

The **IOP** category is intended to check the multi-vendor interoperability at different layers:

- ✓ MAC (WALTER IOP)
- ✓ IP (Ping, data transfer...)
- ✓ Upper layers...

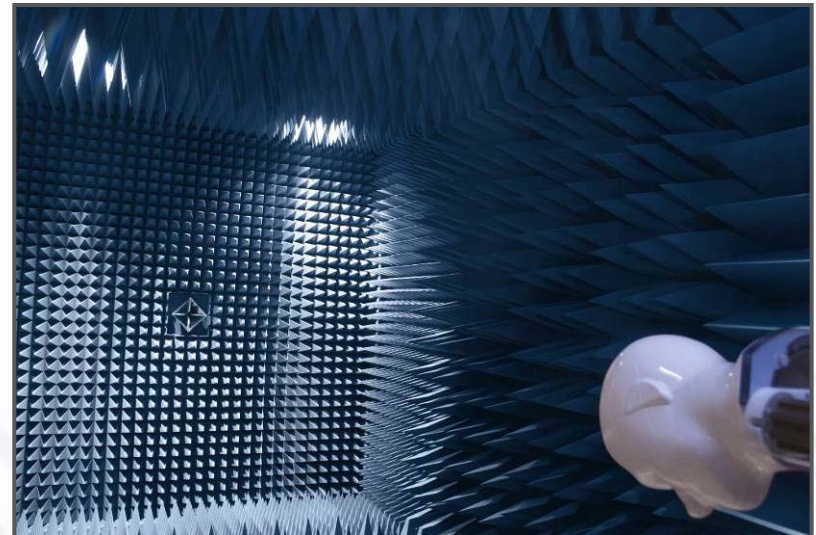
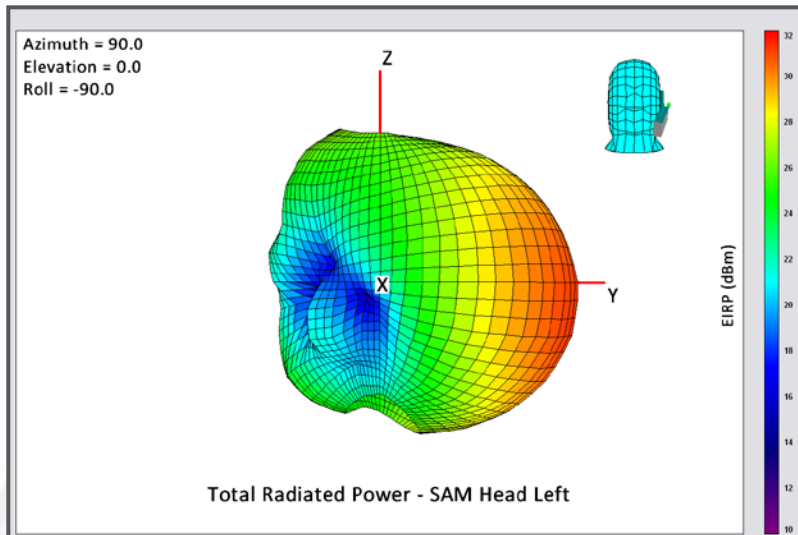




Test Categories - RPT

The **RPT** category deals with the radiated performance of the device:

- ✓ TX (TRP measurements)
- ✓ RX (TIS and desense measurements)





Test Categories - OTA

The **OTA** category deals with:

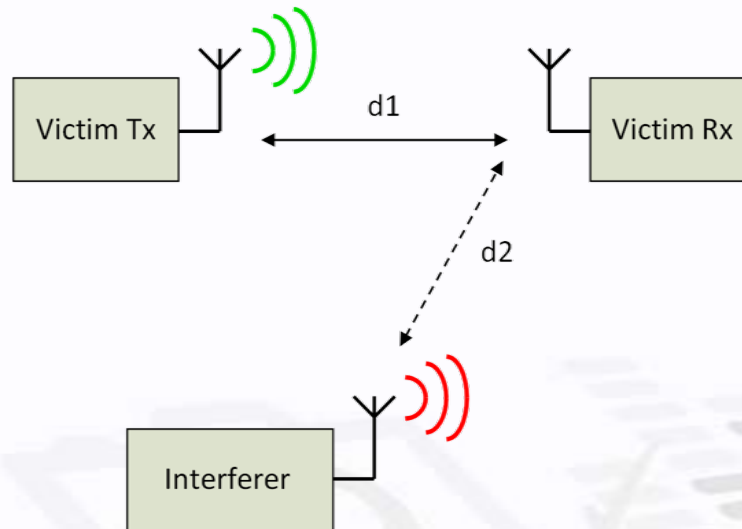
- ✓ Software Defined Radio (SDR): controlling the device over the air
 - Transmit Power Control (TPC)
 - Dynamic Channel Selection
 - Data Rate Adaptation...
- ✓ Environmental Field Tests (EFT): Real environments outside an anechoic chamber
 - LOS/NLOS performance tests



