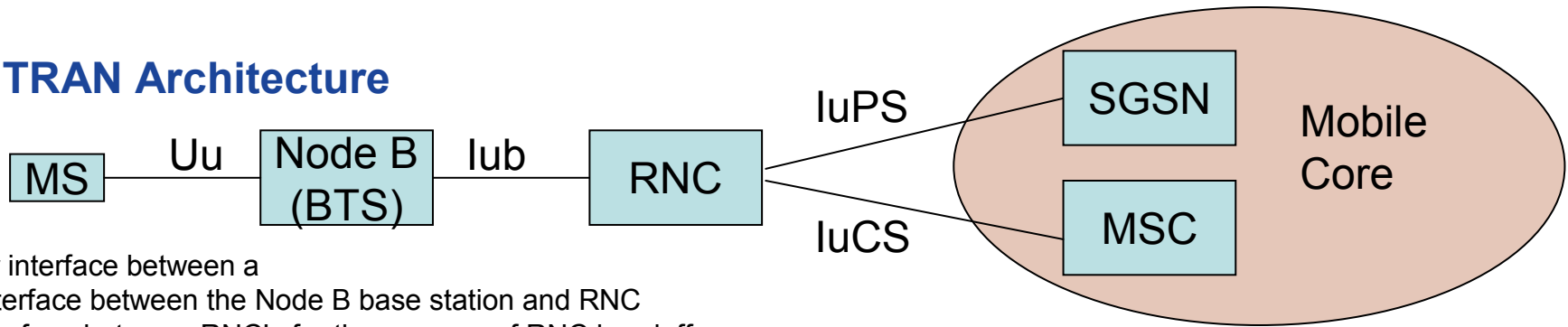




3GPP UMTS HNB IMS Architectures

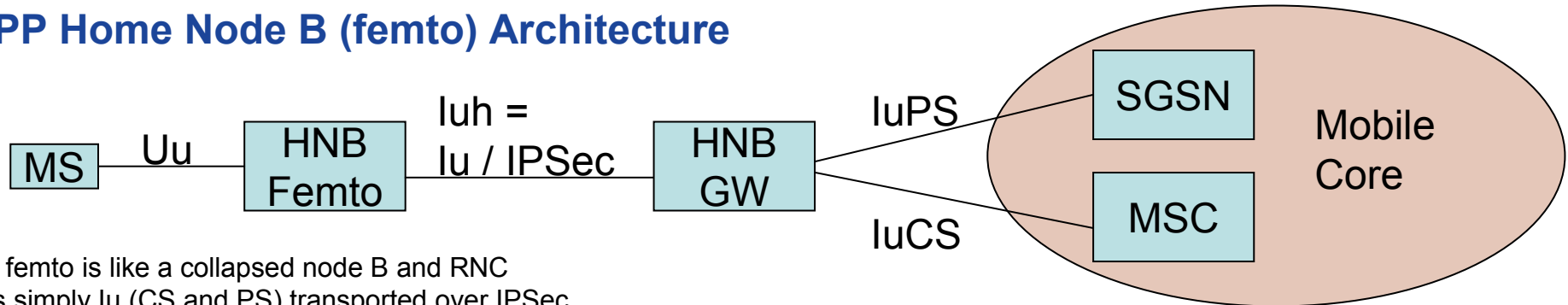
3GPP UTRAN Architectures

3GPP UTRAN Architecture



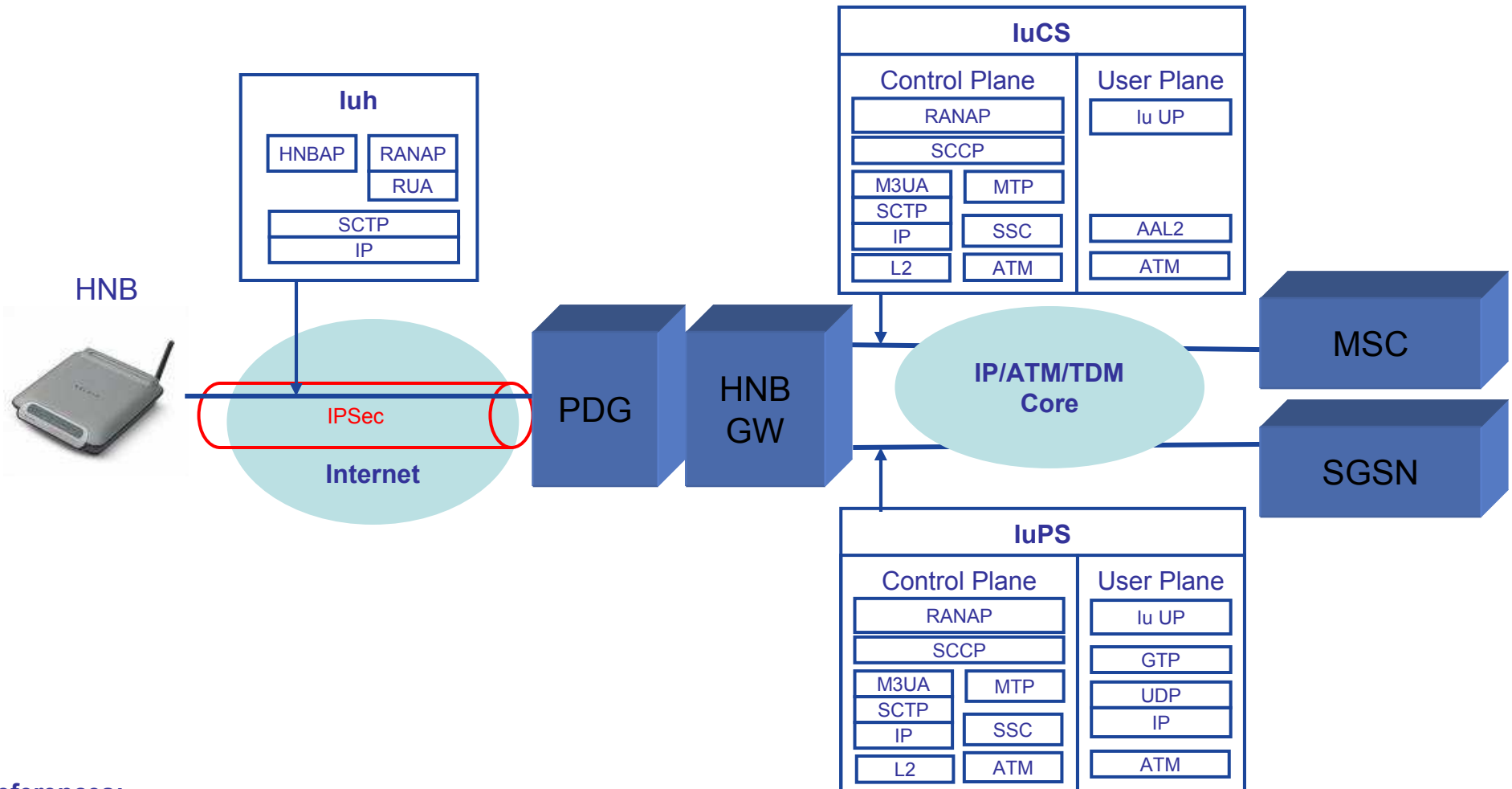
- Uu is the air interface between a
- Iub is the interface between the Node B base station and RNC
- Iur is the interface between RNC's for the purpose of RNC handoff
- IuPS is the data interface between the RNC and SGSN
- IuCS is the voice interface between the RNC and MSC
- RANAP is the control protocol common to both IuPS and IuCS

3GPP Home Node B (femto) Architecture



- HNB femto is like a collapsed node B and RNC
- Iuh is simply Iu (CS and PS) transported over IPsec
- RANAP (Iu control protocol) is carried over lightweight encapsulation and relayed through HNB-GW
- RTP CS traffic is simply relayed to IuCS side
- GTP-U PS traffic is simply relayed to IuPS side
- HNB-GW terminates IPsec, concentrates HNBs, and splits IuCS and IuPS
- HNB-GW will be implemented in PDG/PDIF boxes from Airvana, Stoke, etc
- Iu runs over SS7/SIGTRAN and ATM

