

IPv6 Roaming Behavior Analysis

draft-ietf-v6ops-ipv6-roaming-analysis-01

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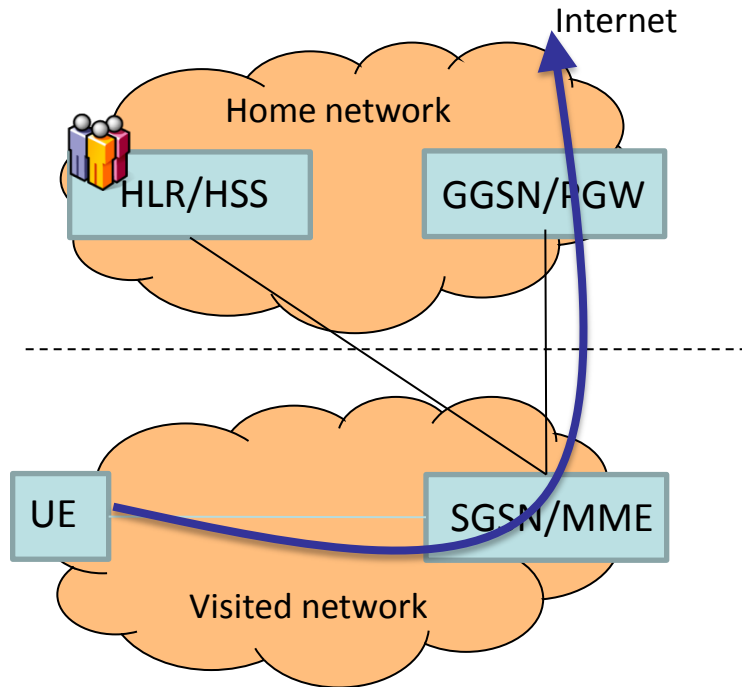
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Observation & Goals

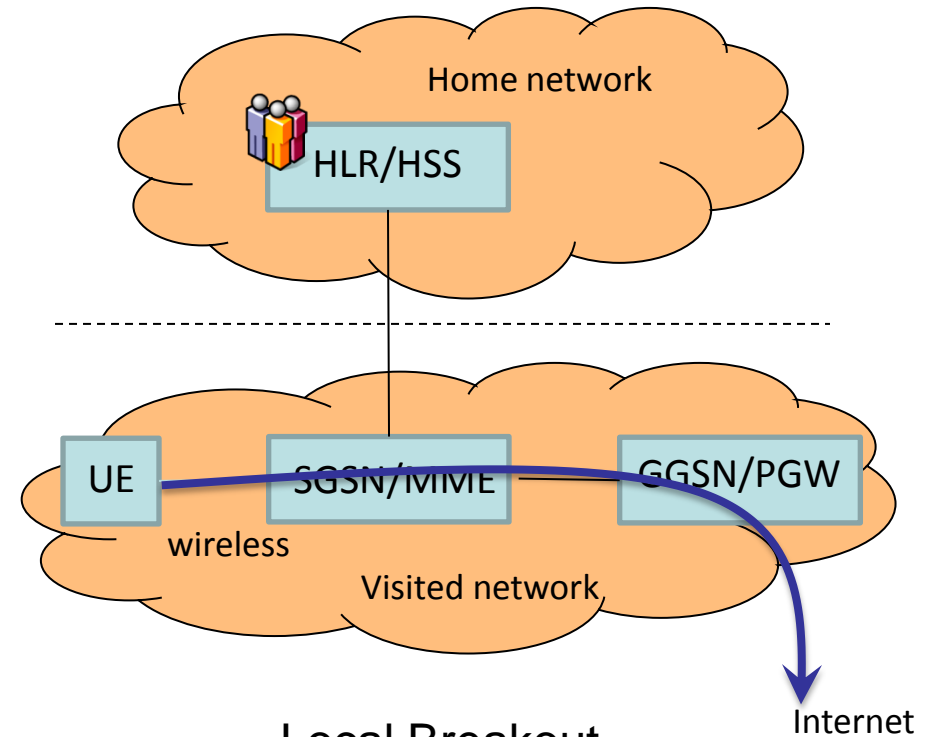
- Something new with mobile roaming
 - **VoLTE roaming**: the deployment is accelerated worldwide. Operators deploy DS or IPv6-only to serve VoLTE users. Traffic local-breakout is required during the roaming
 - **Data service roaming**: Traffic home-routed is the normal case for the time being. However, the situation is changing. *EU Roaming Regulation III* adopts local-breakout mode to avoid Bill Shock while roaming
- The document intends to exhaust the roaming cases, identify the failure cases with IPv6 support and list known solutions

Review about the roaming architecture



Home routed

For example, data service roaming at current cases



Local Breakout

For example, VoLTE roaming or evolved data service roaming

Updates

- Improve the description as clear as possible
- Categorize the failure cases into two stages:
 - Attach stage: PDP/PDN Type IPv4v6 not supported

[impact] can't attach to the network

– IP allocation stage

Case 1: Splitting Dual-stack Bearer

[impact] UE may lost IPv4 or IPv6 connection, etc.

Case 2: Lack of IPv6 support in applications

[impact] failed to support IPv4 apps

Case 3: Fallback Incapability with IPv6-only allocation

[impact] no data connectivity

Case 4: 464xlat unable to accommodate

[impact] failed to discover NAT64 prefix

Further Details

Stage	Cases	Failure Cause	Possible solutions
Attach Stage	Case #0	HLR/HSS contains PDP/PDN IPv4v6 in subscription profile , however vSGSN is standards incompliant.	<ol style="list-style-type: none"> 1. Fix roaming agreement 2. HLR/HSS deliver different profiles according to vPLMN capability
IP Allocation Stage	Case #1	<ol style="list-style-type: none"> 1. dual-stack mobile device roams to pre-R8 networks 2. SGSN/MME does not set the Dual Address Bearer Flag 	<ol style="list-style-type: none"> 1. Disable local breakout 2. Configure a roaming Access Point Name (APN) type for IPv4-only on mobile device
	Case #2	Dual-stack mobile device roams to IPv6-only network (mostly IMS scenarios)	<ol style="list-style-type: none"> 1. Ensure full IPv6 support in operator applications/services 2. Enable 464xlat function
	Case #3	Device request PDP/PDN type IPv6 when it roams to IPv4 only network	<ol style="list-style-type: none"> 1. Disable local breakout 2. Configure a roaming Access Point Name (APN) type for IPv4-only on mobile device
	Case #4	464xlat device roams to an IPv6 only network without NAT64 deployment (mostly intra-PLMN case)	<ol style="list-style-type: none"> 1. Disable local breakout 2. Configure a roaming Access Point Name (APN) type for IPv4-only on mobile device

Next Steps

- Expecting more reviews from the group
- Is it ready for WGLC?