

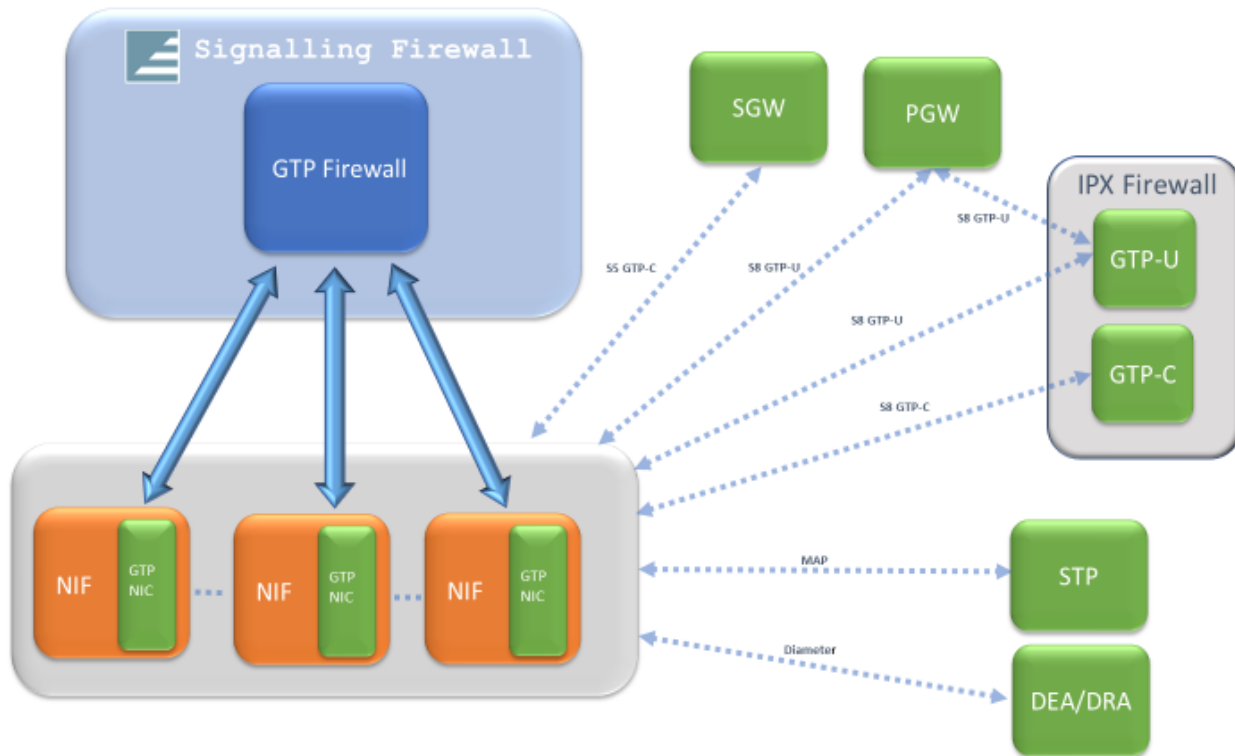


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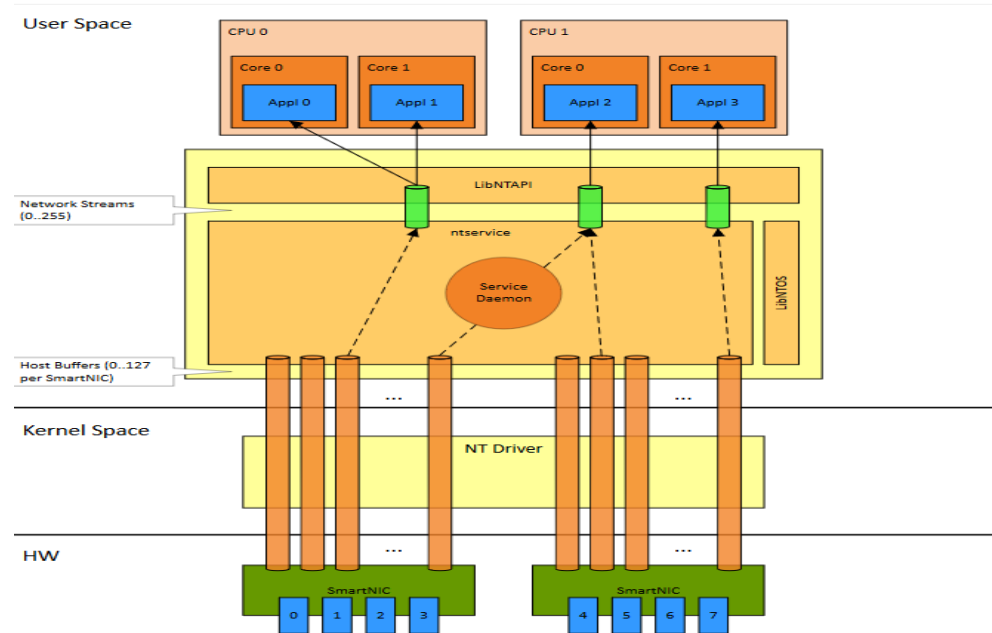
GTP Firewall



