Your digital lab

Laboratoire des Applications Numériques

Catalogue

2011

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A Centre of Expertise

The Laboratoire des Applications Numériques is a unique centre which regroups specialised resources both human and material to test a diverse range of digital applications.

Our services are tailored to correspond to your requirements whether it be in testing, technical engineering or training.

The work we carry out is undertaken by skilled technicians specialised in wired network technologies (DSL, GPON) and digital communications for the home environment (PLC)

The LAN resides in more than 1000 m2 floor space with :

- Equipped laboratories.
- Autonomous platforms.
- Hundreds of DSL and PLC modems.
- Dozens of DSLAMs of numerous brand names

The “xDSL Testing” laboratory has a dozen test platforms ADSL, ADSL2+, G.SHDSL, G.SHDSL.BIS, VDSL2, GPON.

LAN focuses on Industry objectives

- To propose to manufacturers, ISP’s, network operators in telecommunication and energy, a range of testing services to test compliance with industry standards, the coexistence of other products and their interoperability.
- To develop advanced technological platforms for experimentation and modelling associated with home environment applications, regrouping and structuring the digital trend in the numerous research programs.

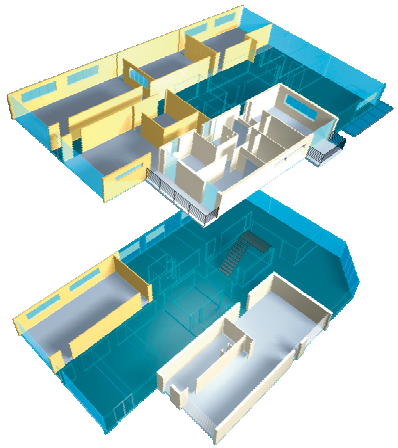
These automated platforms test the interoperability of DSL and DSLAM modems.

The LAN has three test units for PLC.

They simulate several electrical “star” networks or daisy-chained plug networks.

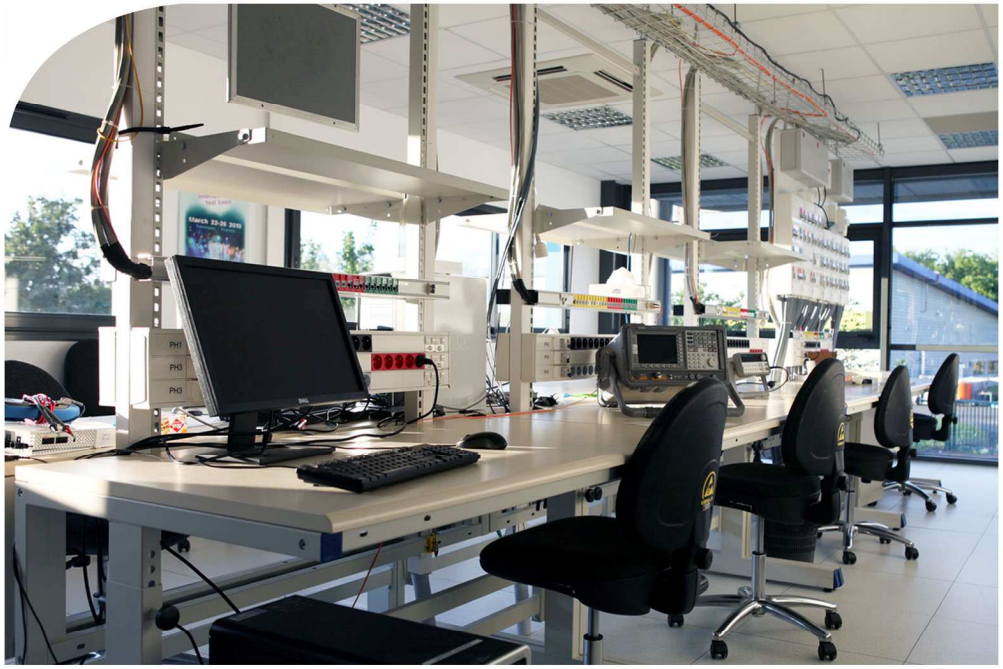
These test beds allow the operator to set up representative simulations for performance tests in robustness (throughput, latency, jitter), interoperability, and application tests (data/audio/video).

They can also be used for compatibility tests on PLC modems with the HomePlug® AV standard



PLC = Power Line Communication


165
LABORATOIRE
DES APPLICATIONS
NUMERIQUES

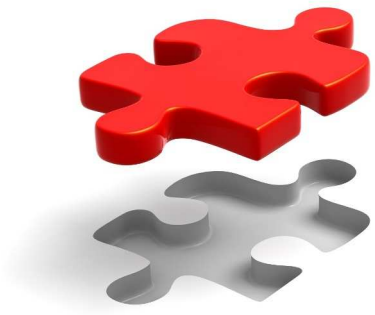



DELL

Conformity

It functions
It conforms !

In addition to functionally validating your product,
the teams at LAN will test for communication protocol conformity
with the associated technical standard.
This test and validation will ensure that your product
can communicate with others using the same protocol.
Because of the complexity of communication protocols today,
conformity is generally insufficient to guarantee perfect
interoperability with different solutions.
Nonetheless, it is the first stage which if performed
with precision, will significantly enhance interoperability.
In the long run, this will allow your product(s) to address
a mass market based on the fact that many other products
are based on the same language/protocols and standards.
These language/protocols correspond to the current
requirements of carriers, service companies and end users.



