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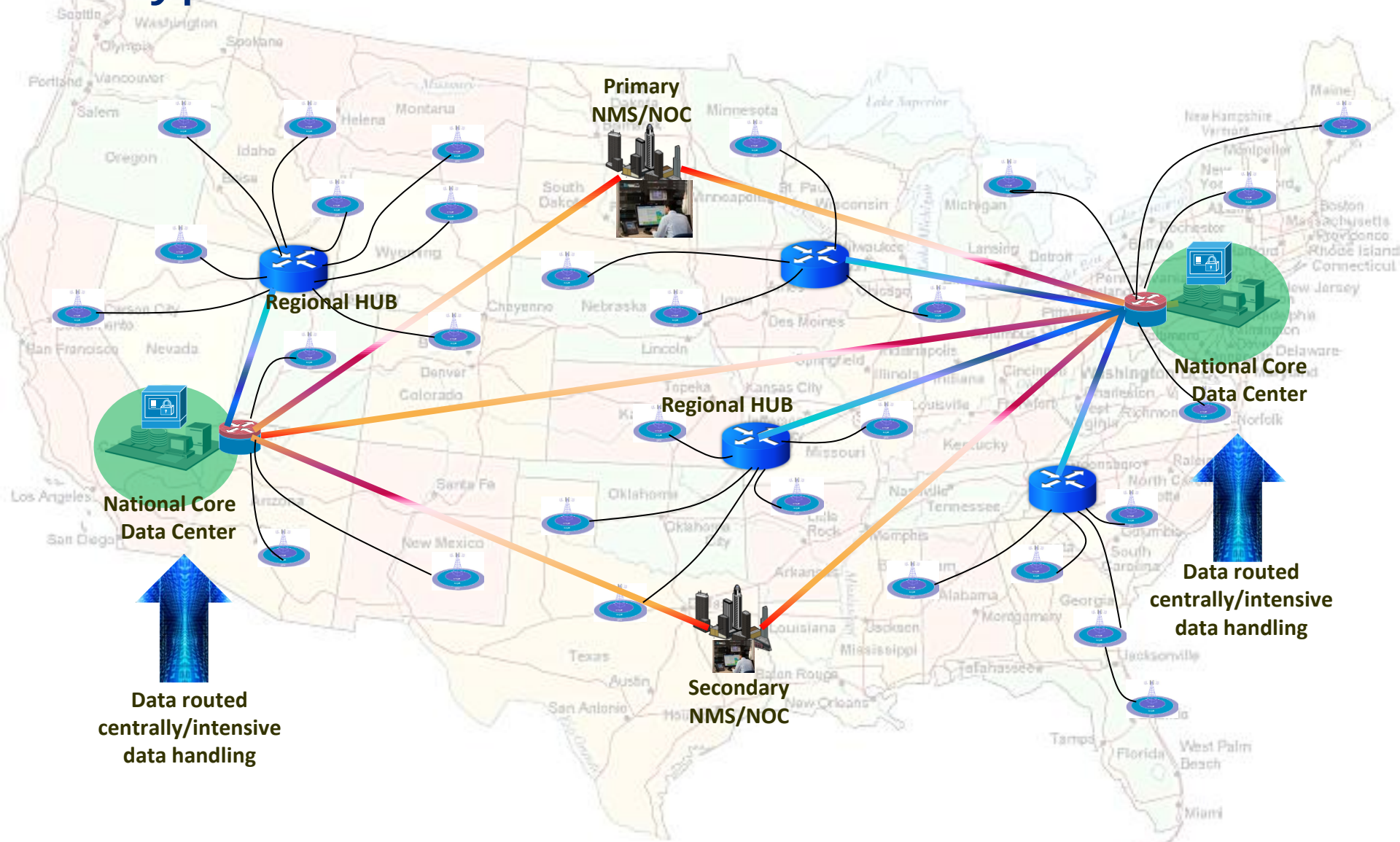
Building the FirstNet Nationwide Network: Architecture Solutions

Edge-centric Distributed Network Model

Lives Depend on How We Design the Network!

