



# **IPv6: Protocol evolution for a Net revolution**



**Patrick Cocquet**  
**6WIND Chairman**  
**IPv6 Forum vice-president**  
**IPv6 Task Force France Chairman**

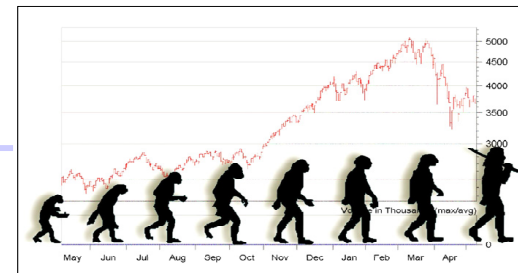
**WSIS GENEVA 2003**



# Agenda

- **IPv6, a Net Revolution,**
- **Deployment advantages**
  - **WiFi**
  - **Standard devices**
  - **Peer to peer**
- **IPv6 Ready programme**
- **IPv6 Organisations**
- **6WIND**
- **Conclusion**

# The IP Evolution



# Only the Tip of the Iceberg



**< 10% IP penetration  
ww – not yet a global  
mass market**

**Broadband & Wireless are  
just arriving**

- ✓ 1,2 B mobile telephone subscribers today are potential Internet service users
- ✓ Growth of DSL line: +30% in 6 months (47,6M – june 03)



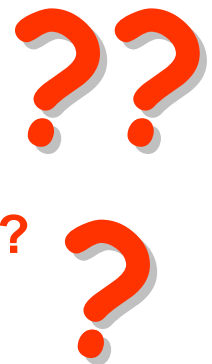
# Is there Another Solution To IPv6?

- **Yes if:**

- ✓ we don't want worldwide universal services
- ✓ only Private-NET services
- ✓ and INTER-NAT clusters via different agreements between ISPs
- ✓ we want to constrain new applications

- **So the RIGHT question is:**

- ✓ **What model for the future of the INTERNET?**



# The New Generation Internet IPv6



**End To End Connectivity**



**The New Internet**

☺ **Why complicate the NET when we can  
SIMPLIFY IT!**

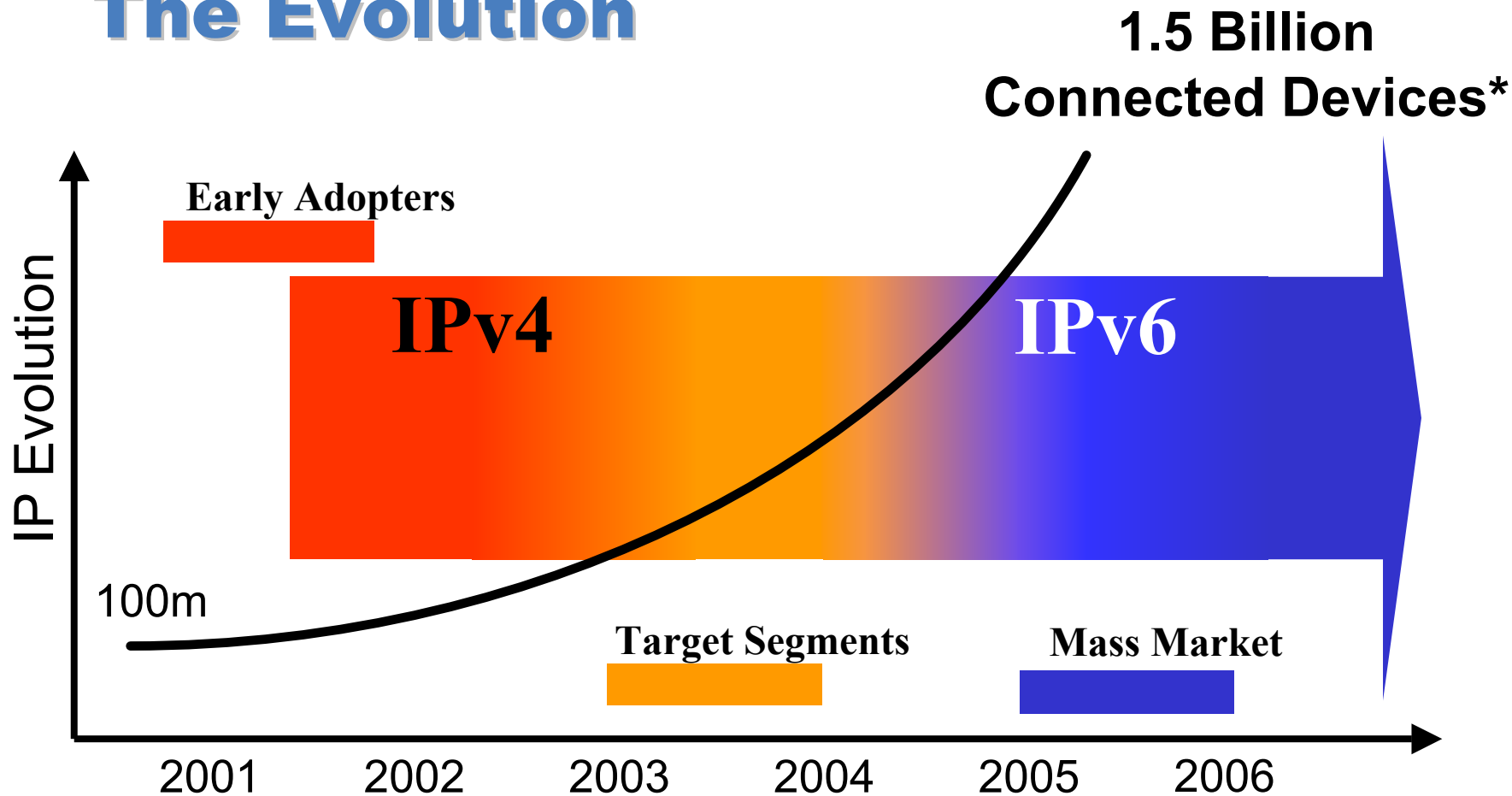


# IPv6 Is The Answer!

## FOR:

- **ALWAYS-ON broadband connectivity** - a necessary condition for deploying new applications & services
- **ADDRESS CAPACITY** to meet explosive device connectivity
  - ✓ Users (C-to-C)
  - ✓ Business (B-to-B; B-to-C)
  - ✓ Machines (M-to-M; C-to-M)

# The Evolution



\* Harbor Research Inc.

