Leveraging Geospatial Technology for Improved Telecommunication Network Planning, Provisioning and Monitoring

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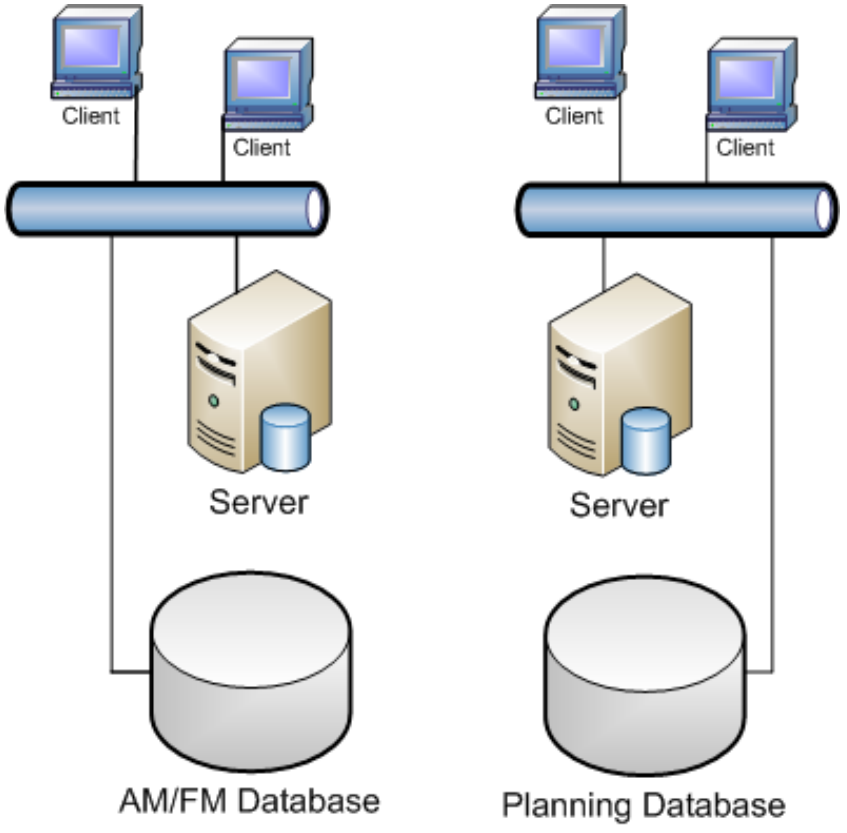
Overview

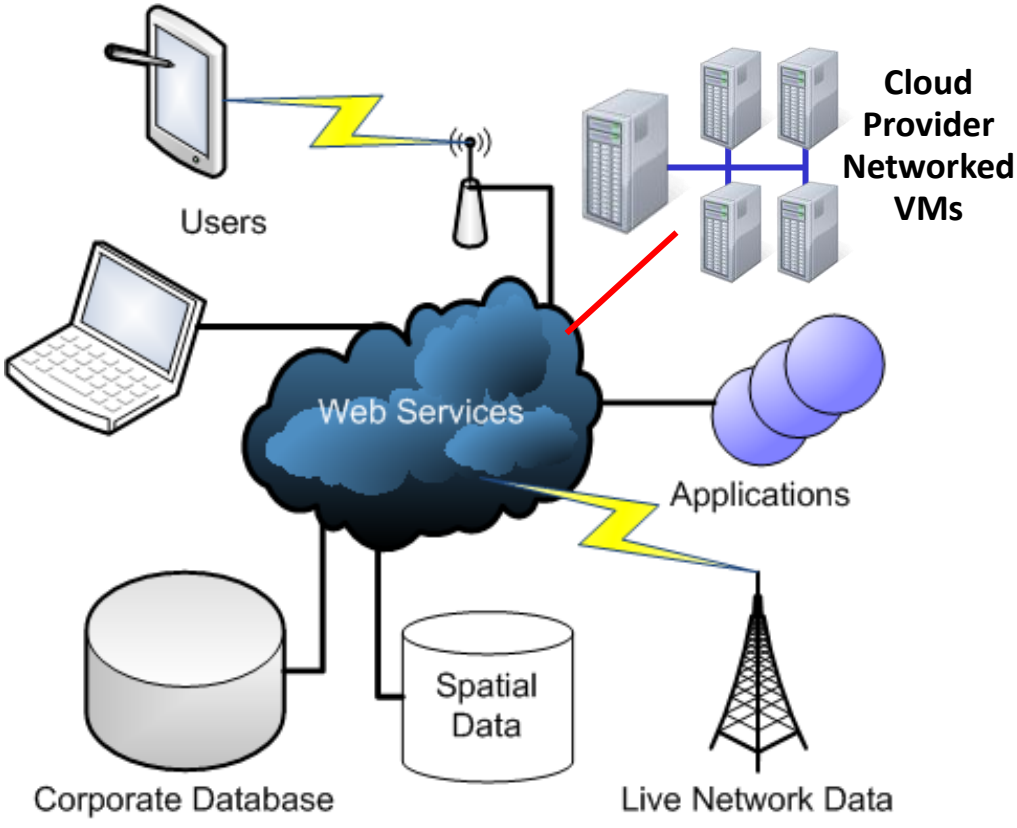
- Cloud-Based Architecture for Telecom and Geospatial Data
- Benefits
- Challenges
- Sample Applications and Case Studies