- Public safety communications never takes a day off – No room for network outages
- Requires the need to minimize network single points of failure
  - Building robust network resiliency and pushing intelligence to the edge (close to the user)
  - One network with seamless communications and no geographical boundaries
  - Fully interoperable with centralized core components
- In Edge-centric networks, lite EPC (Evolved Packet Core) and local HSS functionality are distributed close to the cell site.
- Local communications route locally using lite EPC core
  - Provides direct access to local jurisdiction applications/file servers etc.
  - Locally generated sensitive traffic never crosses state lines/boundaries

Hypothetical Centralized Network Model



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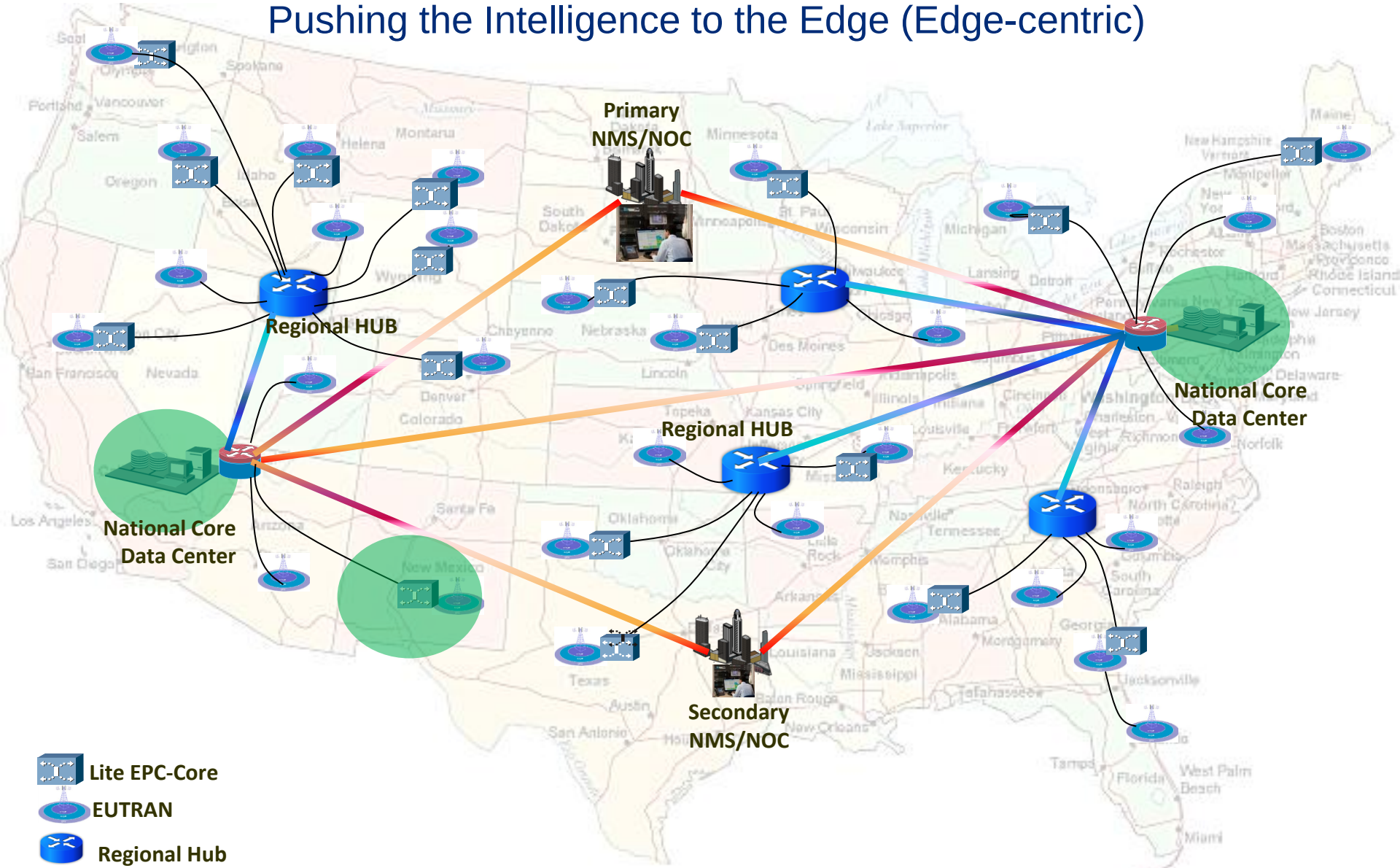
Hypothetical Hybrid Network Model
Pushing the Intelligence to the Edge (Edge-centric)