Adopt
the « Pro » methodology

By testing your product
with respect a standard;
it gives you security
and a guarantee.
It is an insurance policy
that your product meets
the precise criteria detailed
in the standard.
Your clients will understand
the reference in terms
of reliability, security, energy
economies, compatibility
and interoperability.
Being able to put
an International Standard logo(s)
on your product gives credibility
and reassurance for the end-user.

Interoperability the key for success !

Those that master product Interoperability control their destiny. Just as the industrial revolution transformed society, in today's scientific universe Interoperability is the radical phenomenon in expanding technology, as crucial as the invention of the wheel in the Neolithic age. The power of communication will be shared with our machines and appliances of tomorrow.

Compatibility, is this sufficient ?

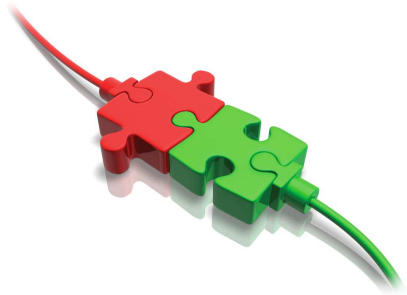
Often Industrial manufacturers' give importance to "compatibility", ensuring their products meet certain criteria on paper, and then testing them on restricted test beds.
Compatibility does not guarantee Interoperability.
(Compatibility is one dimensional and Interoperability is three dimensional.)
Compatibility seeks that a product can work in a specified environment.
Interoperability goes much further.
The concept is that different types of equipment from various brand names can communicate with each other.

Interoperability is imperative

The LAN proposes services to calibrate, regulate, and debug DSL chips. We offer standard tests at fixed rates, or tests carried out continuously throughout the day for qualification or the non regression tests of CPE modems, or DSLAM's based upon a specific network operator. For example, DSL modems and DSL multiplexors (DSLAM) are tested against all the different versions of hardware and software deployed by all the various telephone operators, in a way to ensure the interoperability on the network.

Quantify, Qualify, Certify

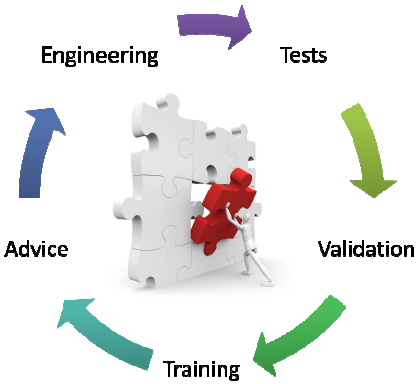
The LAN proposes to quantify, qualify, and certify the interoperability of your products and solutions. Our laboratory has the necessary tools, test benches and network facilities susceptible to challenge the potential interoperability of your systems.



Service +

Get into overdrive !

The LAN will objectively analyse your test procedures, and make practical recommendations on how to "supercharge" them throughout your project lifespan.
In an effort to optimise quality, the LAN proposes a pragmatic approach to help you find the test strategy which corresponds best to your requirements.
We adapt to find the most appropriate industrial tests taking into account your organisation, your resources, and budgets.



Our project managers and experts will also help guide you to select the most appropriate tools which correspond to your needs and requirements.

Research +

LAN's engineering offer is geared to

- Advice
- Engineering, Technical design
- Testing
- Validation
- Training

Principles which distinguish us

Our training programs were designed with concepts in mind which are unique, and differentiate us from other training programs.

Individualising your project

When you train with LAN, you will have access to our testing platforms based on technology that interests you.
The theoretical technical aspects, their potential and limits, you will be able to develop and ascertain for yourself with the full support and assistance of our supervising staff.
At LAN, trainees can take charge of their projects themselves, and resolve interoperability issues, set up their own networks and find their own solutions by manipulating the hardware and testing various setups.
Trainees have autonomy to develop their knowledge base.

The best of ...

everything we have to offer in terms of facilities and expertise. The training is supervised by top rated specialists in each sector, the same people who test the latest technologies and are conversant with the latest developments in their sector.
The LAN focuses on interoperability, product conformity and quality, all in the context of challenging trainees to surpass themselves.
It is our trade, our job, our “reason for being”
Whatever your initial knowledge base, you will enjoy the best of both worlds, today’s world and tomorrow’s world !

Trial and error

Children learn quickly because the advantage they have is they are not "conditioned".
They are expected to dream and be creative, and much of what they do is by trial and error, and by practicing.
Our training builds on this concept.
A training program is more efficient if the apprentice can be coaxed to “disconnect” from their normal habits and limitations and push the boundaries further afield.
Experimenting with trial and error, practicing without boundaries, stimulates creativity.
Interestingly, it also stimulates team work.

After product conception, Validation !

Testing throughout the development cycle
helps ensure quality is maintained.
Test procedures for Product quality
are variable, and will vary in cost depending on three main variables:

- The nature of the object to test.
- The level of complexity in the structure of the object.
- The types of characteristics and properties that need to be tested, such as functionality, robustness, weaknesses, etc...

