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LCOS 8.61 Beta 1 – in a nutshell
December 2011

www.lancom.eu

LC.OS 8.61
[LANCOM OPERATING SYSTEM] Public Beta

The LANCOM operating system LCOS and the corresponding management tools (LCMS) regularly provide **free** new functions to all current LANCOM routers, access points and gateways.

As a new service, LANCOM offers you a beta version of our updated operating system LCOS. The **LCOS 8.61 Beta 1** is based on version 8.60 and extends it with IPv6 capability. This trial version offers you for the first time the opportunity to test IPv6 with your current LANCOM network components.

The following is an overview of the new IPv6 features.

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- LCOS 8.61: Based on LCOS 8.60, additionally with IPv6 functions

- The tunneling techniques 6to4, 6in4, and 6rd enable IPv6 Internet access even if your provider does not support native IPv6

- Support for native IPv6 Internet access (plain IPv6, IPv6 over PPP)

- DHCPv6 client

- DHCPv6 server (stateless mode)

- IPv6 firewall

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Paths to IPv6
Our recommendations

There are two ways to migrate to IPv6:

- a) Without native IPv6 Internet access (tunneling)

  – "6to4" (not recommended)

  – "6in4" (worth considering)
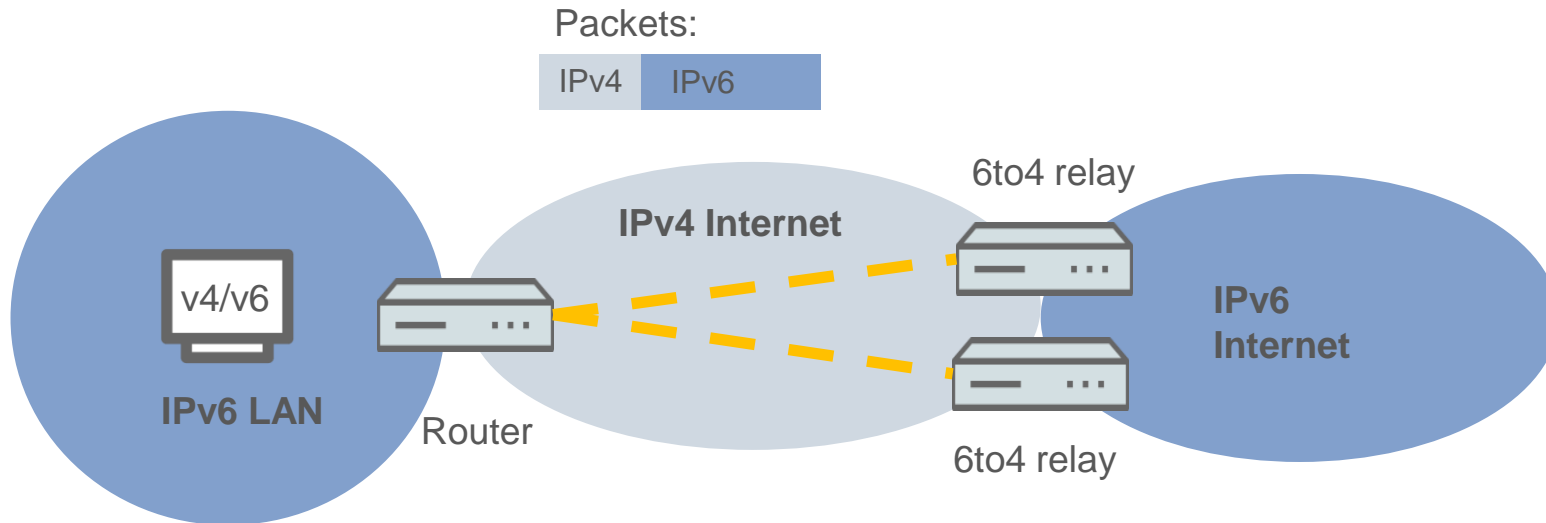
  – "6rd" (recommended)

- b) Parallel IPv4 and IPv6 access (dual stack)

  → as the desired goal, although not yet widely available

...LCOS 8.61 Beta can implement any of these options!

