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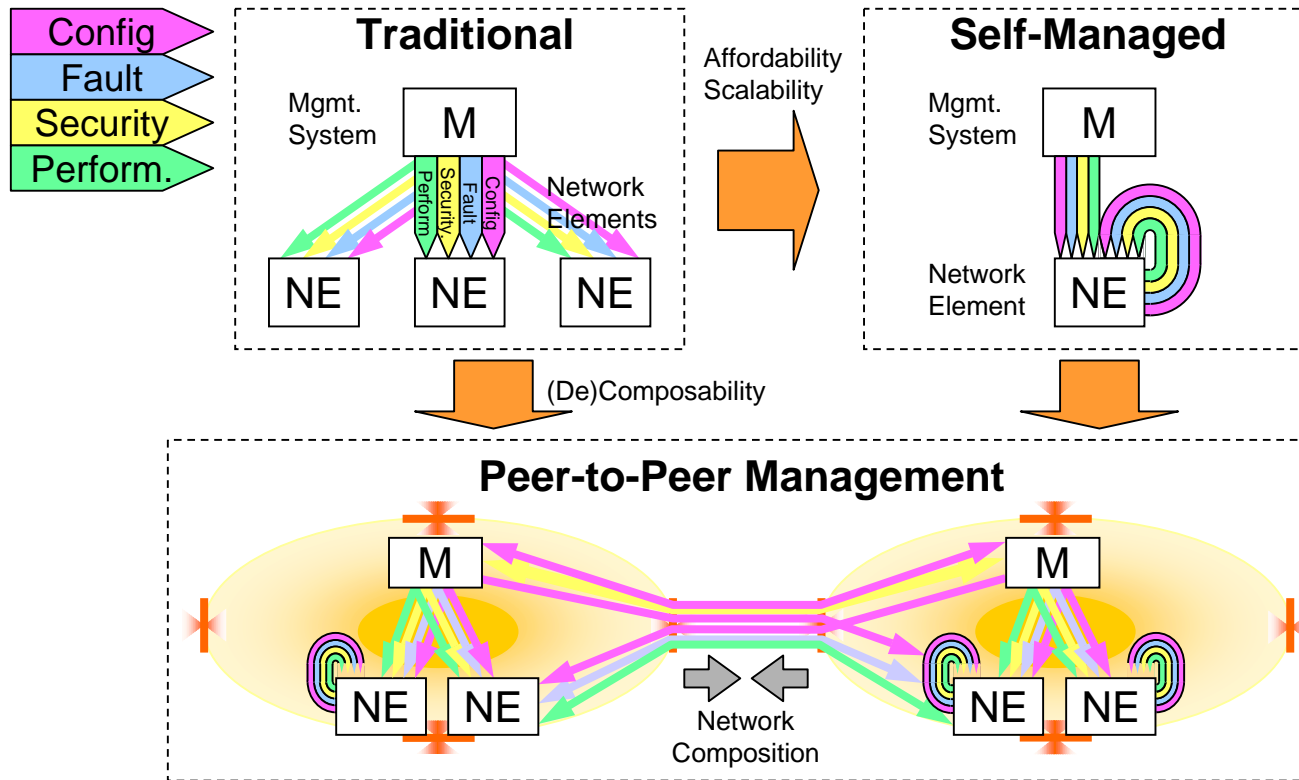
# *Key Issues and Challenges in Ambient Network Management*

