GSAW2005
Ground System Architectures Workshop

WIPRO
Applying Thought

Application of Next Generation Telecom Network Management Architecture to Satellite Ground Systems

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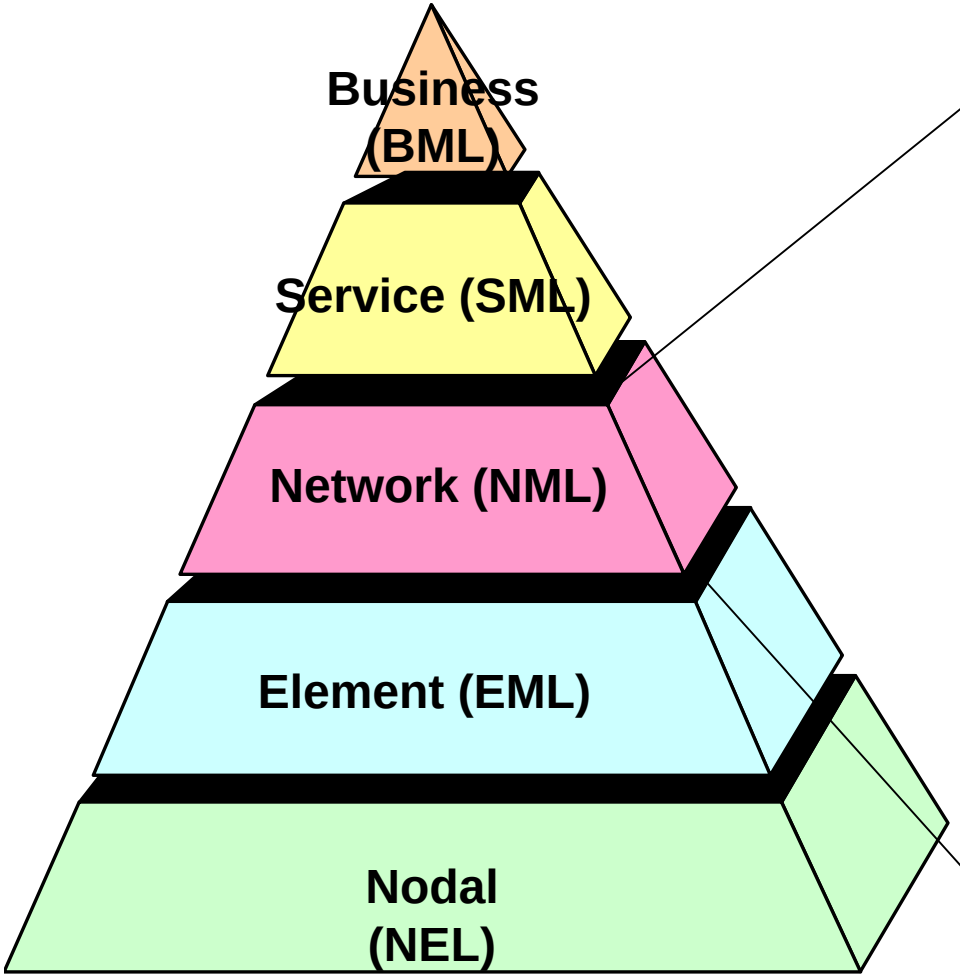
Agenda

- Background
  - Network Management Systems (NMS) – Where do they fit?
  - Telecom Network Management Vs Satellite Ground System Monitoring
  - Legacy Based NMS - Architecture pitfalls
  - Next Generation NMS - Architecture Attributes
- Motivation
- Wipro Contributions – Next Gen NMS technologies
  - J2EE-based Satellite Ground Monitoring System Architecture - Proof of Concept
- Need for Mediation
- Generic Mediation Framework
  - Architecture Details
  - Benefits
- Conclusion

Network Management Systems (NMS) – Where do they fit?