# A Net Revolution





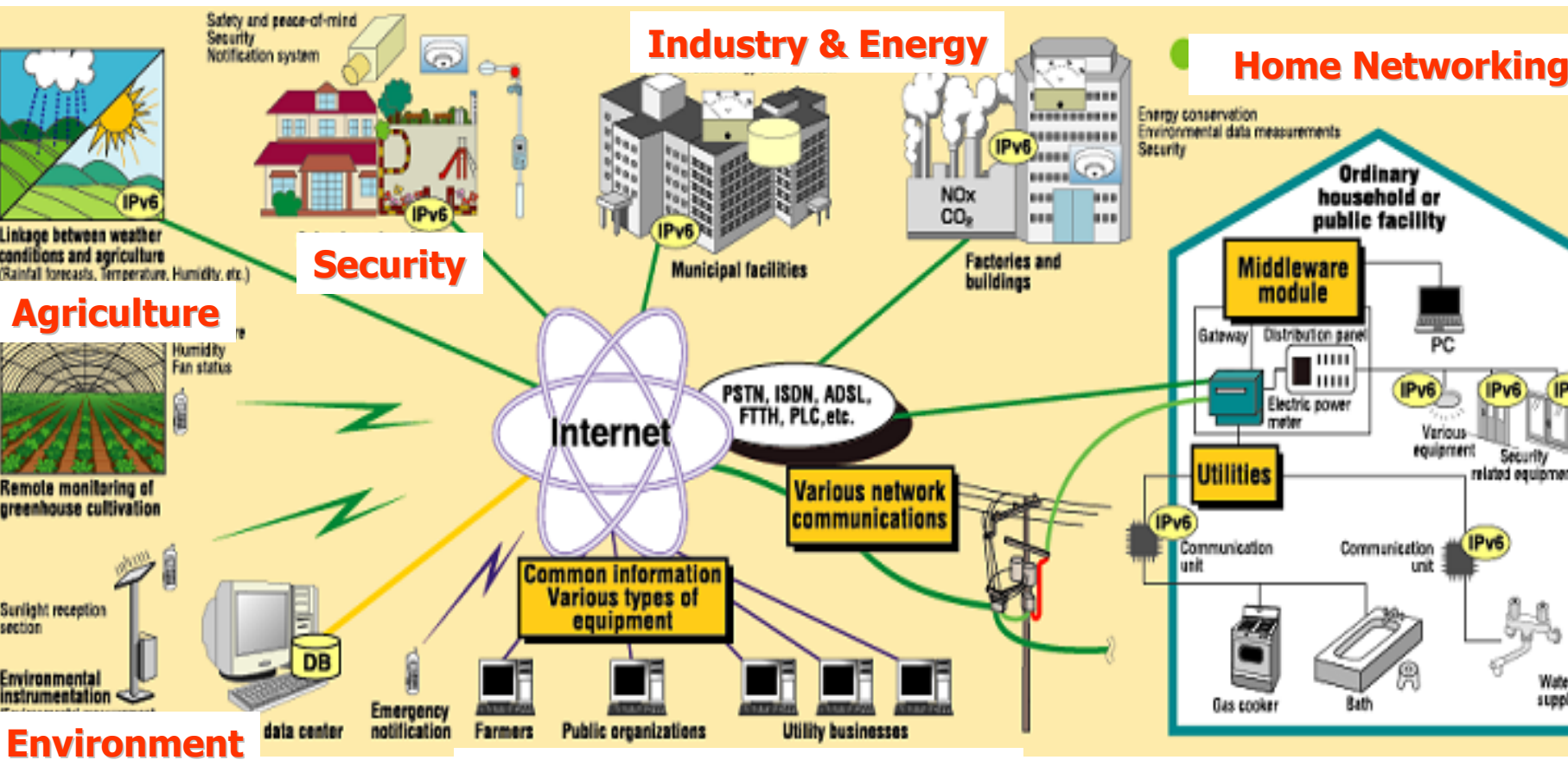
# For the usages too!