The Emergence of Web Services
Breaking with the Past

Traditional Client-Server Model



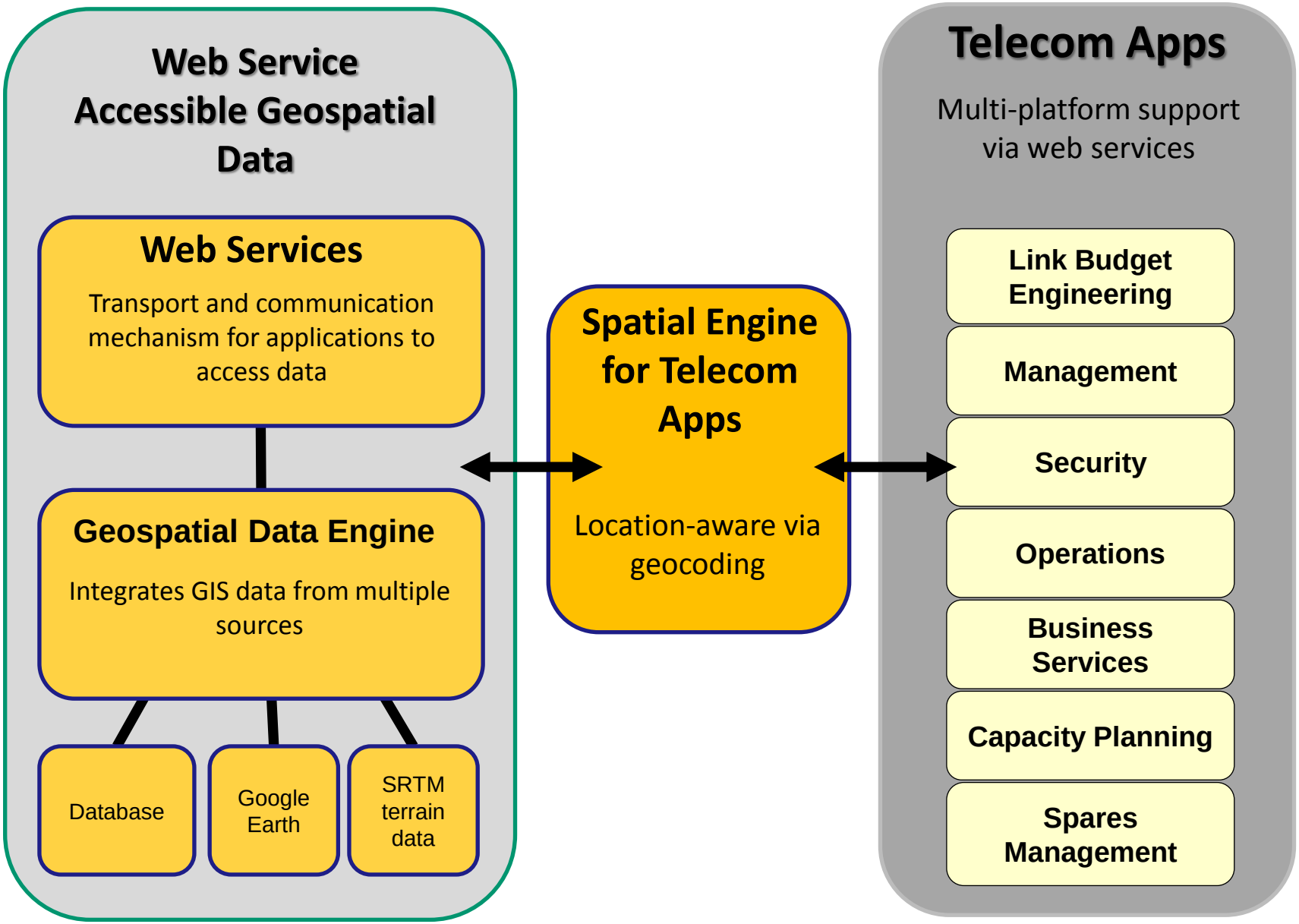
Cloud-based Architecture



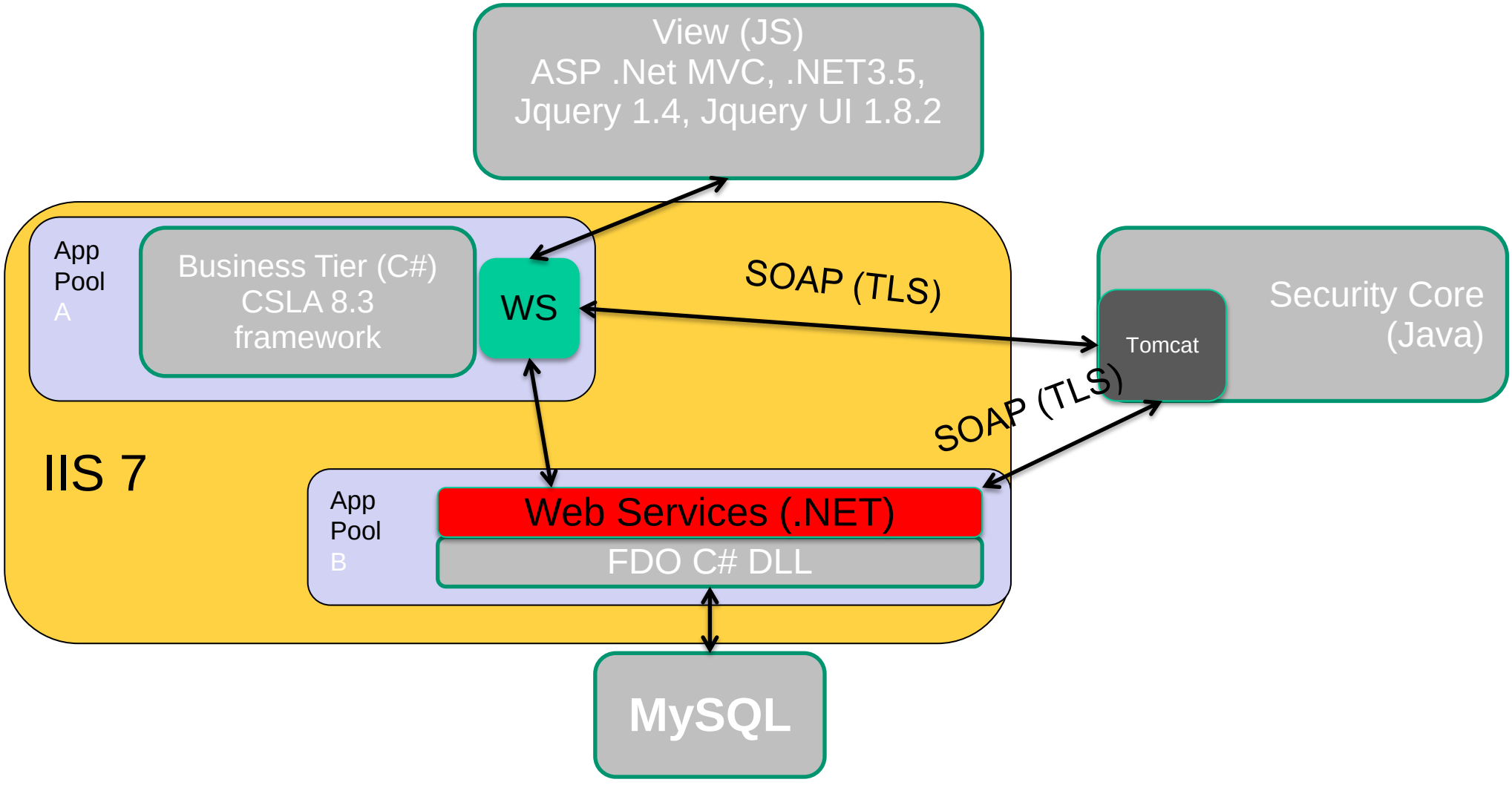
Enabling Technology

- Spatial data is free or low cost, and accurate enough
- Rapid application development with open systems tools
  - Web services–based toolkits now freely available (e.g., Google, MapGuide Open Source, Map Server)
- Simplicity of web services facilitates integration between applications, including new geospatial data sources
  - Network planning to provisioning
  - Network management to root-cause analysis
- Mobile users can readily update corporate data
  - Increased compute power and location-aware smart mobile device