TMN Management Layers

Fault Management
Alarm handling, Trouble Detection, Trouble Correction, Test and Acceptance, Network Recovery, Alarm Forwarding, Filtering, Log Management, Diagnostic

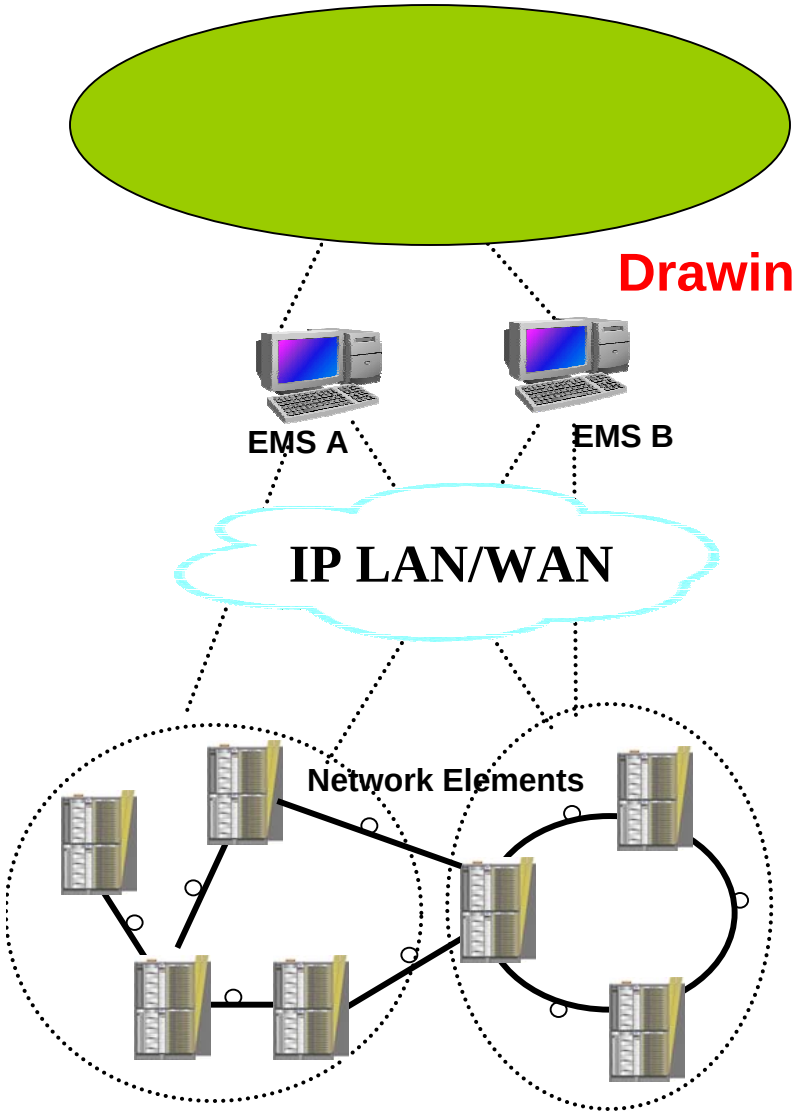
Configuration Management
System turn-up, Provisioning, Auto discovery, Backup and restore, database handling, Inventory Management

Accounting Management
Track service Usage, Bill record management, Service level agreement

Performance Management
Data collection, report generation, Data analysis, Performance monitoring