3GPP HNB Architecture (UMTS Release 8)



References:

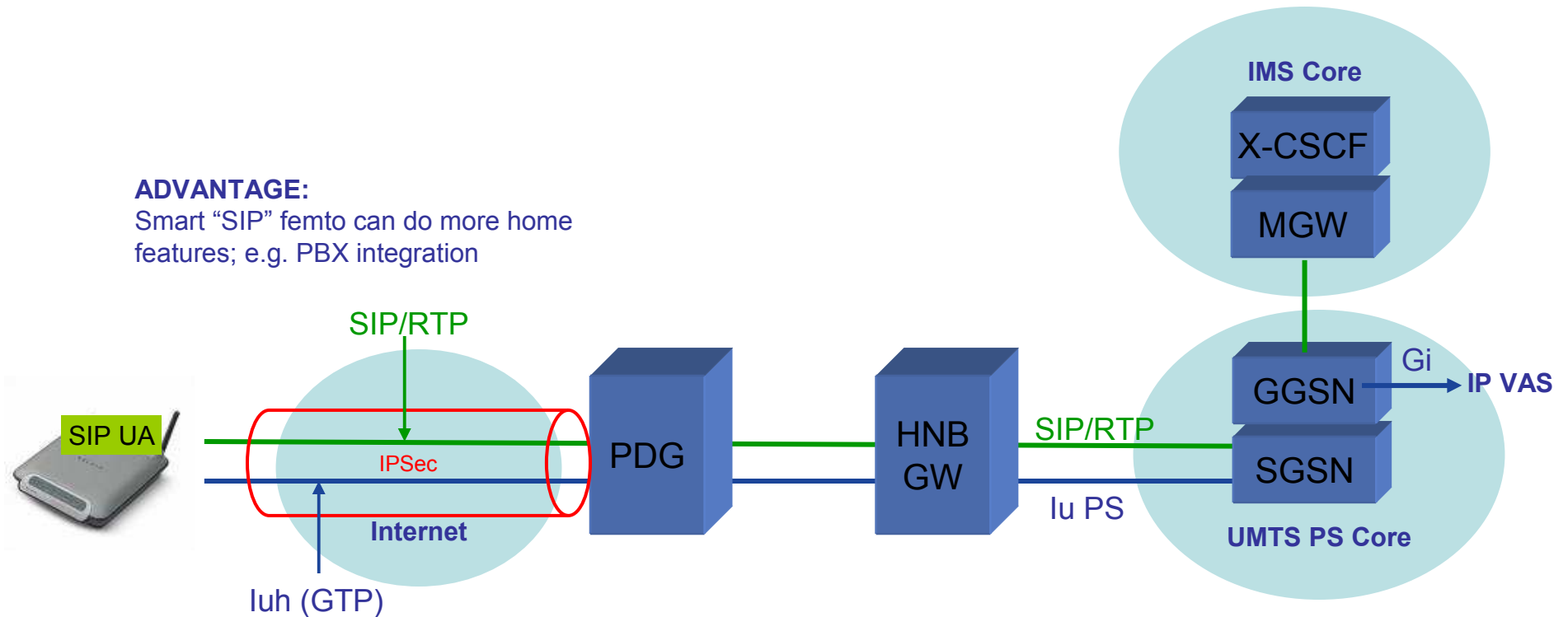
- TS 25.413 v5.12.0 (2005-06), UTRAN Iu Interface RANAP Signalling (release 5)
- TS 25.413 v6.13.0 (2007-03), UTRAN Iu Interface RANAP Signalling (release 6)
- TS 25.413 v7.5.0 (2007-03), UTRAN Iu Interface RANAP Signalling (release 7)

3GPP HNB IMS Architecture (UMTS release 9)

Variant 1: SIP UA in the HNB runs over Iuh (PS)

ADVANTAGE:

