

Architectural Considerations for Distributed Mobility Management

Summary of offline discussions

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Terminology

- Access Network
- Home Network
- Mobile Anchor
- Control Plane Anchor (CPA); (Access-CPA & Home-CPA)
- Data Plane Anchor (DPA)
- Data Plane Node (DPN)
- Mobility Controller

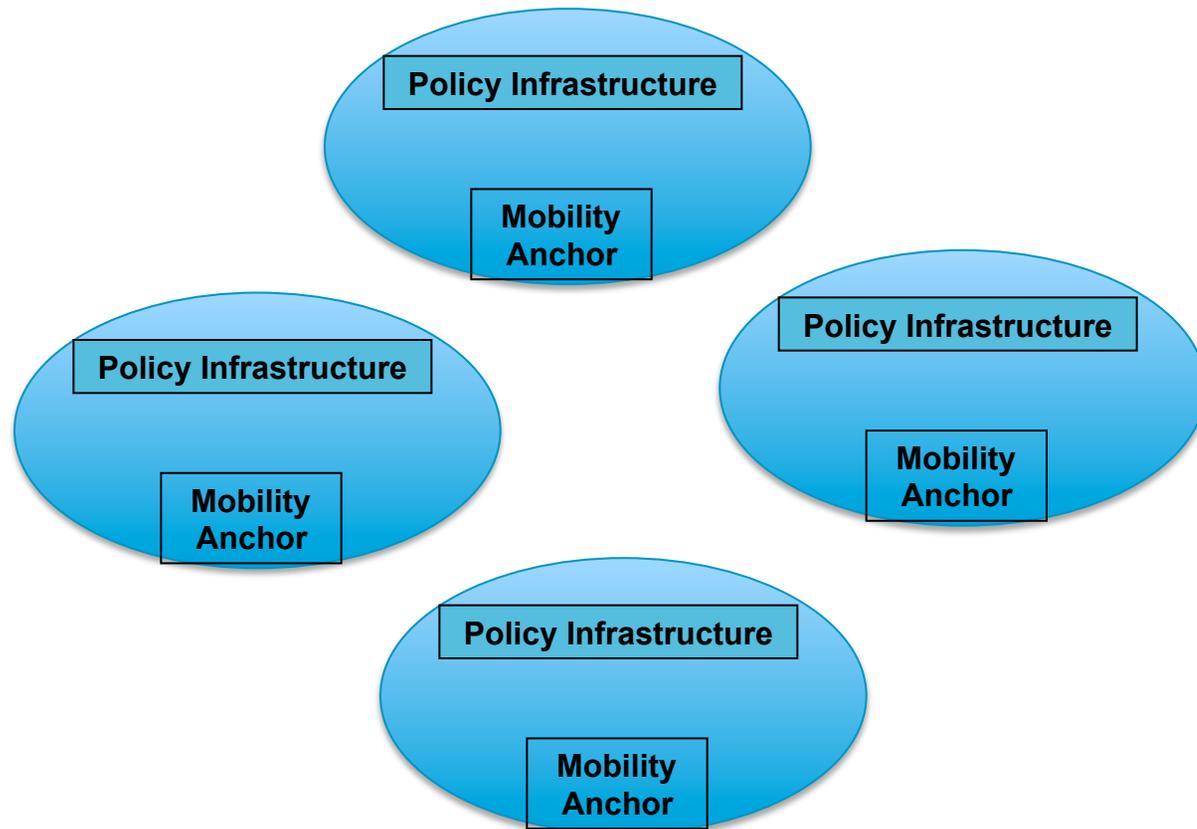


Realizing DMM – Approaches