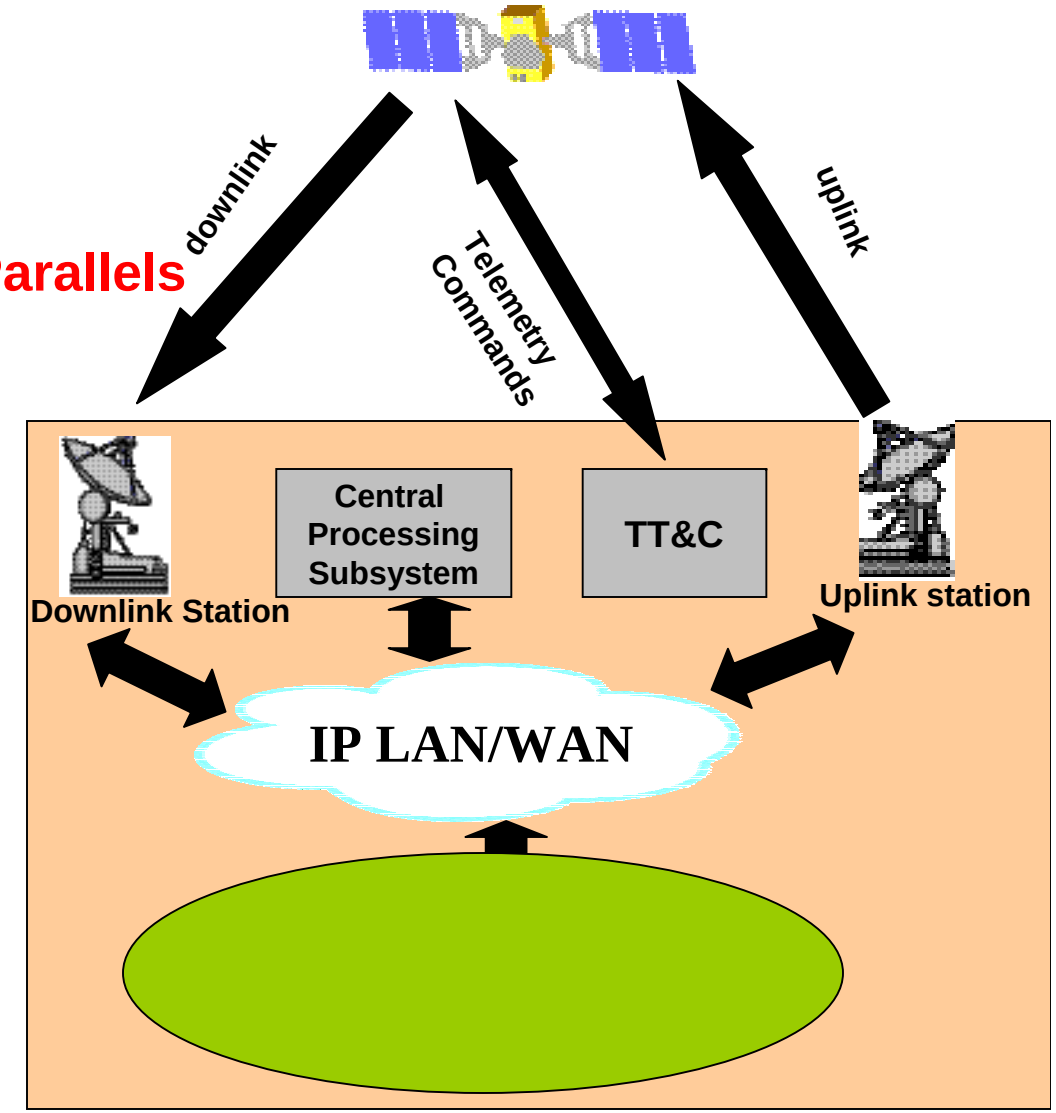
Security Management
Control NE access, Enable NE functions, Access logs