Smart "SIP" femto can do more home features; e.g. PBX integration

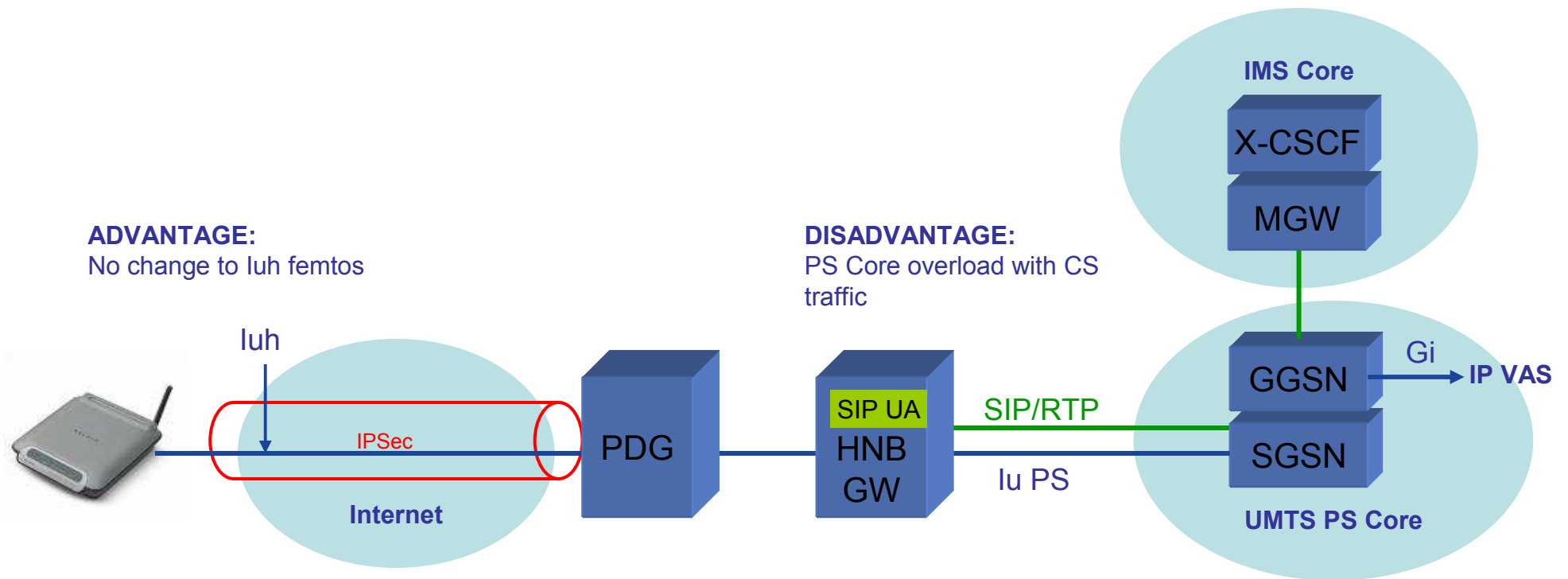


References:

- 3GPP S2 090383 S2 Iuh 70 Iuh-IMS-HNB-Architecture v2, 11/2008, NEC, SoftBank
- 3GPP S2-090382 S2 70 IMS HNB General Architecture v7, 11/2008, NEC, SoftBank
- 3GPP S2-090387 S2 70 IMS HNB with Local PBX v4; 11/2008, NEC, SoftBank, Starent, NTT DoCoMo

3GPP HNB IMS Architecture (UMTS release 9)