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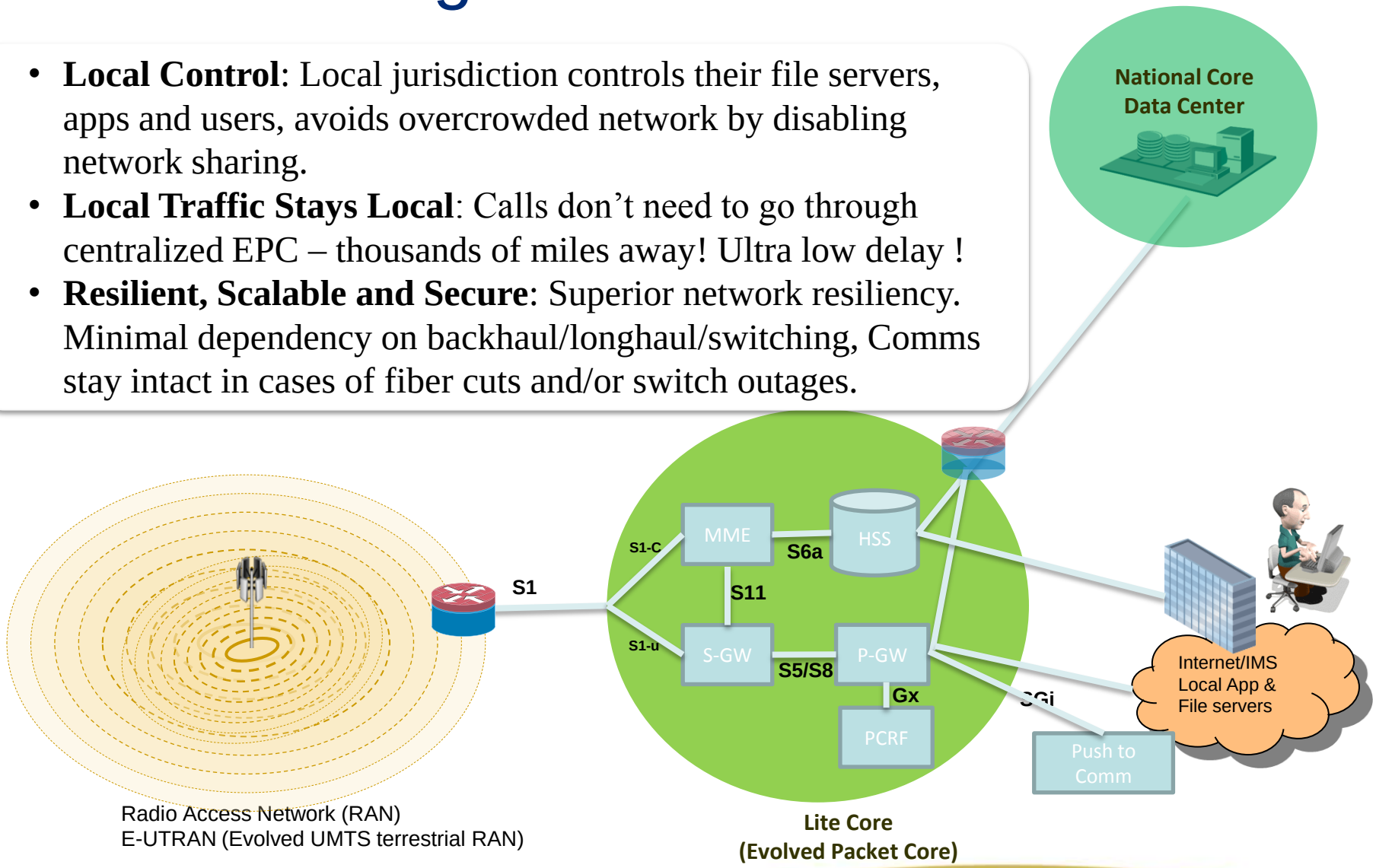
Detailed Edge-centric Network Model

- **Local Control**: Local jurisdiction controls their file servers, apps and users, avoids overcrowded network by disabling network sharing.
- **Local Traffic Stays Local**: Calls don't need to go through centralized EPC – thousands of miles away! Ultra low delay !
- **Resilient, Scalable and Secure**: Superior network resiliency. Minimal dependency on backhaul/longhaul/switching, Comms stay intact in cases of fiber cuts and/or switch outages.



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Backup material

Features of Edge-centric Network

- Edge-centric network architecture means thinking outside the network box !
  - Pushing network intelligence to the edge (close to the user)
  - EPC, HSS-AAA, local file/app server functions decentralized towards RAN (user community)
  - Lite EPC (MME, S-P GW, HSS, PCRF) can be deployed close to RAN and integrated with central core network
  - Local HSS connects to local jurisdiction AAA and also syncs with central HSS/user database
  - Local P-GW connects to local jurisdiction file and app servers – this will eliminate sensitivities of storage of local government information in FirstNet central database
  - Possible flexible connectivity to local proximity GWs for the integration of local LMR/P-25 systems