JRA4 Update

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Network Performance Monitoring (NPM)

What is NPM?

- **Main function**
  - Provides network performance data
    - to high level middleware (JRA1)
      - *available bandwidth between end sites (CEs and SEs)*
      - *allows for calculation of equivalent of Network Cost Function in EDG*
    - to NOCs and GOCs
      - *end site and backbone statistics*
      - *e.g. round trip time, one way delay, available bandwidth...*
    - to end users
      - *end site statistics*
      - *allows simple examination of network problems*

What is NPM?

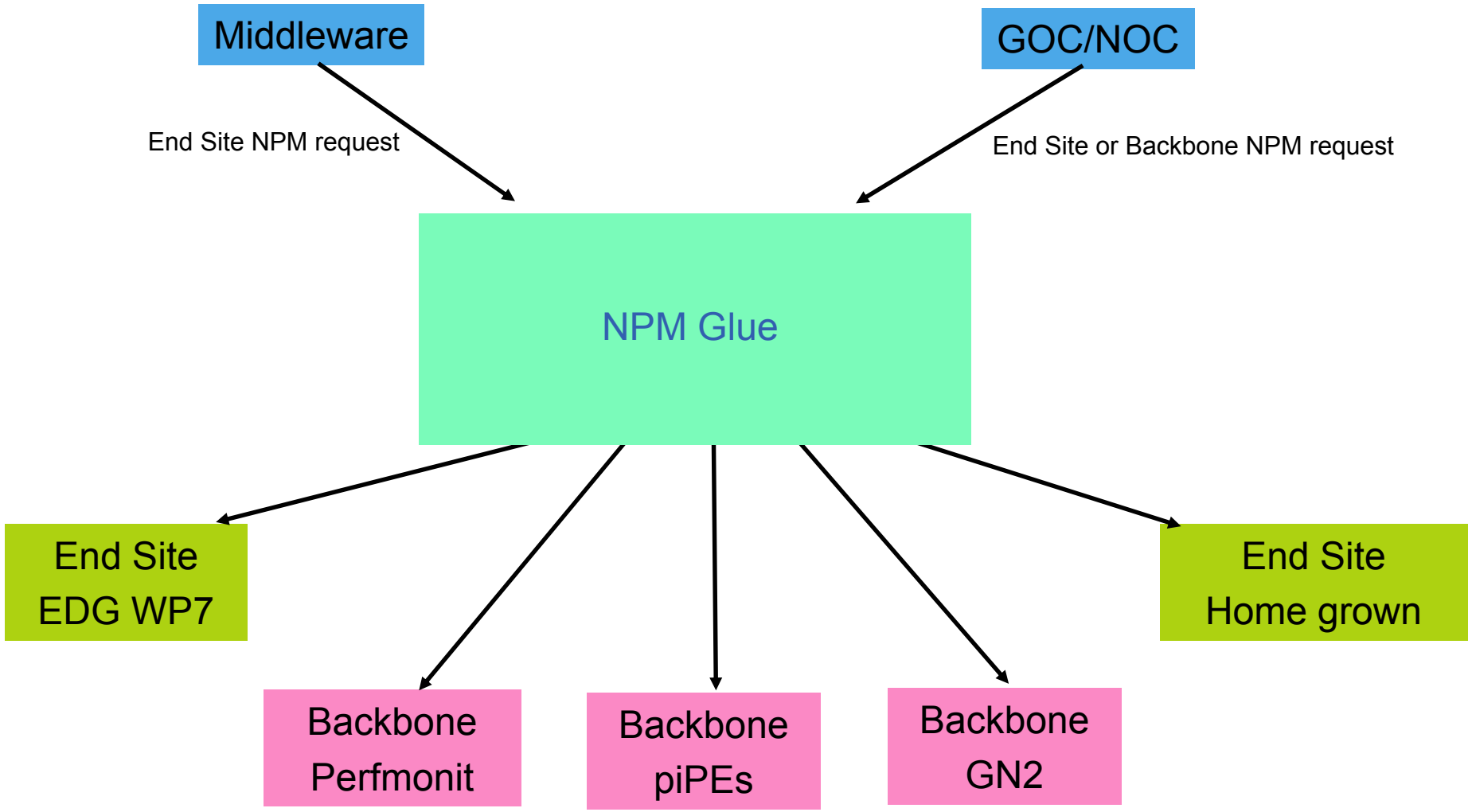
- **Additional functions**
  - Running on demand network tests
    - for NOCs and GOCs
    - useful for diagnosing faults
  - Alarms
    - for NOCs and GOCs
    - useful for diagnosing faults

Architecture and Interface

High Level Overview

- **Provides access to Network Monitoring Frameworks**
  - End to End Frameworks
    - e.g. PingER, EDG WP7, GridMon, IEPM-BW, home grown
  - Backbone Frameworks
    - e.g. perfmonit, GN2's own, Internet2, piPEs, home grown