Test Categories - COE

The **COE** category is intended to check whether two wireless technologies can coexist simultaneously:

- ✓ Among different technologies (e.g. WiMAX-UWB)
- ✓ Within the same technology (e.g. UWB)

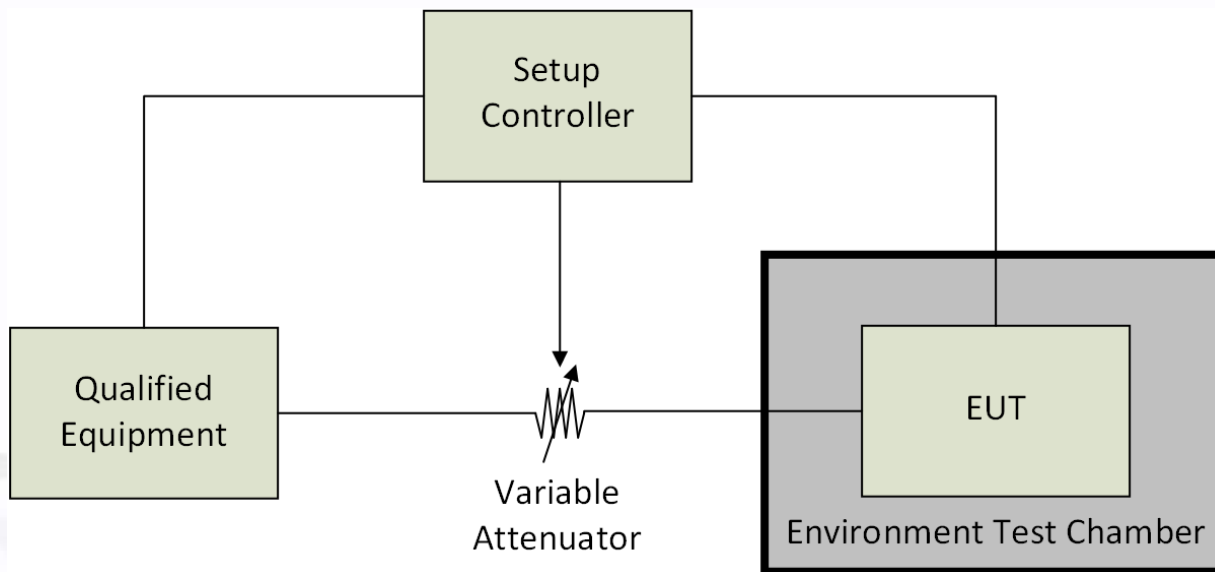




Test Categories - PER

The **PER** category checks whether the DUT fulfils commercial assurances quoted by the manufacturer

- ✓ Sensitivity - Temperature
- ✓ Output Power - Temperature





Test Categories - PCF

The **PGF** category refers to those testing activities performed at Plugfest events

- ✓ Test plans developed according to participants needs
- ✓ Oriented to prove multi-vendor interoperability





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Testing Capabilities - REG

The WALTER test beds offer the following **REG** services:

Standard	Covered	Limitations
EN 302 065 v1.2.1	✓	EIRP below 2.7 GHz and above 10.6 GHz DAA test methods to be validated
FCC Part 15 Subpart F	✓	EIRP in the range 960 – 1610 MHz (indoor and portable devices) EIRP above 12.75 GHz (portable devices)
EN 301 489-33 v1.1.1	✓	None
FCC Part 15.107-109	✓	None

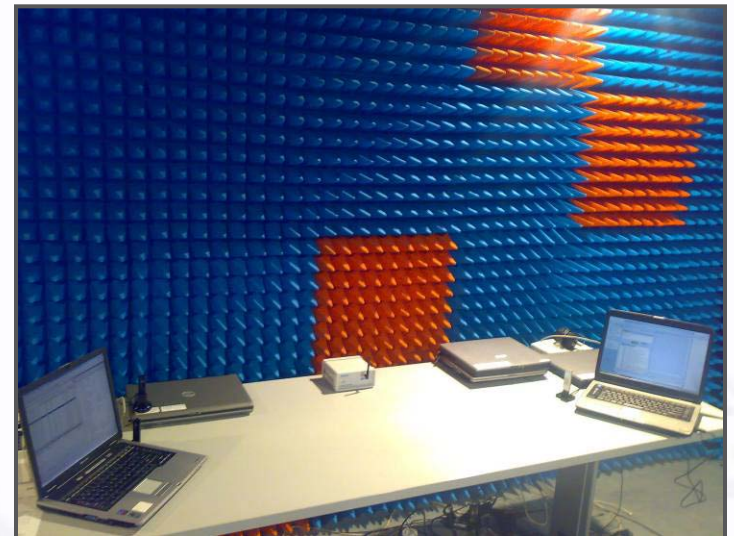
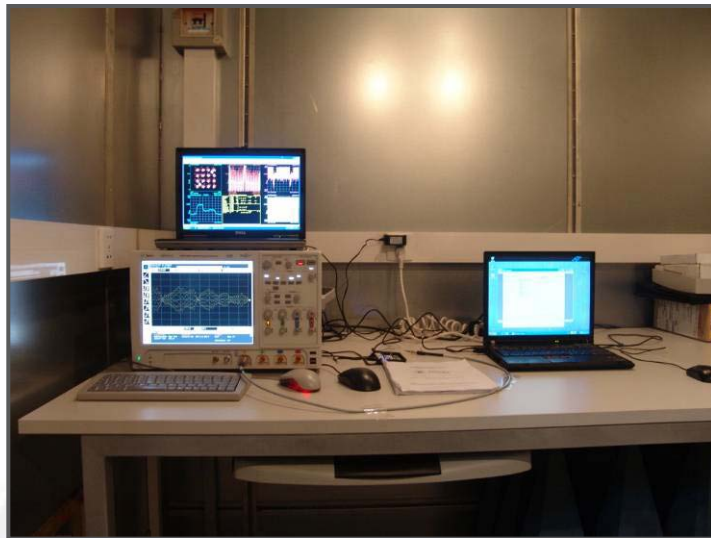




