CFN-dyncast Architecture

(dynamic anycast in Compute First Networking)

draft-li-rtgwg-cfn-dyncast-architecture

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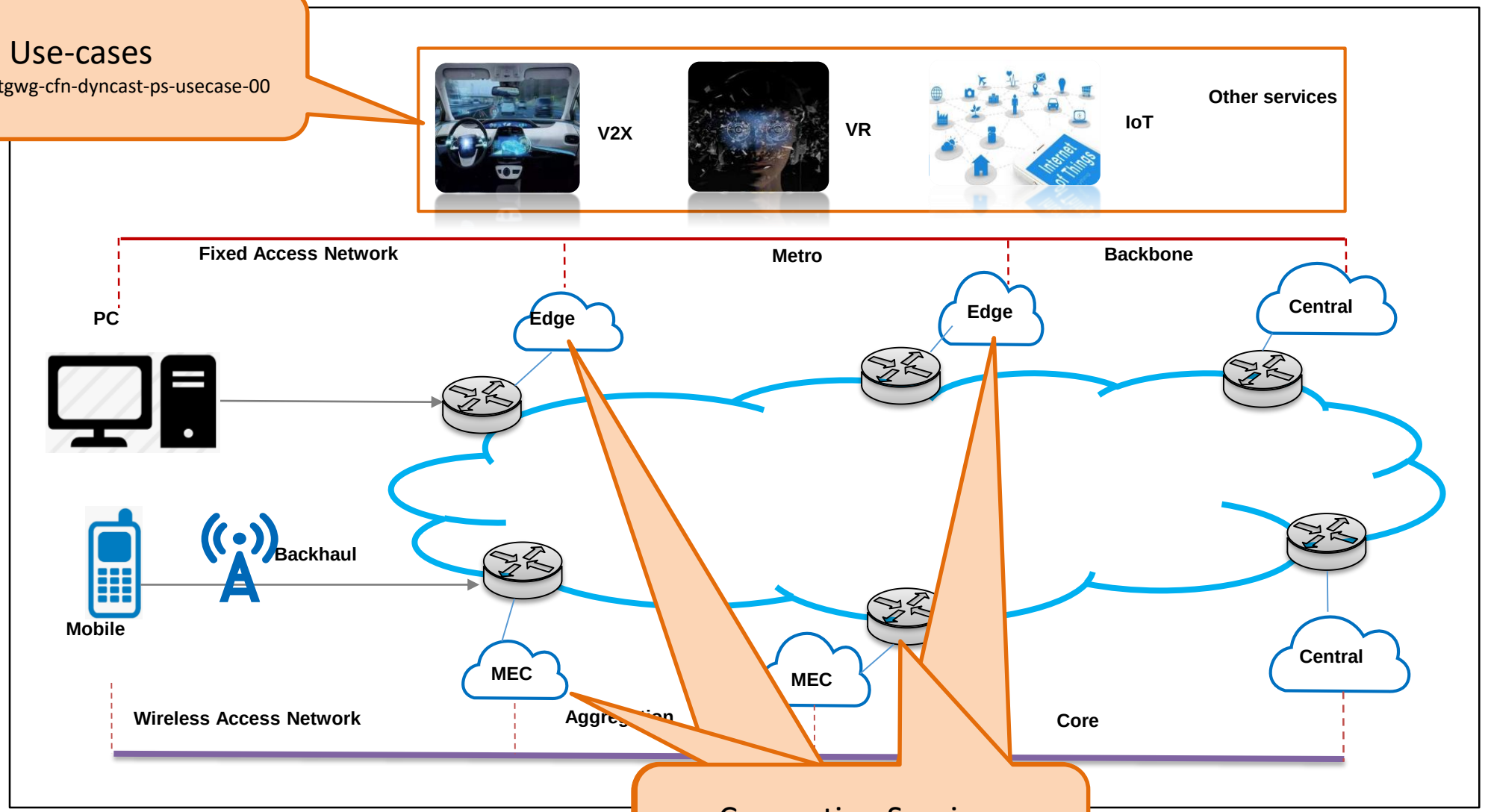
109 IETF Side Meeting