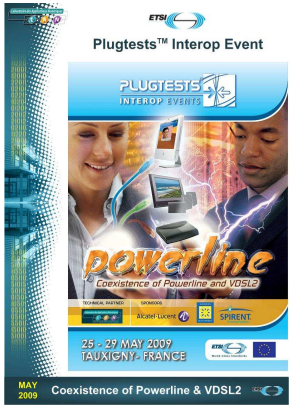
Drive initiative ! Validate each stage

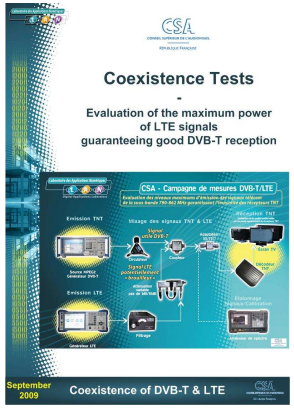
The right balance for quality testing depends upon the complexity and critical characteristics of the product under test.
Depending on the development stage, and the stage's impact on the global project, it is imperative that the various test phases are an integral part of the development cycle.
For example, in regression tests the LAN teams will set about establishing the errors or anomalies that occur in the non modified parts of your product or software as a direct result of changes in the current stage. Changes such as corrections, revisions in the product, as well as environmental changes.

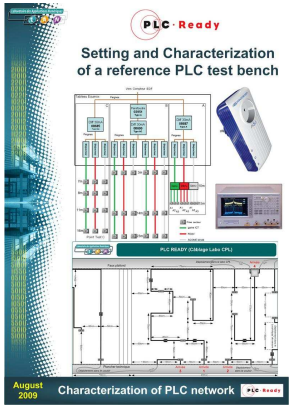
« TESTING » workshops

The LAN organises exhibitions several times a year geared for companies that are fore-runners in our Industry.

The associated « workshops» reunite main industry players (such as manufacturers, standards and regulative organisations, operators…) to work on a common subject of interest in a neutral environment. The objective is to bring ideas to the table, and maximise interoperability between chips of a certain technological field (such as DSL, GPON, PLC,..) by performing tests based on representative fields of interest at the current time (eg triple-play).







The objective is also to evaluate the impact of new technology already widely deployed to help define practical rules of deployment (for example, maximum level of emissions).

It is generally the moment, whilst tests are being carried out, to prepare how the technology will evolve discussing new functionality and proposing specifications for implementation which may be included in the standard itself.

Our Packs

Fast track efficient solutions

You develop or subcontract the build of a product with detailed specifications.

This typically is synonymous with problems in sourcing, time schedules, logistics, etc.

So why take a risk in the control of all the technical requirements (often extremely detailed) to validate your prototypes.

To endorse the best choice in your development, the LAN has designed and regrouped three Test packs,

one of which is likely to correspond to your expectations in terms of cost, support and expertise in troubleshooting.

Evaluate your product at low cost !

Go one step further !
Test advanced functions
Such as interoperability !

Be reassured by a complete range of testing at competitive rate !

Qualification Certification

You wish to qualify or certify a product

such as a modem DSL intended for deployment

with a specific network operator.

A PLC modem which requires HomePlug® certification ?

Or something else...

Contact us, we will indicate le best course of action. !