TMN Systems Vs Satellite Ground Monitoring System



Telecom Management Network System

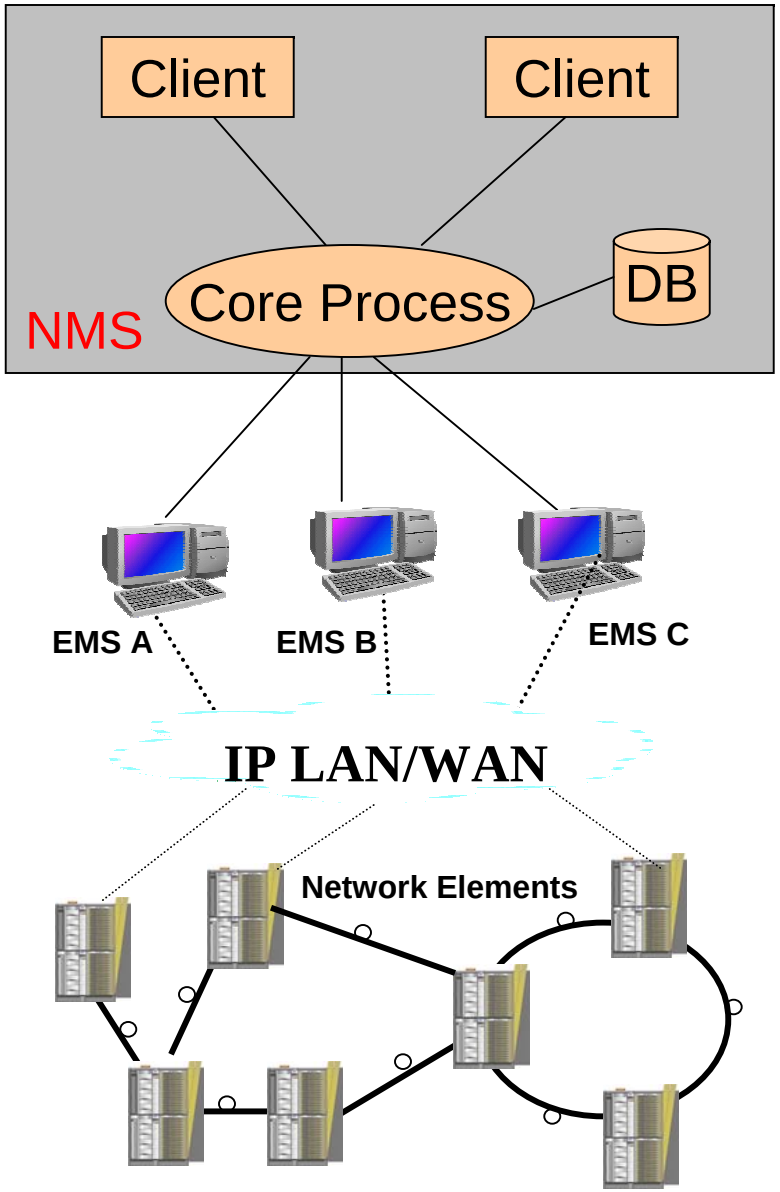
Drawing Parallels



Satellite Ground Earth Station

Legacy NMS – Architecture Pitfalls

- Monolithic Architecture
- Platform Dependent
- Low Extensibility
- Not Scalable
- GUI Development - complex
- Difficult to maintain the code