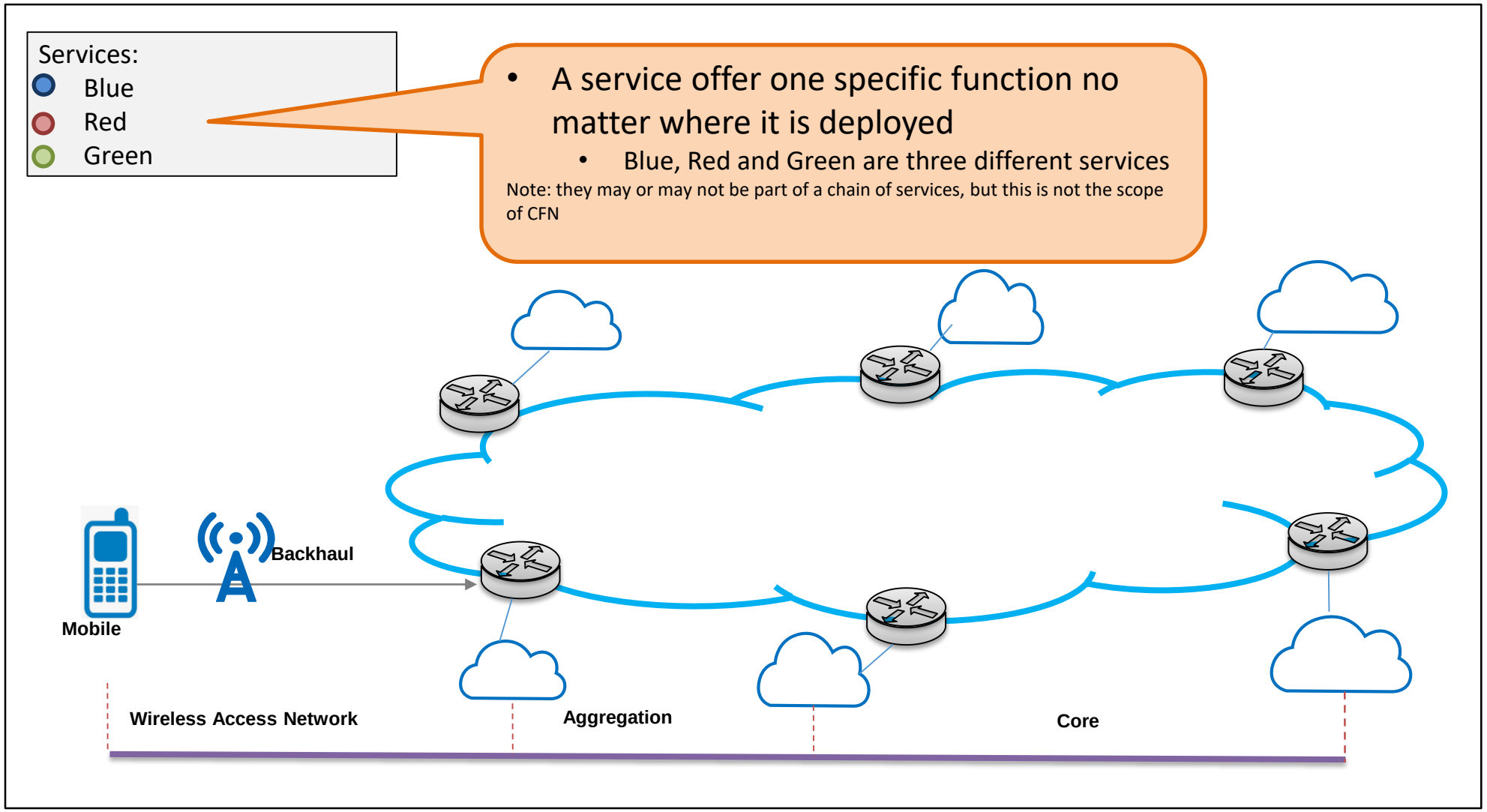
Context

Use-cases

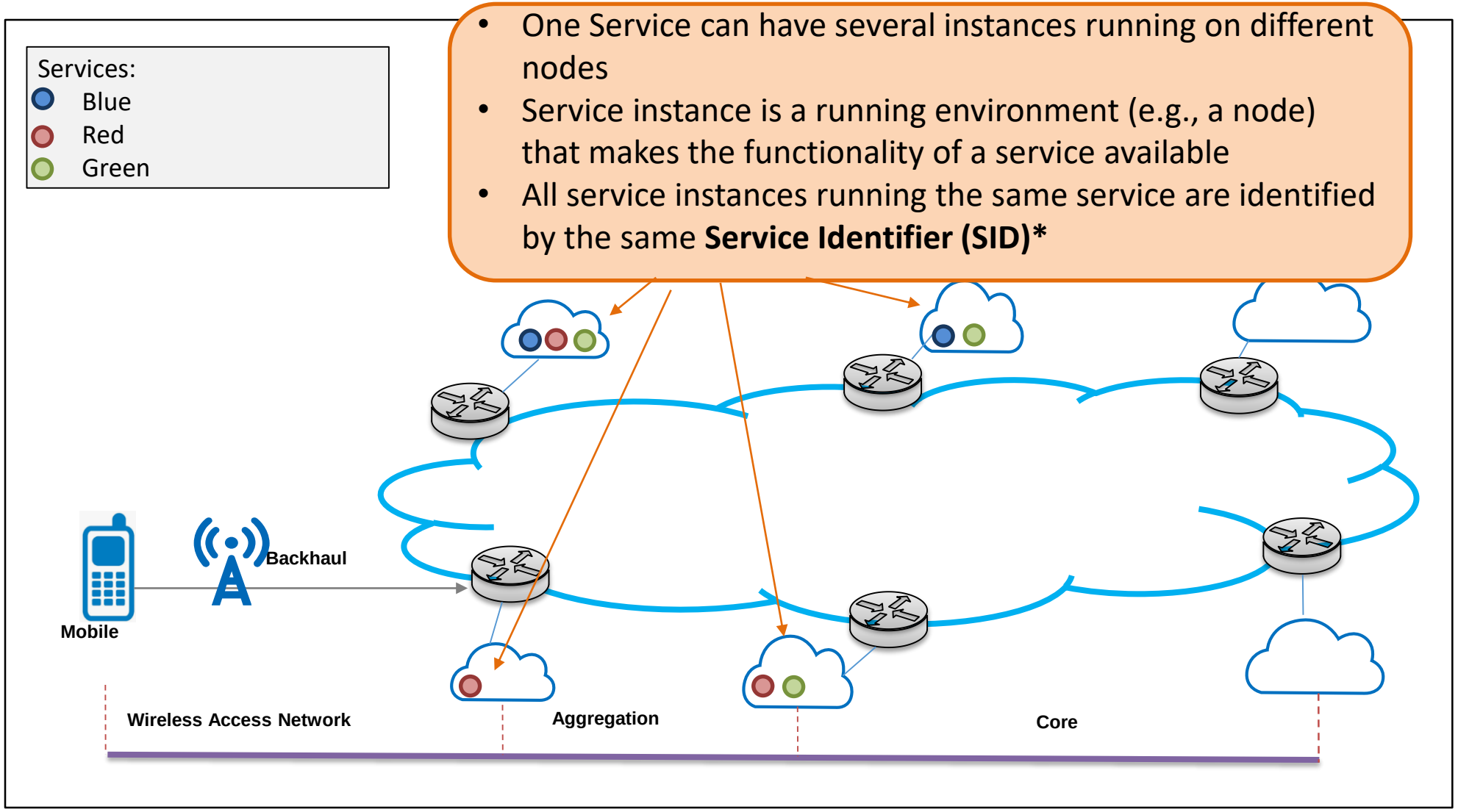
Draft-geng-rtgwg-cfn-dyncast-ps-usecase-00