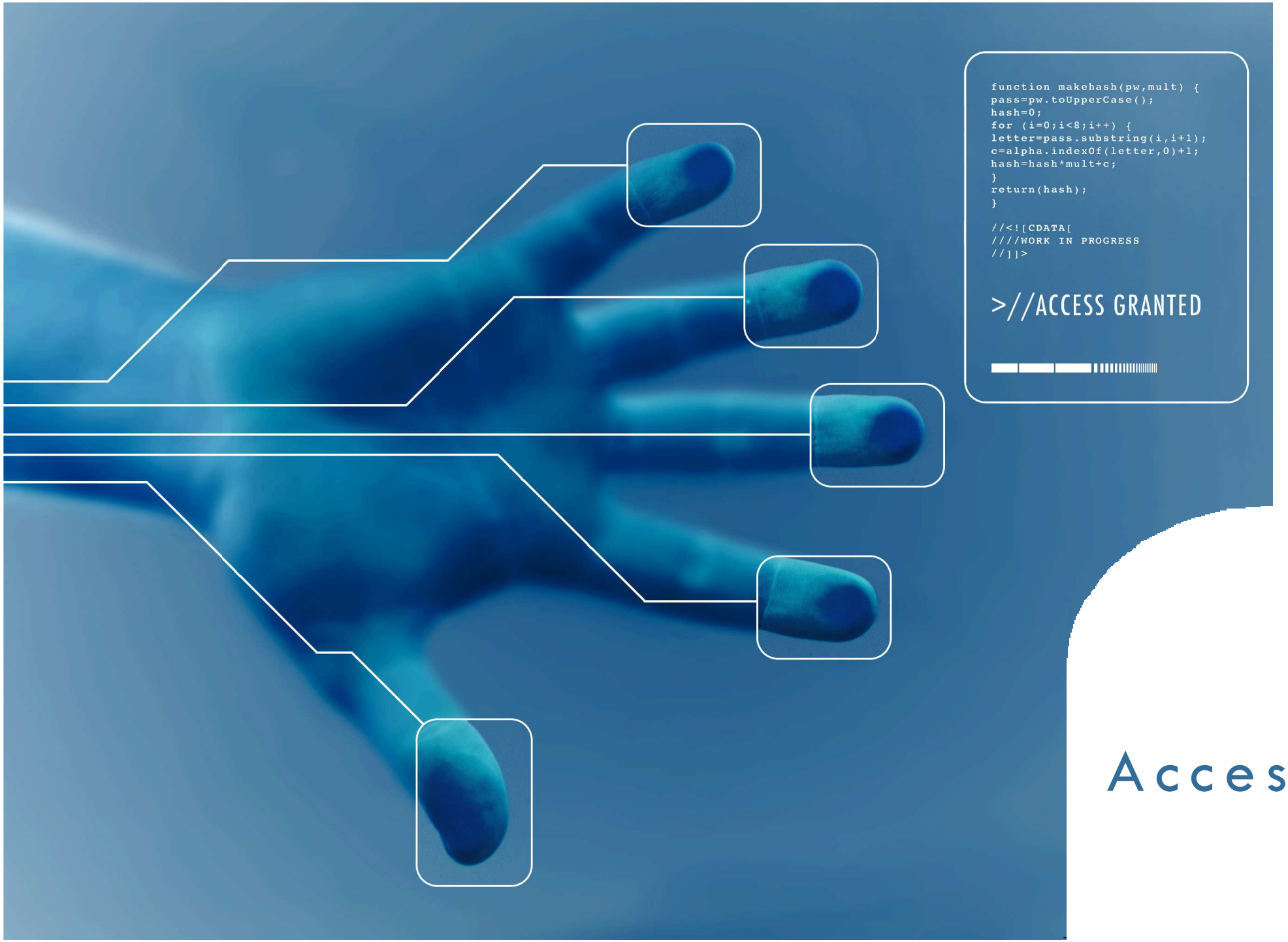
Tailor made

Define your own choice

You have your “modus operandi”, your own internal protocols.

Do not feel restricted by the Packs.

Consult us, we can tailor our services to suit your requirements !


function makehash(pw,mult) {
pass=pw.toUpperCase();
hash=0;
for (i=0;i<8;i++) {
letter=pass.substring(i,i+1);
c=alpha.indexOf(letter,0)+1;
hash=hash*mult+c;
}
return(hash);
}
//<![CDATA[
////WORK IN PROGRESS
//]]>
>//ACCESS GRANTED

Access

The LAN
unique in the telecoms industry

Setup in 2001, the “Laboratoire des Applications Numériques” centres its principal activity in interoperability testing of DLS equipment associated with telephone operators and end-users.

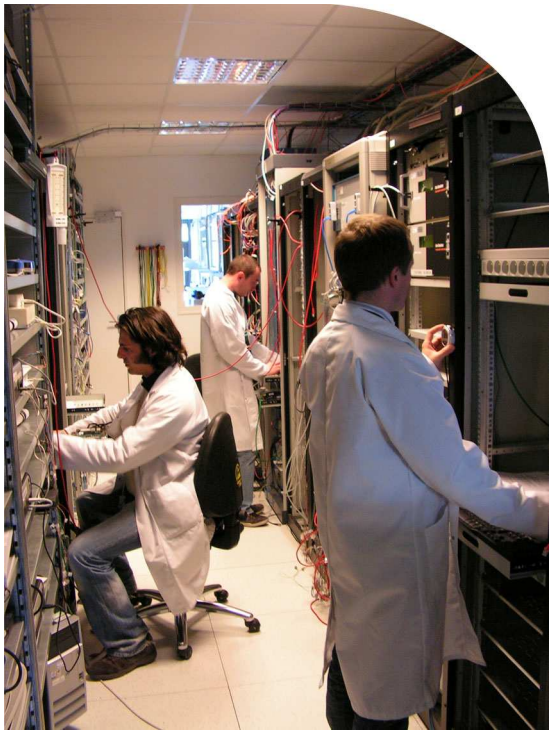
The LAN has developed a reputation with the DSL Forum (now know as the Broadband Forum) as being the point of reference as an ITL (Independent Test Laboratory).

In 2005 the LAN merged with the HF group, and this facilitated its development and investments in ADSL2+, SHDSL, VDSL2 technologies.

In 2006 a new purpose-built laboratory was built in Tauxigny, near Tours.

This enterprise is considered the best of its kind in Europe.

In 2007 the LAN SARL became an independent subsidiary of the HF group.



More than just a test centre
A recognised talent in telecommunications

We regroup a recognised expertise and talent in the telecommunication field.

The LAN is an active member of the Broadband Forum. It is an active participant in the elaboration and progress of standards associated with conformity tests, interoperability and performance technologies (high bandwidth DSL and fibre optics).

With this association, we are well placed to provide the most adapted up-to-date testing facilities for your requirements.

Our equipment

- Line simulators
- « Noise » generators
- Commutation matrices
- DSL analysers
- Traffic generators/ analysers
- Video server
- IP & ATM DSLAMs
- xDSL Filters
- CPE modems
- Test benches TR-060, TR-067, TR-100, TR-105, TR-114, TR-115, TR-127.