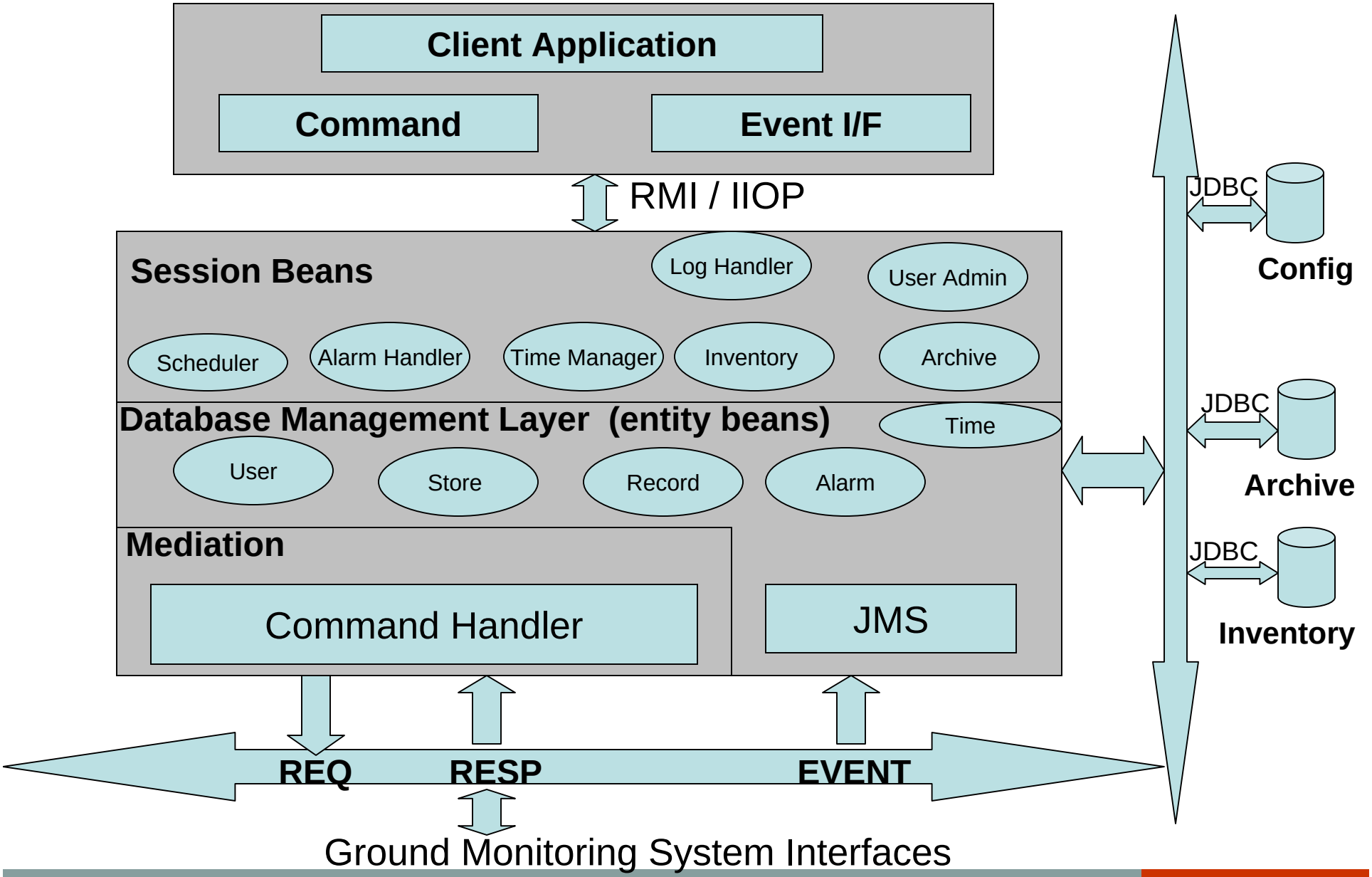
Next Gen NMS - Architecture Attributes

- Portable – Platform independent
- Low Coupling and High Cohesion
- Improved Performance / Scalability – Utilize backend processing of application server
- Automatically maintain accurate and up-to-date client applications
- Software caching on client platforms to optimize GUI performance

