



Fixed Networks Migration towards NGN

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Why a Next Generation Network ?

- > **Convergence** between the packet-based Internet and telephony networks
 - Driven by **technological evolution**
 - Demand for a network capable of introducing **new services**
- > Take the best from each
 - **Service provision** of the telephony network model
 - **Openness and flexibility** of the Internet model
- > Possible Definition of a Next Generation Network
 - A **packet transport based network** where the transport, control and service layers are **separated** from each other and interact through **open interfaces**
- > The target is well defined but **how to reach it ?**

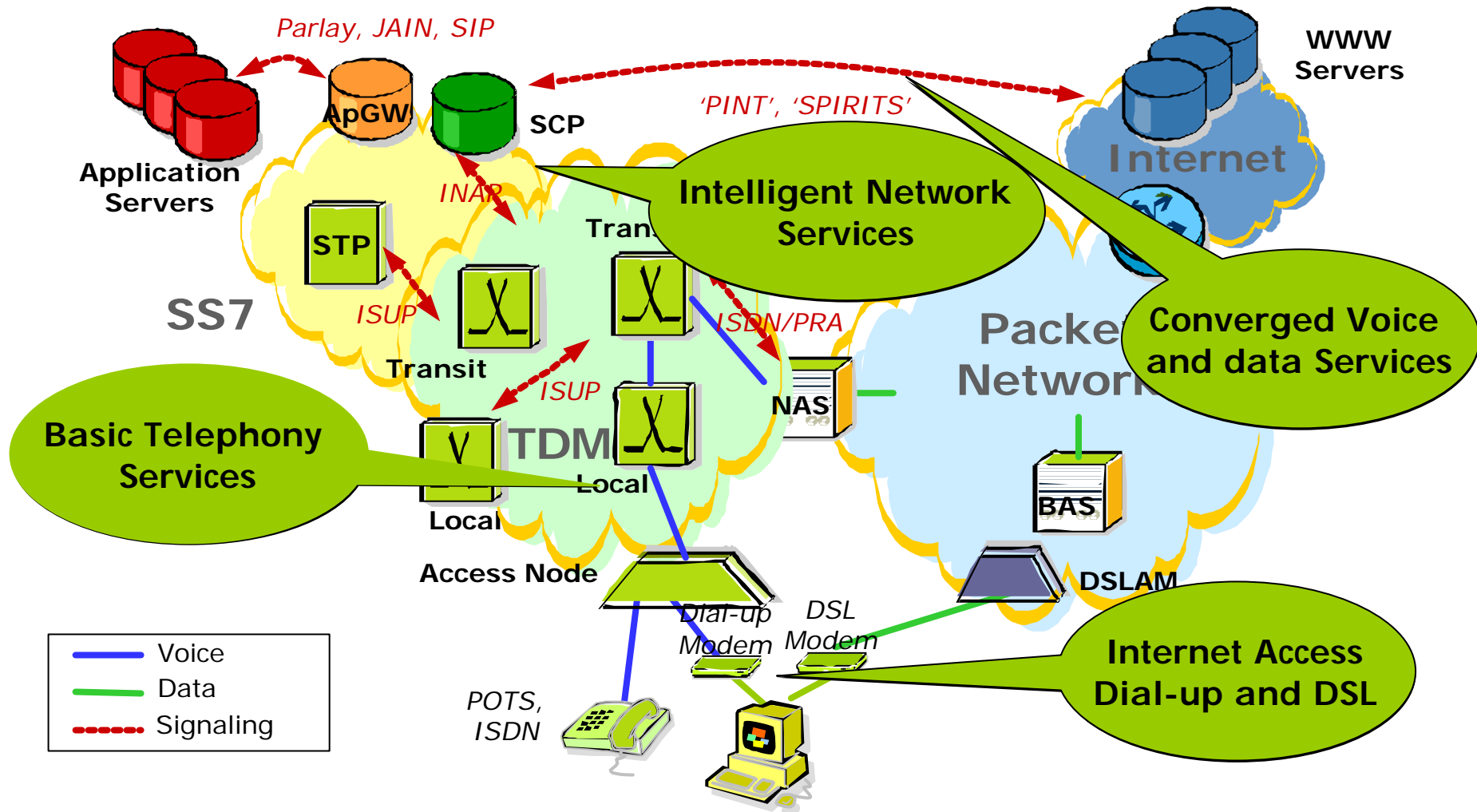
Migration Rationale

- > Migration of current telephony networks (2 billion users worldwide) should **preserve the existing investments**
- > Key investments in any network are in provisioning **access for end-users** to the network services (80% of the costs)
 - Any technological changes become **costlier** when they get **closer to end-users** and should be justified by added value brought with them
- > Migration must be driven by **basic principles**