What our tests cover

Our tests cover DLS to VDSL2 passing through ADSL2+ and SHDSL

They compose of measures of range, speed, stability and functional tests

On the following page you will find an overview of our xDSL tests.

The LAN Partnerships with operators

If you are an Operator then LAN can help you maintain your DSL network.

We can simulate your infrastructure, and assist you with a test process for new equipment such as CPE's and DSLAMs in your network, so you can guarantee and maintain their interoperability.

Economise, Use our services and equipment

8 autonomous test beds, interconnected to telecom equipment.

Evaluate your solutions and adapt and improve them at your convenience and in your time-frame.

If you wish to modify software on your equipment on test in our laboratory, then simply remotely download it.

Access

Our xDSL offers

xDSL tests			
Telecom equipment	Technology	Standard	LAN reference
xDSL Equipements CO and CPE	ADSL	TR-067 Broadband forum	AC_ADSL_TR067
	ADSL2+	TR-100 Broadband forum	AC_ADSL2+_TR100
		TR-105 Broadband forum	AC_ADSL2+_TR105
	SHDSL	TR-060 Broadband forum	AC_SHDSL_TR060
	VDSL2	TR-114 Broadband forum	AC_VDSL2_TR114
	VDSL2	TR-115 Broadband forum	AC_VDSL2_TR115
Filters CO and CPE	ADSL2+ VDSL2	TR-127 Broadband forum	AC_VDSL2_TR127
	ADSL/2/2+ VDSL2	TS-101-952-x ETSI	AC_xDSL_TS-101-952
Telecom Equipment	All Telecom Equipment	K.20 K21 K45 (ITU-T série K)	AC_ALL_ITU-K_Ed00

Contact us,

We will clarify any questions and details you may wish to ask regarding xDSL testing !

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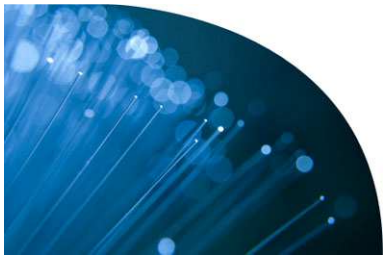
contact@lanpark.eu

In March 2010, the LAN organised in its laboratory the 10th event for GPON tests.

The test event was managed over the period of a week.

15 companies were involved (these included OLT, ONT and test tools manufacturers)



From time to time Interoperability Tests are organised on neutral territory to allow industry to progress and improve the Interoperability challenges between different OLT and ONT.

This initiative was originally organised by FSAN, and subsequently by the Broadband Forum.

FSAN
Full Service
Access Network

An active participation in « future » technology

The LAN is active in contributing to defining test specifications associated with GPON (Gigabit Passive Optical Networks)

This technology is standardised by the ITU under the serial G.984.4, and complimented by an implementation guide OMCI.

The technical report TR-156 from the Broadband Forum detailing the functionality L2/L3 also defines the requirement of optical multiplexors (OLT) and end-user modems (ONT).

The Broadband Forum is defining the GPON test procedures:

- document WT-247 for conformity tests.
- document WT-255 for Interoperability tests.

The LAN is involved and assisting the transcript of these specifications, and is preparing the testing infrastructure and environment which will be required for manufacturers to validate their products.

broadband forum

Habitat

PLC High Speed
A historical and strategic mile-stone

Since its appearance on the market in early 2000, and notably its original version operating at 14 Mbps (HomePlug 1.0), PLC has been adopted by the Home Environment and allowed sharing internet connectivity, notably DSL.

Over a short time span, network access offerings and services have exploded and higher performance in terms of Data, VoIP, IPTV, VoD is an essential requirement.

The PLC has adapted itself to become a technological reference for high speed data transmission which started at 14 Mbps and rose to 85 Mbps.

From 85 Mbps it targeted 200 Mbps !

Today the latest PLC communication protocols strive to attain theoretical levels of 1 Gbps and beyond !

Future services such high definition TV will be based upon this technology and the home environment will transform into Services On Demand for multi-users in any location or room in the home.

LAN has strategically positioned itself with PLC and together we are forming the solid foundation for tomorrow's technology.

PLC = Power Line Communication

Our areas of expertise

Network Performance Evaluation :

- Traffic generation
- Signal loss evaluation
- Latency evaluation, delay, jitter

