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IPv6 Migration/Scenarios for Orange

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agenda

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Context – France Telecom Orange

- More than 189 M subscribers in 30 countries
- Mobile subscribers: 128 M
  - 3rd operator in Europe
  - ~ 25M in France
  - High growth on Mobile TV service
- Broadband Internet Access (ADSL): 13,4 M in Europe
  - 1st operator in Europe
  - ~9 M in France with multi-play services into the home
  - Strong growth of Voice over IP and TV
- Orange Business Services
  - Extensive seamless data network with local support in 166 countries and territories
  - Leading the IP-VPN access market (IPv6 in the portfolio)

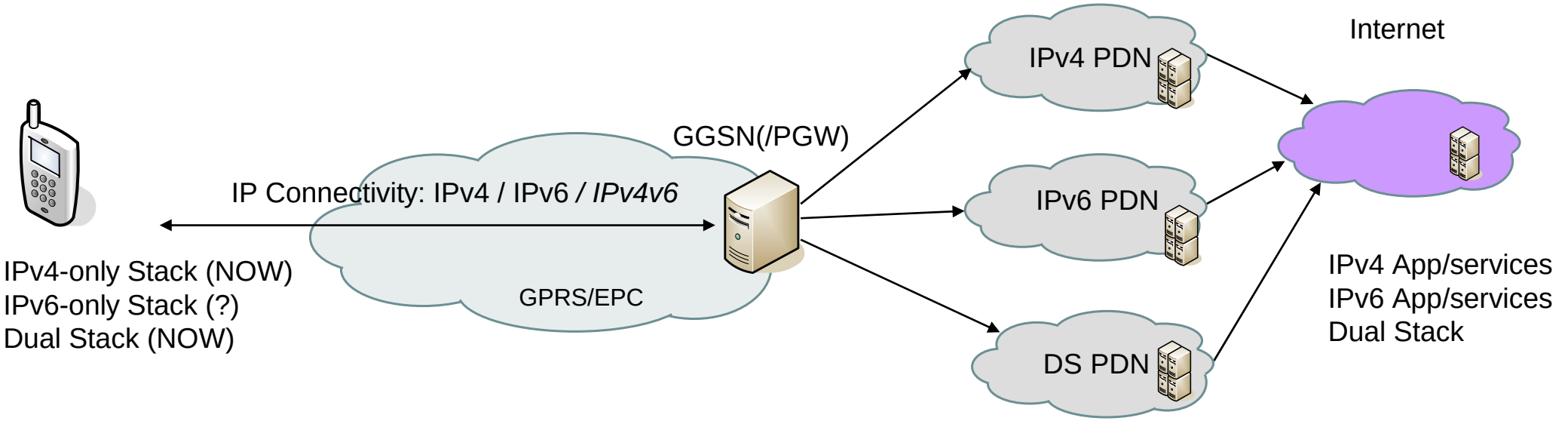
Motivations

- NAT Issues
  - lower QoE
  - Introduction of new Services is more complex
- IPv4 @ exhaustion (public and private ones!)
  - 17 millions of private addresses (without overlapping) may not be enough as far as the number of subscribers increases
    - PDP context on-demand -> always-on connectivity
    - LTE/EPC natively always-on!
- New kinds of clients imply more address space (e.g. M2M, Sensors)
- Our Fixed access is migrating to IPv6 and we are thinking about and working on Fixed-Mobile Convergence (backbone, gateway, service platform)

Some of our Requirements

- IPv4 devices shall continue to access all services
- Global connectivity
  - v4-to-v4
  - v4-to-v6 (with IPv4 private/public address)
  - v6-to-v4
- Some Applications may remain IPv4-only in the device even with an IPv6-only connectivity!
- Some Services/Applications may remain IPv4-only in the server side
- New servers may be IPv6-only (e.g. M2M or third-party Service providers)
- Orange Services + Third-party Services are considered

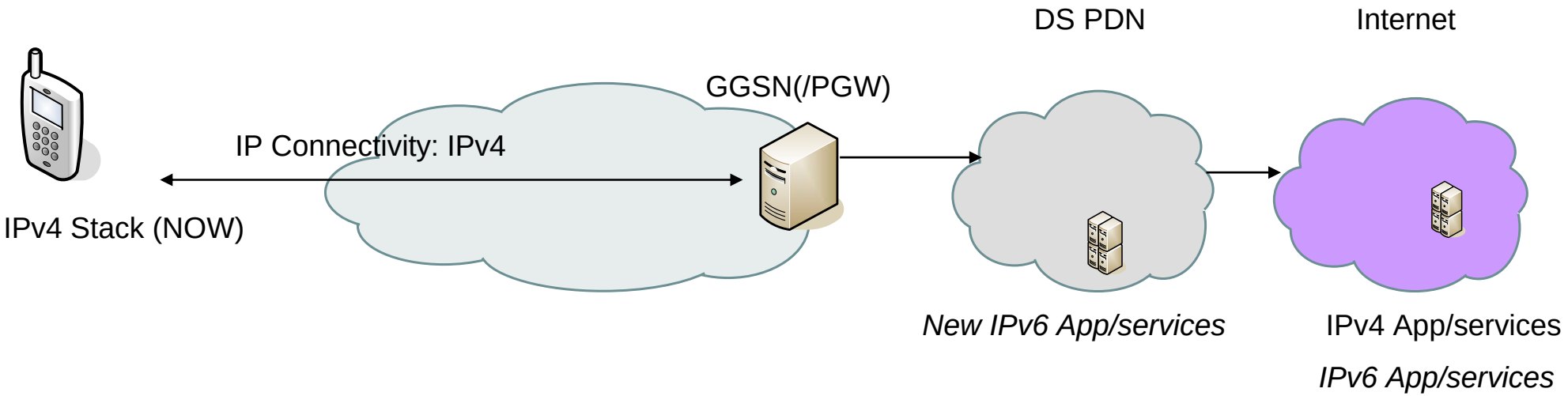
Scope – IPv6 Integration in our Mobile Networks