 - **Continuity of services** offered to end-users
 - **Inter-working** between new and old technologies
 - **Cost control** of the migration process
- > Migration should above all be **driven by economic considerations**
 - **Network consolidation** and optimization **and/or**
 - **New revenues** driven from new services

Proposed Migration Approach

- > **Stepwise approach** where each step is justified by new services or advantages brought from consolidation
- > The proposed migration steps are **generic**
 - Application of each step depends on the **specific operator context**
 - All are **not compulsory** and do not follow in the **same** sequence
 - **There is no “one size fits all” migration scenario**
- > Network views of migration steps are not exhaustive
 - Emphasis put on **significant network elements** needed for service provision, on **signaling relations** between end-users and the network and between network entities
 - Emphasis put on **fixed access networks** though the approach is very similar for mobile networks evolution (see tomorrow's presentation)

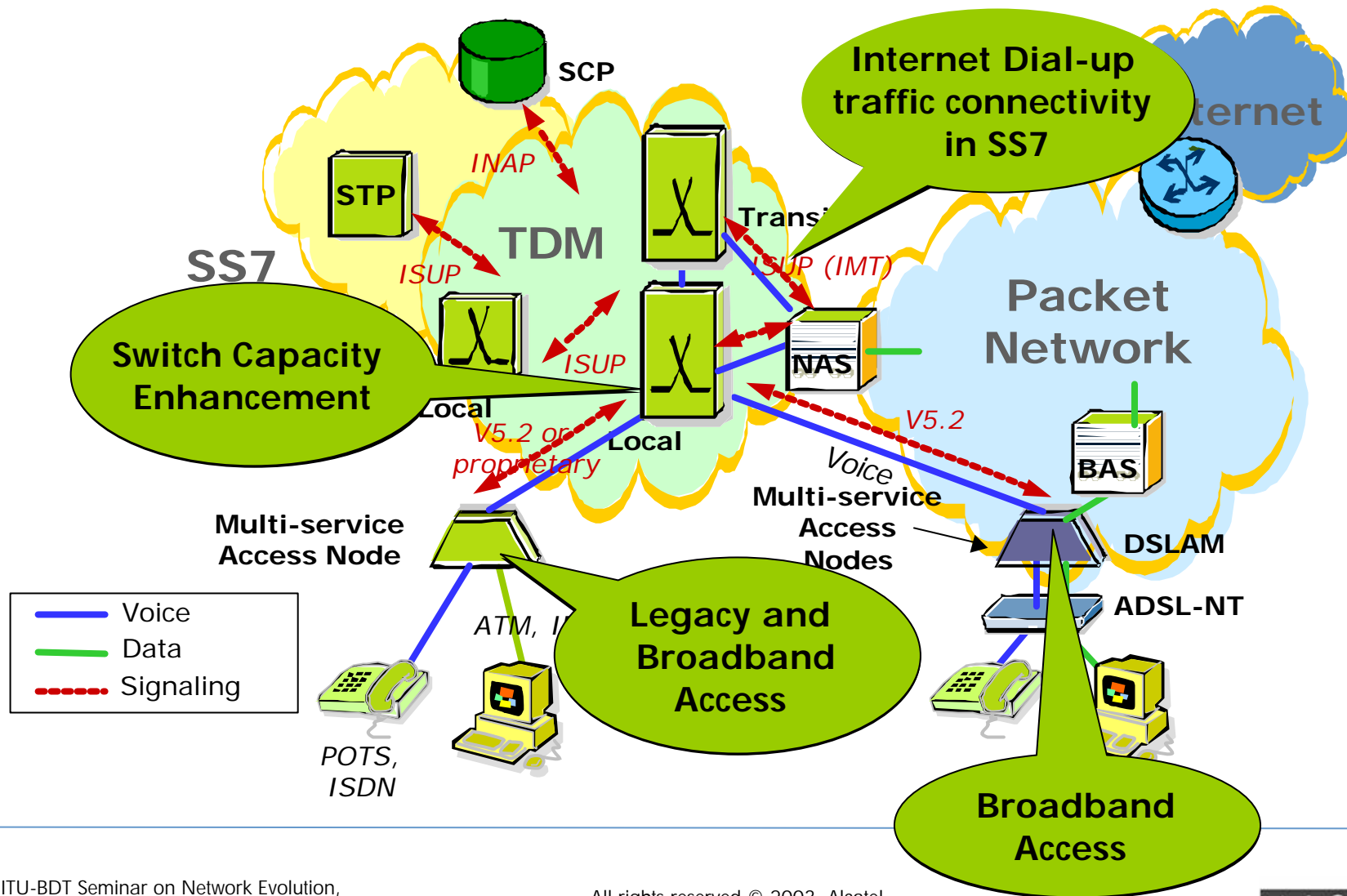
Access to the Internet and Converged Internet/Telephony services