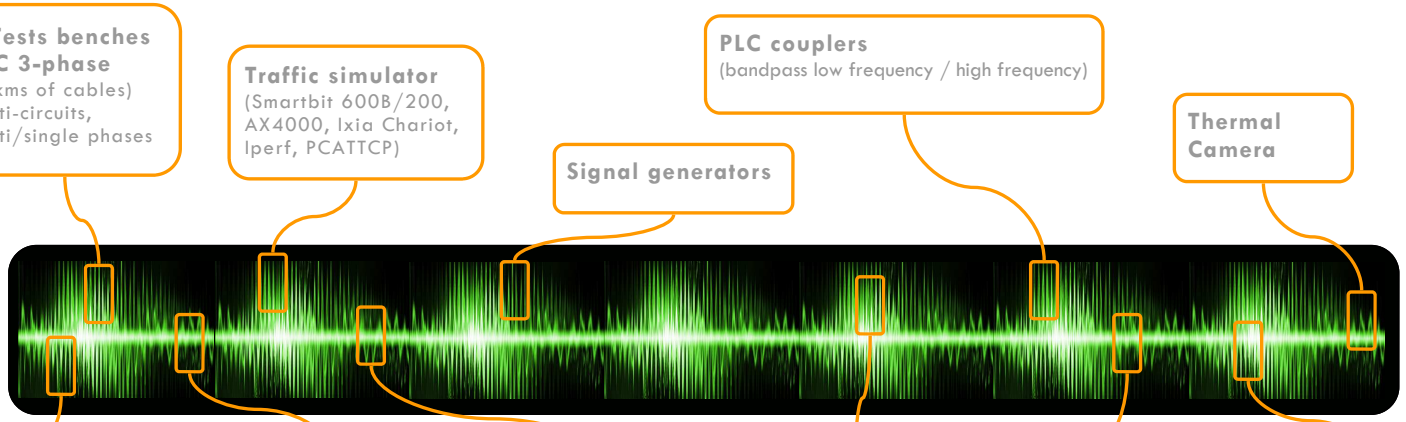
Test bench design using PLC instrumentation

- Point to point
- CEM confinement
- Automation of measuring test beds

Measure and characterisation of electrical PLC interface

- Impedance measure
- Measure of electromagnetic interference
- Measures of stability due to radio electric disturbances (noise, propagation frequency selectivity)

Our equipments



3 Tests benches PLC 3-phase
(2 kms of cables) multi-circuits, multi/single phases

Traffic simulator
(Smartbit 600B/200, AX4000, Ixia Chariot, Iperf, PCATTCP)

Signal generators

PLC couplers
(bandpass low frequency / high frequency)

Thermal Camera

1 test bench PLC Point-to-point
Calibrated and confined to EMC

1 test bench multi-cables PLC Ready
Calibrated and confined to EMC

1 tests bench PLC point-à-point
Calibrated and confined to EMC

Network Analyser

Environmental Chamber

Digital home
For tests in a real environment (In Vivo)

PLC = Power Line Communication

Habitat

Our PLC offers

Whether you are an OEM, an Operator, or Integrator, the LAN test and validation services will be adapted to your specific requirements.

Product qualification		
Test		**LAN references**
Network Performance	Data rate	HA_QUAL_PROD_PERFO
	Data loss	
	Latency	
Services	Data	HA_QUAL_PROD_SERVI
	Video	
	Audio	
	Other	
Environmental tests	Environmental chamber	HA_QUAL_PROD_ENVIR
	Thermal camera	
Electrical Power Consumption		HA_QUAL_PROD_CONSO
Field tests InVivo (in the Digital Home or elsewhere)		HA_QUAL_PROD_MAISO
Lab tests on PLC test-bed (calibrated & mastered)		HA_QUAL_PROD_LABTE

Contact us,

for all details associated with our PLC tests !

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PLC = Power Line Communication

Homeplug®
Certification...
and Logo marking !

www.homeplug.org

Add real credibility to your PLC network equipment

It is indispensable to obtain PLC HomePlug® certification for your products in today's markets; this guarantees their conformity and high level of interoperability with other products on the market.

LAN is the reference laboratory for HomePlug® certification.

The HomePlug® logo on your products will promote your brand-name, and customers will associate quality with this reference.

HomePlug® Alliance

The membership companies in the alliance have a contractual undertaking to contribute to the accolade of HomePlug® by developing products of high quality which only benefit from the prestigious Logo once they have been tested and certified.

The key to success

The HomePlug® alliance with the LAN laboratory provides product certification based on its technology and standards (HP 1.0, HP AV, CC, BPL).

All products based on this technology can be certified, whether it be a multi-media device like an mp3 player for example, or a network device such as a hub, switch or bridge.

The certification will imply that the equipment will function seamlessly together.

A prerequisite for HomePlug® certification is to be a HomePlug® member.

Contact us for additional information on how to become part of this select membership.

PLC = Power Line Communication

Habitat

A concept « In Vivo »

Laboratories are often reproached because they are not in touch with “reality”, are cut off from the real world, and live in a sterilised protected environment!

The “Laboratoire des Applications Numériques” strives to be different.

Our laboratory is a centre for experimentation which by its very nature produces innovation.

This double approach of living with reality and beyond today’s reality is what nurtures our creativity.

The Digital Home concept was conceived by “probing beyond the walls” of the habitat.

