**Conventional Networks (vs) GSM mobile-originated call in**

**TerraCCN-Mobisite network**

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| **Conventional networks**  **C:\Users\Uche\Desktop\Jobs\2016\November 2016\Houstontech's Terramobile\Technology\SBMN\Conventional Networks1.png**  Conventional bullet  Synchronous TDM-based A and Abis interfaces are required between the MSC, BSC and BTS.  Conventional bullet  Each BTS and BSC are connected hierarchically in a tree to a single controlling MSC, without failover.  Conventional bullet  Even brief disruptions of TDM links cause call failures.  Conventional bullet  Multiple small messages have to travel the entire network from BTS to MSC.  Conventional bullet  All-voice data is transcoded to G.711 even for a call between two mobile stations. | **GSM mobile-originated call in TerraCCN-Mobisite network**  **C:\Users\Uche\Desktop\Jobs\2016\December 2016\Houstontech's Terramobile\Technology\SBMN\Network FUnctions\gsm mobile-originated call in y-mobisite.png**  Pure IP solution, any network backhaul is supported with low packet loss rates.  Tech bullet  Doesn't require a BSC function.  Tech bullet  BTS and BSC functions are not geographically attached to a single MSC.  Tech bullet  The mobile station connects to the Mobisite, which makes a connection to a TerraCCN's MSC/VLR component via SIP/RTP.  Tech bullet  The subscriber is authenticated to the network by the TerraCCN using the SIM/USIM and SIP AKAv1-MD5 algorithms.  Tech bullet  All low level, time critical signaling is confined in the Mobisite and does not require any transport.  Tech bullet  Entire SIP messages are sent over the IP network instead of multiple short messages.  Tech bullet  Voice data is compressed and transported using the standard RTP (real time transport) protocol.  Tech bullet  Transcoding is performed only if required. Optionally, local calls in the same cell can bypass the network completely. |

**Conventional Networks (vs) GSM mobile-terminated call in**

**TerraCCN-Mobisite network**

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| **Conventional networks**  **C:\Users\Uche\Desktop\Jobs\2016\November 2016\Houstontech's Terramobile\Technology\SBMN\Conventional Networks1.png**  Conventional bullet  GMSC is usually a separate hardware function  . Conventional bullet  ISUP/SS7 is used as signaling transport, voice uses G.711 over TDM.  Conventional bullet  Routing to the Visited MSC/VLR uses dynamically allocated Roaming Numbers.  Conventional bullet  The MSC sends the paging request to all BSCs and all BTSs in its Location Area.  Conventional bullet  All voice data is transcoded to G.711 even for a call between two mobile stations. | **GSM mobile-terminated call in TerraCCN-Mobisite network**  **C:\Users\Uche\Desktop\Jobs\2016\November 2016\Houstontech's Terramobile\Technology\SBMN\GSM mobile-originated call in YateUCN-SatSite network1.png**  Tech bullet  TerraCCN includes the GMSC function, can receive and forward calls on SIP.  Tech bullet  Doesn't require a BSC function.  Tech bullet  Routing to the TerraCCN or any other Visited MSC uses dynamically allocated Roaming Numbers.  Tech bullet  Calls are delivered over SIP to the Mobisite where the subscriber is registered.  Tech bullet  The Mobisite pages the Mobile Station and allows it to connect to the Radio Network.  Tech bullet  The TerraCCN authenticates the subscriber using the SIM/USIM and SIP AKAv1-MD5 algorithms.  Tech bullet  Transparent interworking with IMS, fallback to GSM. |

**Conventional Networks (vs) VoLTE call in TerraCCN-Mobisite**

**network**

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| **Conventional networks**  **C:\Users\Uche\Desktop\Jobs\2016\November 2016\Houstontech's Terramobile\Technology\SBMN\Conventional Networks1.png**     * Several separate network functions (ENB, MME, S-GW, P-GW) are involved in the data session establishment.      * Several other IMS functions (CSCF) are involved in voice call establishment.      * Uses a completely different infrastructure, protocols and services from GSM.      * Fallback to GSM involves complex Roaming Retry or Roaming Forwarding procedures | **GSM mobile-terminated call in TerraCCN-Mobisite network**  **C:\Users\Uche\Desktop\Jobs\2016\November 2016\Houstontech's Terramobile\Technology\SBMN\GSM mobile-originated call in YateUCN-SatSite network1.png**     * Converges the EPC layers, offering access to the interfaces required for roaming.      * Includes an IMS that performs the functions of the P-CSCF, I-CSCF and S-CSCF.      * Call paths and processing are similar to GSM calls, most services are shared.      * Fallback to GSM can be performed in the same box. |