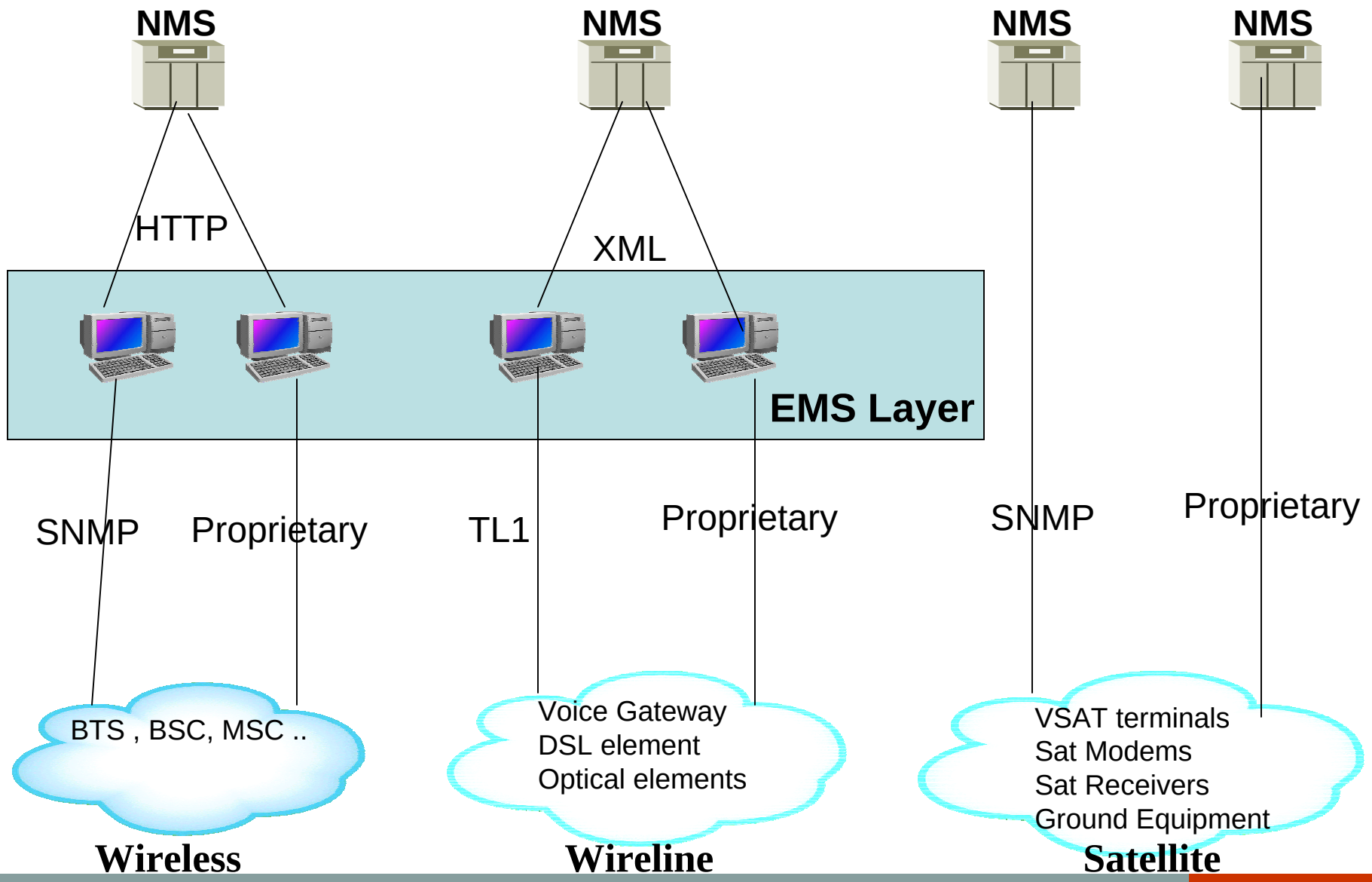
Motivation

- Share Next Gen Network Management Architecture best practices in Telecom Networks for usage in Satellite ground monitoring system