**WEB,  
Messaging,  
P2P (audio, video)**

**Telephony/visiophony  
Always-on » and new  
Machine-to-machine  
applications**

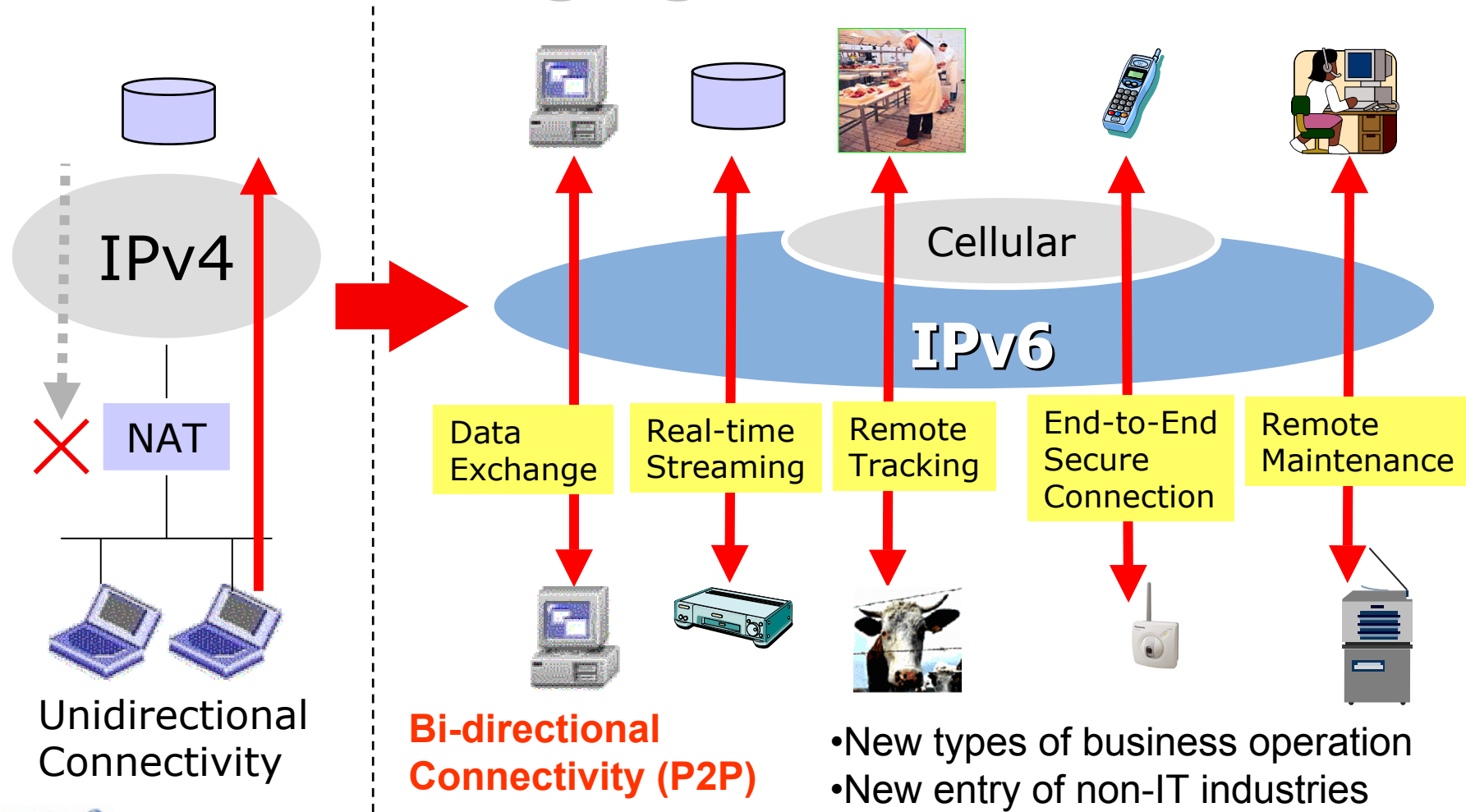
# IPv6 enables Net to become Ambient



Environment

Public & Private Networking

# IPv6: bringing back innovation



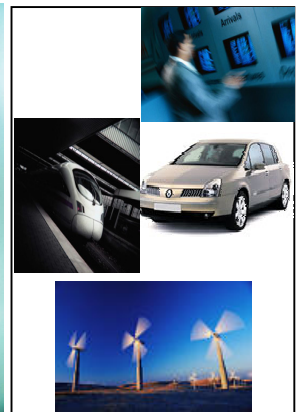
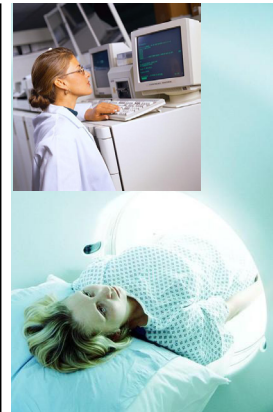
# Building New Business Models

**New revenue generation**

## Multi-purpose devices



## Dedicated devices/systems



**Large range of services**  
application oriented and user community oriented

**CAPEX/OPEX  
optimisation**

# Deployment Advantages of IPv6







# Example 1

## Public WiFi Networks

# WiFi: Vector of IPv6 Deployment

- **Hotspots:** 12th (2002), 147th (2007)
- **WiFi-capable laptops:** 90% (2006)  
of all corporate laptops (source  
Visiongain)
- **Laptop and tablet PCs:** estimated  
33m shipped for 2003



**Like mobile phones, mobile PCs lead to new usages, and the customer will not accept limitation of use!**



# Top Considerations for Public WiFi

- **Flexibility**
  - **Scalability**
  - **Security**
  - **Billing Constraints**
  - **Costs**
  - **Legal Constraints**
- ✓ Application Constraints?
  - ✓ Number of Users?
  - ✓ User authentication, data encryption, user profile
  - ✓ Link with billing systems
  - ✓ Customer support
  - ✓ Monitoring User Activity



