802.16g Scope and Architectural Considerations

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Purpose:

This is a response to a call for contribution to 802.16g

802.16g Scope and Architectural Considerations

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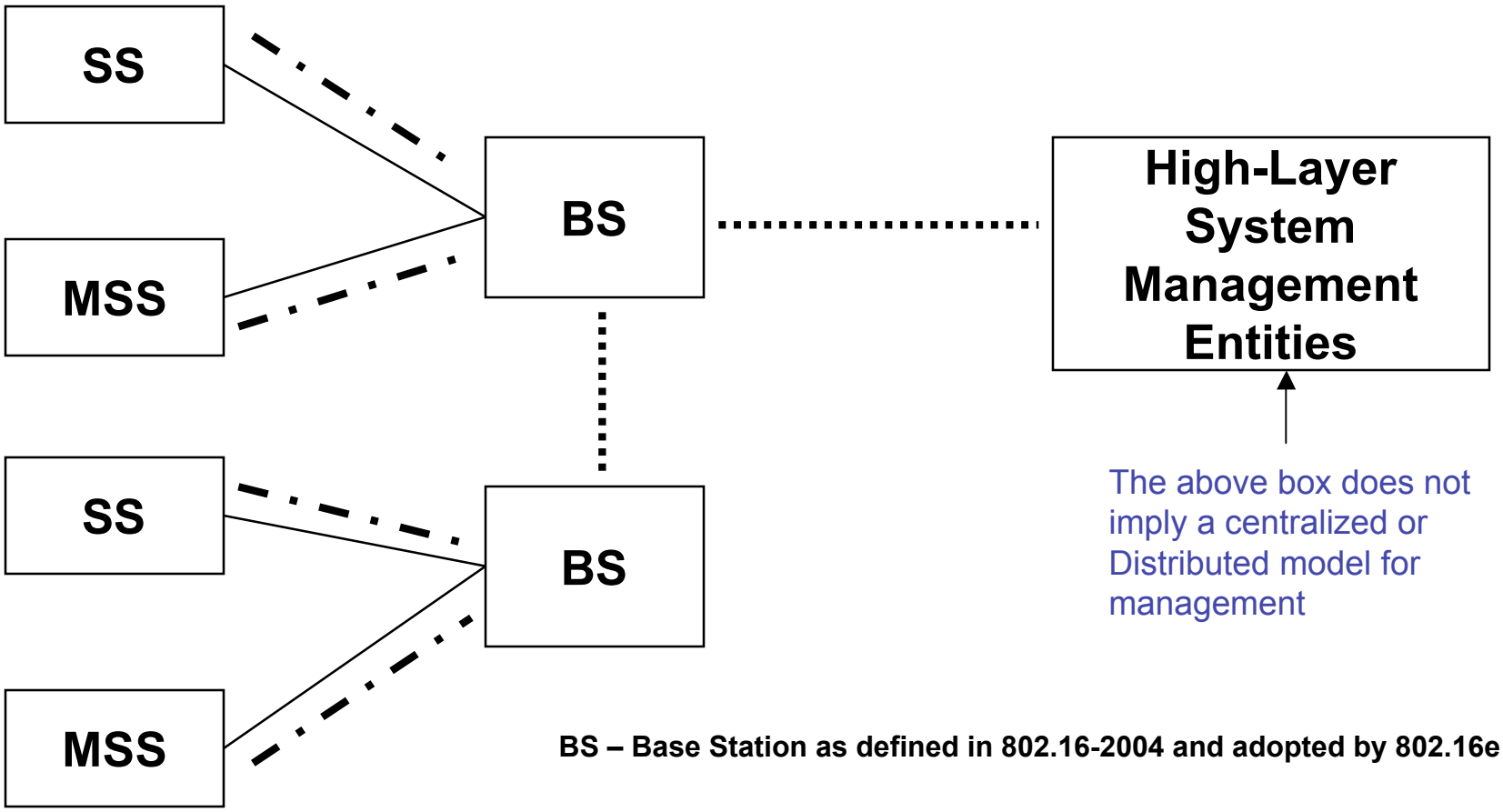
Outline