Access to the Internet and Converged Internet/Telephony services

- > **Basic telephony service** and its associated supplementary services
 - TDM based transport
 - SS7 based signaling
- > **Intelligent Network Services**
 - Calling Cards, Free phone, Voice virtual private networks, ...
- > **Internet access**
 - In **dial-up mode** or in **broadband mode** with DSL technology
- > **Converged Voice/data services**
 - Benefit from the **simultaneous** availability of a telephony access and Internet access in the case of broadband Internet access
 - Examples of converged services: Click-to-Dial, Internet Call Waiting, Web Augmented Calling, Unified Messaging, ...

Network consolidation: evolution towards multi-service access nodes and Internet traffic optimization



Network consolidation and introduction of new multi-service access nodes

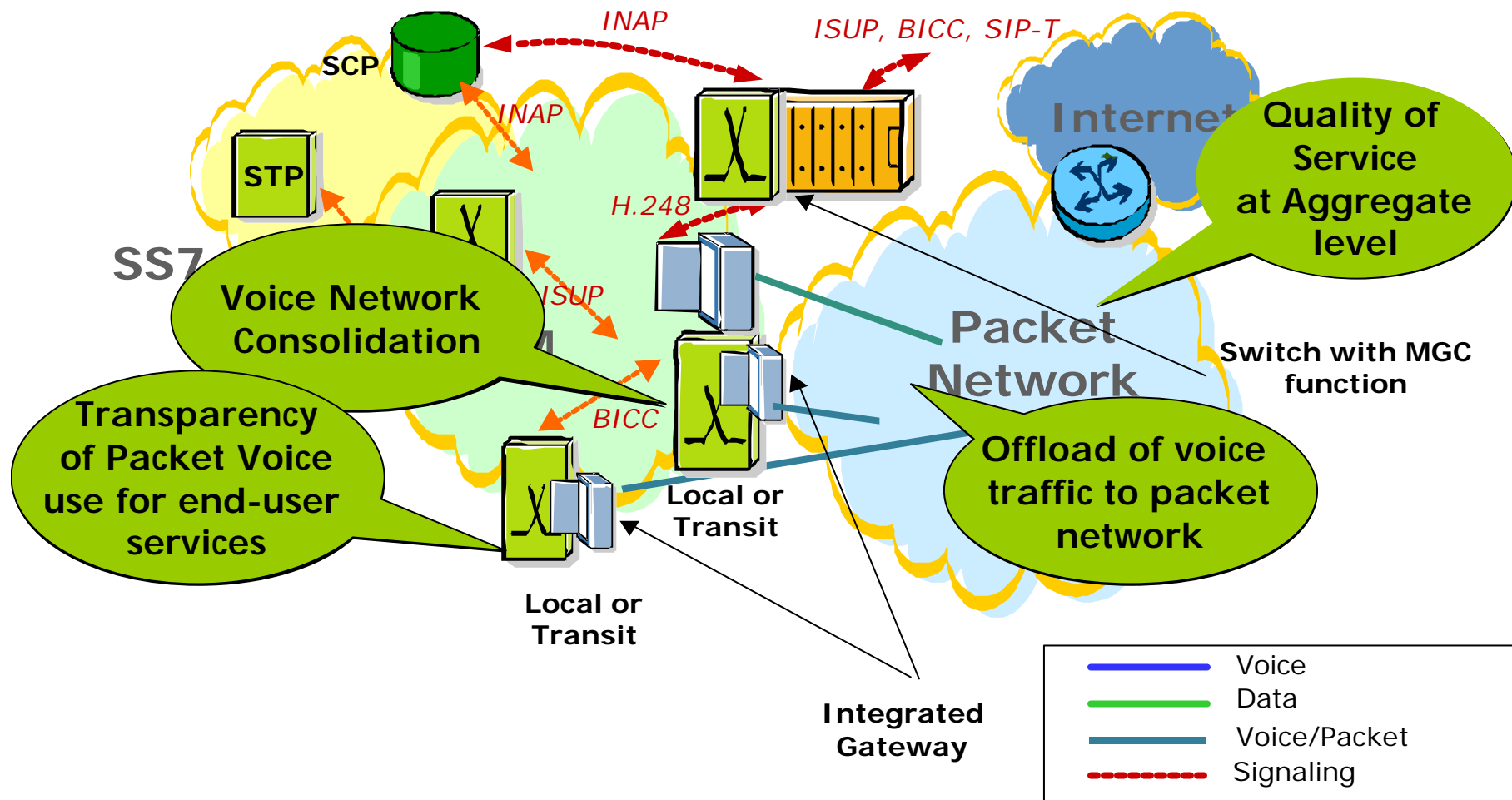
> Switch consolidation

- **Maximize** number of line, **minimize** number of nodes
- Upgrade of switch fabric and processors for **higher capacity** and speed

> Access Consolidation

- Introduce NGN-ready **multi-service access nodes**
 - End-user can be in **native packet** access mode
 - **DSL** but also other alternative next generation local loop technologies (cable networks, wireless local loop, satellite,...)
 - Introduce **Voice-over-DSL** (loop emulation service) and extend voice service offer **without modification of the legacy switches**
- > **Optimize interconnection** to the data network for dial-up access
 - Interconnection at local exchanges level (**offload transit level**)
 - Use of ISUP and Inter Machine Trunks (IMT) instead of ISDN/PRA