**The Key Issue: Managing IP Addresses!**

# Use of Private Addresses: Expensive & Inefficient



**Client-Server applications**  
+  
**VPN IPSec**  
**P2P, Games, Chat...**

**IPv4**

***DHCP + NAT + Private @***  
***DHCP + Global @ is not often possible***

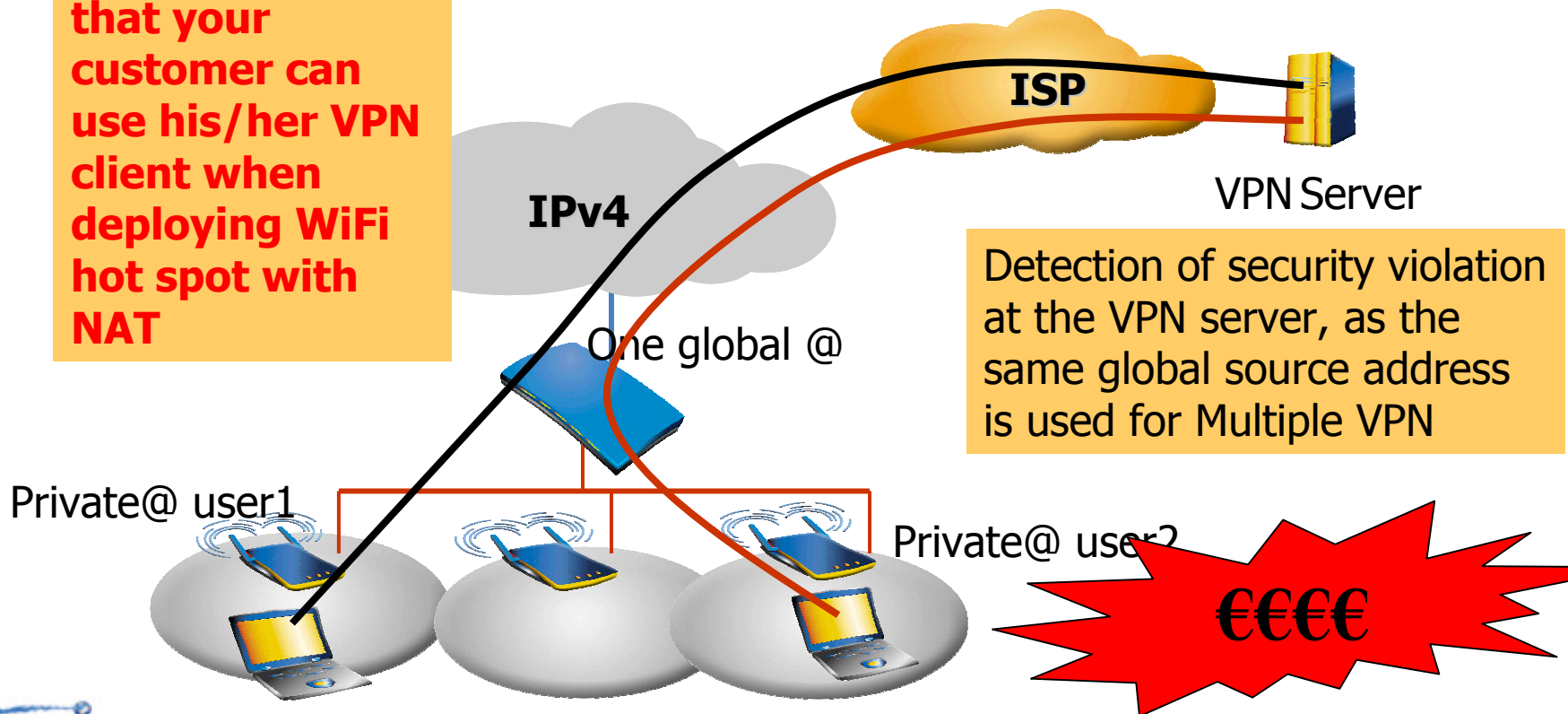
**IPv6**

***Global @***  
***RA + Prefix delegation (opt)***

**Global Addresses = Flexible & Cost-Effective  
Wireless Access**

# No Guarantee of Service Availability with IPv4+NAT

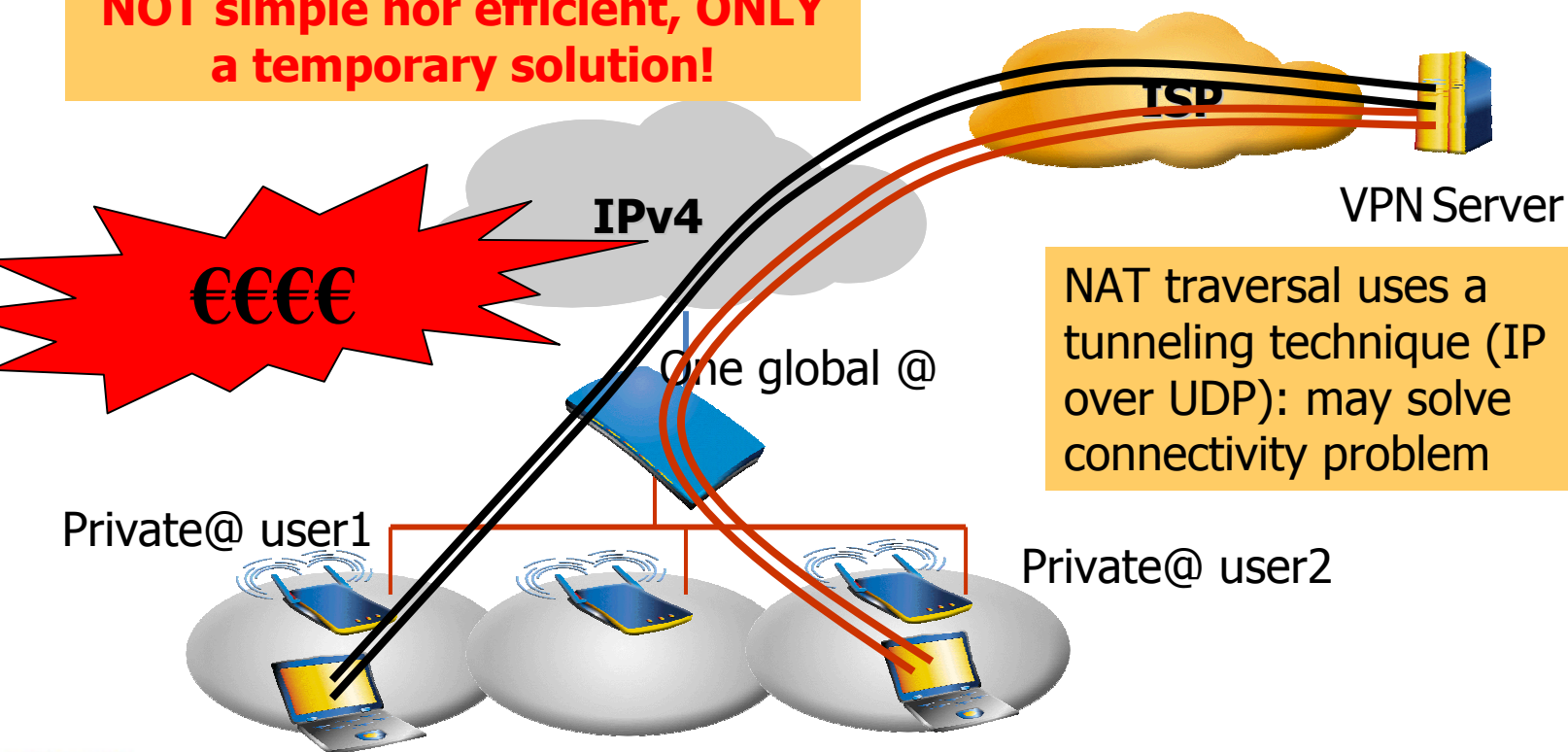
**No guarantee  
that your  
customer can  
use his/her VPN  
client when  
deploying WiFi  
hot spot with  
NAT**