- Review 802.16g PAR scope
- Simplified Reference Model
- Architectural Considerations
- 802.16g Primitives
- Management Categories
- Out of Scope Areas
- Recommendations

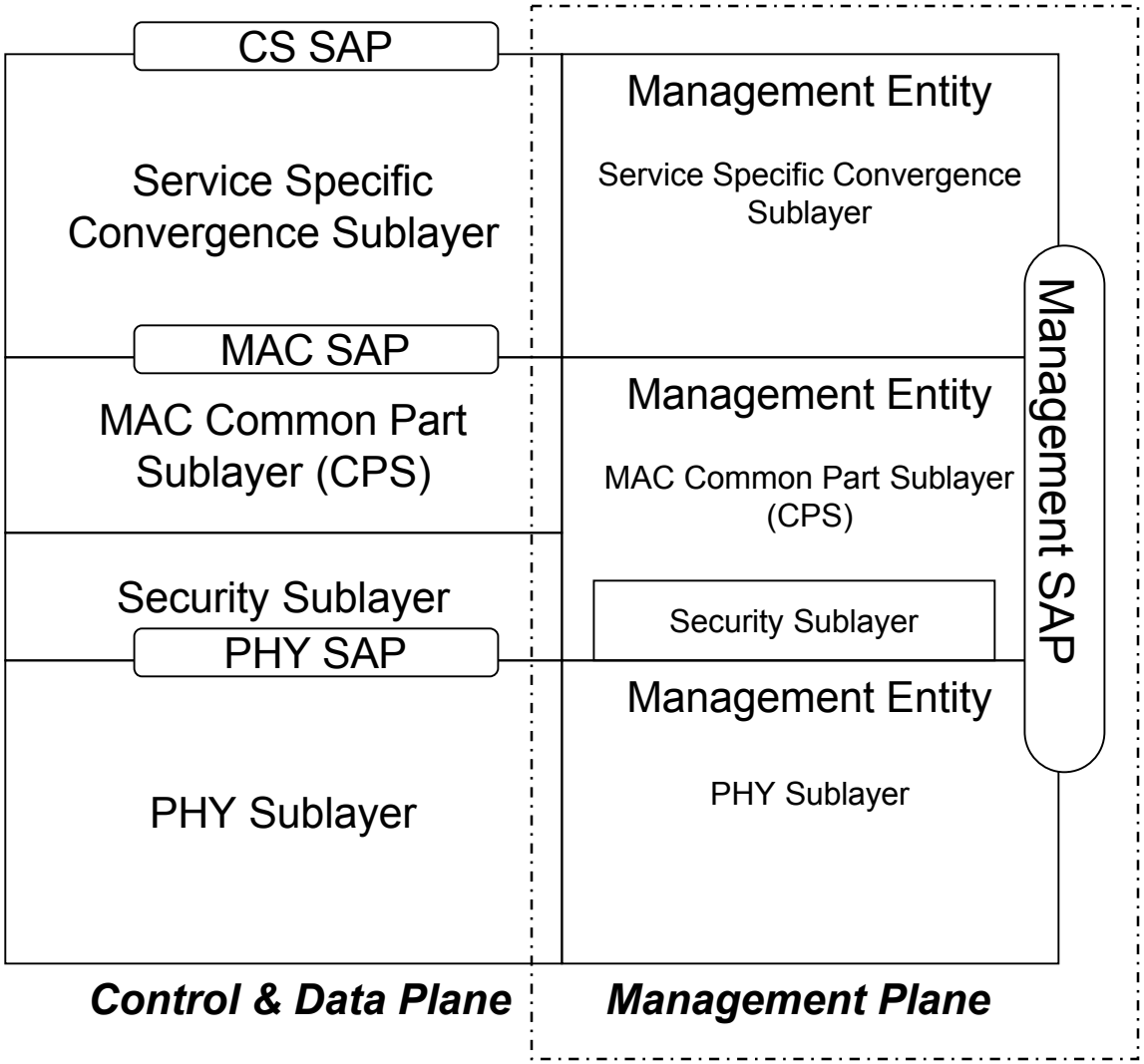
From the 802.16g PAR …

- **Amendment to Std IEEE 802.16-2004 as amended by P802.16e**
  - i.e. Reference models should be fully compatible with 802.16-2004 and 802.16e
- **… provides enhancements to the MAC and PHY management entities of IEEE Standard 802.16-2004, as amended by P802.16e, to create standardized procedures and interfaces for the management of conformant 802.16 devices**
  - i.e. Should limit itself to 802.16 MAC and PHY primitives that do not break compatibility with 802.16-2004 and 802.16e keeping layer-3 and above protocol layers should be out of scope except for informative reasons
- **… provide conformant 802.16 equipment with procedures and services to enable interoperable and efficient management of network resources, mobility, and spectrum, and to standardize management plane behavior in 802.16 fixed and mobile devices**
  - i.e. needs to clearly identify (and possibly prioritize) all categories of MAC layer manageability functions before taking in solution contributions; keeping all L3+ management plane functions out of scope
- **… facilitate cross-vendor interoperability at the network level for the management of 802.16 devices and networks**
  - i.e. MAC layer primitives that could be used in interoperable management systems

Simplified Reference Model



Architectural Model



Scope of 802.16g

Architectural Considerations

- Intent is not to specify a Network Management System, but primitives/procedures that enable such a system to be implemented
  - e.g. 1: Procedure for setting the Soft Handover threshold in a BS
  - e.g. 2: Procedure for Monitoring Connection Failures in a BS
- Management Primitives should be:
  - RAN transport and backhaul independent - however, such links are assumed to be secure with very low packet loss characteristics