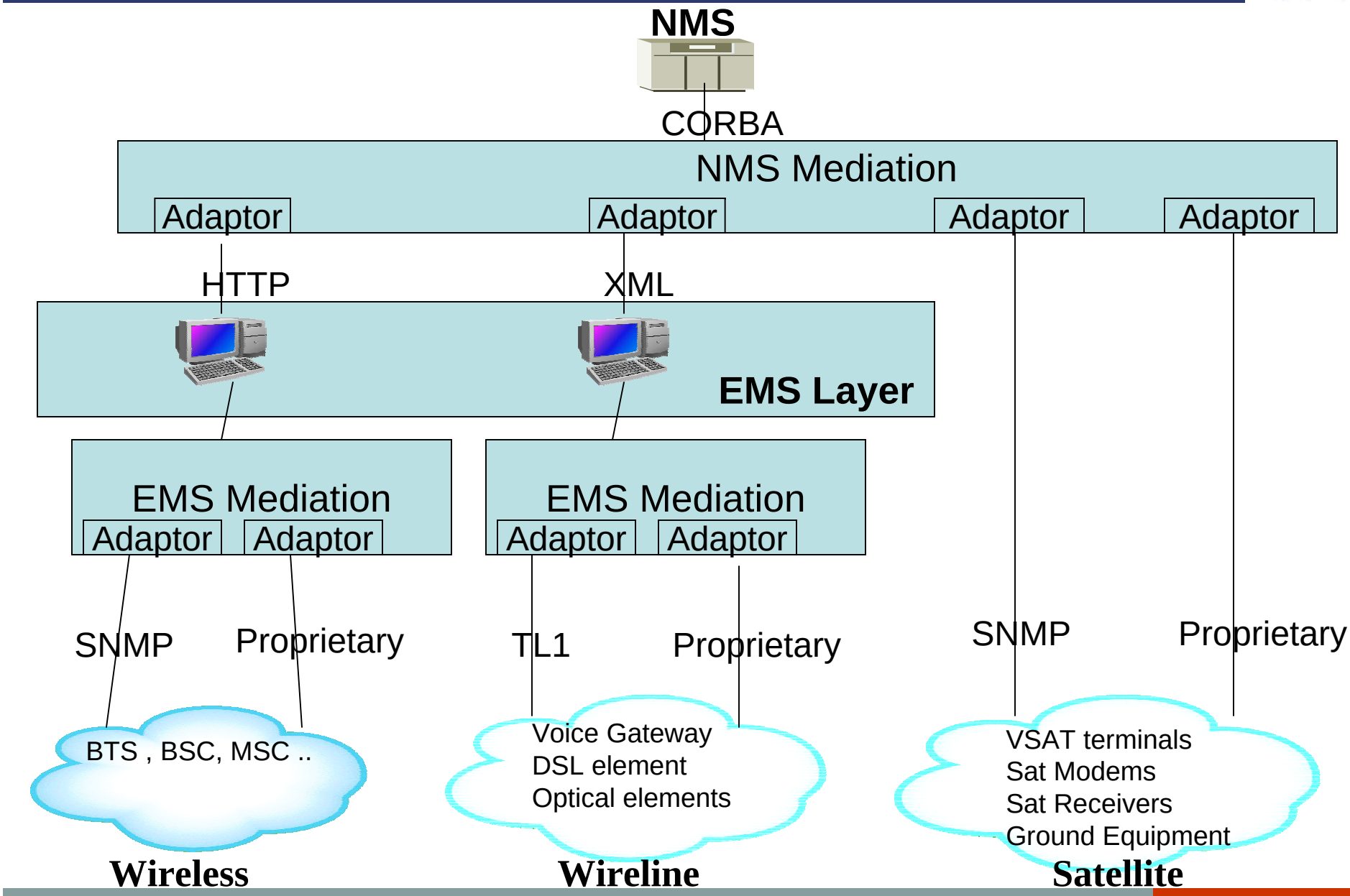
J2EE-based Satellite Ground Monitoring System
- Architectural PoC