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Tunneling mechanisms
6to4 tunnel

Packets:

IPv4	IPv6

IPv4 Internet

6to4 relay

IPv6 Internet

v4/v6

IPv6 LAN

Router

6to4 relay

- Dynamic tunnels: Automatic selection of a relay (no need to explicitly set up a tunnel; choice of 6to4 relay depends on the location and network)

- IPv6 prefix: Formed from 6to4 prefix 2002::/48 and the router's own public* IPv4 address (* required)

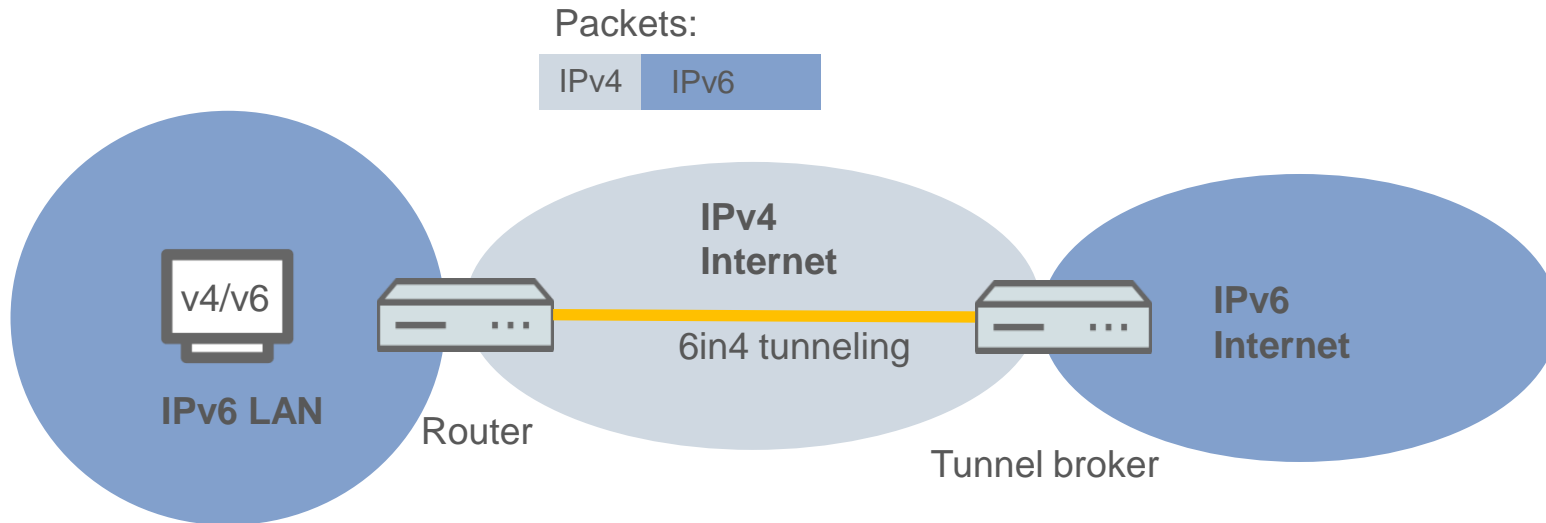- 6to4 router sends packets to a 6to4 relay

Advantage:
6to4 relays offer public access to the IPv6 network over an IPv4 connection.

Downside:
Open architecture theoretically allows IP spoofing, i.e. the falsification of IP addresses.

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Tunneling mechanisms
6in4 tunnel

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Packets:

IPv4	IPv6

IPv6 LAN — v4/v6

Router

IPv4 Internet
6in4 tunneling

Tunnel broker

IPv6 Internet

- Linking of IPv6 networks via IPv4-only Internet

- Static tunnel configuration

- IPv6 prefix: Statically assigned by a "tunnel broker"
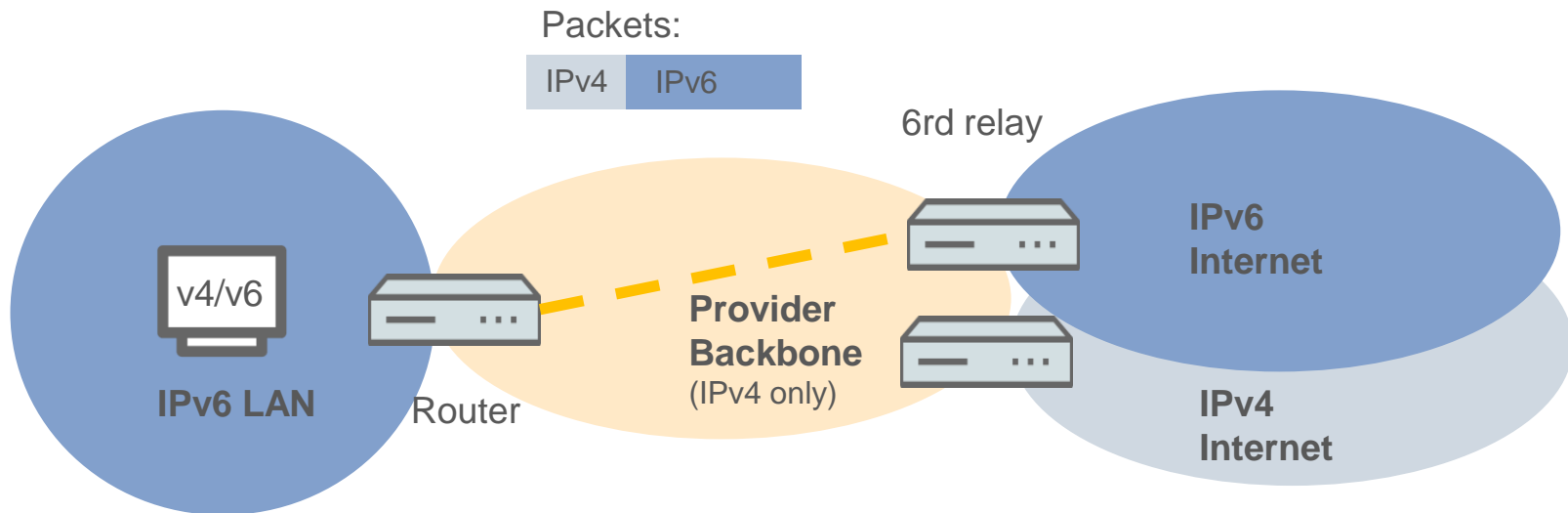
- Tunnel broker, e.g. *Hurricane Electric* (http://www.he.net/)

Advantage:
Secure, static tunnel configuration from an existing IPv4 access to the IPv6 network.

Downside:
Must be applied for from the tunnel broker.

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Tunneling mechanisms
6rd tunnel

Packets:

IPv4	IPv6

6rd relay

IPv6 Internet

Provider Backbone (IPv4 only)

v4/v6

IPv6 LAN   Router

IPv4 Internet

- 6rd = IPv6 Rapid Deployment

- Dynamic tunnel with 6rd relay in the provider backbone, no explicit tunnel set-up required

- Router sends packets to the provider's 6rd relay

- IPv6 prefix: Assigned by provider (static or DHCPv4)

- Provider support essential

Advantage:
Better security than with 6to4.

Downside:
Provider (ISP) must support 6rd.

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Native Internet access
PPP (dual stack)

Current status (Q4/2011):
Only a few ISPs assign their end customers IPv4 and IPv6 addresses.

Intended goal (2012):
Internet providers offer widespread coverage of IPv4 and IPv6 addresses in parallel (dual stack).

