# 3GPP all-IP Workshop -- Nokia All-IP System Design Principles

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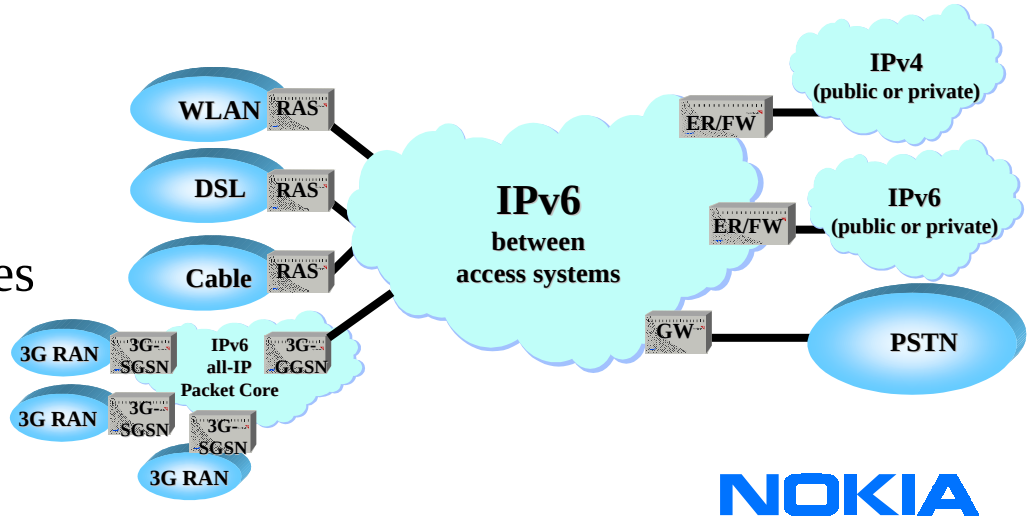
# Nokia All-IP System Design Principles


- Fast track: Leverage the best-in-class telecom and datacom standards
- Enhance existing specifications, or develop new ones when necessary, to reach open, multivendor system design
- Smooth evolution for both network and services
- Scalability: Support for 1 Billion+ terminals
- Rapid and flexible creation of new services: unlimited differentiation
- Separation of service, connection and mobility control: access independent and globally unified services
- System optimized for high load IP traffic
- Support of mobility between accesses
- End-to-end QoS support with high reliability and spectrum efficiency

# IP Version 6: The Basis of the All-IP System

- Huge growth of mobile Internet terminals will exhaust IPv4 address space
  - All wireless terminals will have WAP and GPRS
    - IPv6 brings enough IP addresses
- Ease of scalability
  - Supporting billions of new devices and huge amounts of new bandwidth
  - Simplified, cost-efficient architecture without NATs , Proxies, ALGs,...
- Always-on connection establishes a variety of new services
  - Push, location-based, etc.
- Integrated Security
- Efficiency: IPv6 improves efficiency in a number of areas.
  - Routing, Broadcast handling
- Quality of Service improvements
  - Fragmentation, Flows
- Mobility Across Access Technologies



# Benefits of IPv6

For end users / companies

- Easy management: Autoconfiguration
- Embedded encryption support and authentication
- Embedded mobility
- Embedded multicasting
- Internet Provider selection
- Efficient packet processing in routers
- Real-time support
- Protocol extensions for proprietary solutions

For ISPs / Operators

- Easy management: Autoconfiguration
- Efficient address allocation
- Improved multicast management
- Renumbering possible
- Efficient network route aggregation
- Efficient packet processing in routers
- Real-time support