Services and Services' Instances

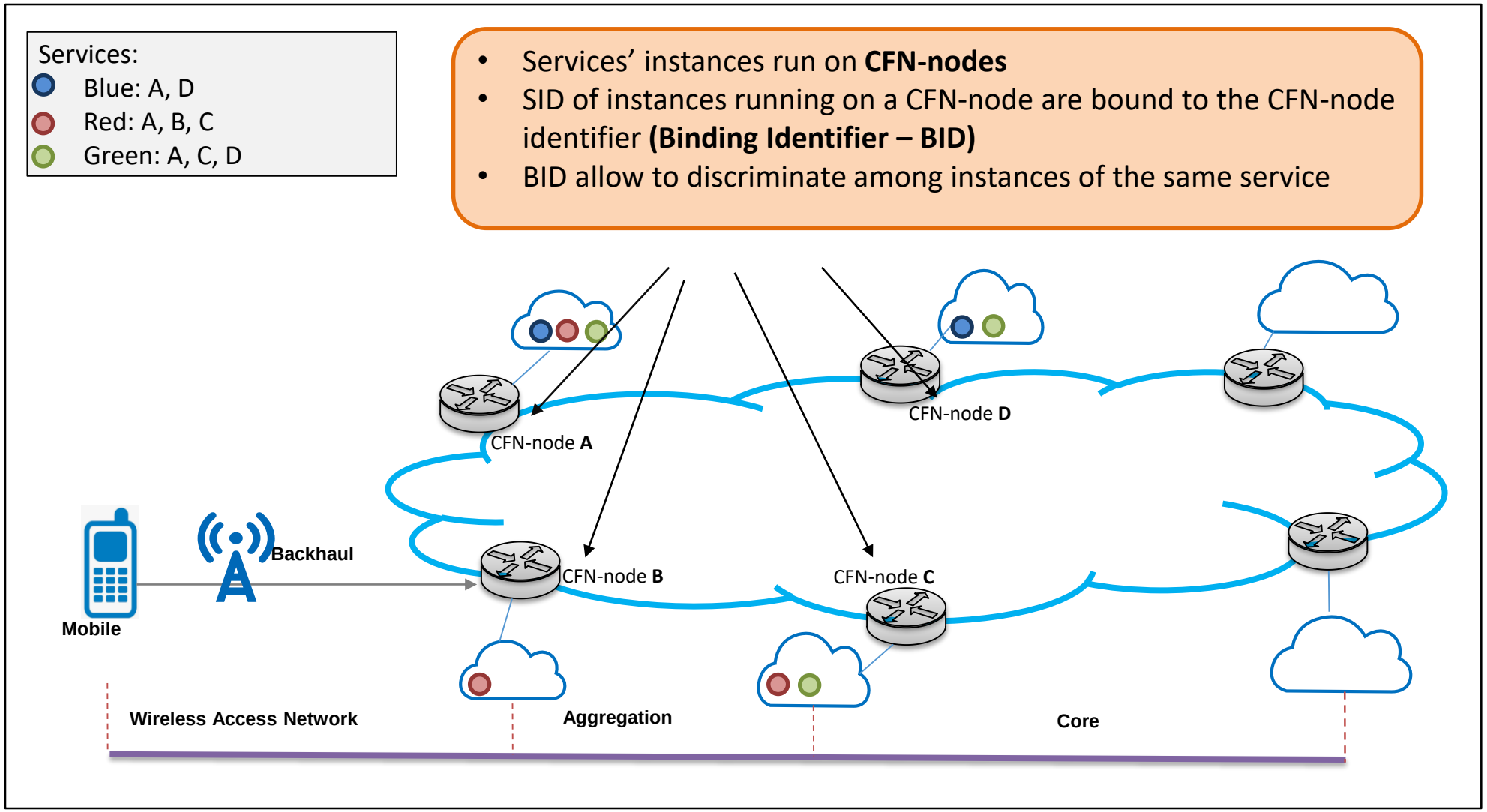


Services and Services' Instances



* This term overlaps with SFC and may change in the future

Services and Services' Instances



CFN-Dyncast: Architecture

- Service ID (SID) is an anycast service identifier (which may or may not be a routable IP address)
- Binding ID (BID) is a unicast IP address. It is usually the interface IP address of a CFN node running a specific service instance