An apartment in the heart of the Laboratory

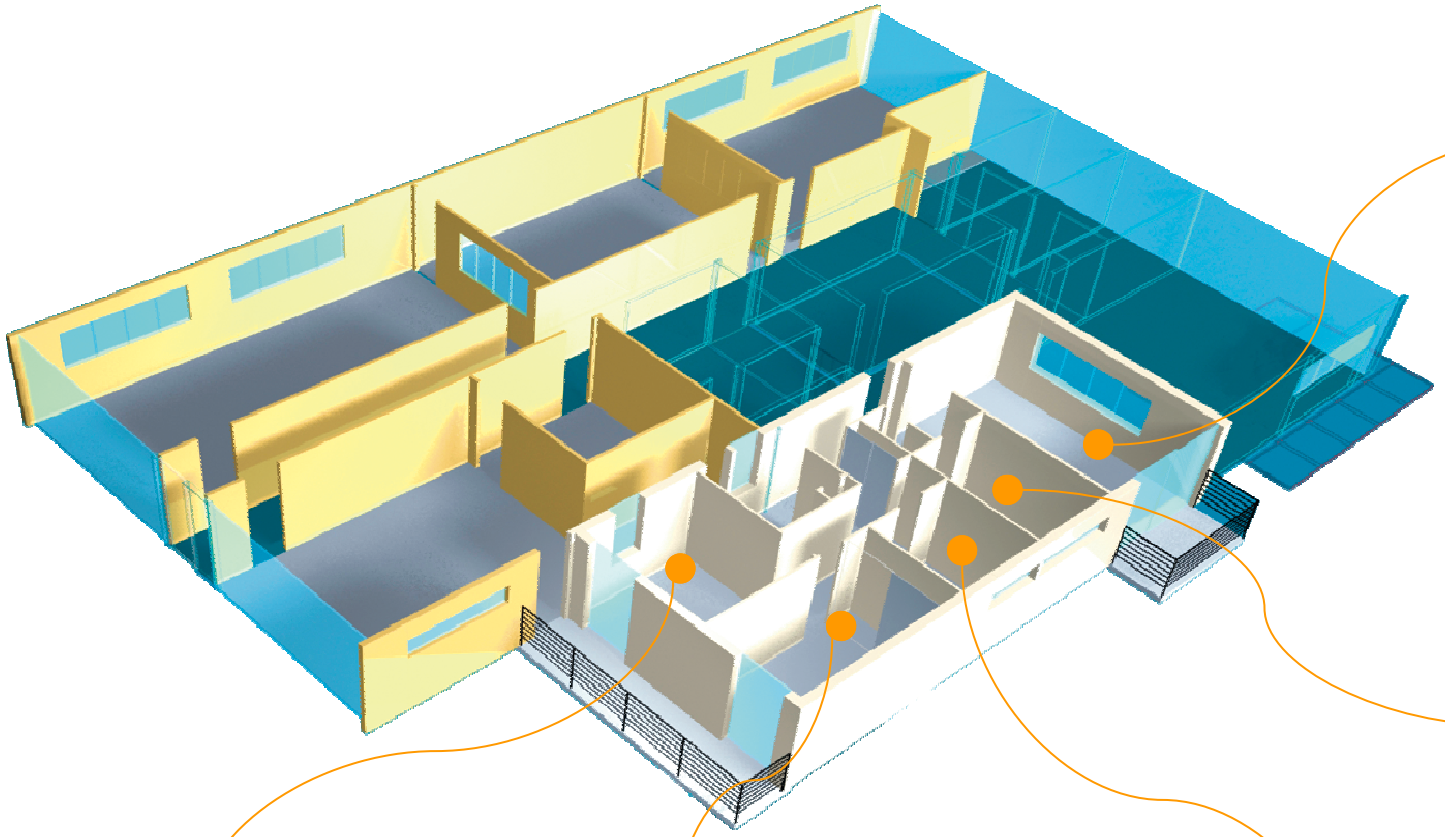
With its living room, kitchen, bedrooms, and amenities.

Furnished and equipped like a typical apartment which is lived in, with the exception of being fully scalable and having integrated cable trays in each room accessible from the basement.

An added bonus for simulation and modelling

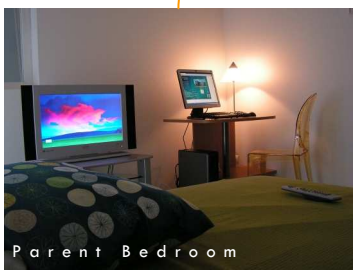
It has purposely been build as a standard home, and not as the home of the future, full of home automation and gadgetry. This standard home, in which engineers and researchers can test the interconnection of electrical and electronic equipment notably using networks that are designed using the power lines as carrier.

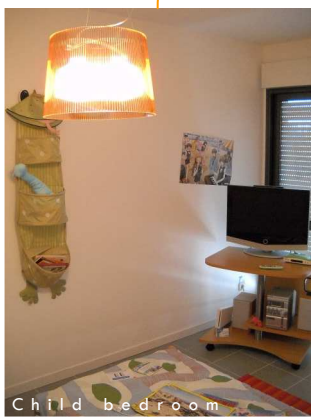
This standard home is set-up with equipment accessible to the public like flat screen TV’s, audio 5.1, gaming consoles, washing machines, microwave ovens, surveillance equipment, wifi portable computers, etc...