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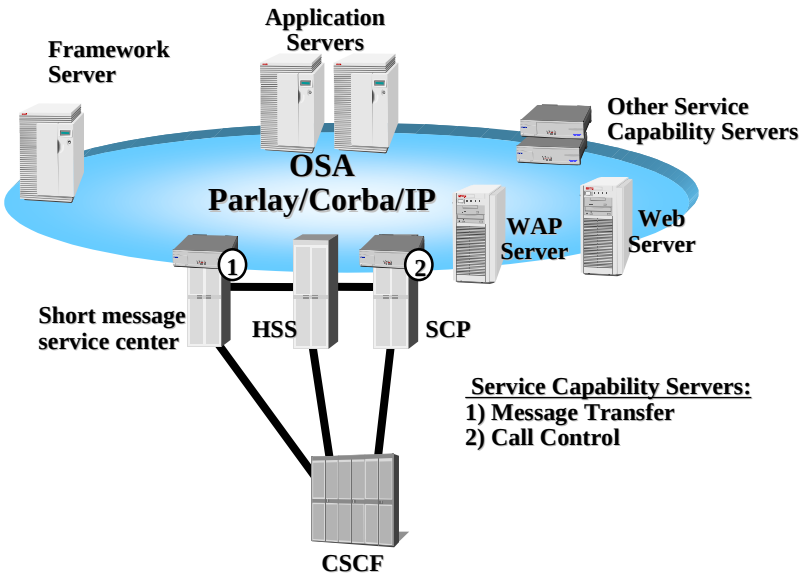
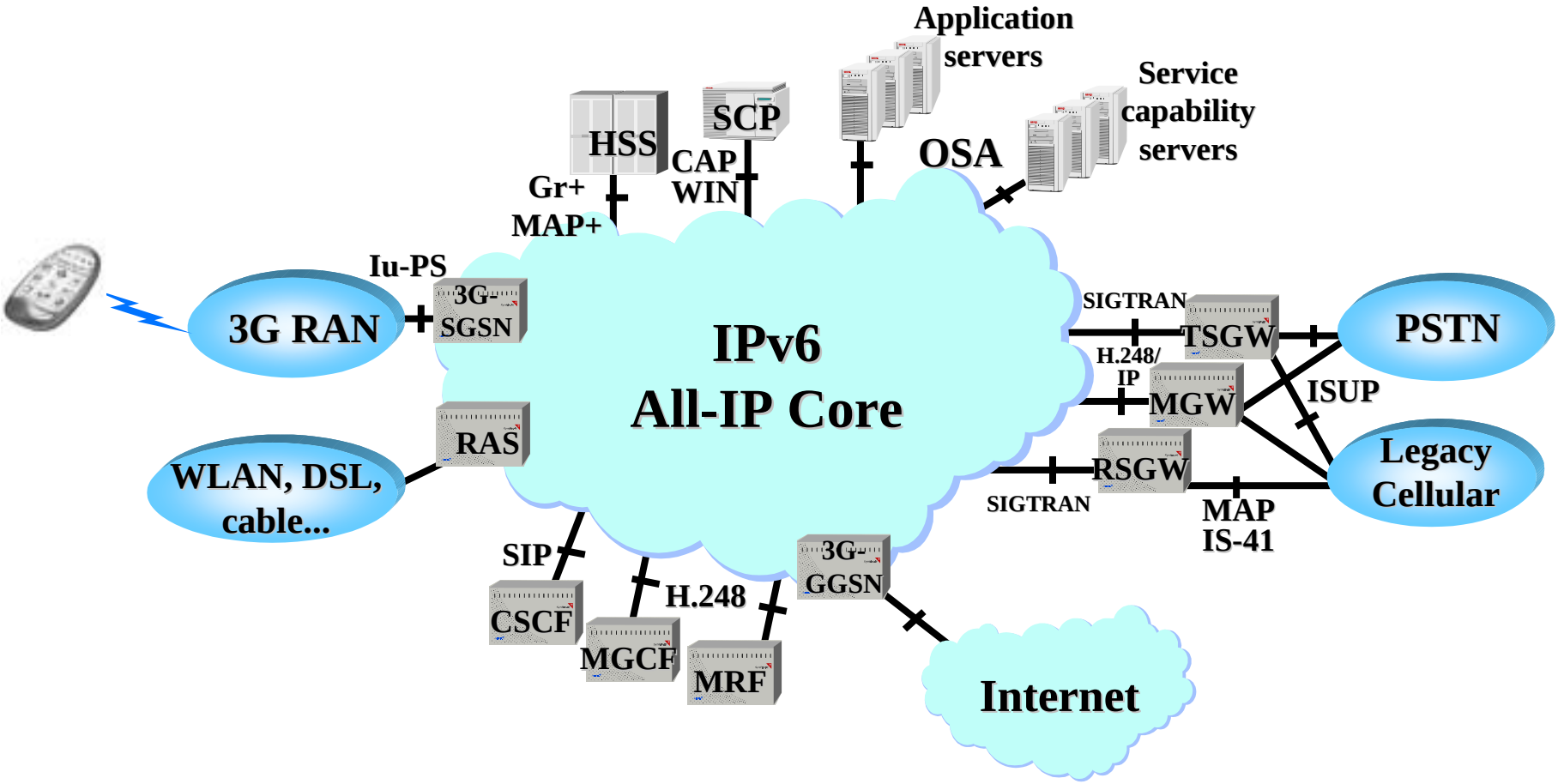
# Service Architecture

- Common service machinery for all access systems
- A core set of basic and supplementary services defined
  - e.g., call divert, barring, pre-paid, emergency call, etc
- Open APIs (Parlay, JAIN, etc.) to support rapid, flexible and secure service creation to enable
  - 3rd party application development
  - Vendor independence
  - New business models with external service providers
- OSA service architecture to support services
  - Similar to current IN services
  - Exploiting the enhanced capabilities of IP network (video, multimedia etc.)
- Globally accessible services via CAMEL/WIN or by direct access between terminal and application server