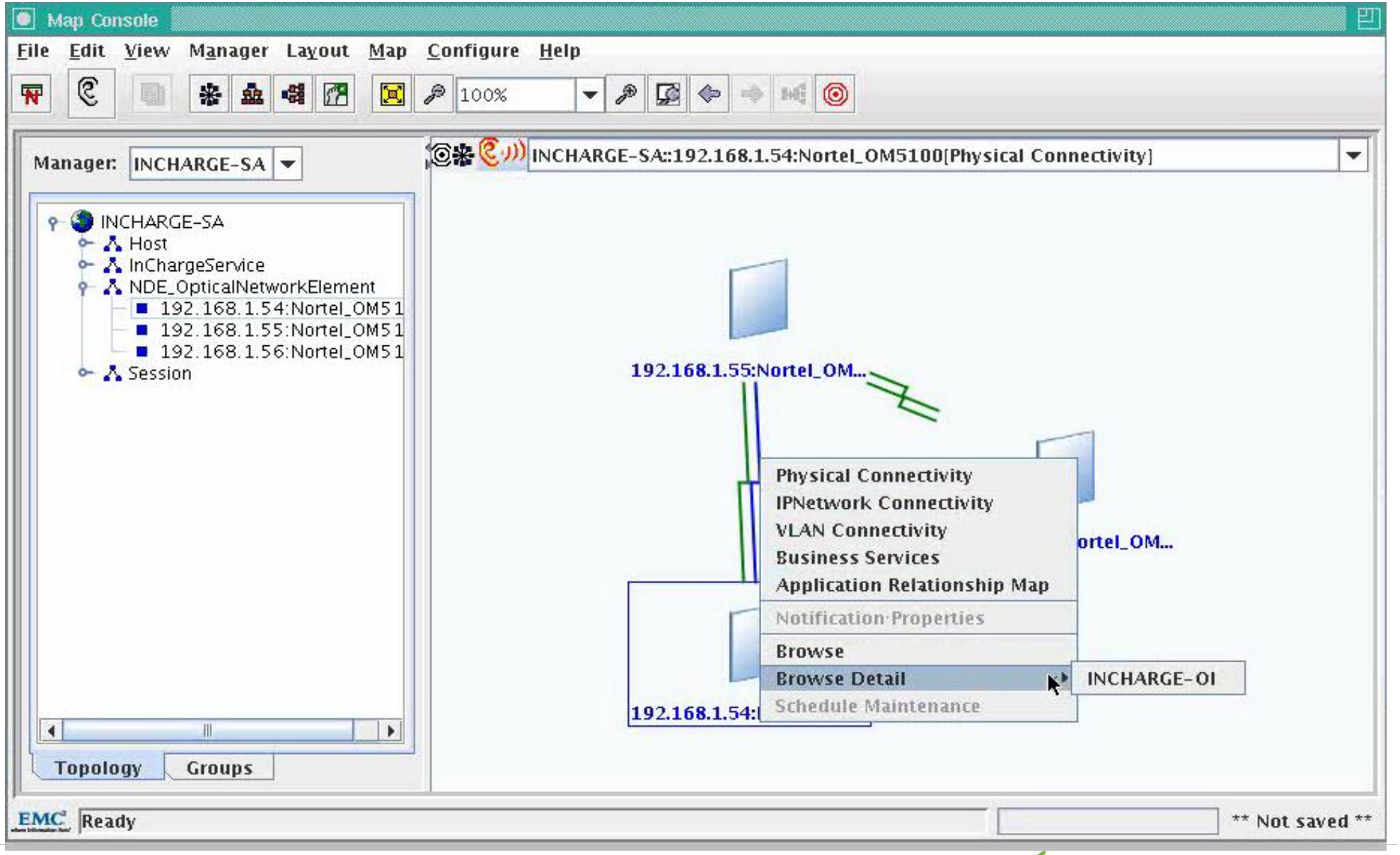
Telecom Geospatial Data Framework



Web Services Architecture for Telecom Geospatial Framework



What are Common Practices Today



The Data Store

- Evolving from foundation of the client-server architecture to part of the cloud web service
- Still the common framework used to integrate information
  - Central store, Data mining, Versioning, History, Business Rules, GIS references
- Specialized knowledge no longer required to build and maintain the data store
- Toolkits such as Google have simplified the handling of spatial data – no need any longer to understand how it is built, stored, or managed

Technology and Business Challenges

- Is geospatial data really “free” in the open world (Google API and others)?
  - What are you giving up for access to the data?
  - Privacy – need to provide information that can be critical for the telecom provider, and need to maintain subscriber and customer confidentiality
  - No Service Level Agreement (SLA) with open-source providers
- Quality of information available in the cloud
- Securing the cloud – end-to-end
- Providing end-to-end security of transactions
  - As a method to mitigate challenges

Benefits of Spatial Enabling for Telecom

General…a few examples

- OSS applications today depend on infrastructure, but are poorly integrated at the spatial layer
- Awareness of collocation, proximity, and spatial relationships among infrastructure
- More rapid response to subscriber service requests

Network Planning

- Faster service rollout to subscribers

Network Management

- Correlation of critical events and outages
- More efficient operations – e.g., route planning for maintenance crews

Case Studies

DragonWave Horizon Link Planner

Optical Link Budget Engineering

Network Management Integrated with EMC Ionix in a Geospatial Framework for Event, Correlation and Analysis