# The IPv4 Solution: Building Blocks

Using UDP as a level 2 protocol:  
NOT simple nor efficient, ONLY  
a temporary solution!



NAT traversal uses a tunneling technique (IP over UDP): may solve connectivity problem

# No WiFi without v6 !



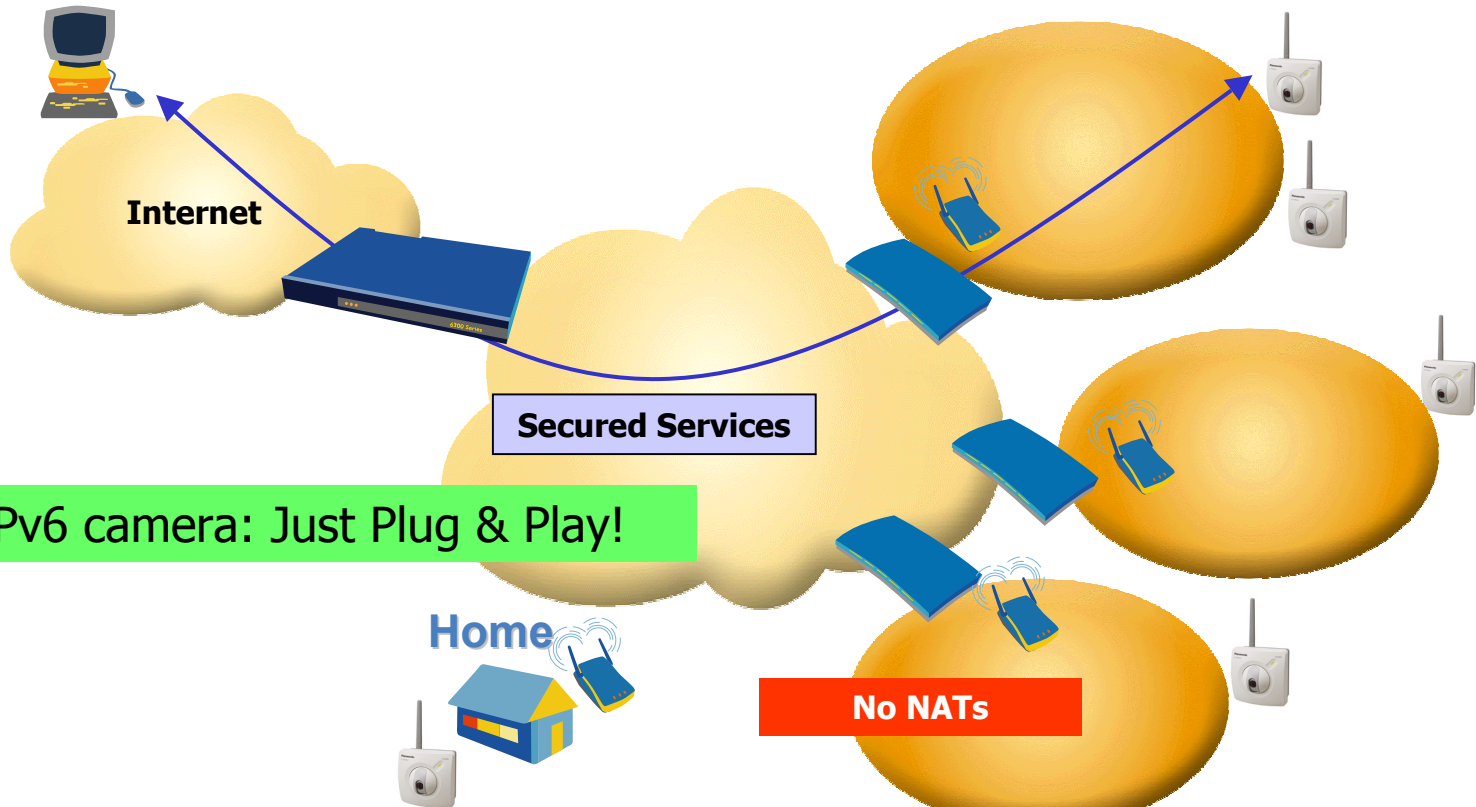
- **No extra cost to offer IPv6 in addition of IPv4 services**
- **A way to start the training of the technical team and to study the information system evolution**
- **Most wireless devices will be IPv6 ready soon**
- **A « lab » for study new business cases**
- **Available IPv4/IPv6 solutions integrating IPsec VPN features and all transition mechanisms**