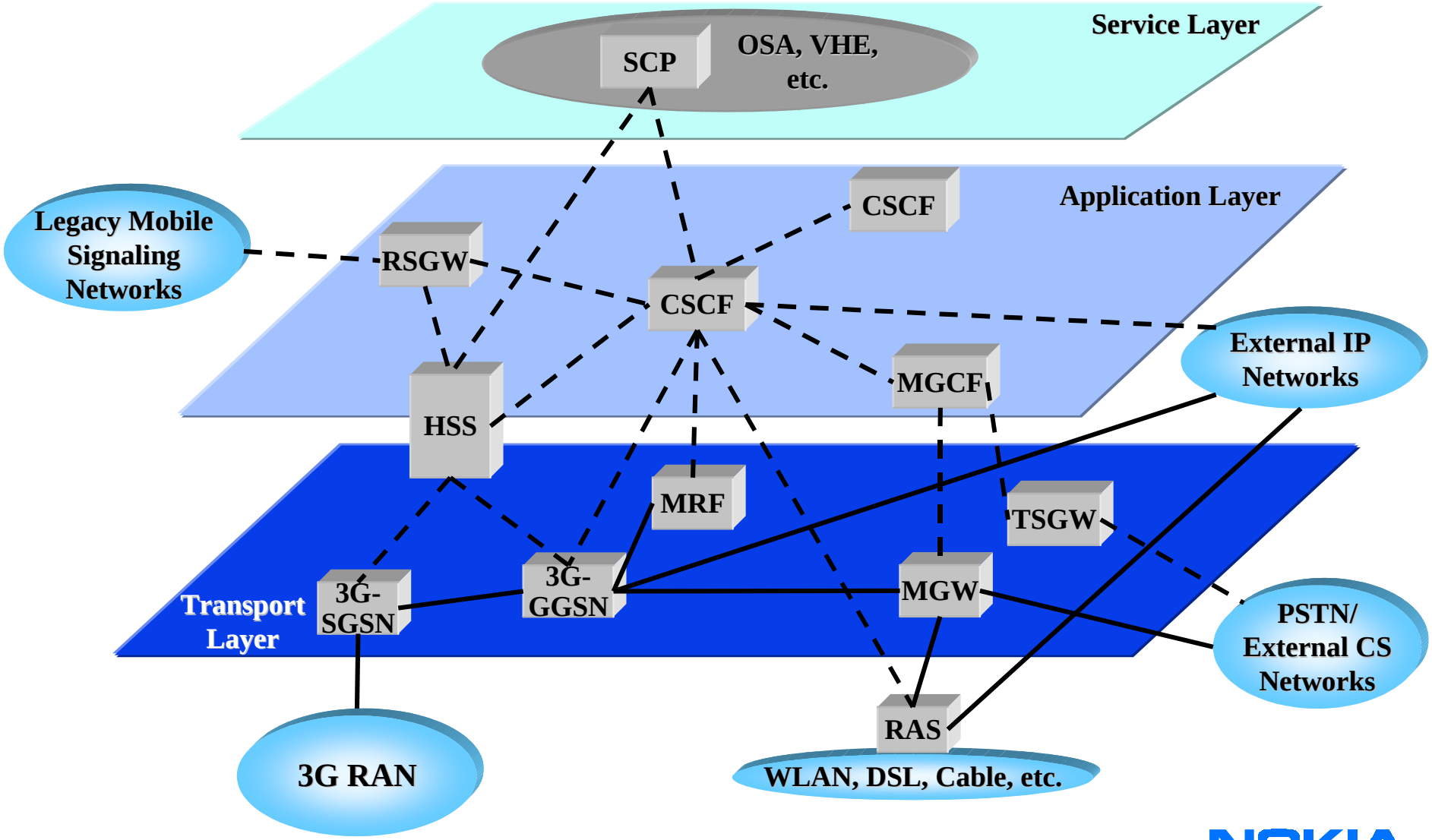


# All-IP System Level Architecture




| | |
|---|---|
| CSCF | Call State Control Function |
| HSS | Home Subscriber Server |
| MGCF | Media Gateway Control Function |
| MGW | Media Gateway |
| MRF | Multimedia Resource Function |
| RAS | Remote Access Server (DSLAM, head end…) |
| RSGW | Roaming Signaling Gateway |
| TSGW | Transport Signaling Gate |

# All-IP Reference Architecture -- Robust Platform for Future Evolution



# Conclusion -- Requirements for Future All-IP Systems

- Mobility Handling
  - Determined by, and optimised for, mobile terminals
- Multiservice
  - Common Network for real time and non real time services
  - Rapid, flexible and easy creation of new services
- Layered Network Functionality
  - For independence of access, transport, applications and service creation
  - For system flexibility and future evolution
- Multiaccess & Access Independence
  - Several accesses including WCDMA, EDGE, WLAN, Cable etc.
  - Mobility between accesses (Global IP Mobility)
- IPv6-Based
  - For mobility between accesses (Global IP Mobility)
  - For scalability and address space
- Evolution and Legacy Support
  - For utilisation of existing investments
  - For service continuity
- Shared Transport and Network Management
  - For cost efficiency



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