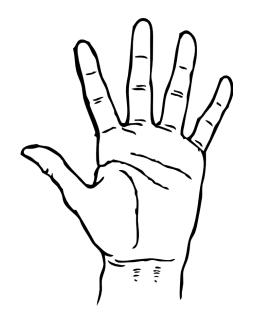
Michael B Robinson

Business Architect Digital Transformation Group

cisco



Principles for Addressing Distribution Grid Needs

Modularize the distribution grid in terms of electric operation, communication, security and information flows. Seek harmony between autonomy and federation.



Maximize reliability through **systematic diversification** of resources. (Supply, connectivity, control)

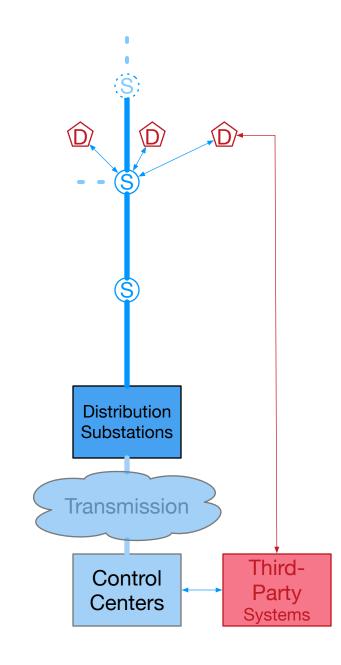
Balance operational, financial, and innovation risk by **maintaining private and public** infrastructure elements and support



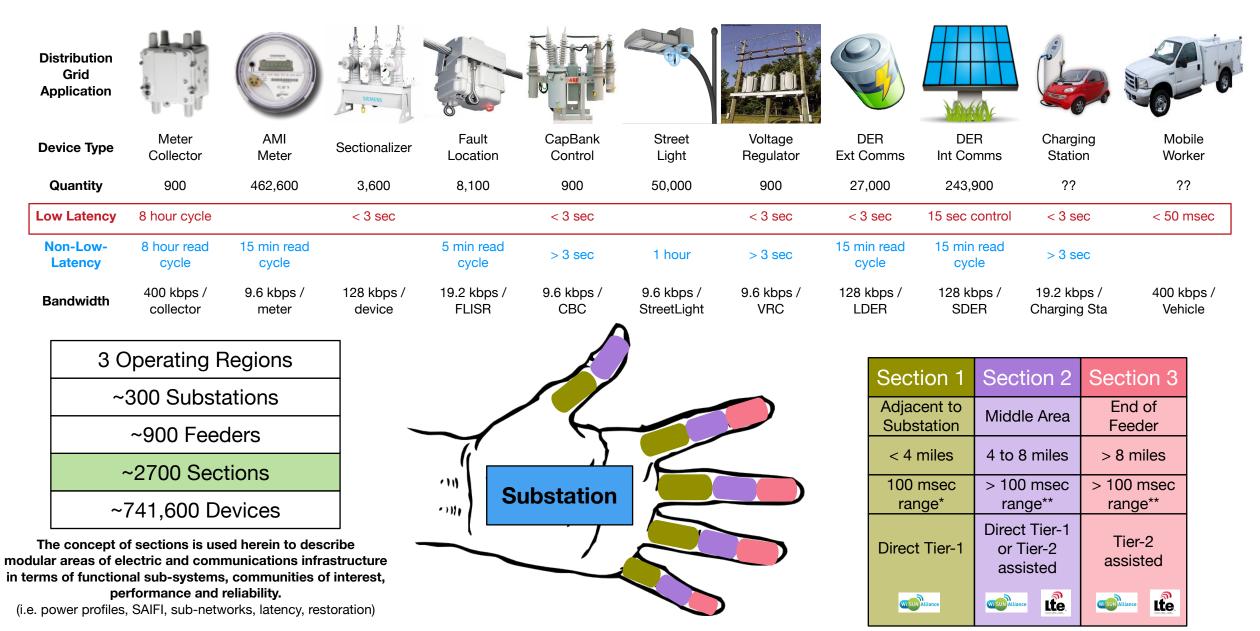
Innovate distribution grid operations by using edge-, substation-, control centerand third-party- compute systems

5 Design for both **legacy** and foreseeable (industry standard) **new applications**

 Optimize business cost structure (CAPEX+OPEX) and business flexibility through virtualization with appropriate performance and quality service levels. (Multi-service grid devices, multi-service communication networks, virtual computing)

