

# Communication Pathway Scenarios and Interfaces

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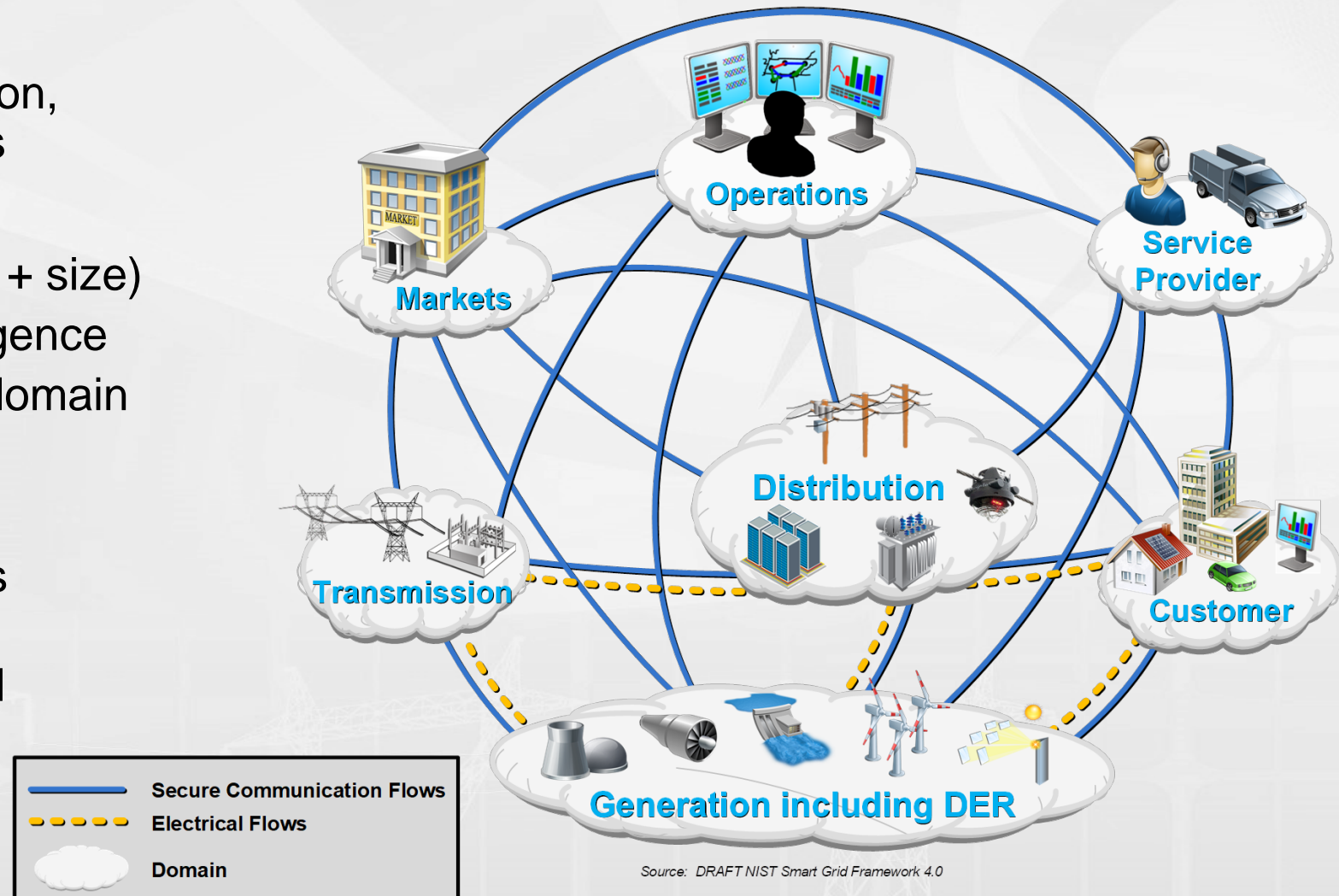
Engineering Laboratory  
NIST Smart Grid & Cyber-Physical Systems Office