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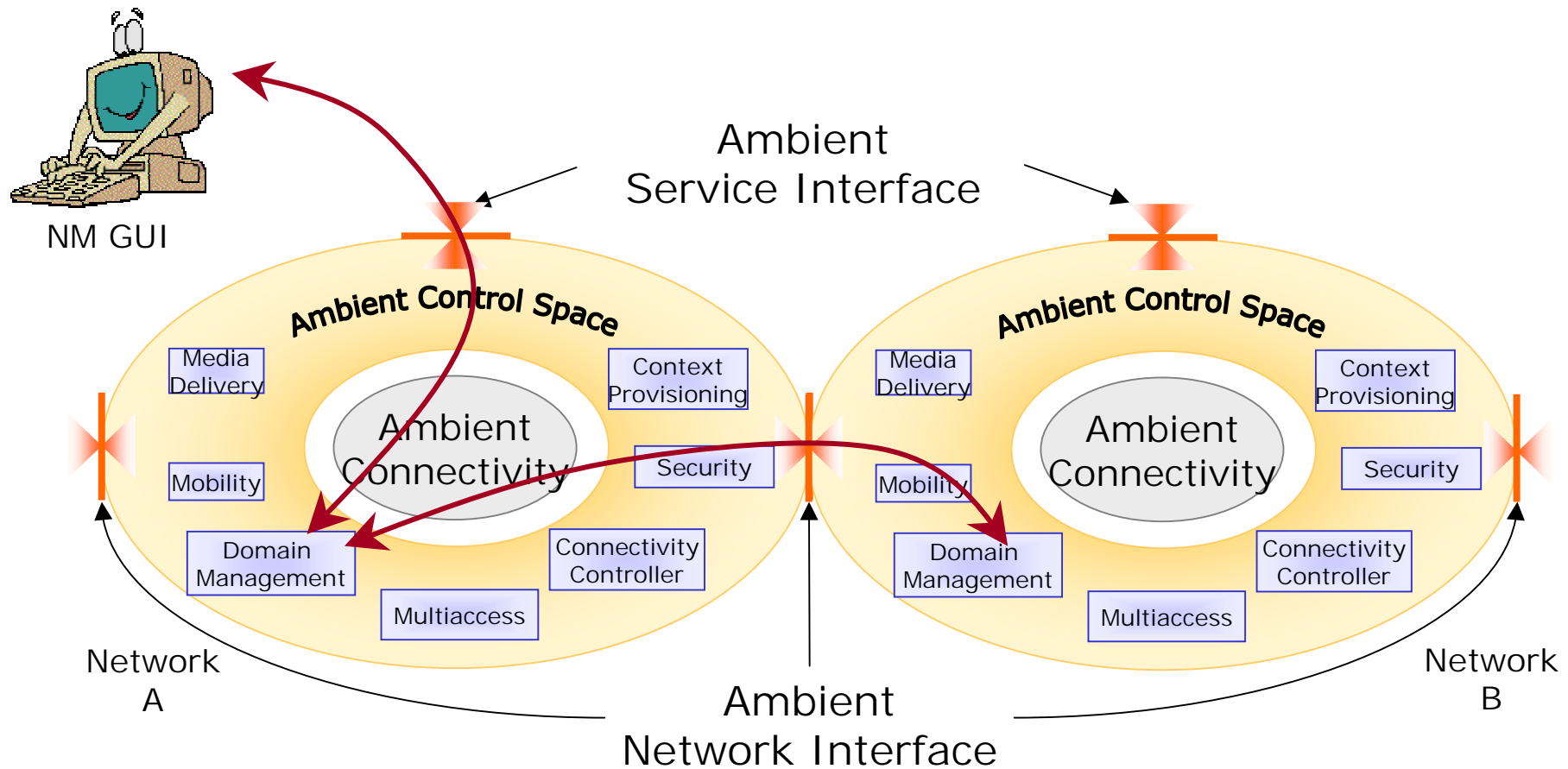
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- ❖ Exploration of network management technologies under the Ambient Network Constraints (dynamic Composition, Mobility of Networks, overlay networks)