Network Planning

DragonWave Horizon Link Planner

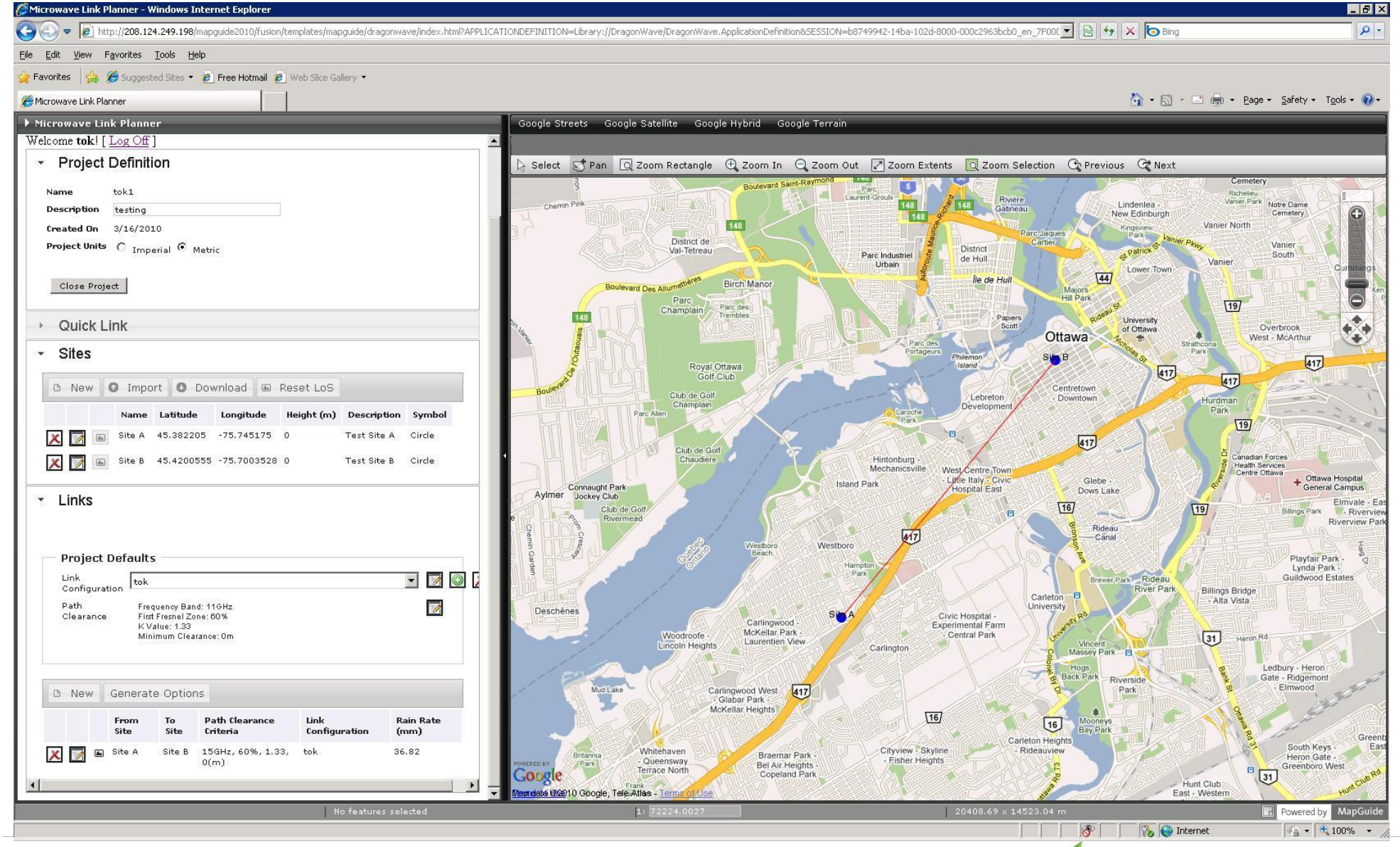
RF Planning Tool

http://www.dragonwaveinc.com/

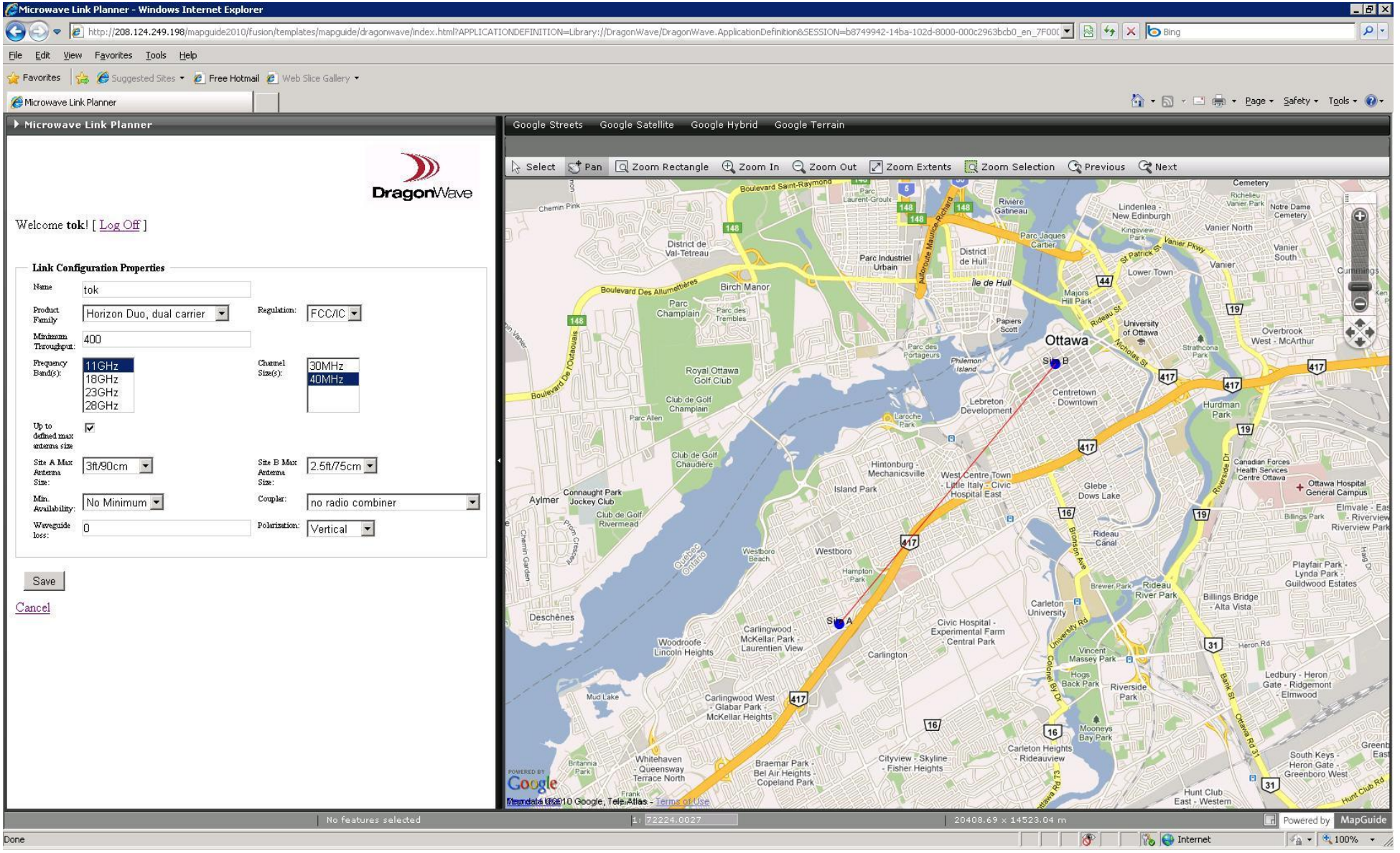
- What geospatial function was required for RF planning: location, line-of-sight, distance and elevation
- Going from 4-5 “power users” to 100’s of channel and non-specialist users and integrated with the sales process and systems
- Integration of free and open Google Maps, Google API SRTM, Goes, and Autodesk MapGuide