Living room

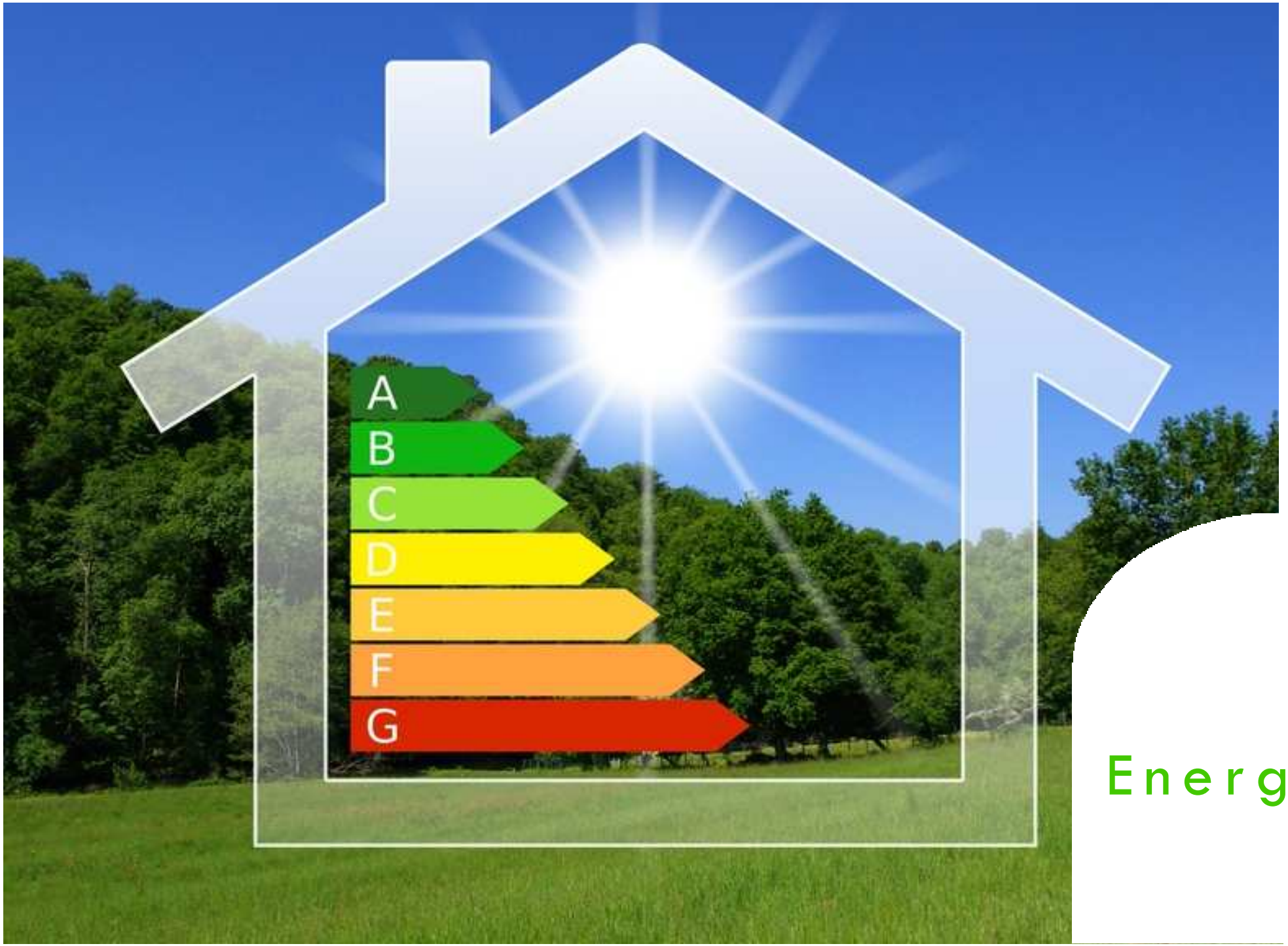

Kitchen


Parent Bedroom


Child bedroom


Bathroom

Habitat



Energy

Energy Control and conservation, a prerequisite in our society

High speed networking in homes has influenced and changed our life styles; we have information and services at our fingertips. Our social habits and even our culture have taken a new path. We are better informed.

Interestingly our relationship with energy has not significantly changed over the last few decades.

Our homes are better insulated, and better equipped.

We are more ecologically minded, but the majority of us do not yet have tools to be energy conscious.

Our homes do not have equipment for discerning our energy consumption in real time, or be able to monitor energy consumption by electrical appliance and control it.

All this is going to change. We will be able to control our appliances so we can live in better comfort, reducing wastage and manage our energy requirements.

Home equipment will become “intelligent”.

The development is this market will require considerable integration, solid standards to which manufacturers comply, and of course certification. New standards will emerge and existing standards may well have to adapt.

The “Laboratoire des Applications Numériques “ will be a fore-runner in the integration work associated with ensuring best practices for interoperability

Evaluation, Testing, Certifying

The LAN has test beds with a range of electronic and electromagnetic meters. This will allow evaluation of metering systems adapted to this type of equipment.

GREEN PHY® BY HOMEPLUG

Energy control in buildings can only become reality if electrical devices can communicate and be controlled (from a distance) to optimise their energy requirements.

The efficiency of such a system will depend upon the performance and reliability of the network.

The alliance HomePlug® can offer this new communication technology along electrical power lines called Green PHY® (HPGP)

This technology allows all different types of equipment like electric meters, water heaters, convectors, and even electric car chargers to “talk” to each other and communicate.

Homeplug® Green Phy is completely interoperable with products that comply to HomePlug® AV and IEEE1901.

It is a technology with low power consumption and compatible with the wireless ZigBee technology.

The LAN is actively participating with the work-group and preparing suitable adapted test benches.

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