DMM Deployment Model:: Smaller Cells

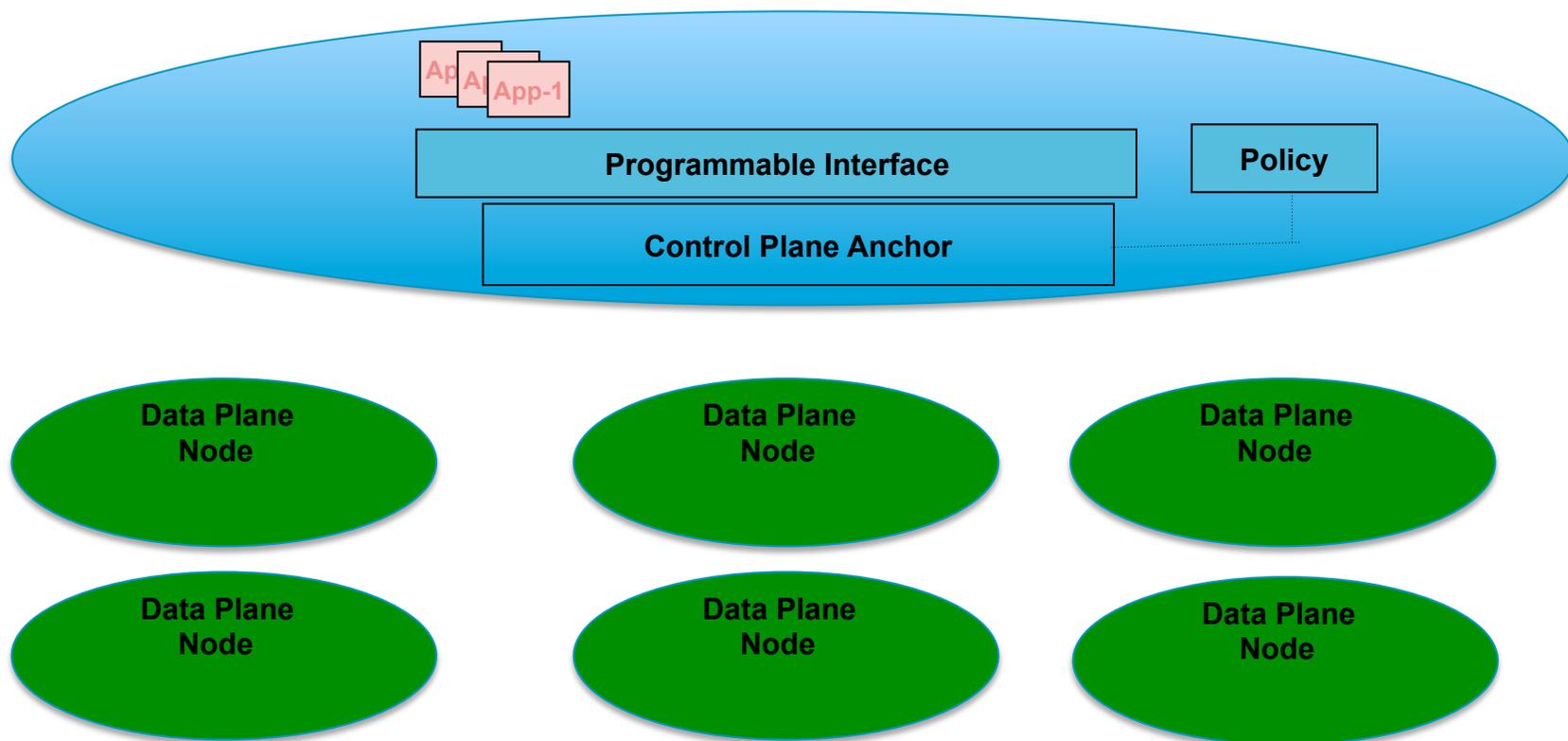
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- Distributed mobility Anchors and policy plane; Smaller sized cells; Integrated Control and Data Plane functions



DMM Deployment Model:: Split CP/DP

- Centralized Control Plane; Distributed Data Plane
- Centralized Subscriber State with programmable Interface for application integration and manageability