## ❖ Management is part of Ambient Control Space





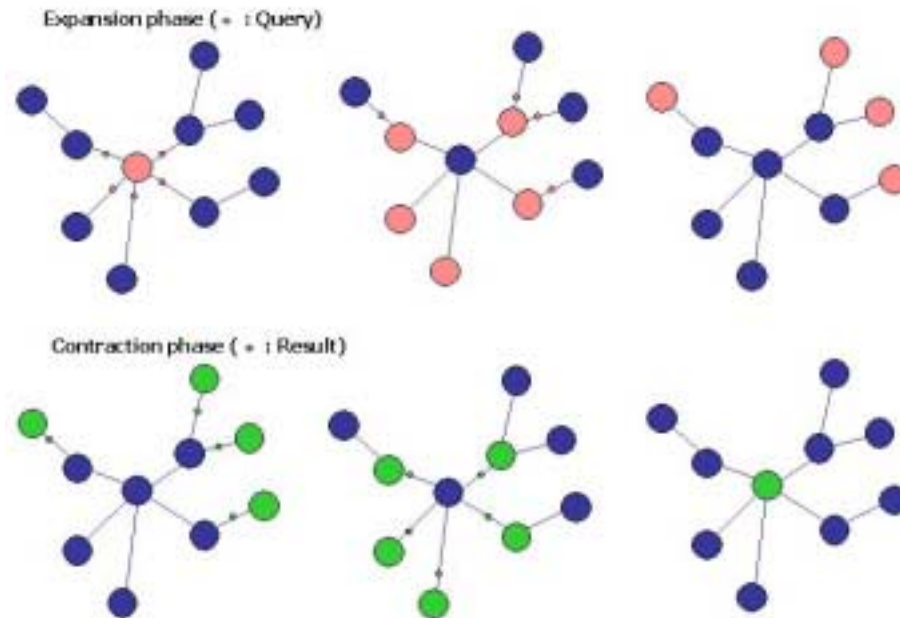
# *Management Challenges*

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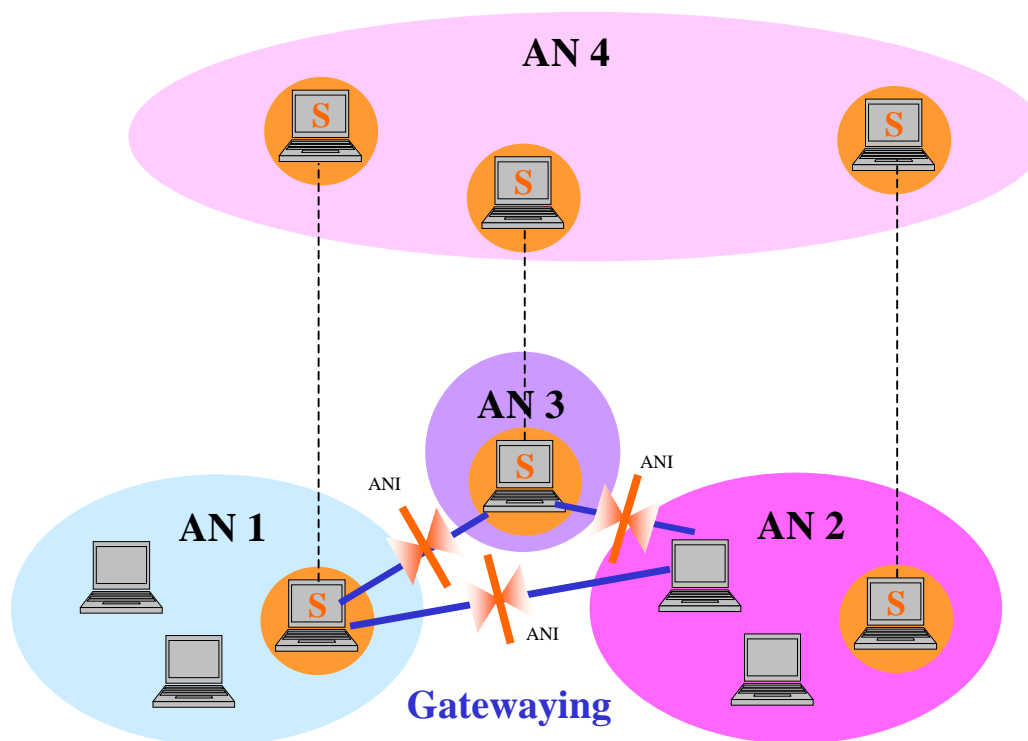


- ❖ Enable & manage dynamic network composition
  - Highly dynamic environments -> traditional management technology does not work anymore
- ❖ Enable & manage dynamic network services
  - Ambient Virtual Networking and overlay networks
- ❖ Reduction of Cost
  - Enable high degree of autonomy of network elements
  - Self configuration/ Plug & Play configuration
  - Optimization of dynamic networks

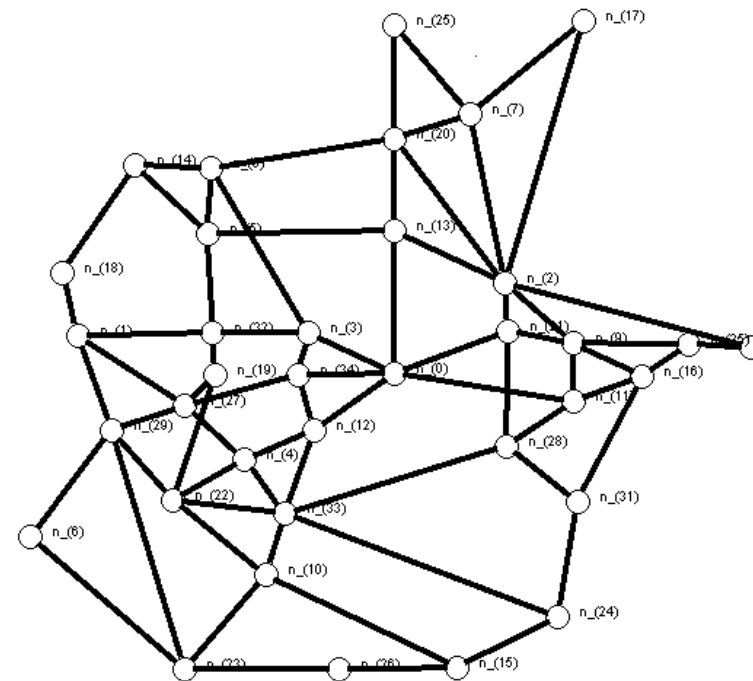
- ❖ Fully distributed management
- ❖ Separation of communication pattern and functionality
  - In analogy with OO programming it would be a base class (abstract class), where instantiations need to implement certain functions.
- ❖ It enables the collection, correlation, and processing of information from very large networks.
- ❖ Two applications: Real-time Monitoring and Overlay Network Setup