Benefits: Rapid expansion of business sales model and acceleration of business processes

Application with Line of Sight, Integrated with Terrain Data in a Web Services Framework

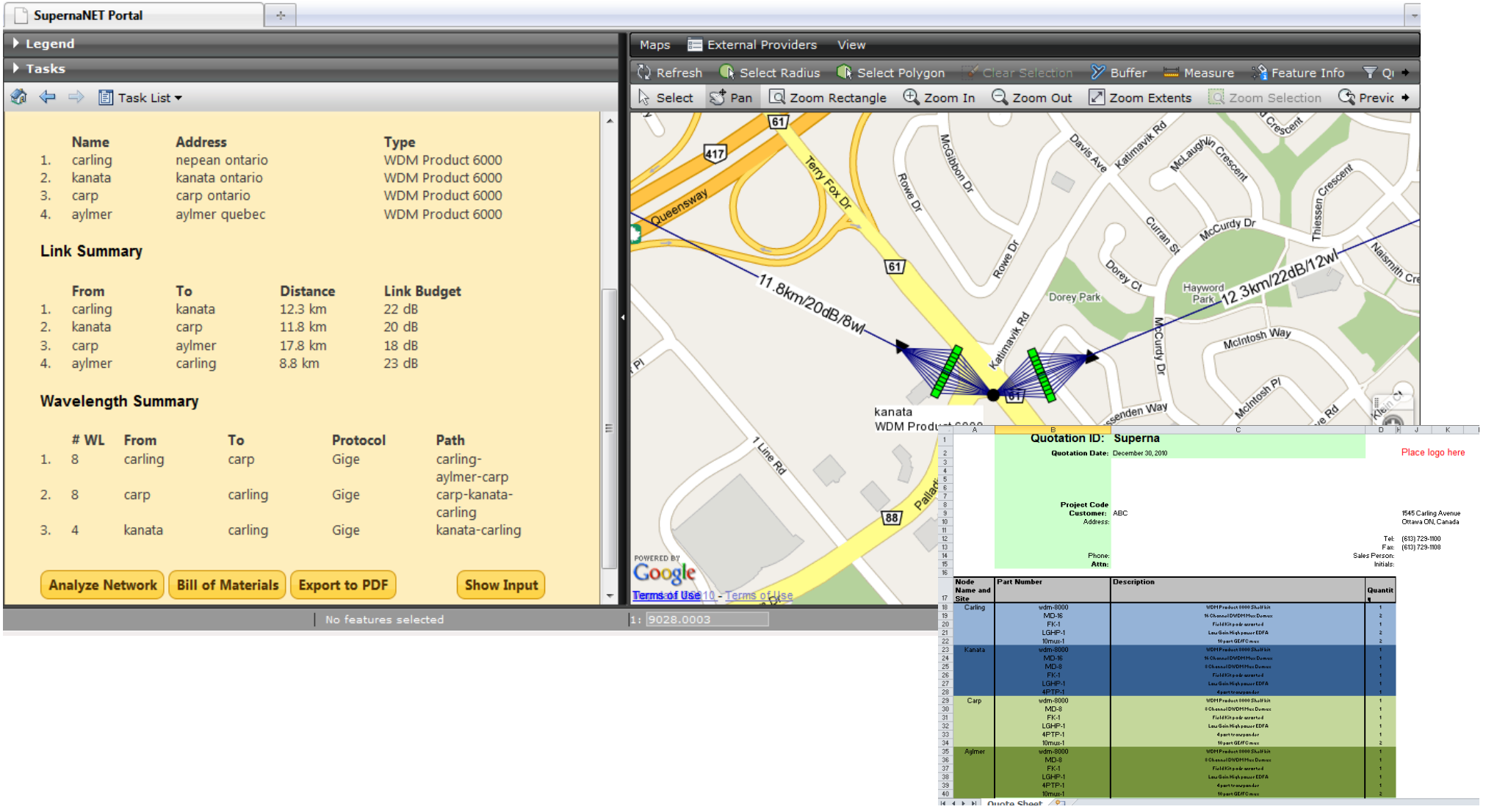


RF Engineering Function



Optical Network Planning

Automating Network Engineering and Design Automation



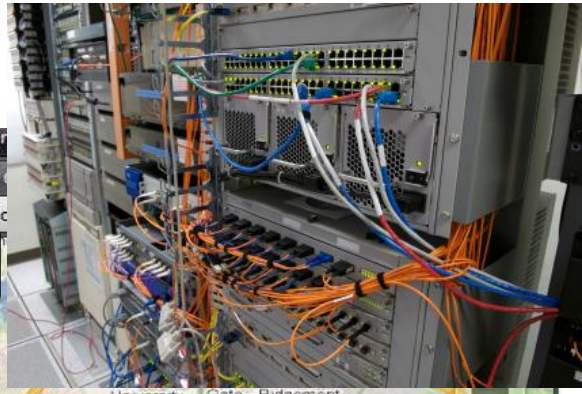
Key Values

- Cost reduction for engineering and BOM creation
- Faster network engineering
- Improved security and control with a single planning tool
- Reduced R&D costs for a licensed application

Geo-Spatial Integration Solutions

- NOC Center's receiving alarms from devices often need location information
- Dynamic map technology coupled with fault correlation can reduce the cost and time of problem resolution
- URL per incident decouples the OSS system from the display of information using web services
- Optimize spares and inventory