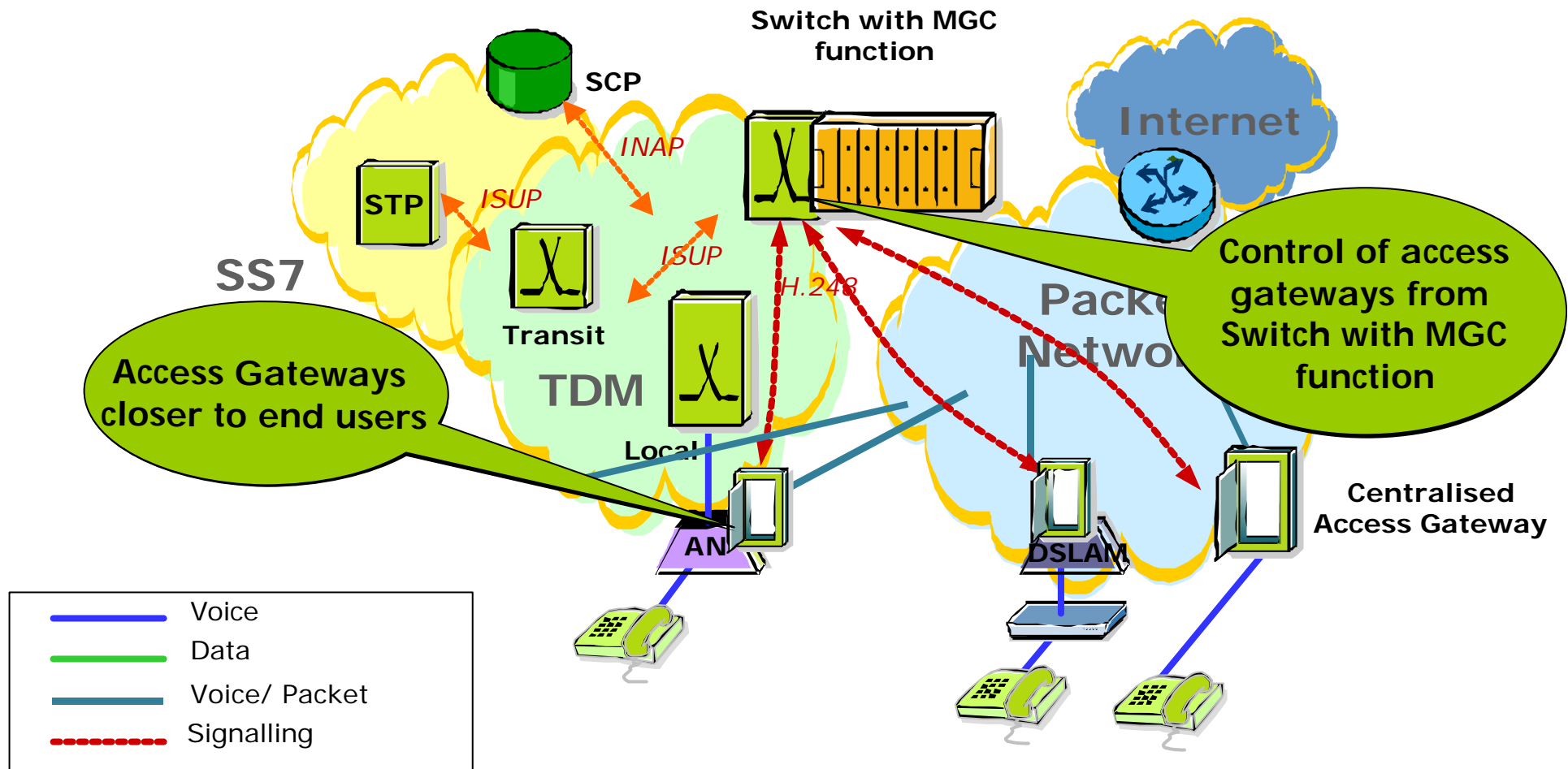
Voice over Packet for Trunking



Voice over Packet for Trunking

- > **Gradually** offload voice trunking traffic to the packet network
- > **Network consolidation** by removal of an upper transit level or optimization within a transit level
 - Voice-over-Packet trunking through **integrated gateways** in the LEX/TEX
 - Alternative solution based on **external trunking gateways** controlled by a **Switch with Media Gateway Control** (MGC) function
 - Use of SS7 based **BICC signaling** for co-existence with PSTN/ISDN services
 - **Reuse of existing IN services** for business continuity
- > First mastering of voice over packet technology at **aggregate level**
 - Simpler Quality of Service issues
- > **Service transparency** of Voice over Packet use for end-users

Voice over packet up to access level



Voice over packet for access

- > Extend use of packet transport to the access network for voice services
 - Introduction of **Access Gateways**
 - **Integrated** within next generation multi-service access nodes or
 - **Standalone** centralized access gateways
 - Access gateways are controlled by a switch with MGC function
 - Same **services portfolio** as on the PSTN/ISDN
 - Tighter integration of voice and packet services
- > **Improved network consolidation**
 - control of the voice traffic from **fewer** Switches with MGC function
 - Voice traffic gradually **moved** from the control of old generation switching equipment to the control of upgraded MGC switches

Multimedia Services