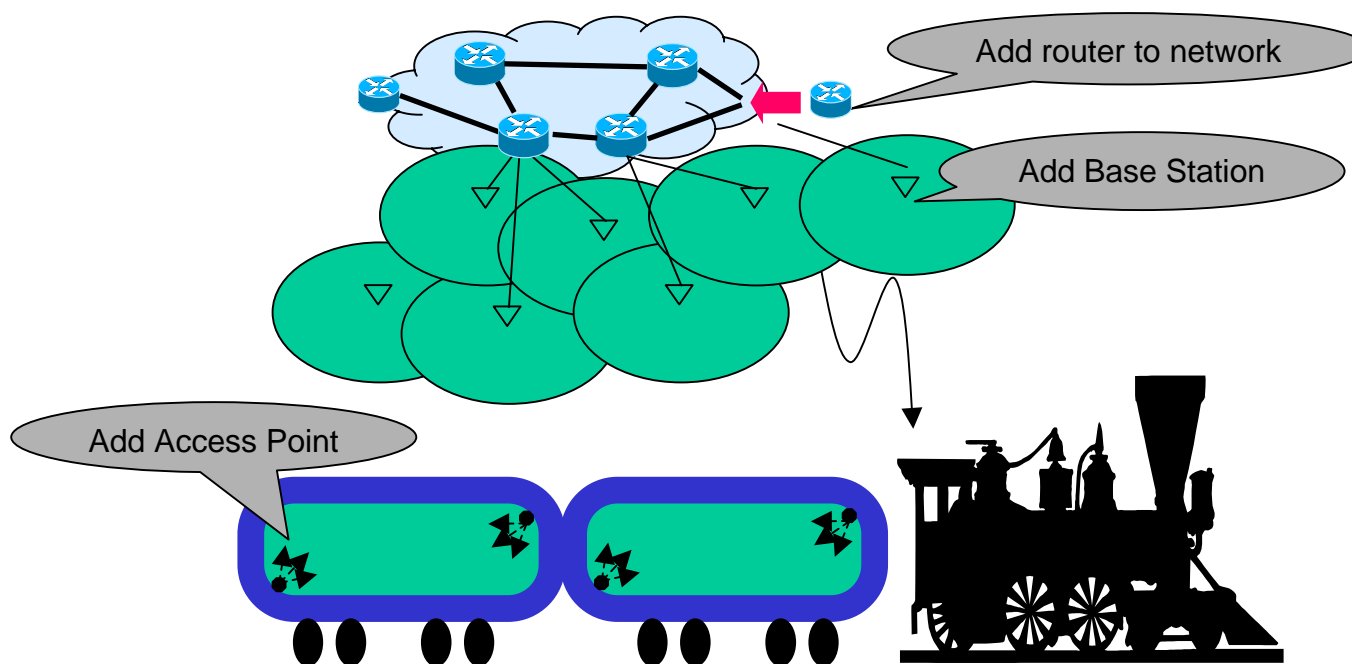
- ❖ Network resources composition performed through AN management
  - Composition of AN topology based network resources
  - Composition of AN services
- ❖ Structuring the AN as a Peer-to-Peer network
- ❖ Dynamic creation/self-organization of management overlays



- ❖ Challenge: dynamic change of topology and traffic pattern
- ❖ Global optimization
  - Utilize global information
  - Make a coarse optimization of the routing.
- ❖ Local optimization
  - Performed in each node
  - Based on local information
  - Fine tune routing parameters
- ❖ Scenario: Madrid Subway
  - Trains moving with people getting into and out of the train
  - Goal to optimize the routing in such a dynamic environment



- ❖ Self-configuration of routers
  - Locators (IP address spaces)
  - Routing protocols (e.g., OSPF)
- ❖ WLAN base station self-configuration





# Conclusion



- ❖ Dynamic ‘composition’ of network
  - Composition of AN topology based network resources
  - Composition of AN services ( I.e. network resource facing services e.g Ambient Virtual Networks)
- ❖ Capable of adapting to different environments
- ❖ Incorporating Self-configuring network components
  - Enable a higher degree of autonomy of network elements
  - (Un)Plug & Play configuration
  - Autonomic reconfigurability
- ❖ Management of dynamic Ambient Virtual Networking and overlay networks