Variant 2: SIP UA runs in the HNB-GW

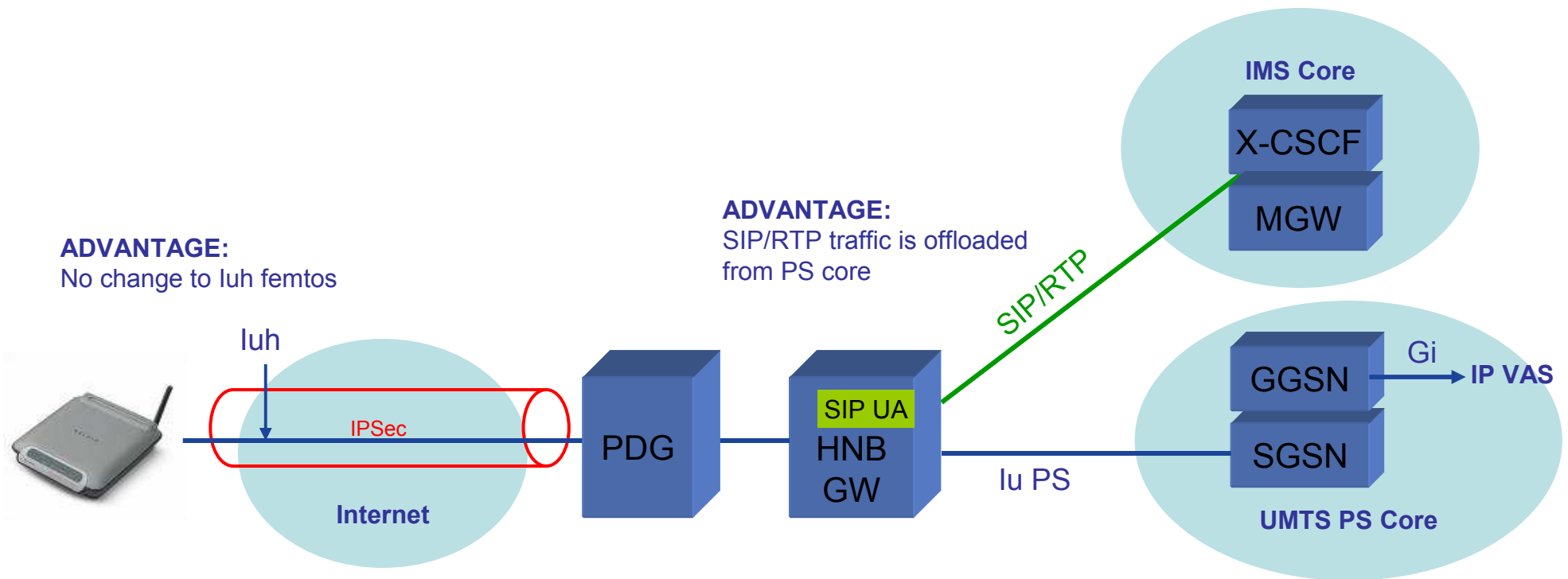


References:

- 3GPP S2 090383 S2 luh 70 luh-IMS-HNB-Architecture v2, 11/2008, NEC, SoftBank
- 3GPP S2-090382 S2 70 IMS HNB General Architecture v7, 11/2008, NEC, SoftBank
- 3GPP S2-090387 S2 70 IMS HNB with Local PBX v4; 11/2008, NEC, SoftBank, Starent, NTT DoCoMo

3GPP HNB IMS Architecture (UMTS release 9)

Variant 3: SIP UA runs in the HNB-GW; direct Wu to IMS



References:

- 3GPP S2 090384 S2 70 Wu-IMS-HNB Architecture v4, 11/2008, NEC, SoftBank
- 3GPP S2 090385 S2 70 IMS HNB Architecture Comparison v2, 11/2008, NEC, SoftBank