Need for Mediation

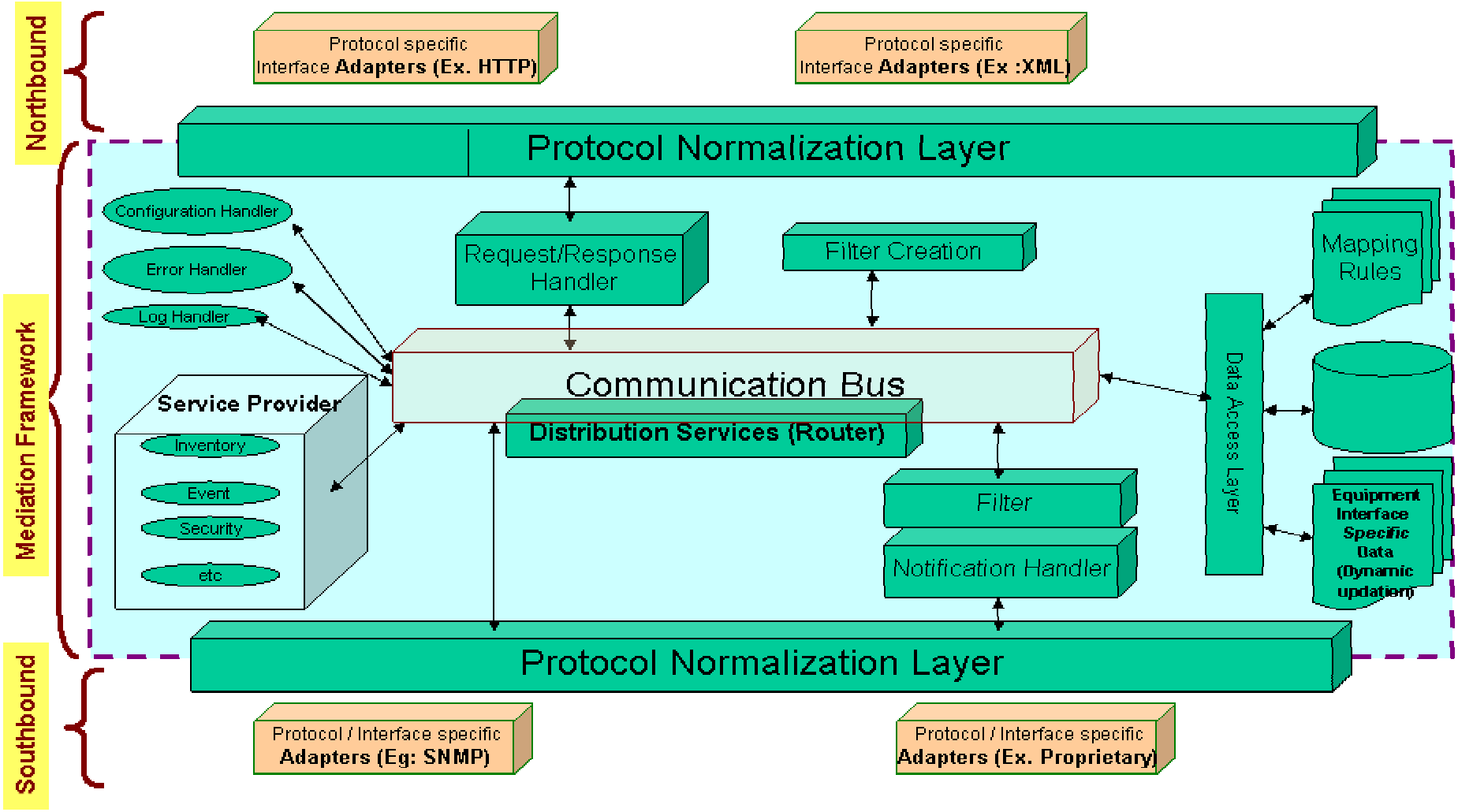


Need for Mediation



Generic Mediation Architecture

- Generic Mediation framework for converting one protocol to another.
- Reduces complexity and efforts in building mediation adaptors.



Mediation Framework : Benefits

- Could be used as a **framework to develop adaptors** for the following requirements:
  - Integration with disparate Network Elements or equipments
- Could be used as **framework for developing mediation layer** for a new Monitoring system

Technology and Methodology Used

- Generic Technologies
- JMX (Java Management Extension)
- Protocols like SNMP, TL1, CORBA, RMI
- RDBMS concepts
- XML

Software Engineering Practices:

RUP and UML
Design Patterns

Testing Methodologies and Tools:

JTest
Rational Rose

Conclusion

- Distributed Network Management Architecture
  - Significant advantages over legacy systems
- Satellite Ground Monitoring Systems V/s Telecom Network Management System
- Convergence of Technologies / Domains
  - Single EMS and NMS
  - Need for Mediation Adaptors
- Generic architecture for Mediation Adaptors based on Normalization of data

Thank you for your time