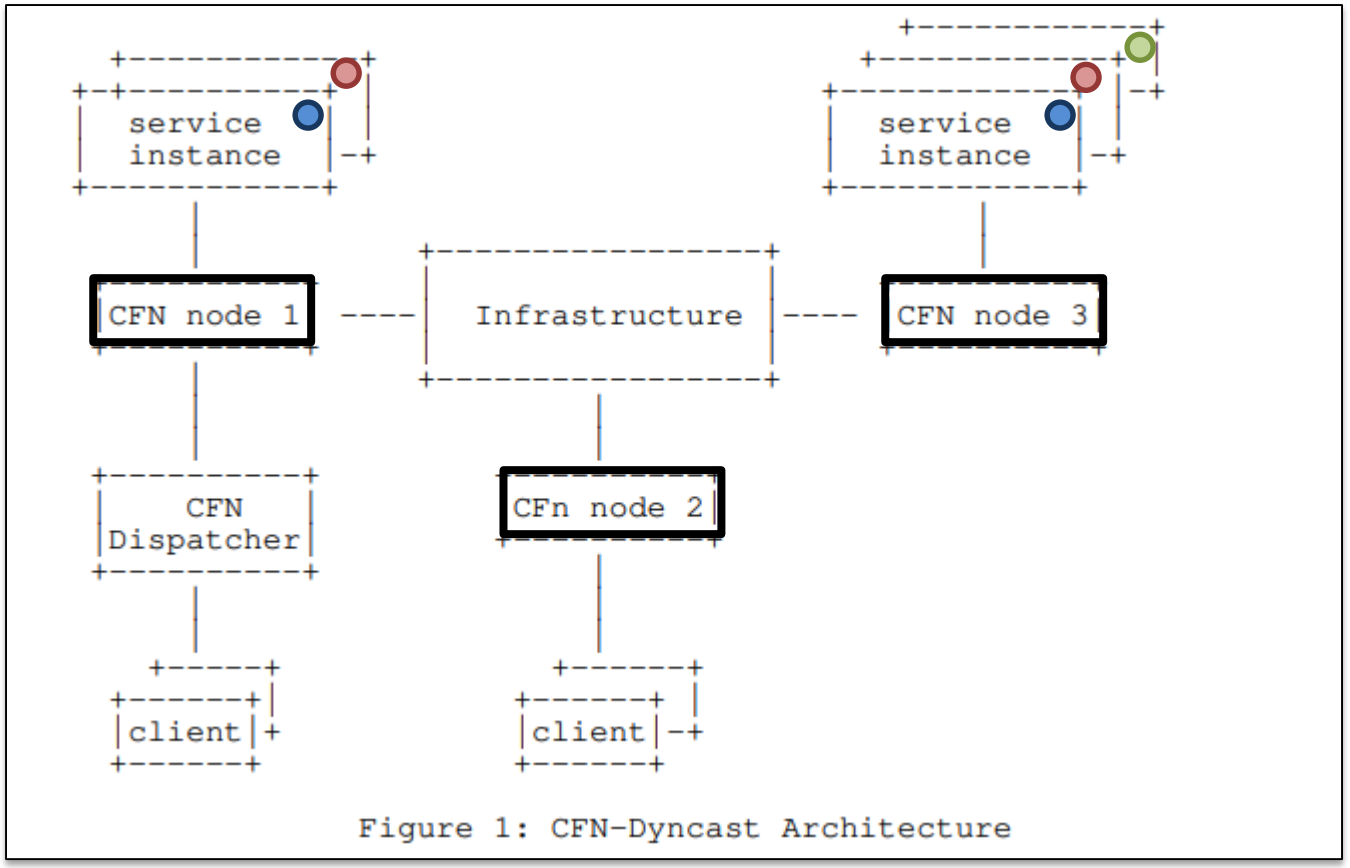
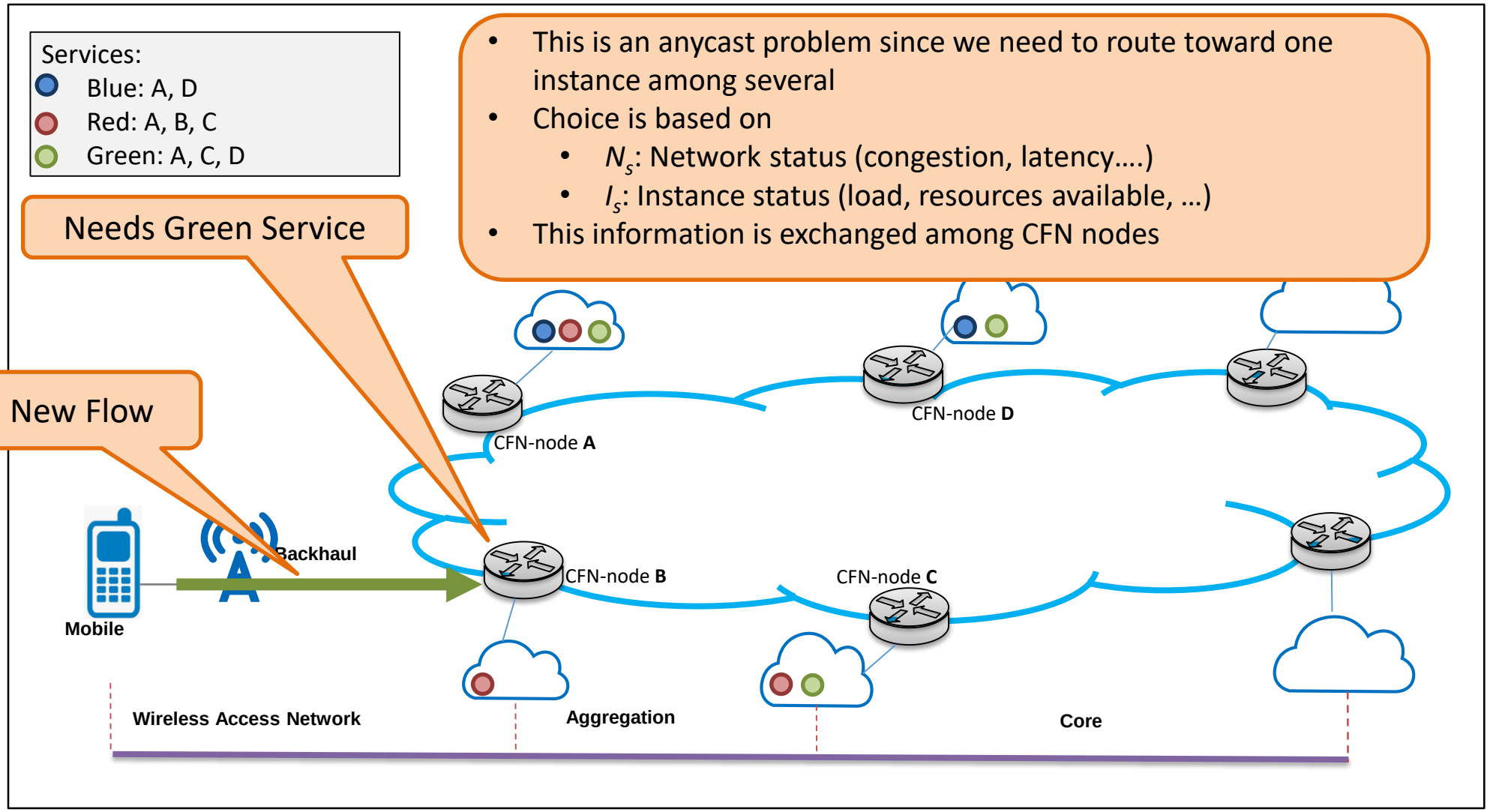


Figure 1: CFN-Dyncast Architecture

Flow Handling



CFN-Dyncast: SID to BID bindings

- Mapping and binding from a SID to a BID is dynamic and depends on the computing resources and network state at the time the service demand is made