Geospatial Telecom Fault Solution



Alarm contains clickable ULR Http://NDE/alarm1.html

EMS

Root Cause alarm

Site A

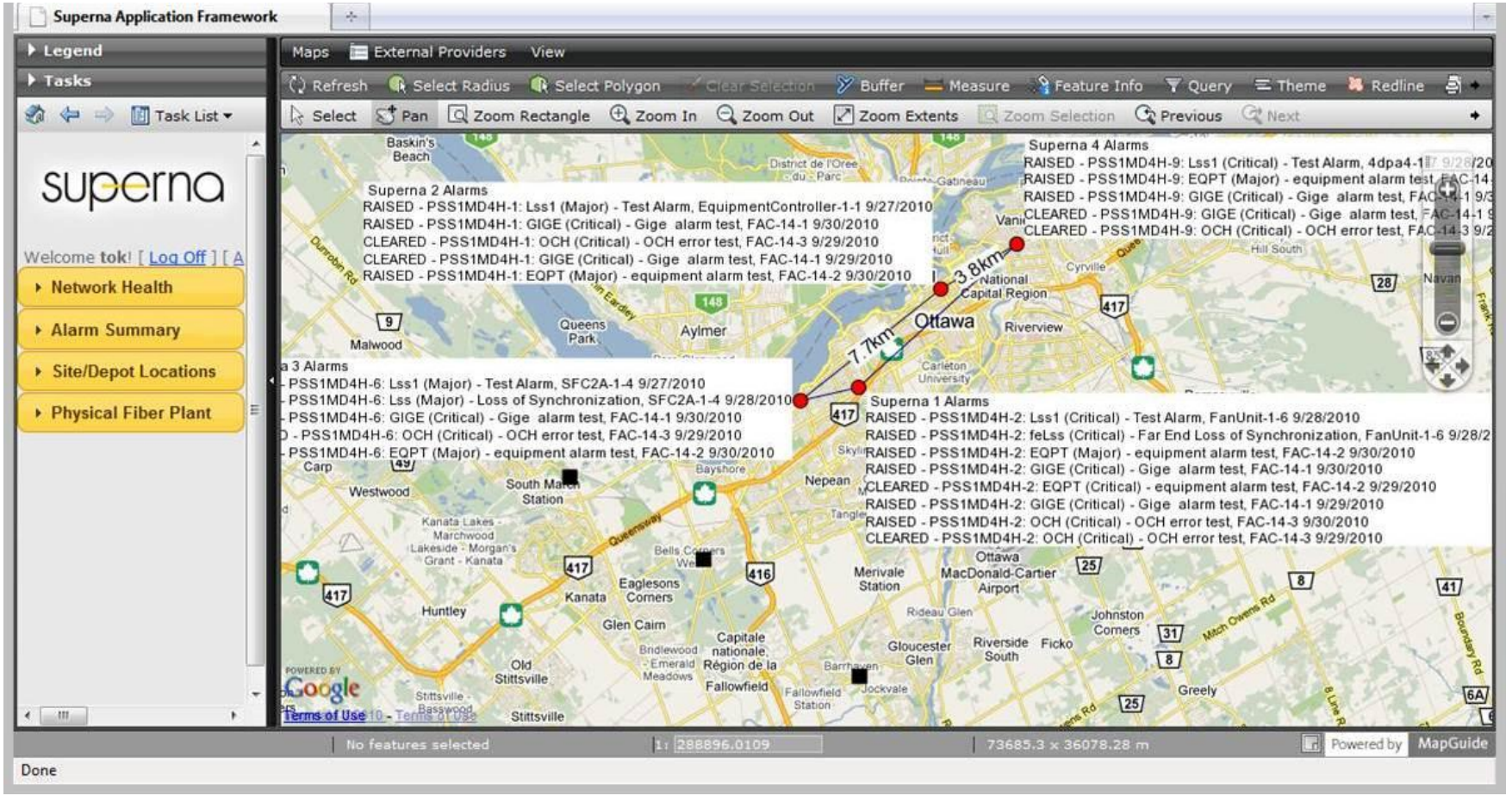
Site B

Site C

Link to Inside Plant

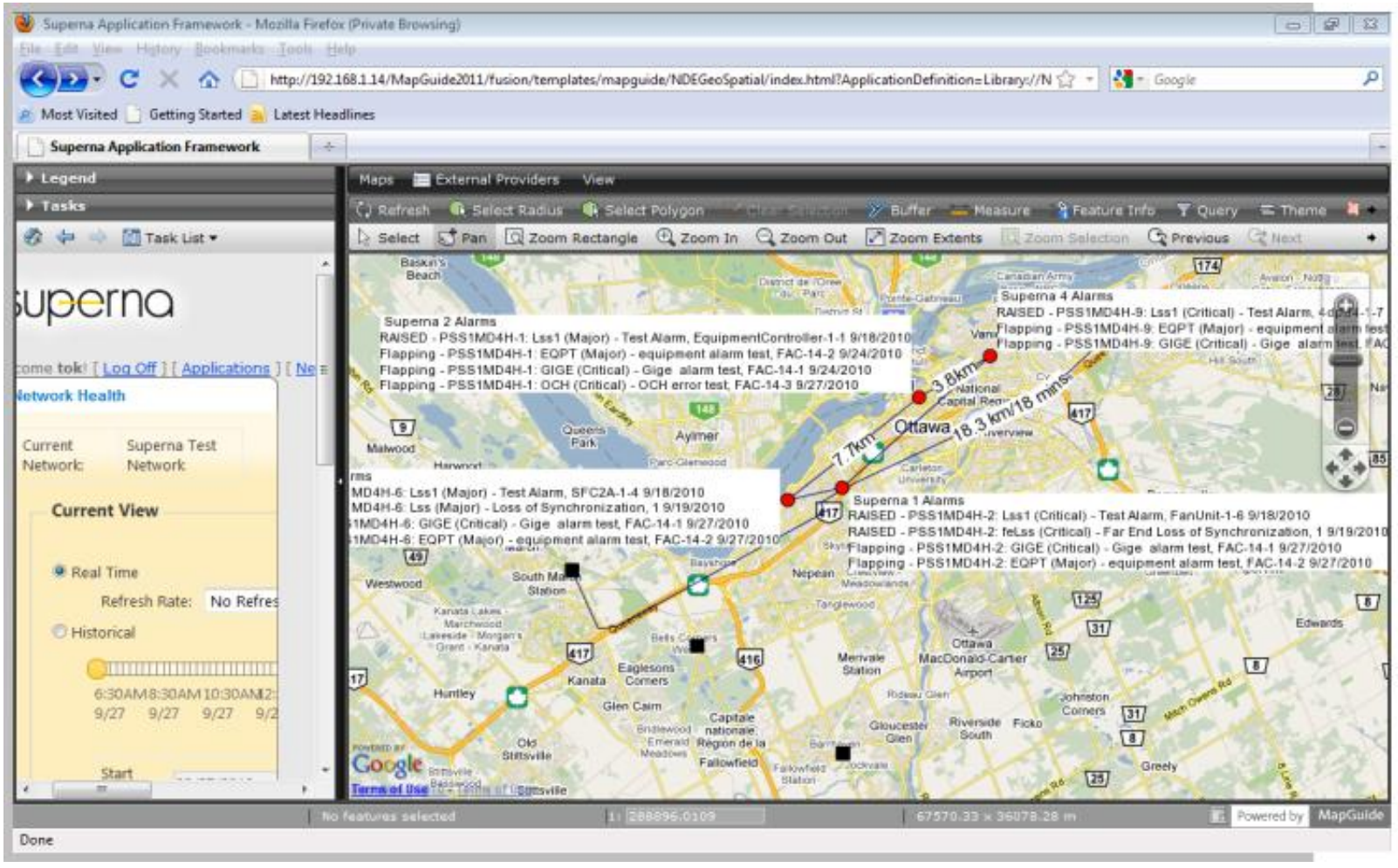
Cloud Based Demonstration

Location-Aware Application Monitoring, Spares Management



Spares routing based on open geospatial framework
Correlation analysis linked to analysis of optimal spare depots

Location-Aware Application Monitoring Integration with EMC Ionix



Cross-domain application monitoring with a geo-spatial framework
Geospatially enabling EMC Ionix

Summary

- Traditional telecom data models and tools for planning and management have been limited, providing a virtual network view.
- Cloud networks are inherently more intelligent, complex and dynamic. Need to address security.
- Network planning and management applications must leverage Web-based, spatial-enabled technology to scale application usage.
- Web services–based tools facilitate creative use of spatial technology, to empower employees from Sales to Maintenance.