  - RAN topology independent, and support any network operator type
  - Independent of Backend/L3 and higher layer core network
  - Applicable to License Exempt systems as well
  - Applicable to IPv4 and IPv6 systems and limiting assumptions should not be made.

What are 802.16g Primitives?

- Management SAP
  - Node Management Messages/Procedures*
  - Node Management IEs
- MAC
  - MAC IEs
  - MAC messages / procedures
- PHY
  - PHY Specific IEs

*A procedure may involve a sequence of messages

Candidate Management Categories (1)

- BS Configuration Management
  - System configuration
  - Admission control (CID, SFID Management)
  - BW Management (MAPs)
  - OTA QoS provisioning
  - Calibration and tuning
- Network Management
  - Event Management
  - MIBs and Database Management
- Location Management
  - GPS Geocodes
  - Locale information
- SS/MSS and BS Radio Resource Management (ala 802.11k)
  - Measurement and Control of Radio resources
  - Power Control

Candidate Management Categories (2)

- Mobility and Handover Management
  - Interfaces to support different levels of HO optimization
  - Neighbor List Management
  - Service Flow Context Management
- Paging Management
  - Calibration, Tuning
- Security Context Management
- Applications Configuration Management
  - Multicast and broadcast services

802.16g Out of Scope Areas

- Layer-3+ architecture/solutions for mobility, security, roaming etc.
- Specific 802.16 radio network topologies or backhaul link types
- MAC primitives to support 802.16 <-> Other radio network Roaming / Interworking scenarios
  - If needed, would be 802.21 scope
- New convergence sub-layers

Recommendations to Task Group

Adopt the process outlined below:

- Discuss and adopt a basic network reference model that is 802.16 operator-type agnostic
- Adopt informative combined fixed and mobile deployment and usage models to facilitate determination of scope of work
- Agree on management functional categories
- Issue call for detailed contributions