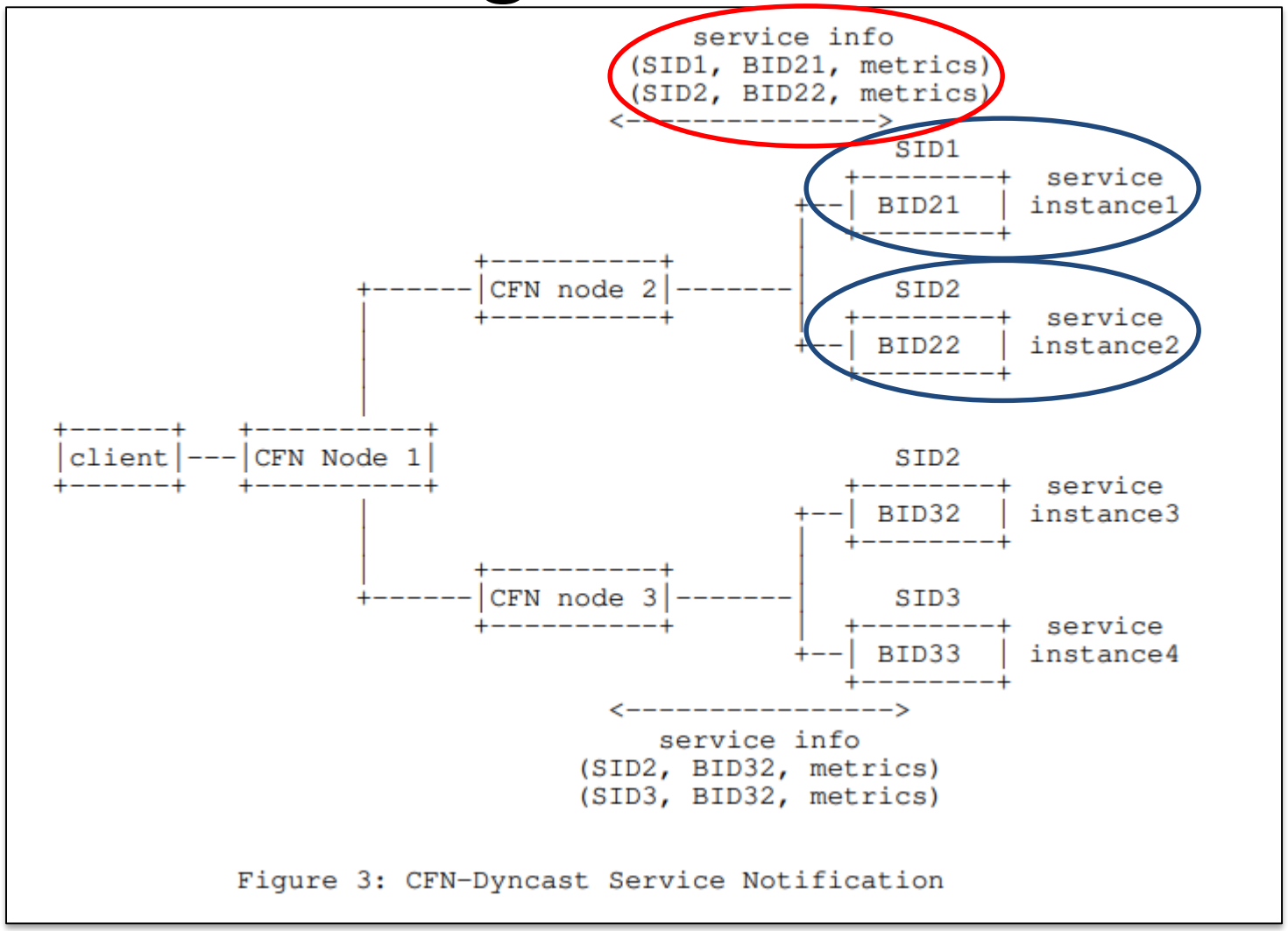
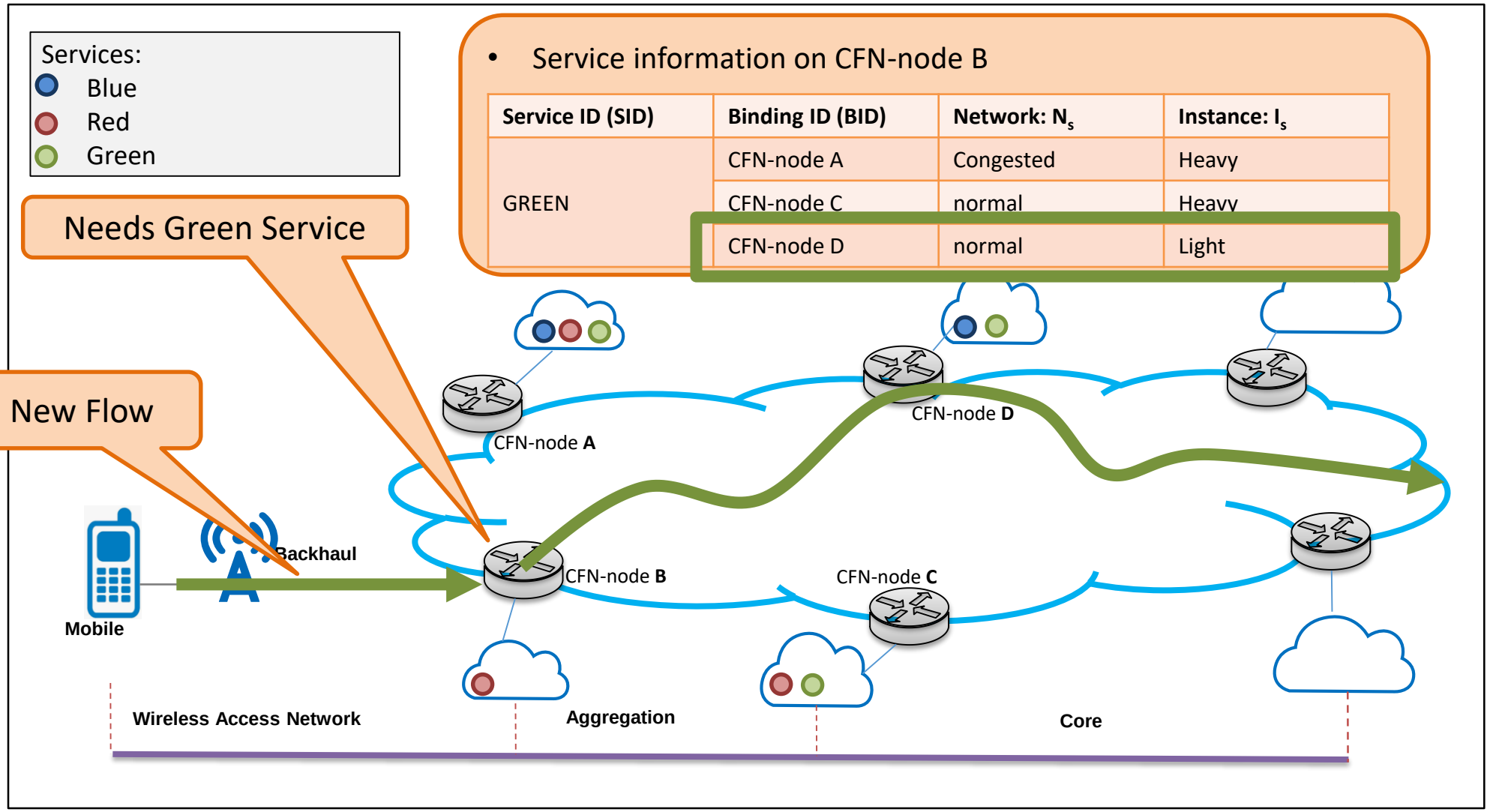