Testing Capabilities - CON

WALTER test bed **CON** services. The WALTER test beds check whether an UWB implementation is compliant to:

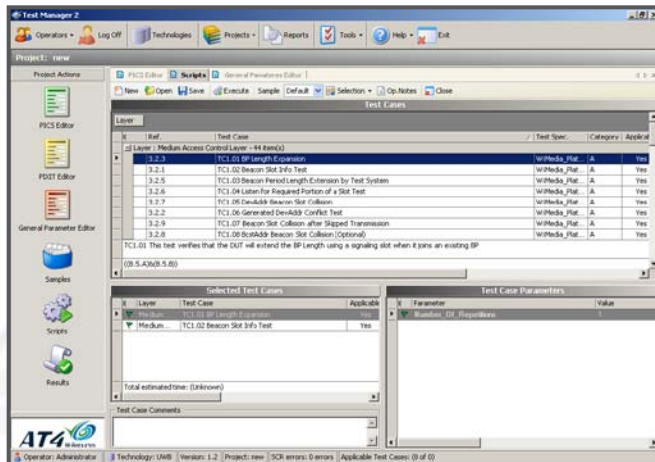
Test Specification	Version	Limitations
WiMedia PHY Test Specification	1.0, 1.2	Lack of reference units
WiMedia Platform Test Specification	1.1, 1.2	Checker for 1.2 is not available yet





Testing Capabilities - CON

- ✓ WALTER has developed **TX-RX test scripts** for MAC testing
 - Intended to be part of WiMedia Platform Certification program
 - To be validated within WALTER and in certification events
 - Replaces the previous and no longer supported WiQuest TX-RX scripts
- ✓ WALTER has developed an **Automated MAC Test Tool**
 - Intended to save testing time and avoid manual testing mistakes
 - Based upon validated test equipment (analyzers, generators, etc.)



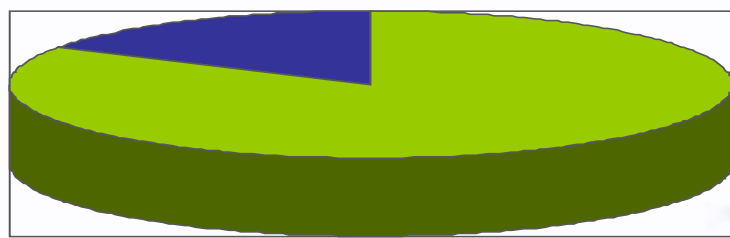





Testing Capabilities - IOP

WALTER offers **IOP** test services for:

✓ WALTER IOP MAC Test Specification

- Developed within WALTER
- Intended to check multi-vendor IOP at MAC level
- Validated in a WiMedia certification event (Geneva, 2008)
- Debugged and refined against real implementations



	PASS (15)
	FAIL (0)
	Non-valid verdict (3)



Testing Capabilities

The **OTA** services offered by WALTER are:

- SDR: No SDR test specs have been specifically defined for UWB
- EFT: LOS and NLOS performance tests in office environments

WALTER offers **RPT** services for wireless technologies such as:

- 2G/3G Cellular communications
- WiMAX
- Wi-Fi
- UWB (experimental trials only)



Testing Capabilities

WALTER offers experimental **COE** test services for:

- WiMAX – UWB Coexistence
 - Evaluation of performance degradation (BER, PER, etc.)
- Coexistence in UWB
 - Check whether two or more UWB devices can coexist in the channel

In terms of **PER**, the WALTER test beds can:

- Evaluate performance degradation against T (sensitivity, power)



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Conclusions

- ✓ WALTER has set up **test services** for broadband technologies
- ✓ Test services have been made more **effective** (automation)
- ✓ WALTER test services have been **validated** (inter-comparison)
- ✓ WALTER test beds have produced **inputs** for standardization bodies (ETSI) and alliances (WiMedia)



Thanks for your attention

Any questions?