- > End-users connected through next generation multi-service access nodes will adopt **IP terminals** for multimedia services
 - Better benefit of the high bandwidth, always-on and interactivity associated with such next generation access networks
- > New IP terminals will be controlled by **Multimedia Softswitches** through a **new type of NGN signaling**
 - **SIP** or **H.323**
 - Access network will focus on **resource provision** under the softswitch control depending on the service used
- > A multimedia softswitch offers **network services** but also **third party services** through **portals** and **open interface**
 - Network operator becomes the intermediary **broker** between application providers and their clients

Conclusions

- > **Services** are key drivers for the evolution of telecom networks
 - NGN is **more** than just broadband access to the Internet
 - Broadband access is a **necessary but not sufficient condition** ! It is above all an **enabler** of new services with new revenues
 - NGN must build on the strengths of the **telephony service model** albeit being based on technologies coming from the Internet

- > NGN emergence **will** happen but **will take time**
 - PSTN networks will **continue** to provide the **voice telephony** service for a while
 - **State-of-the-art** PSTN solutions of **today** will evolve to be part of the future NGN picture
 - Some technical issues (QoS, naming, signaling) **must be matured** for new NGN services to become a **mass market** phenomenon
 - **NGN must above all bring new services to be meaningful**

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**Thank You !
Questions ?**