## Example 2

### Zero-configuration devices

# Remote Control of Devices



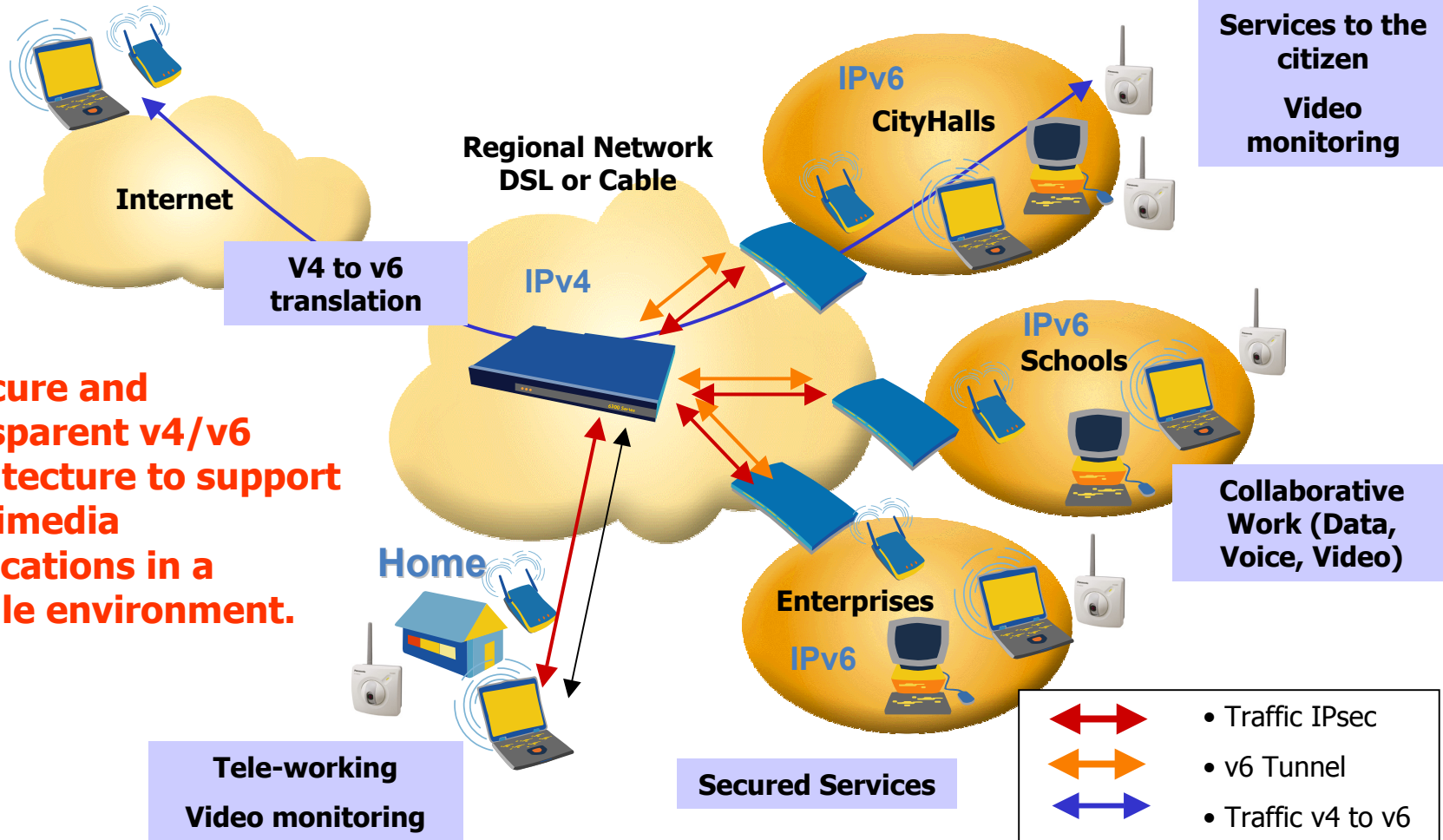
IPv6 camera: Just Plug & Play!

No NATs

Video monitoring

IPv4 camera: configuring the NAT on the local site adds to real costs on Man Power!