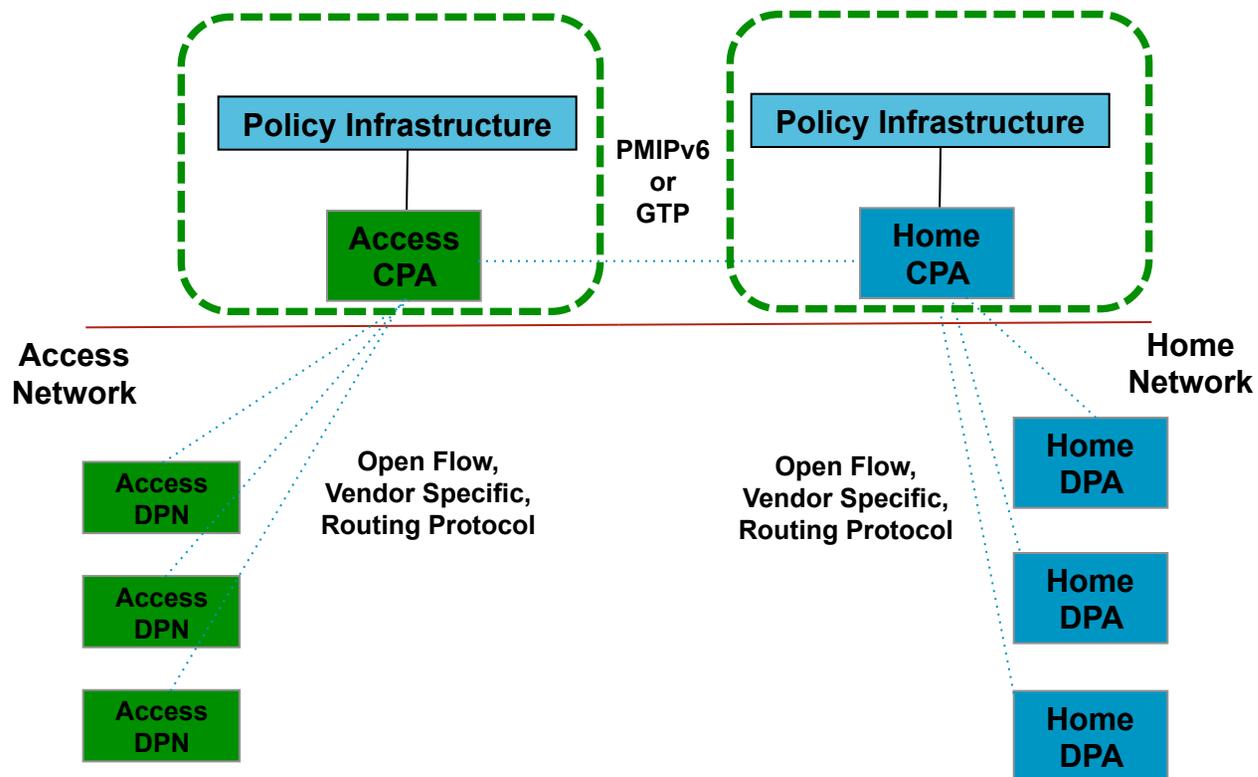


Functional View

Split CP/DP:: Home and Access Domains

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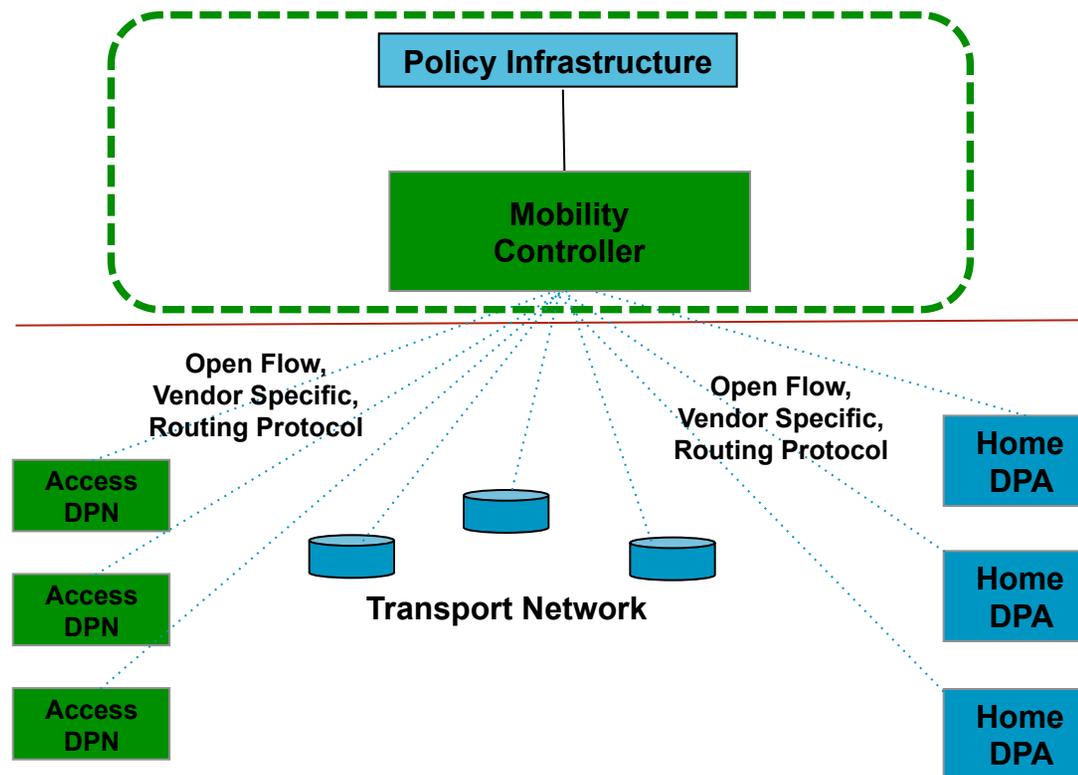
- Mobility Controller in home and access