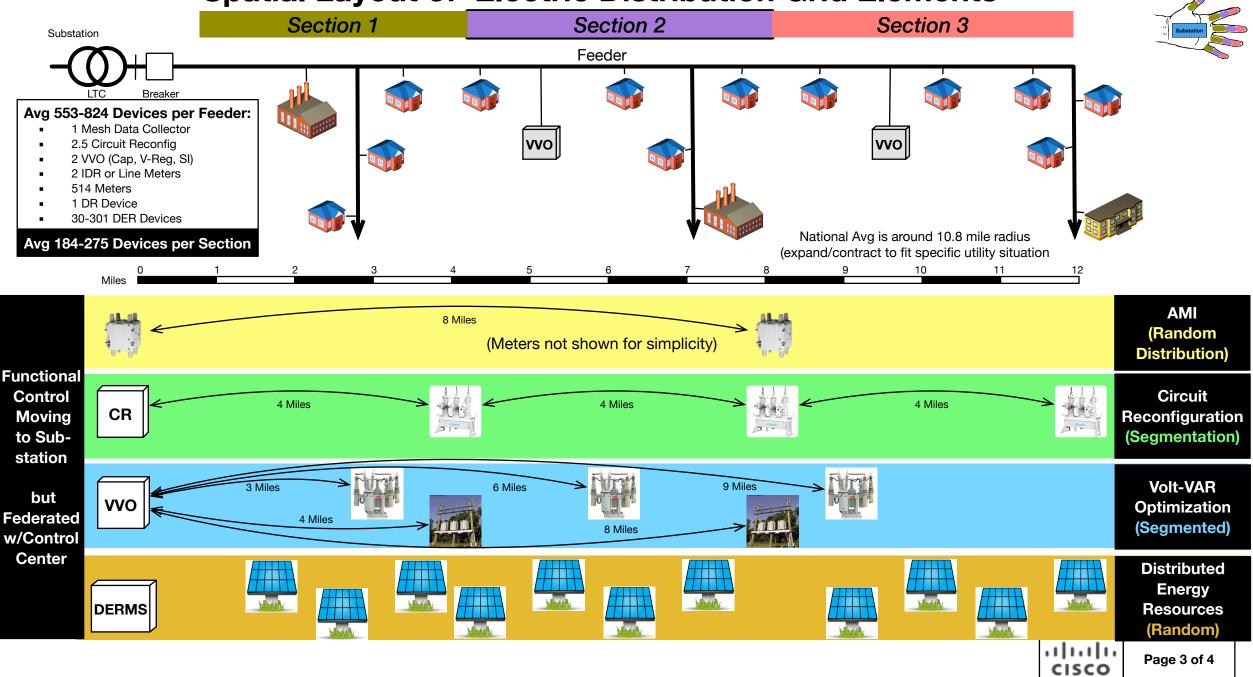


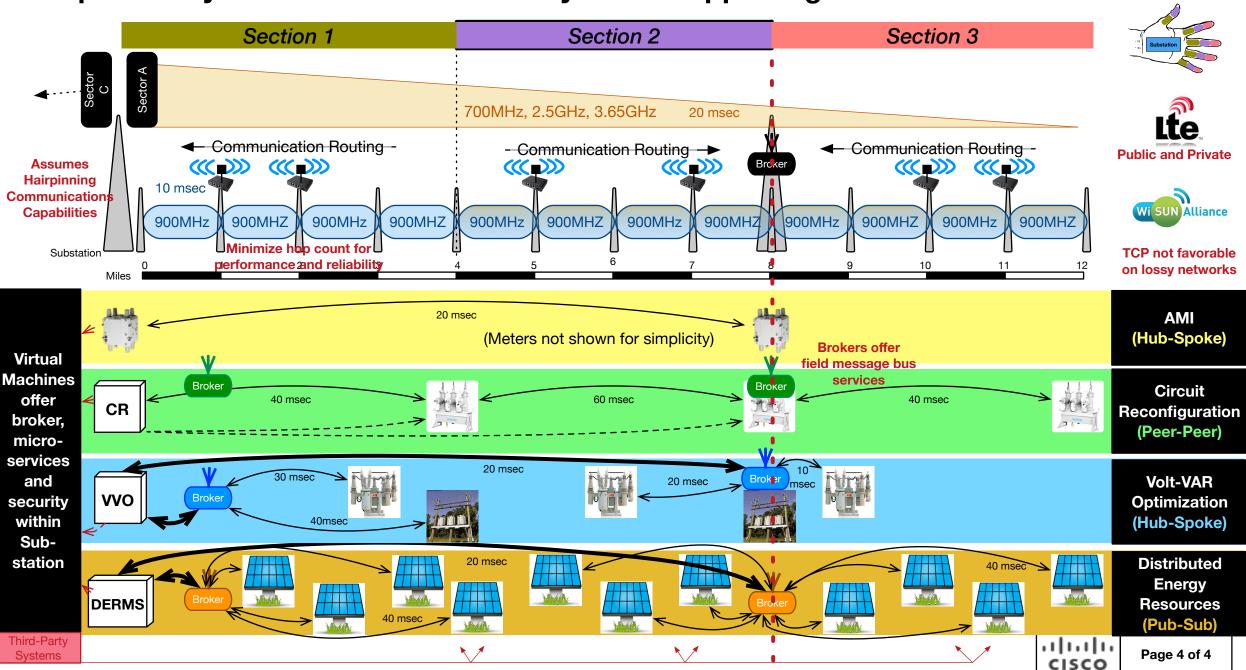
Characterizing and Forecasting What We Are Solving For



CISCO Page 2 of 4

Spatial Layout of Electric Distribution Grid Elements





Spacial Layout of Information Sub-Systems Supporting Distribution Grid Functions