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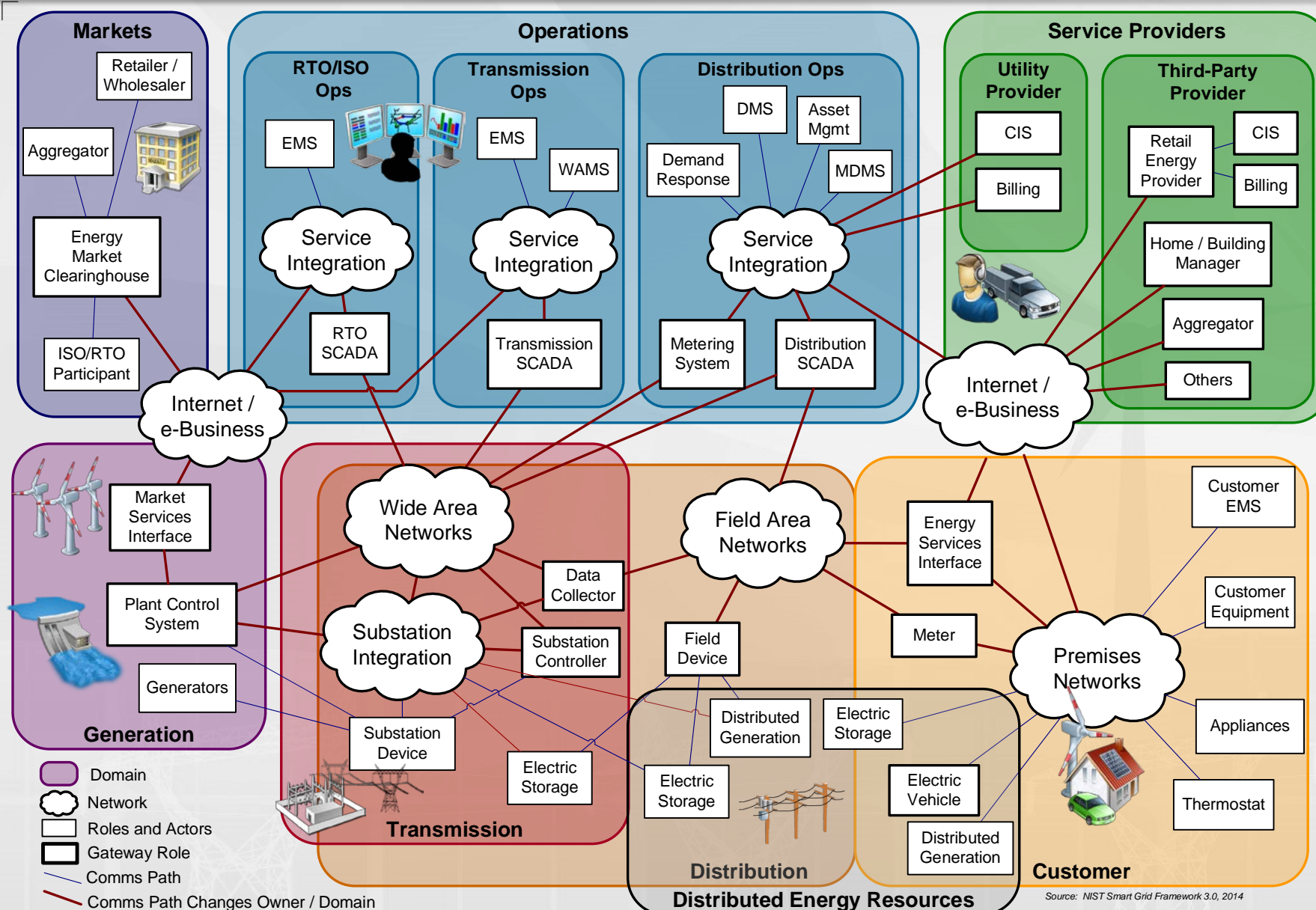
# Conceptual Model

- Generation including DER
  - Technology diversity
  - Physical proximity to transmission, distribution + customer domains
- Intelligent distribution system
  - Increasing importance (location + size)
  - Improved controllability + intelligence
  - Connected to service provider domain (e.g., congestion mitigation)
- Empowered consumers
  - Operations & intelligence enters customer domain
  - Customer diversity incorporated