Split CP/DP – Single Access Domain

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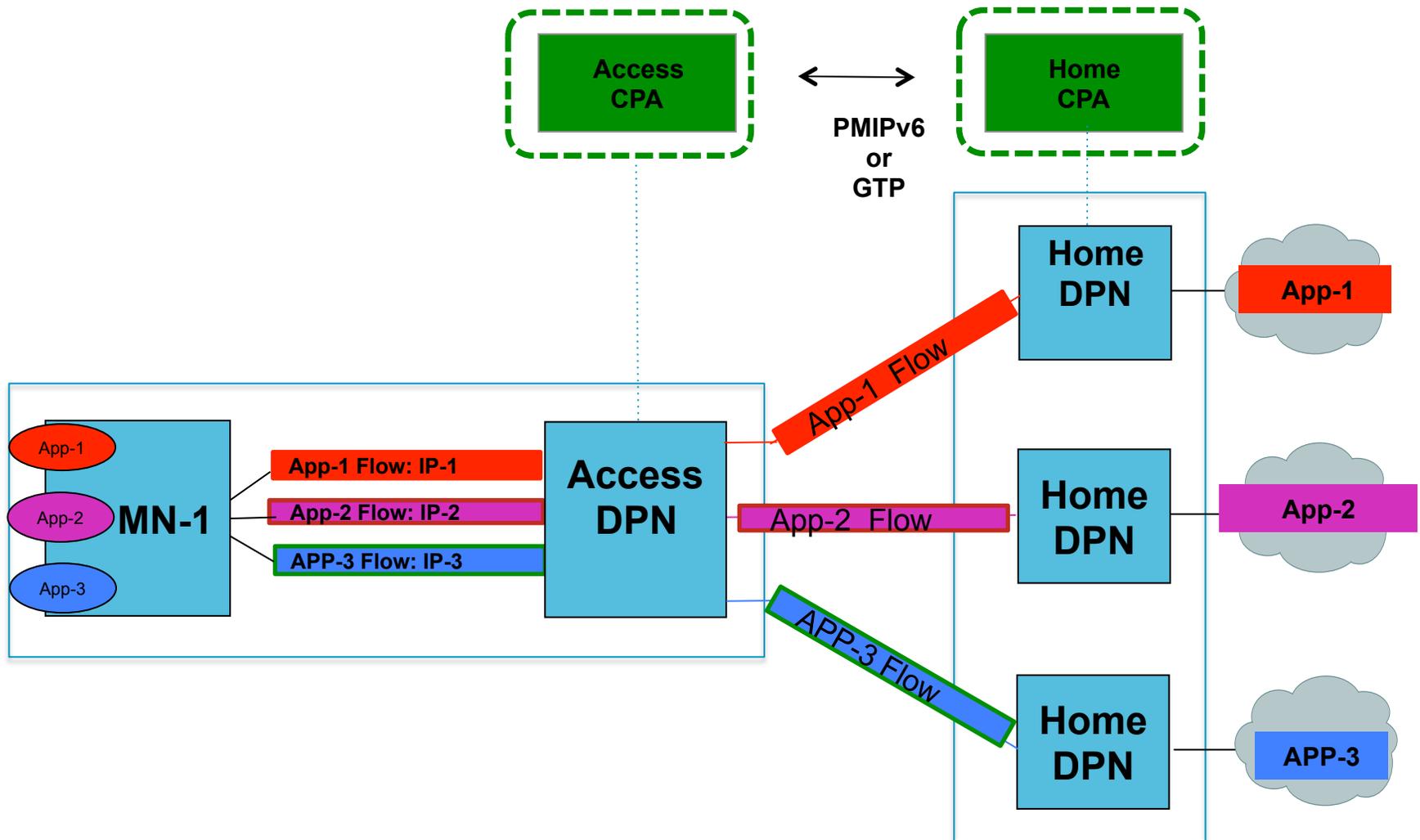
- Centralized Mobility Controller for home and access
- Single Admin domain; Smaller Cell size