GTP Firewall – Q2 19



SmartNIC - Hardware



Supports 200Gb/s per card



GTP Firewall Features

- GSMA FS.20 Category 1, 2, 3
- S8 and Gp interfaces
- Message format checks to ensure the necessary IEs are present
- GTP v0, v1 & v2 support
- Rate limiting
- Powerful configuration options depending on source, messages, consistency between layers and management of exceptions
- Up to 200Gb/s bandwidth support and scalable:
 - CPUs additional can be allocated to streams for processing to spread load across CPUs
 - Buffers can be shared across CPUs
 - SmartNICs support stream separation across cards, i.e. to increase bandwidth additional cards can be added
- GTPu inspection & content filtering (Later roadmap- but SmartNIC hardware enables)
 - Perform consistency checking on GTPu messages to stop tunnel hijacking by spoofing TIED

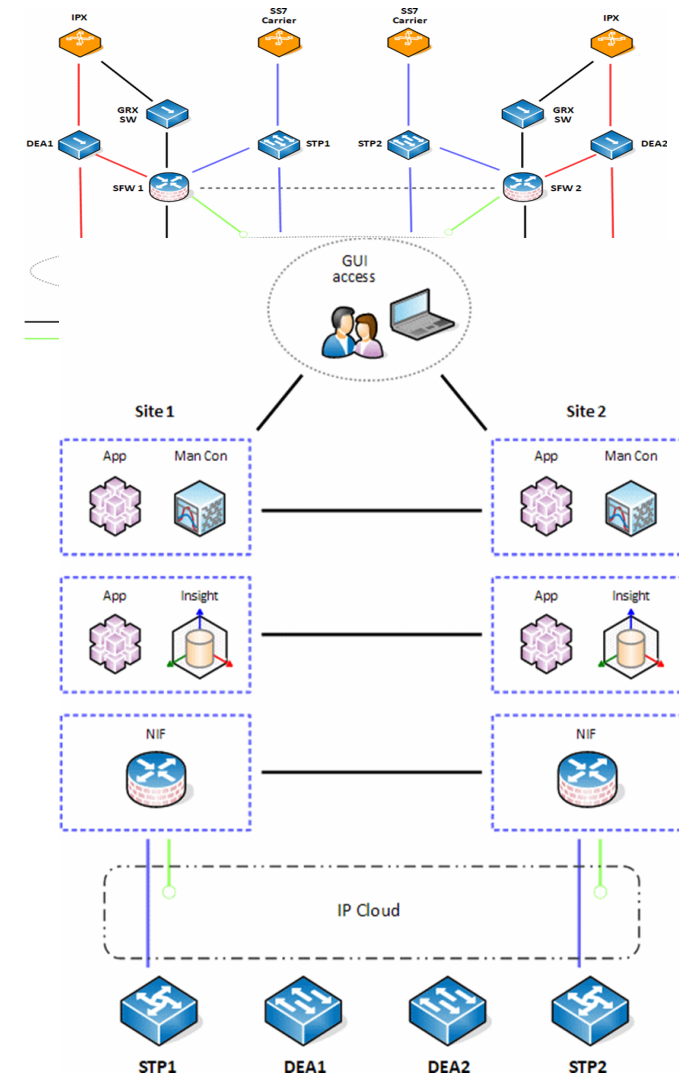


GTPc Firewall – Q2 2019

- SmartNIC to separate GTPc (and this then supports GTPu roadmap) or route GTPc to NIF
- Actions
 - › Block: IP/source, TEID (GTPu roadmap allow content block)
 - › GTPc message/reject
- Format
 - › Order, nesting, mandatory IEs etc
- Source checks (category 1)
 - › Operator, subnet, IR21 etc
 - › E.g. Echo response from known peers (used for discovering network equipment)
- Own subscriber and consistency (category 2)
 - › Check home network of IMSI for appropriate messages
 - › E.g. Delete session should come from home network (DOS)
- Location (category 3)
 - › Check source address location is consistent with other protocols
 - › E.g. Create session
- Rate limiting
- Alerting , EDRs, reports, PCAP etc as per firewall

Integration

- Assuming Tx/Rx SS7, DIAMETER and GTP across two physical sites for resilience & geo-redundancy
- Two options for integration into a MNO
 - GTPc & GTPu forwarded to NIF
 - SmartNIC breaks out GTPc and GTPu into hardware processed streams
 - Disadvantage is that in GTPc only installations the NIF processes the entire GTP bandwidth (GTPu & GTPc)
 - GTPc port forwarded from IPX firewall to NIF
 - Advantage: lower bandwidth SmartNIC required
 - Disadvantage GTPu processing is harder to implement later upgrade to NIF required, higher capacity SmartNIC would need to be added, and additional CPUs to handle the GTPu stream processing





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Thank You