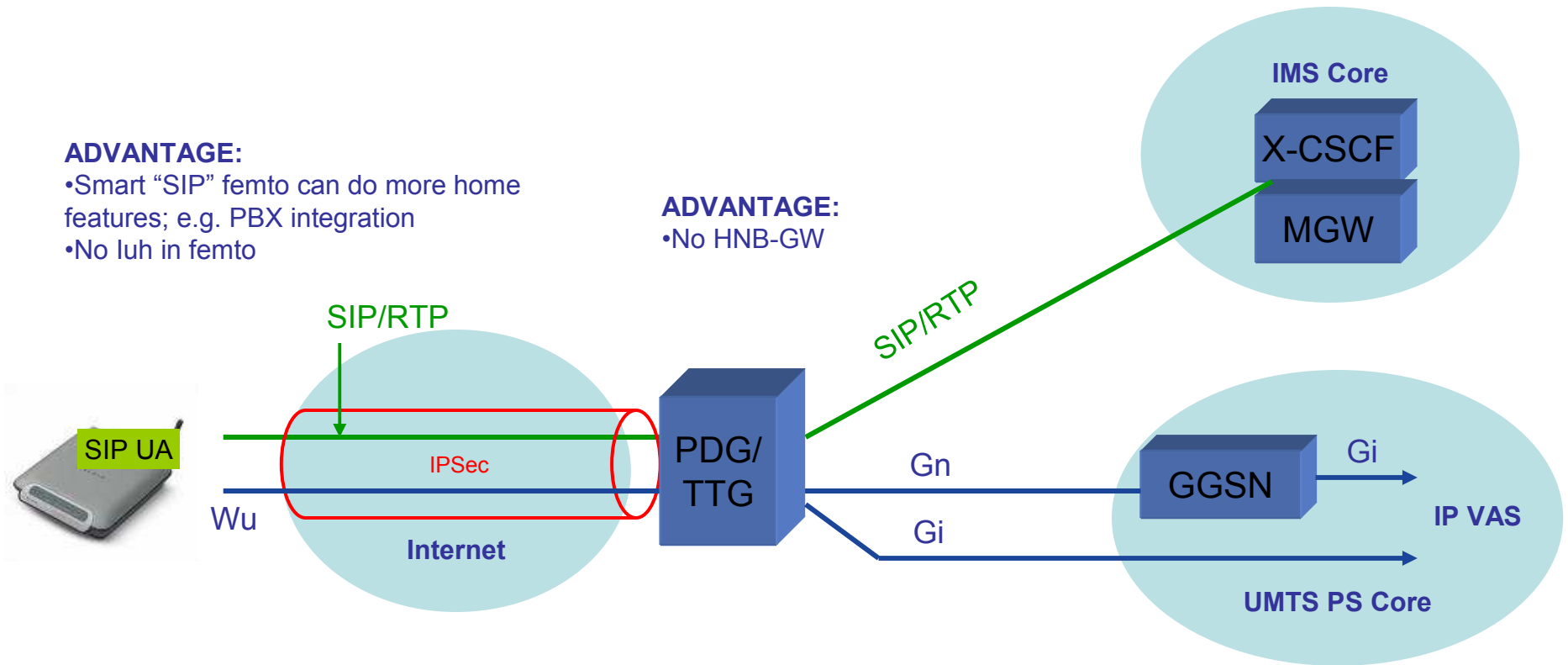
3GPP HNB IMS Architecture (UMTS release 9) Variant 4: SIP UA in the HNB, no luh

ADVANTAGE:

- Smart "SIP" femto can do more home features; e.g. PBX integration
- No luh in femto

ADVANTAGE:

- No HNB-GW



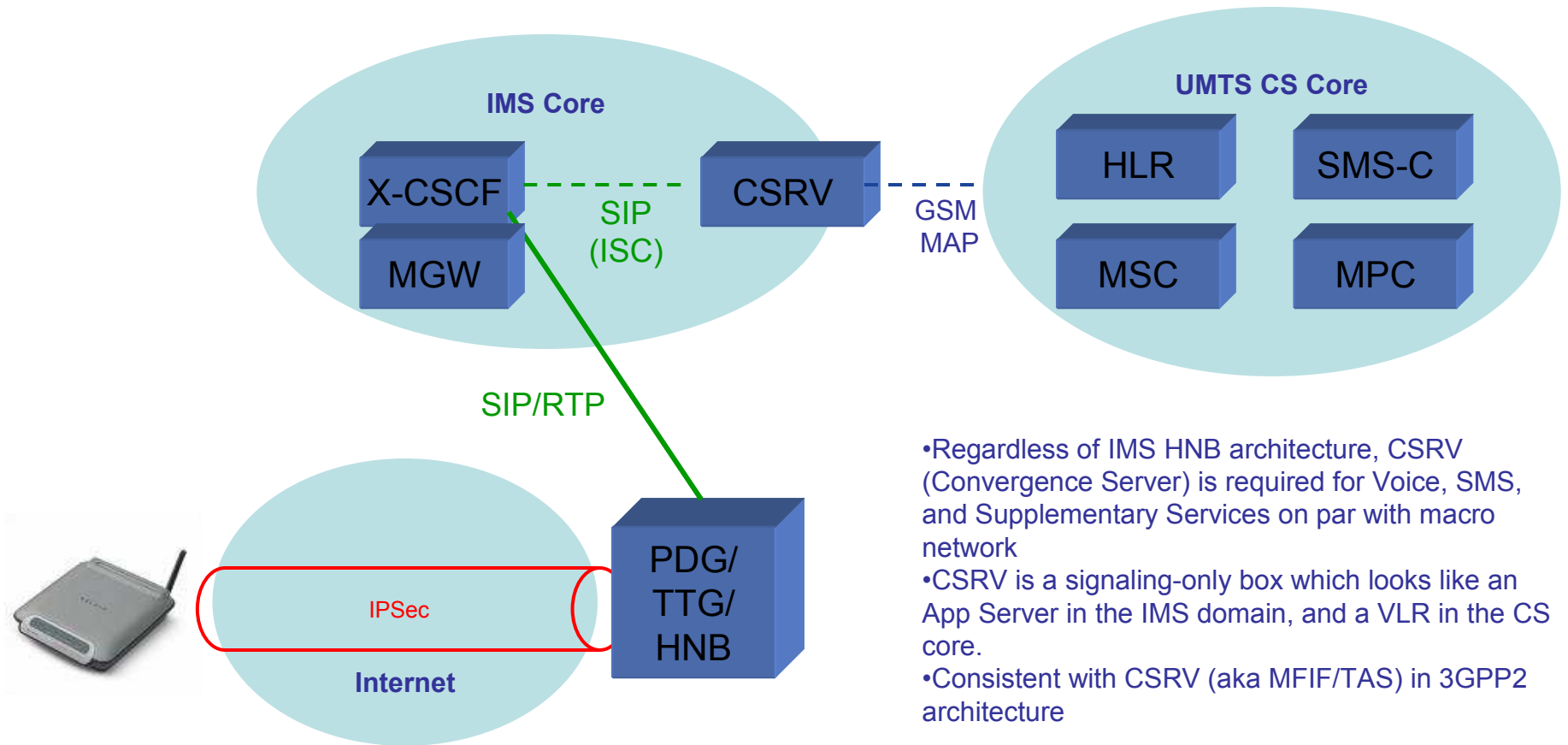
Architecture Comparison

	luh based IMS HNB Architecture	Wu+ based IMS HNB Architecture
Supports "CS Traffic Offload"	☺ Through PS Core	☺☺ PS Core Bypassed
Supports "PS Traffic Offload" from SGSN/GGSN	☹	☺
Additional HNB / HNB-GW interface needed	☺	☹
Optimized backhaul (no unnecessary GTP-U protocol overhead)	☹	☺
Direct IP interface (HGi) at HNB GW	☹	☺
Flat Architecture (only HNB & HNB GW)	☹	☺

References:

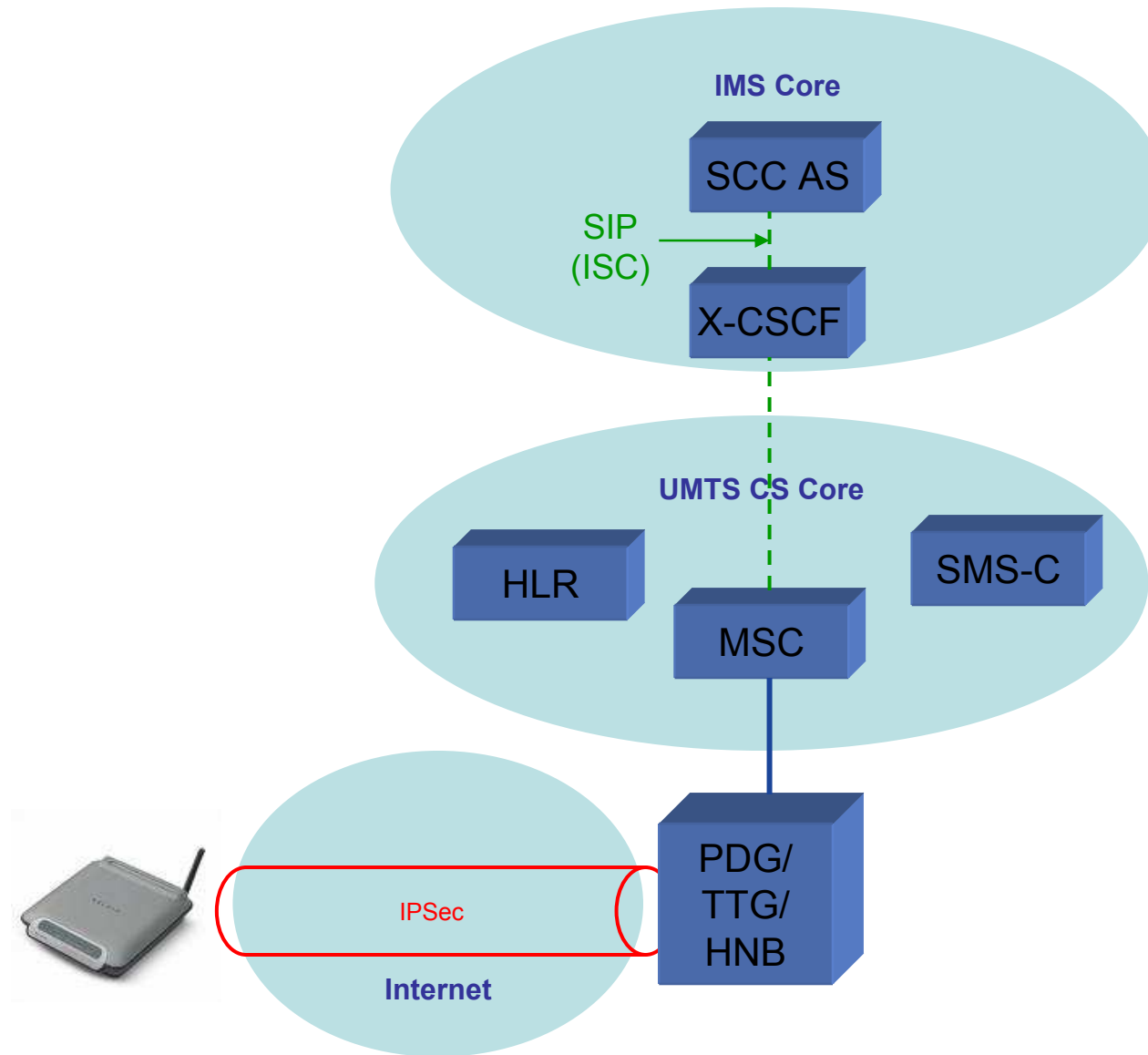
- 3GPP S2 090384 S2 70 Wu-IMS-HNB Architecture v4, 11/2008, NEC, SoftBank
- 3GPP S2 090383 S2 luh 70 luh-IMS-HNB-Architecture v2, 11/2008, NEC, SoftBank
- 3GPP S2-090382 S2 70 IMS HNB General Architecture v7, 11/2008, NEC, SoftBank
- 3GPP S2 090385 S2 70 IMS HNB Architecture Comparison v2, 11/2008, NEC, SoftBank

3GPP HNB IMS Architecture (UMTS release 9) CSRV Role



- Regardless of IMS HNB architecture, CSRV (Convergence Server) is required for Voice, SMS, and Supplementary Services on par with macro network
- CSRV is a signaling-only box which looks like an App Server in the IMS domain, and a VLR in the CS core.
- Consistent with CSRV (aka MFIF/TAS) in 3GPP2 architecture

3GPP HNB IMS Architecture (UMTS release 9) IMS Centralized Services (ICS)



- IMS centralized services utilizes legacy mobile core for voice services AND IMS for IMS services.
- Requires MSC Server changes (SIP)
- HNB / ICS architecture needs investigation.
- Unclear if/how CSRV would fit into this architecture.
- References:
- 3GPP TS [23.292](#) IP Multimedia System (IMS) centralized services; Stage 2