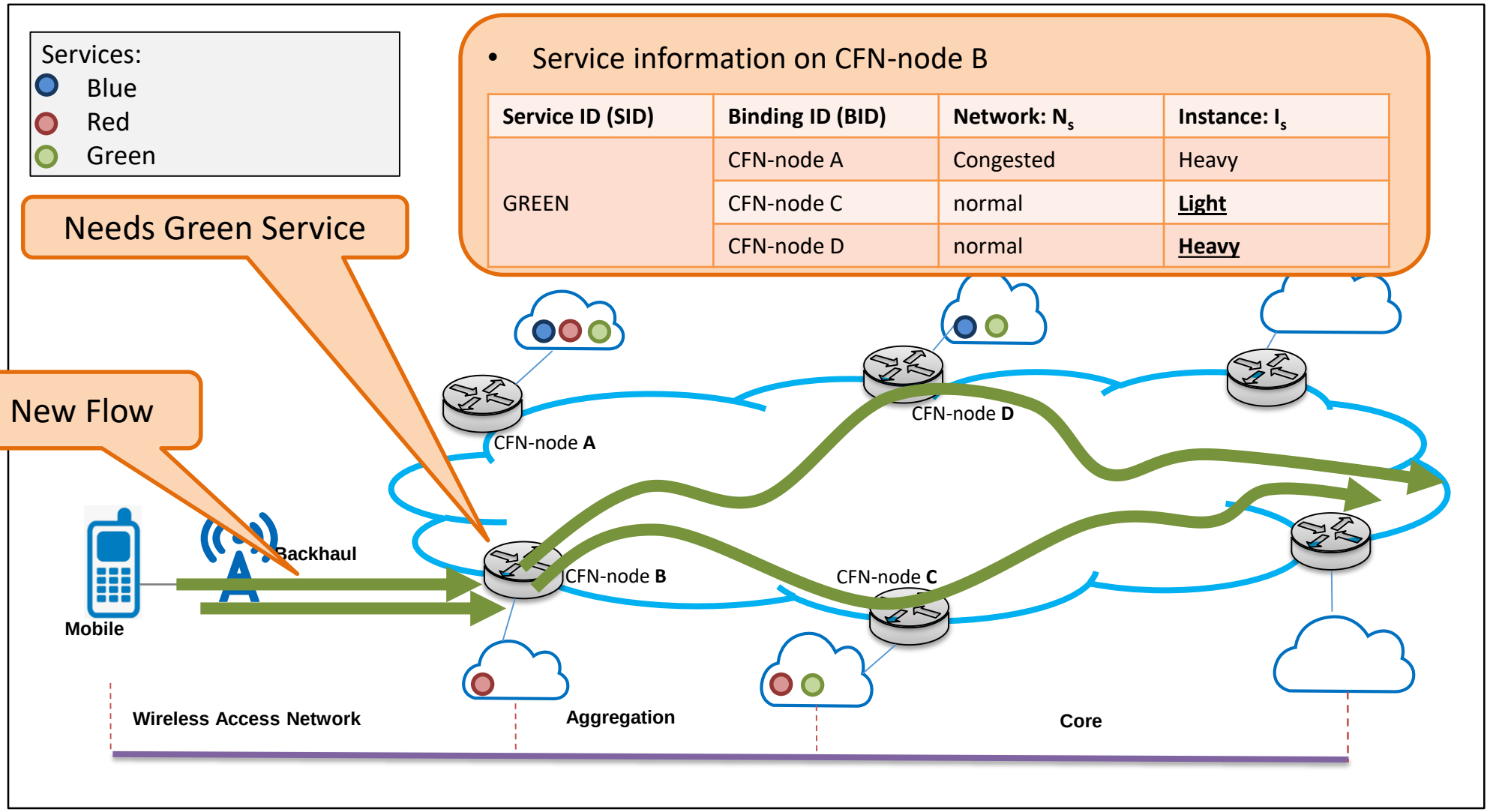