# IPv4/v6 integrated services



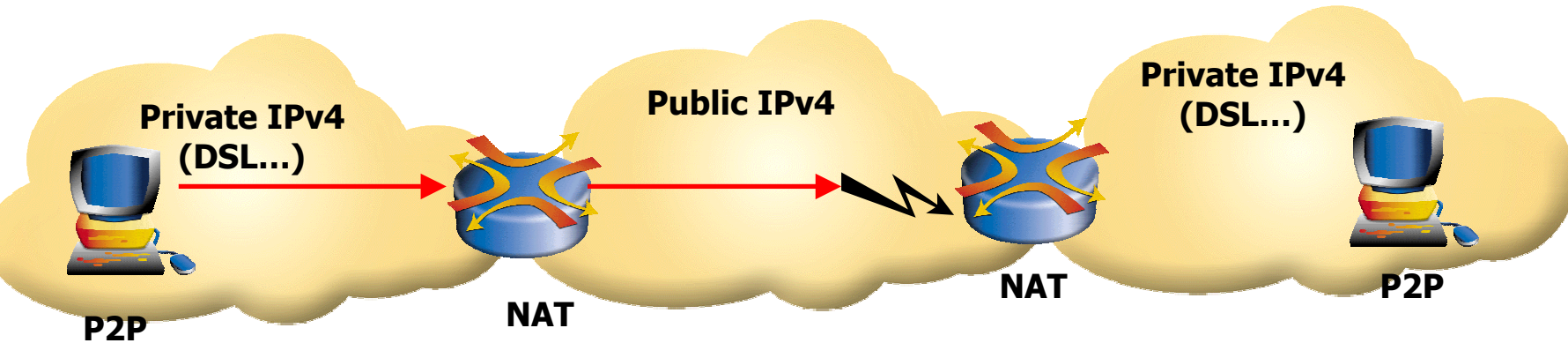




# Example 3

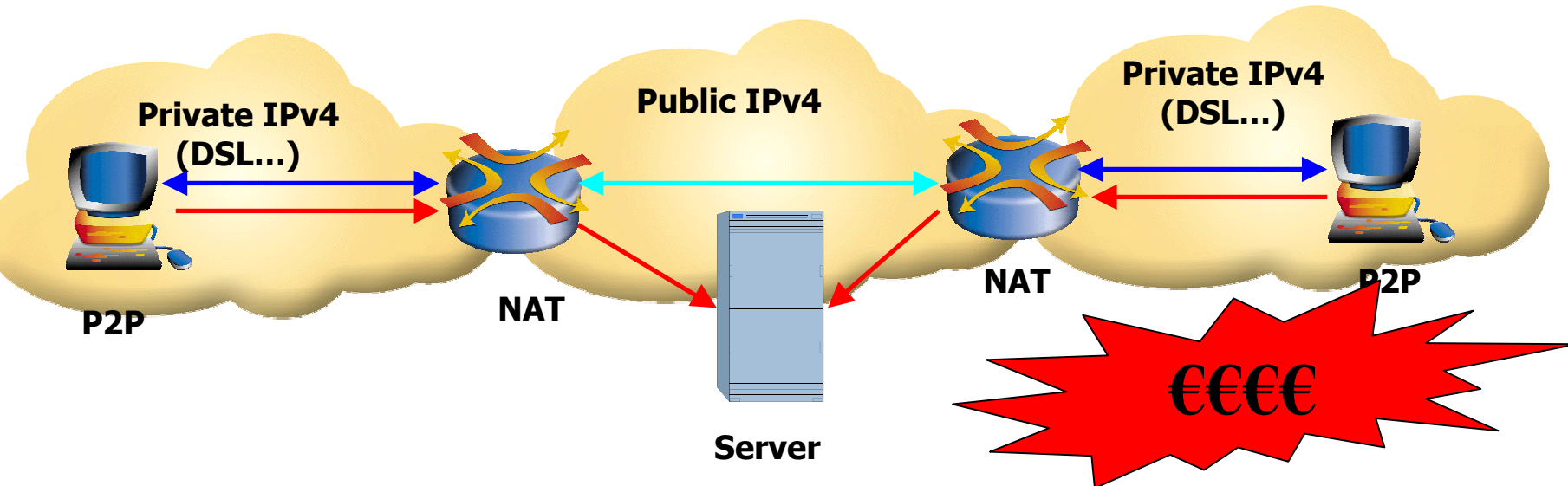
## Peer-to-Peer (P2P)

# P2P Applications and NATs



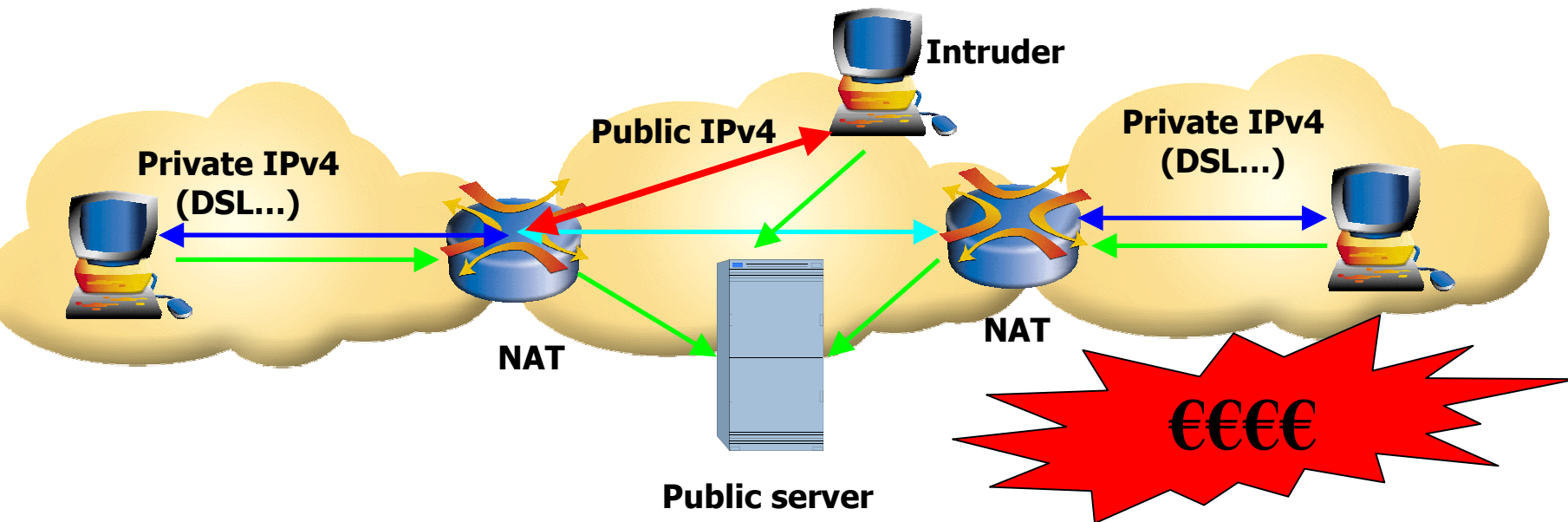
- NATs break end-to-end
- End-to-end communications = telephony, remote diagnostic control, secured camera surveillance, gaming, etc.