- All types of sessions must be supported including hybrid communication (IPv4-IPv6)
- Whatever the IP Connectivity, UE should access IP services (Orange/Internet Services)
- Transport network may be IPv4-only in GPRS/EPC network
- M2M, IMS, Roaming and specific services such as Emergency Services or Lawful Interception

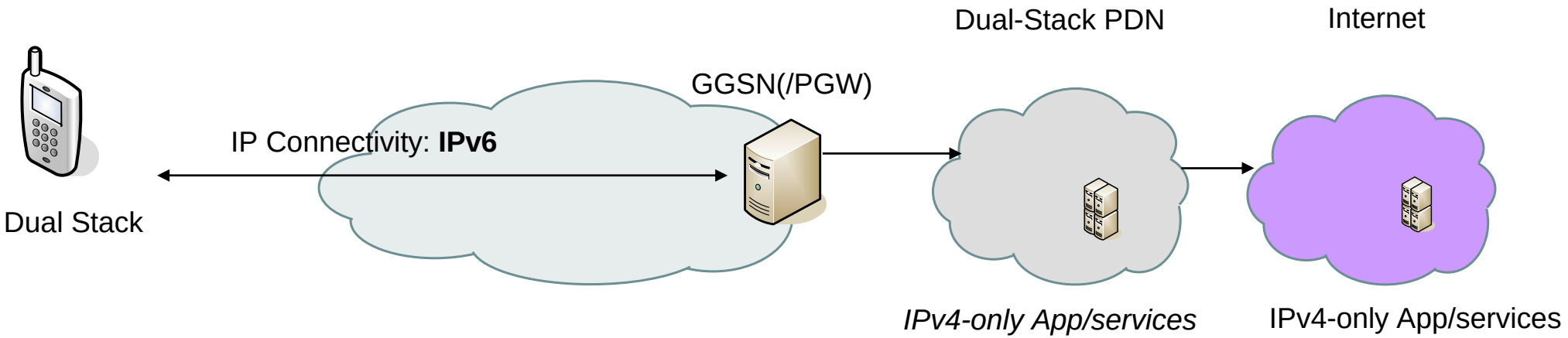
Scenarios

Scenario #1 – UE IPv4 only – IPv6 Services



- UE is IPv4-only (i.e. IPv4-only connectivity is provided for the PDN)
  - BUT this UE may need to access IPv6-enabled services
- 4 use-cases depending on:
  - [IPv4 public or private Address] and
  - Services provided by [Orange's PDN or the Internet]

Scenario #2 UE is IPv6-only connectivity



- UE is Dual-Stack but only IPv6-connectivity is provided at the PDP activation
- This UE needs IPv4 connectivity (e.g. an IPv4-only application is launched on that UE after the PDP context establishment)
- How to implement this ?
  - Always-on IPv6 + IPv4 on request (in a separate PDP context ?)
  - Dual-stack PDP context (w/o IPv4 address sharing) may not be the appropriate solution because it requires an IPV4 address allocation
  - Others ?

Conclusion…

- These scenarios are complementary and there is no timeline nor scenario selection to be considered
- We may need to provide access to IPv6 services to legacy UEs having IPv4 connectivity
  - NAT 46 MAY be needed
  - Not a solution to IPv4 exhaustion issue
- We would prefer IPv6 connectivity for new (DS) UEs
  - Solve IPv4 Addresses exhaustion issue
  - IPv4 optional connectivity or/and other mechanisms may be needed
- Other issues
  - Various terminal types: handsets, MID, FlyBox (CPE connected to the 3G network), sensors
    - Do we need specific addressing schemes ?
  - Some specific IETF functions (PNAT, DS-Lite..) may be required in terminals and/or network elements
    - Need to include them in 3GPP specifications ?

Second Conclusion

- We are deeply involved in IETF for IPv6 (Migration) since the beginning
- We now have a clear view on how to handle IPv6 Migration for fixed Broadband networks
- For our Mobile networks:
  - IPv6 support is neither new in 3GPP specifications nor in network equipments
  - But IPv6 Migration is a new hot topic (probably requiring new functions) !
- We're working on it

Thank you

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