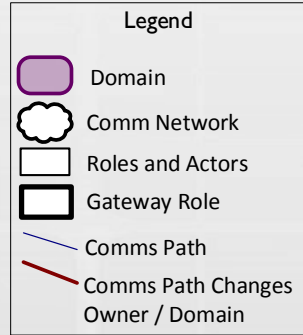
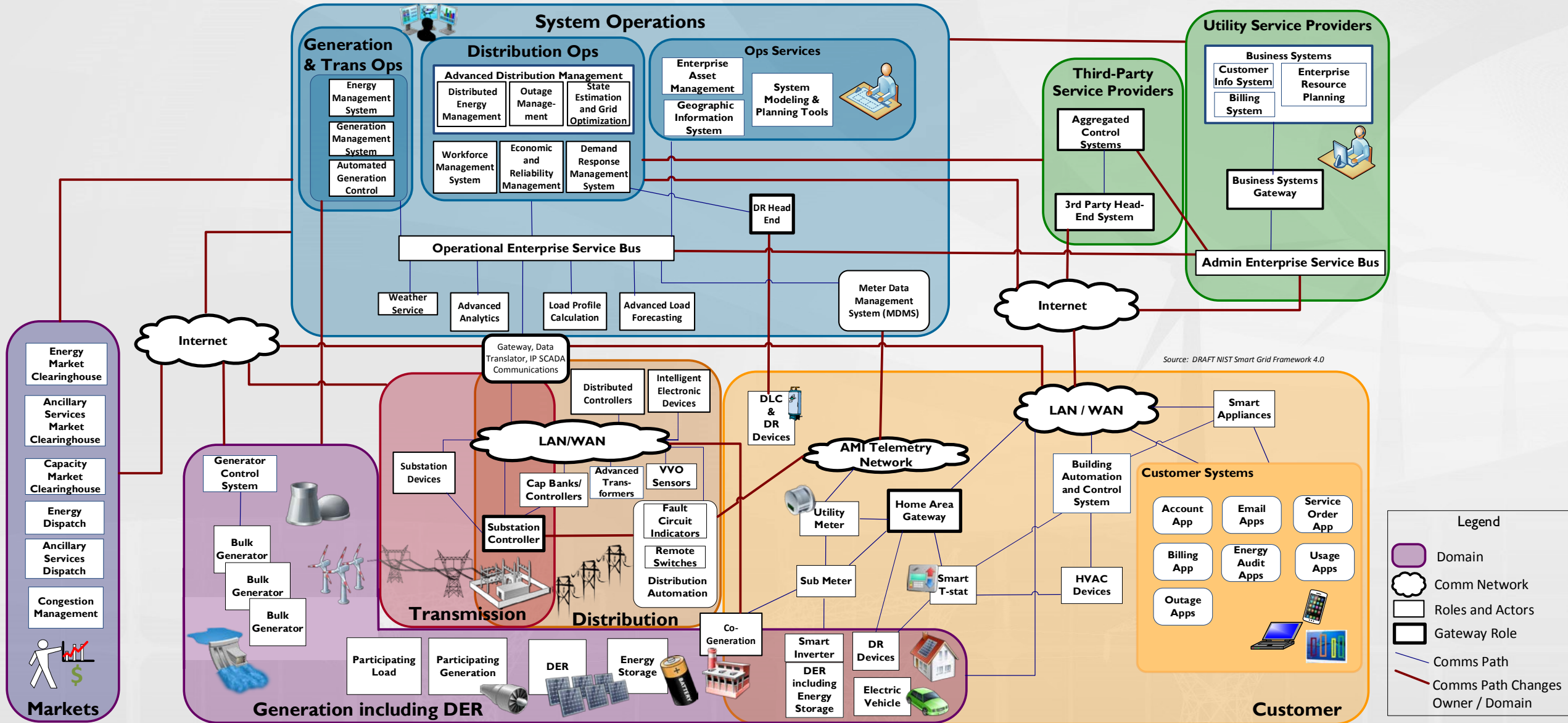
## Smart Grid Conceptual Model