MN Context

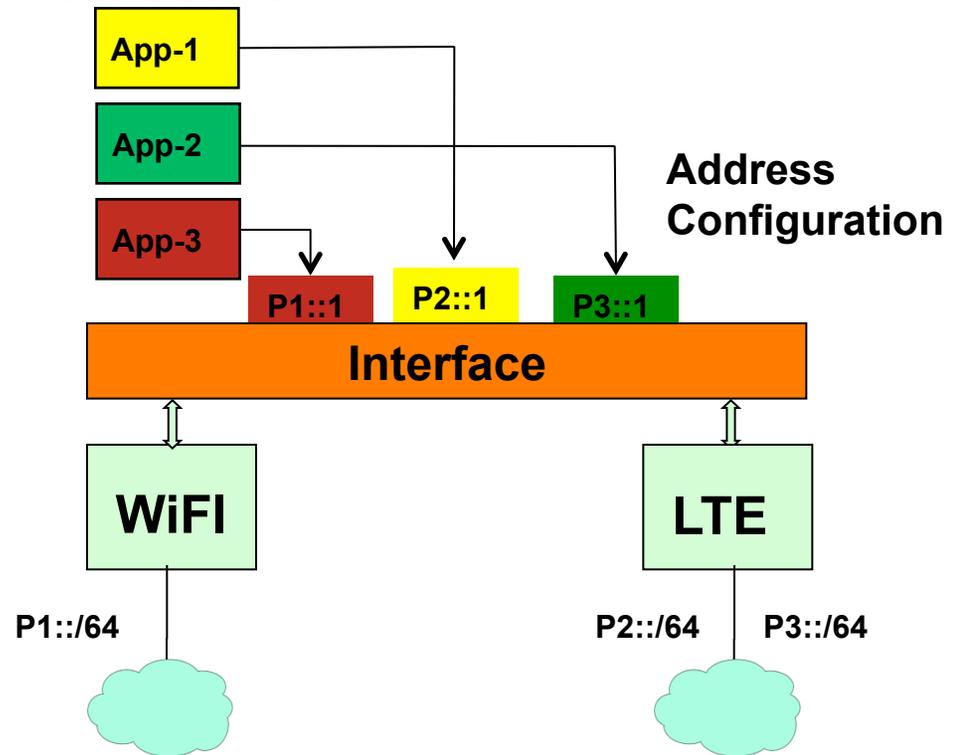
Application-based Session Allocation



Coloring an IP Address/Prefix

- The Policy Table on the Host can include the property attributes that it obtained as part of the address configuration.
- Applications can use the RFC-3484 Source Address Selection rules for address selection.

Policy Table	
Prefix	Attribute
P1::/64	Attribute-1 (Home Bound)
P2::/64	Attribute-2 (Local Breakout)
P3::/64	Attribute-3 (Home Bound)





Conclusions

Stated Assumptions

- The control and the data plane functions in the access or home gateway can be split and hosted on different nodes. The protocol interface between CP and DP is Open Flow, or none (use of routing protocol). The terms Access-CPA, Home-CPA, Home-DPN and Access-DPN are used in this context.
- There can be separate mobility controller in the home and the access networks. The protocol interface between the access and the home controllers can be PMIP or GTP. Relevant for inter-operator scenario.
- There can be converged access and home CP controllers. In such scenario the CP protocol may not be needed in all cases.
- The data plane between the access and the home network can be based on a tunneling scheme. Or, can be based on routing updates.
- Multiple Home gateway allocation is fundamental to the solution. Gateway selection approaches will ensure the allocated gateway is topologically closer to the mobile node's access network.

Stated Assumptions

- Once the mobile node obtains an IP address and changes its point of attachment, it can potentially be assigned a second local gateway resulting in multiple sessions.
- Network may choose to re-anchor the session to a newer gateway, or by means of tunneling reachability to the previous gateway will be ensured.
- Mobile node will be able to obtain multiple home addresses. Each of those addresses may reflect a specific service or other properties.
- Applications on the mobile node will be able to select IP address configuration based on the application requirements.
- Network will ensure IP address configuration includes additional properties. The properties enable the mobile node in efficient source address selection on application basis.

Proposed Extensions

ID	Description
1	DMM Deployment Models (Considerations: MNO/MVNO (Administrative), Policy Layer, Programmability)
2	Gateway Selection Approaches based on multiple sources (Considerations: Access network parameters, Proximity, Policy and Network Conditions)
3	Control and Data Plane Separation in mobility anchors (Considerations: Allow registration of different transport addresses; Avoid CP/DP interface related extensions)
4	Enhancements to mobile node for operating in DMM-enabled network) (Considerations: ND Extensions for carrying IP address meta-data; Improved source-address selection rules)
5	Policy extension for supporting DMM (Considerations: New RADIUS/DIAMETER attributes)
6	Optimized Traffic Steering Approaches for DMM (Considerations: Optimized Routing Path Selection, SIPTO)
7	Exposing Mobility State for Applications (Considerations: Binding State, Access Network Parameters)
8.	Session Re-Anchoring (Considerations: Geo-Redundancy)
9.	Reference Interfaces for (Controller – DPN) & (MN – Access CPA) (Considerations: Extensions to OpenFlow, FORCES, OnePK, BGP ...)