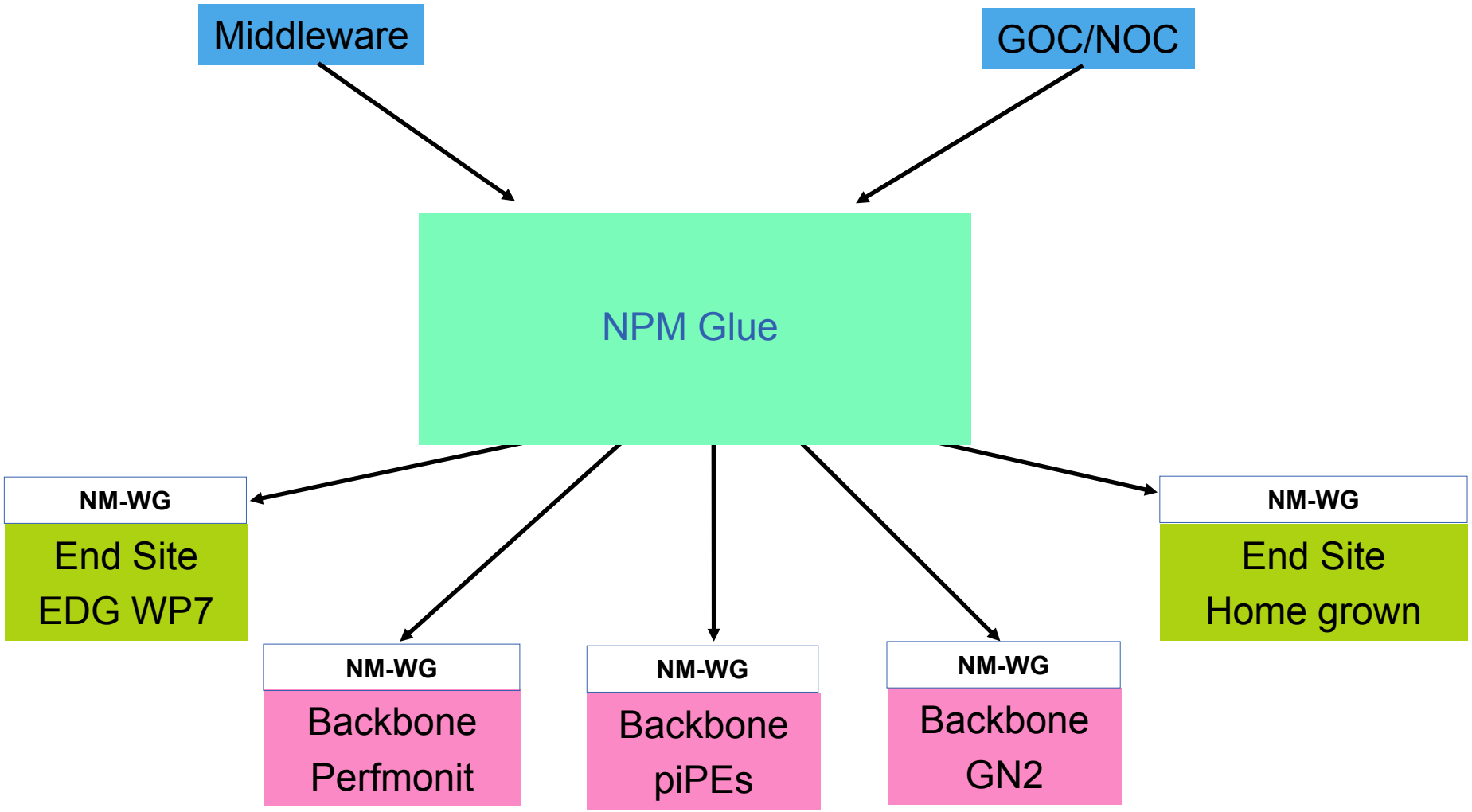
High Level Overview



Framework Interfaces

- **Problem: Each framework exposes own interface**
  - NM-WG
    - piPES, perfmonit
  - R-GMA
    - EDG WP7
  - Flat file
    - GridMon
- **Solution: Require that frameworks support NM-WG**
  - NM-WG is GGF working group
  - “NMWG will determine with of the network characteristics are relevant to Grid applications and pursue standardization of the attributes to describe these characteristics.”
  - Define a request/report schema to gather network monitoring statistics.