# Solution with IPv4



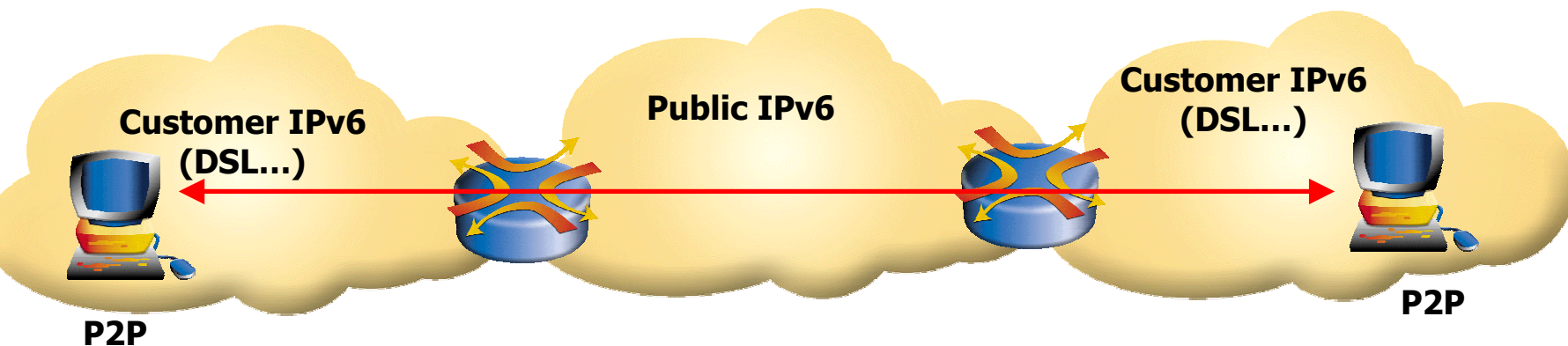
- **Use an intermediate server**
- **Complicated solution, often proprietary**
- **Operational costs**

# Security Problems



- **Applications opens a hole in the NAT automatically!**
  - ✓ Control is very difficult
  - ✓ The association is available in the public server.
- **An intruder may use it!**

# IPv6 based solutions



- **Simple and flexible solution**
- **No server required**
- **Cheaper to implement and operate**
- **Security and billing can be design for all P2P applications (authentication server)**





# Microsoft 3 degrees

- **A P2P application based on P2P SDK**
- **3 degrees is a P2P application connecting small dedicated user groups (current beta test application on Windows XP SP1)**
- **Runs IPv6 natively**
  - ✓ Runs on native IPv6 address if available on the host
  - ✓ Or:
    - If IPv4 addresses are public addresses, 6to4 is used  
NATs are not supposed to be in the way
    - If IPv4 addresses are private addresses, Teredo is used  
NAT is likely in the way.
- **<http://www.threedegrees.com>**



# IPv6 Ready Programme



# IPv6 Ready Logo Program

- **large number of IPv6 implementations**
  - ✓ Routers, host, devices
- **Interoperability is as a critical feature**
  - ✓ Multi vendors, multi applications
- **Global & unique logo programme**
  - ✓ ETSI (EU), UNH (USA), TAHI (J)...
- **IPv6 is available and ready to be used**



# Two phases

- **Phase 1**

- ✓ indicates the product includes IPv6 mandatory core protocols and interoperates with other IPv6 equipments
  - **FIRST LOGO HOLDERS ARE APPROVED**
  - See <http://www.ipv6ready.org/>

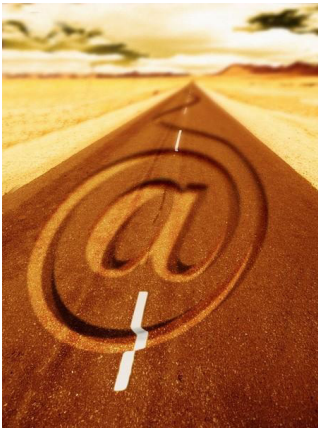


- **Phase 2**

- ✓ Definition of test profiles with associated requirements for specific functionalities

- **Methodology**

- ✓ Conformance tests
- ✓ Interoperability tests



# And to conclude...

# Invest In the Right Technology



- **IP is seen as the application convergence layer**
  - ✓ All legacy systems and all new systems will be IP based
- **IP is seen as the network convergence layer**
  - ✓ All new communication systems are designed to implement efficiently IP communication
- **Do you think you can continue to design systems using an “end-of-life” critical component?**

**Move TODAY to IPv6, and create innovative services!**



# THANK YOU QUESTIONS?

[patrick.cocquet@6wind.com](mailto:patrick.cocquet@6wind.com)  
[www.6wind.com](http://www.6wind.com)