**Conventional Networks (vs) SMS in GSM in TerraCCN-Mobisite**

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| **Conventional networks**  **C:\Users\Uche\Desktop\Jobs\2016\November 2016\Houstontech's Terramobile\Technology\SBMN\Conventional Networks1.png**  Conventional bullet  Many short messages are sent over the TDM based A and Abis interfaces.  Conventional bullet  The entire Location Area is paged for MT SMS. | **SMS in GSM in TerraCCN-Mobisite network**  **C:\Users\Uche\Desktop\Jobs\2016\November 2016\Houstontech's Terramobile\Technology\SBMN\GSM mobile-originated call in YateUCN-SatSite network1.png**  Tech bullet  TerraCCN can send or receive SMS over different IP protocols: MAP/SIGTRAN, DIAMETER.  Tech bullet  The SMS is exchanged with the Mobisite using an IMS compliant SIP MESSAGE.  Tech bullet  The subscriber is authenticated by the TerraCCN using the SIM/USIM and SIP AKAv1-MD5 algorithms.  Tech bullet  The Mobisite deals internally with paging and all the small messages |

**Conventional Networks (vs) SMS in LTE in TerraCCN-Mobisite**

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| **Conventional networks**  **C:\Users\Uche\Desktop\Jobs\2016\November 2016\Houstontech's Terramobile\Technology\SBMN\Conventional Networks1.png**  Conventional bullet  Usually implemented using slow and disruptive CSFB procedures.  Conventional bullet  Some implementations support LTE NAS tunneling.  Conventional bullet  SMS over IP (SIP MESSAGE) requires interaction with IMS components.  Conventional bullet  Needs updated MSCs to propagate the messages received on MAP/SS7.  Conventional bullet  Infrequent DIAMETER support. | **SMS in LTE in TerraCCN-Mobisite network**  **C:\Users\Uche\Desktop\Jobs\2016\November 2016\Houstontech's Terramobile\Technology\SBMN\GSM mobile-originated call in YateUCN-SatSite network1.png**  Tech bullet  Supports IMS MESSAGE, LTE NAS tunneling and CSFB.  Tech bullet  Except for the rarely needed CSFB, all functions are built-in.  Tech bullet  Transparently supports MAP/SS7 and DIAMETER as transport for SMS. |

**Conventional Networks (vs) Mobility and handover in GSM in**

**TerraCCN-Mobisite network**

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| **Conventional networks**  **C:\Users\Uche\Desktop\Jobs\2016\November 2016\Houstontech's Terramobile\Technology\SBMN\Conventional Networks1.png**  Conventional bullet  All BTS and BSC in a Location Area connect to a single MSC, without failover.  Conventional bullet  Inter-MSC handover is required once the Mobile Station leaves the Location Area.  Conventional bullet  Handover can be performed at BSC level with moderate MSC interaction. | **Mobility and handover in GSM in TerraCCN-Mobisite network**  **C:\Users\Uche\Desktop\Jobs\2016\November 2016\Houstontech's Terramobile\Technology\SBMN\GSM mobile-originated call in YateUCN-SatSite network1.png**  Tech bullet  Mobisite is not attached to a specific TerraCCN in a given area.  Tech bullet  Any MS can register and call through any TerraCCN although it prefers the last one used.  Tech bullet  In case of network failure the Mobisite can select a different TerraCCN.  Tech bullet  Inter-MSC handover is needed only at the network edges.  Tech bullet  Mobisite units communicate and perform handover over SIP peering protocols with minimal TerraCCN interaction. |

**Conventional Networks (vs) Mobility and handover in LTE in**

**TerraCCN-Mobisite network**

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| **Conventional networks**  **C:\Users\Uche\Desktop\Jobs\2016\November 2016\Houstontech's Terramobile\Technology\SBMN\Conventional Networks1.png**  Conventional bullet  Network attach causes eNodeB to select a MME which is preferred by UE for later connections.  Conventional bullet  eNodeB performs load balancing based on reported MME capacity.  Conventional bullet  X2 handover moves the UE from one eNodeB to another with minimal MME and S-GW interaction.  Conventional bullet  CSFB and SRVCC functions require extra connections to other components. | **Mobility and handover in LTE in TerraCCN-Mobisite network**  **C:\Users\Uche\Desktop\Jobs\2016\November 2016\Houstontech's Terramobile\Technology\SBMN\GSM mobile-originated call in YateUCN-SatSite network1.png**  Tech bullet  Same as in conventional networks, but simpler because of TerraCCN's converged nature.  Tech bullet  TerraCCN (MME/S-GW) relocation is only required in case of failure.  Tech bullet  Can authenticate and register LTE User Equipment over DIAMETER or MAP/SS7.  Tech bullet  Built-in PDN Gateway can be used for Local IP Break-out or SIPTO functions.  Tech bullet  Optional autonomous local authentication for small deployments.  Tech bullet  CSFB support via built-in MSC proxy using Roaming Retry.  Tech bullet  SRVCC support via built-in MSC handover. |