Figure 3: CFN-Dyncast Service Notification

Flow Handling



Flow Affinity



CFN-Dyncast: Flow binding table

- Flow affinity is one of the critical features that CFN−Dyncast should support
- Flow binding table allows to determine the most appropriate CFN egress and service
- A flow entry in the flow binding table can be identified using the classic 5−tuple value
  - different services may have different granularity of flow identification

Flow Identifier					BID	timeout
src_IP	dst_IP	src_port	dst_port	proto		
X	SID2	-	8888	tcp	BID22	xxx
Y	SID2	-	8888	tcp	BID32	xxx

Summary

- Introduction of a general architecture to enable optimally route service demands based on computing and network metrics
  - Control Plane: SID/BID bindings; binding table; compute + network metrics
  - Data Plane: in-network egress selection; flow affinity

- Further refinements needed
  - Help very welcome ☺
  - Open questions:
    - Computing and network metrics
    - Which distribution model ? (Push vs Pull vs PubSub)
    - How to compose metrics?
    - Privacy issues in mixing network and computing information?

Backup

CFN-Dispatcher

- CFN Dispatcher is deployed closer to the clients and it normally handles the flows for a limited number of clients
- it does not participate in the status update about network and computing metrics among CFN nodes
- CFN Dispatcher queries a CFN node to obtain best egress for a new flow

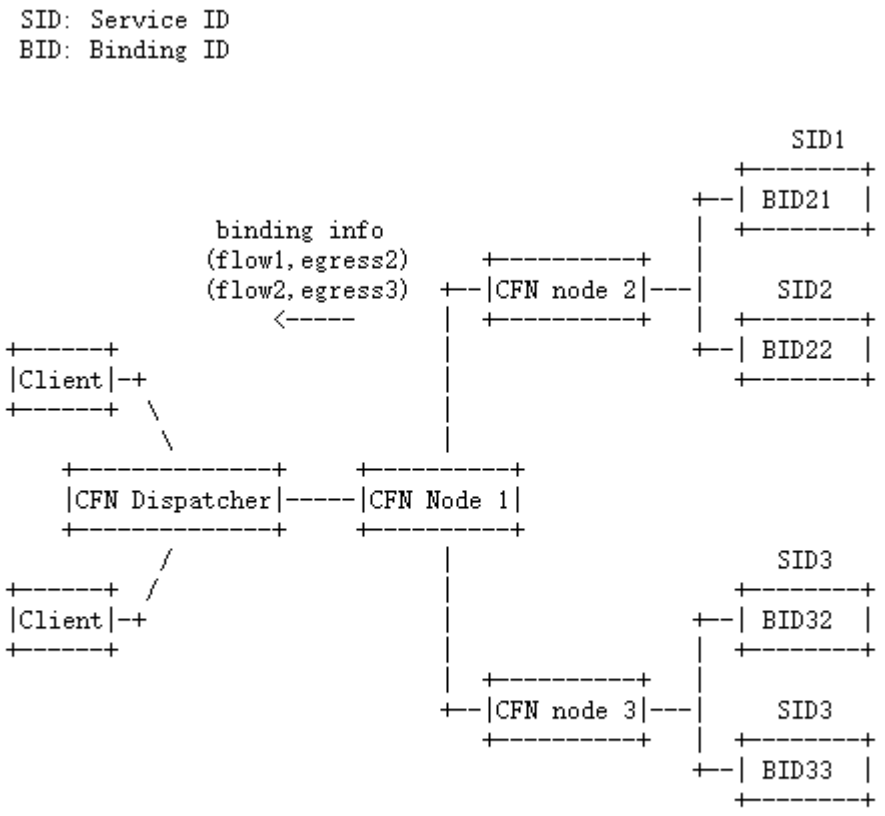


Figure 5: Service Demand Dispatch with CFN Dispatcher