# Legacy Communications Pathway Scenario

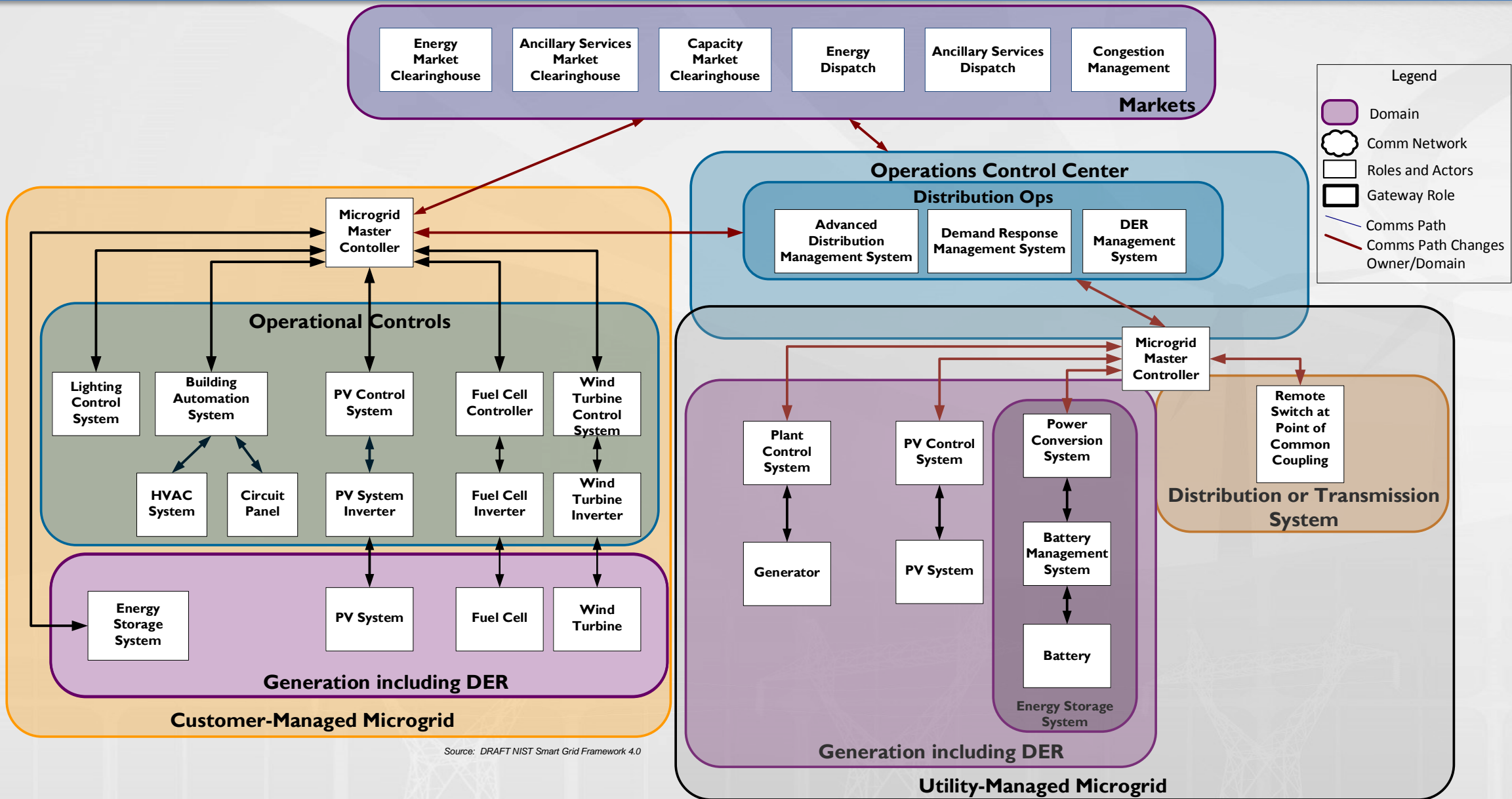


# High-DER Communications Pathway Scenario

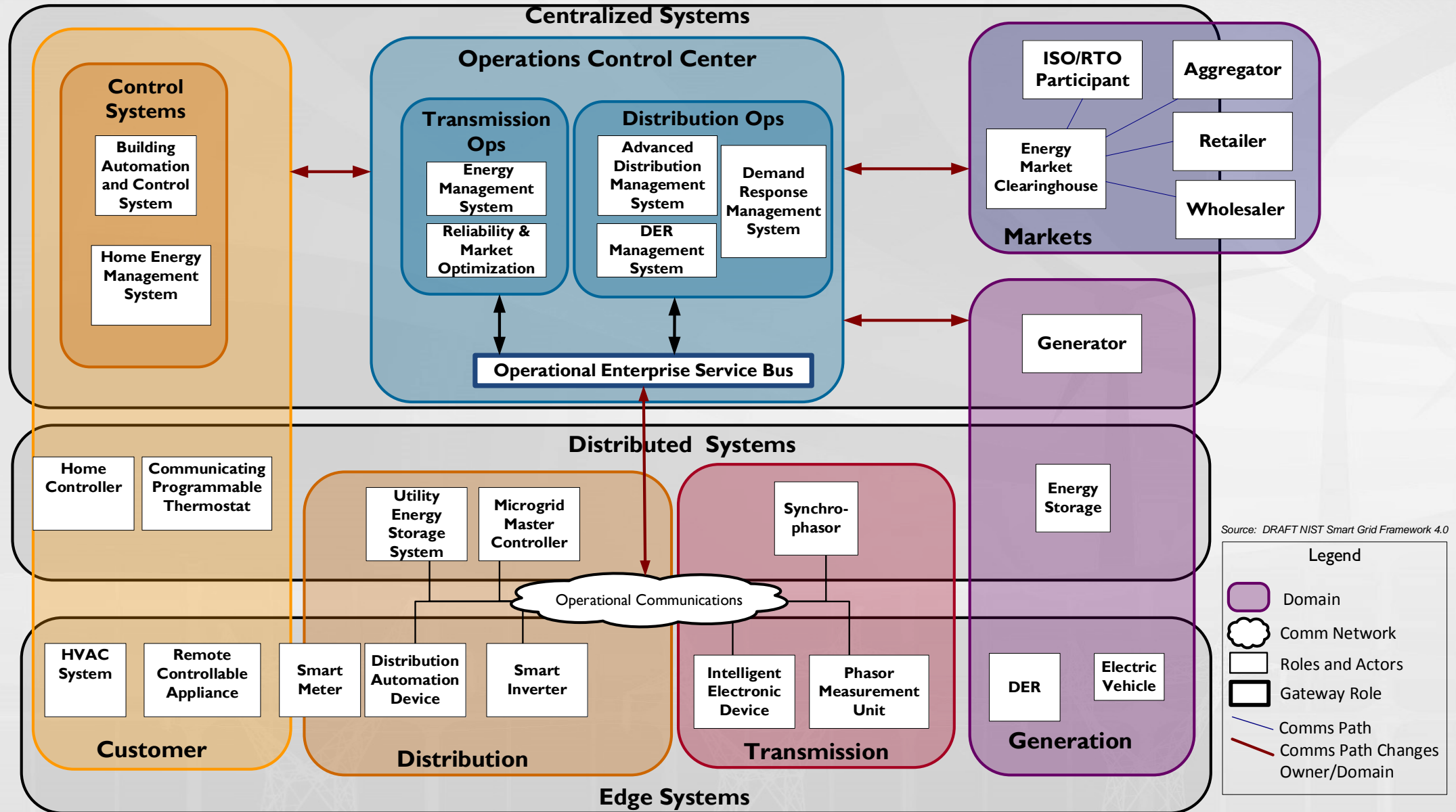




# Microgrid Communications Pathway Scenario



# Hybrid Utility Communications Pathway Scenario



Source: DRAFT NIST Smart Grid Framework 4.0