Packets:
IPv6
IPv4

v4/v6

IPv6 LAN

Router

Provider Backbone

IPv4/IPv6

Provider

IPv6 Internet

IPv4 Internet
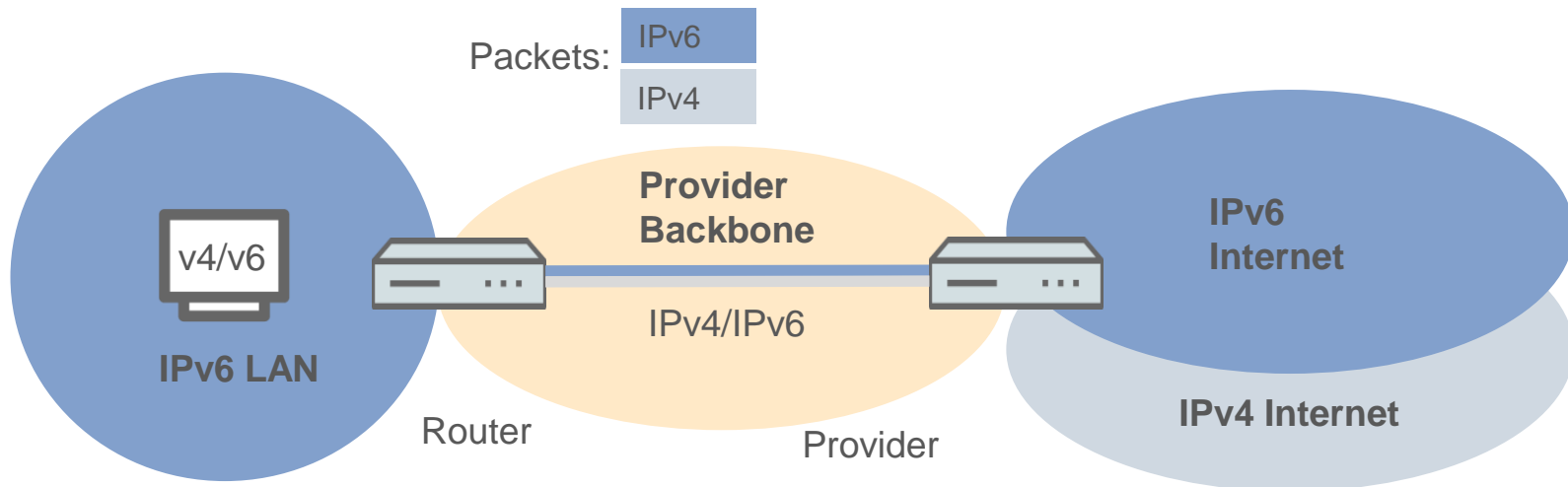
- IPv4 and IPv6 share a PPP session with double address assignment (dual stack)

- Joint and separate PPP sessions for IPv6 are supported

- Provider assigns IPv4 address and IPv6 prefix (prefix delegation)

- Native connectivity to IPv4 and IPv6 Internet

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- IPv6 via PPPoE (client)

- DHCPv6 client (prefix delegation (IA_PD), DNS server)

- Router generates the WAN IPv6 address alternatively from:

    – The received router advertisement (prefix option set in the router advertisement)

    – Subnet 0 from the delegated prefix (DHCPv6) if no prefix option is set for the RA

- Receive prefix delegation of any length, e.g. /48, /56, /64

- Propagate the provider's delegated prefix into the LAN

- DHCPv6 server (stateless mode) propagates the DNS server address in the LAN

IPv6
(ca.2012)

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- Easy setup with IPv6 Internet Wizard

- Device detection over IPv6

- Manual addition of devices using their IPv6 addresses

- Configuration over IPv6

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Questions?
Look here for the answers:

- **IPv6 site** on the LANCOM homepage—just follow the logo!

- **Techpapers on migration and tunnel technology**—see our IPv6 microsite

- **LCOS 8.61 Beta 1 Addendum**

- **LANCOM Training Center:** IPv6 entry-level workshop; further information available on the LANCOM homepage

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Service and Support

We wish you every success with your new LCOS 8.61 Beta version!

We look forward to your **praise and criticism, suggestions or questions**:

mylancom@lancom.de

The latest information about Service and Support can be found on our Support flyer, our Internet site or from our **Knowledge Base**:

If the manual and our latest support topics in the Internet do not resolve your issue, then feel free to contact our **Support Hotline** in Germany from Monday to Friday between 9:00 AM and 5:00 PM (CET)

0900-1-LANCOM (=0900-1-526266)

(1.24€/min. from German landlines).

Your LANCOM Systems Team

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