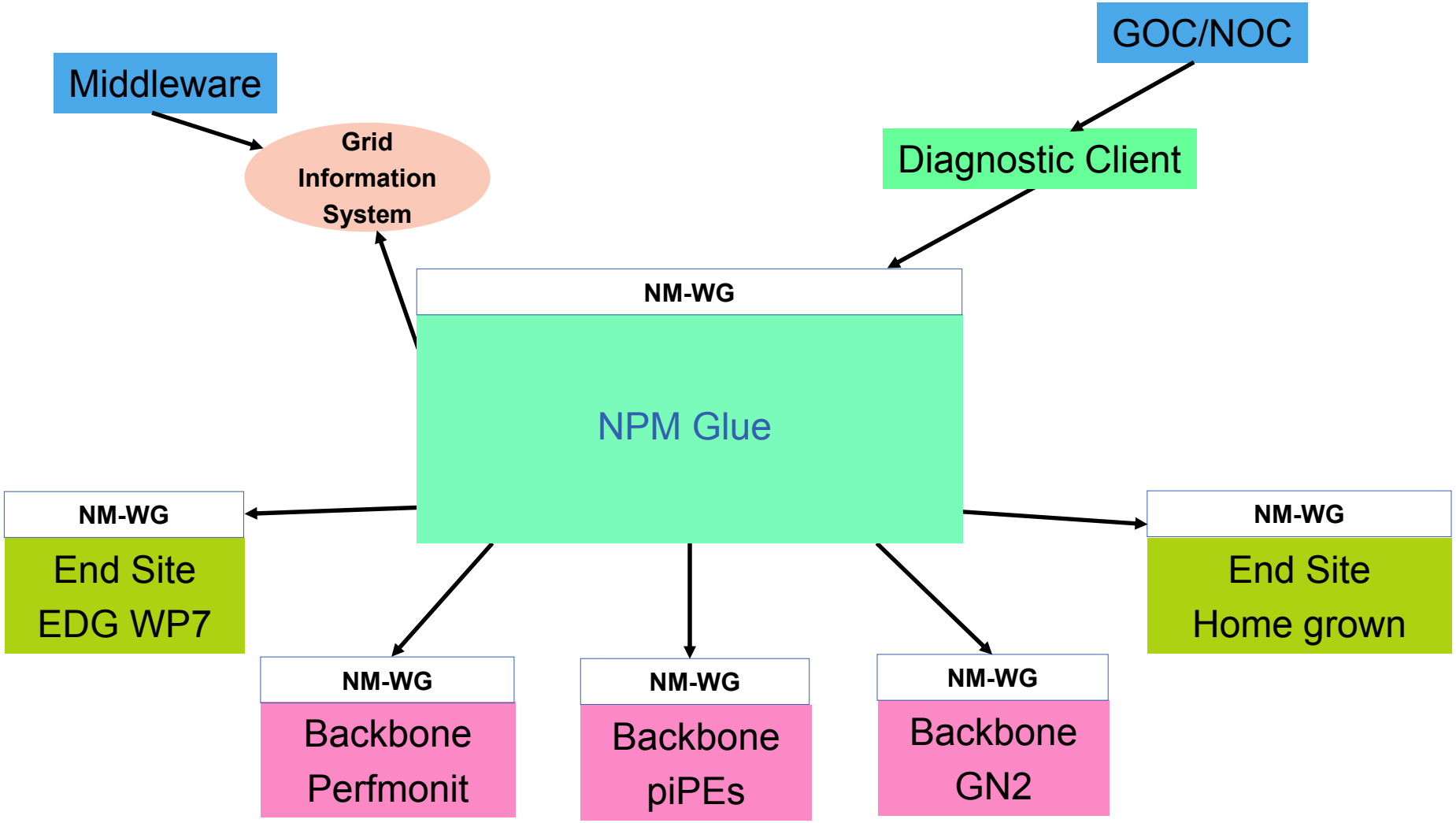
High Level Architecture



Interaction with NPM

- **High Level Middleware**
  - Similar to interaction with WP7 in EDG
    - End site information published to a Grid Information System (GIS)
    - HLM retrieves information from GIS
- **NOC/COG**
  - Interacts with diagnostic client
    - Allows measurement to be built up from along a route
    - Require backbone as well as end site information
    - Will talk directly to NPM Glue
- **End users**
  - Interacts with simple client
    - Provides information on current state of the network
    - Will talk directly to NPM Glue

High Level Architecture – take 2



Bandwidth Allocation and Reservation (BAR)

What is a BAR service ?

- The BAR service will allow (JRA1) Higher Level Middleware (HLM) to reserve network services between two end points.
- Middleware, for example, can use this service to request reservations on guaranteed bandwidth between two end-points during a certain period of time.
- Or it can use this service to reserve a transfer of given volume of data within a given period of time between two end-points.

BAR Requirements

- **Time-windowed bulk transport**
  - Guarantee of *average* bandwidth, B, starting at time S and ending at time E.
  - 'Guaranteed and Configurable Bandwidth' requirement from the joint document.
- **Time-windowed bandwidth guaranteed transport**
  - Fixed *guaranteed* bandwidth, B, starting at time S and ending at time E.
  - 'Guaranteed Delivery Time' requirement from the joint document.
- **Time-windowed high reliability transport**
  - Option to guarantee a very high reliability. In other words, an option that provides better Mean Time Between Failures (MTBF).
  - 'Restoration after Failure' requirement from the joint document.

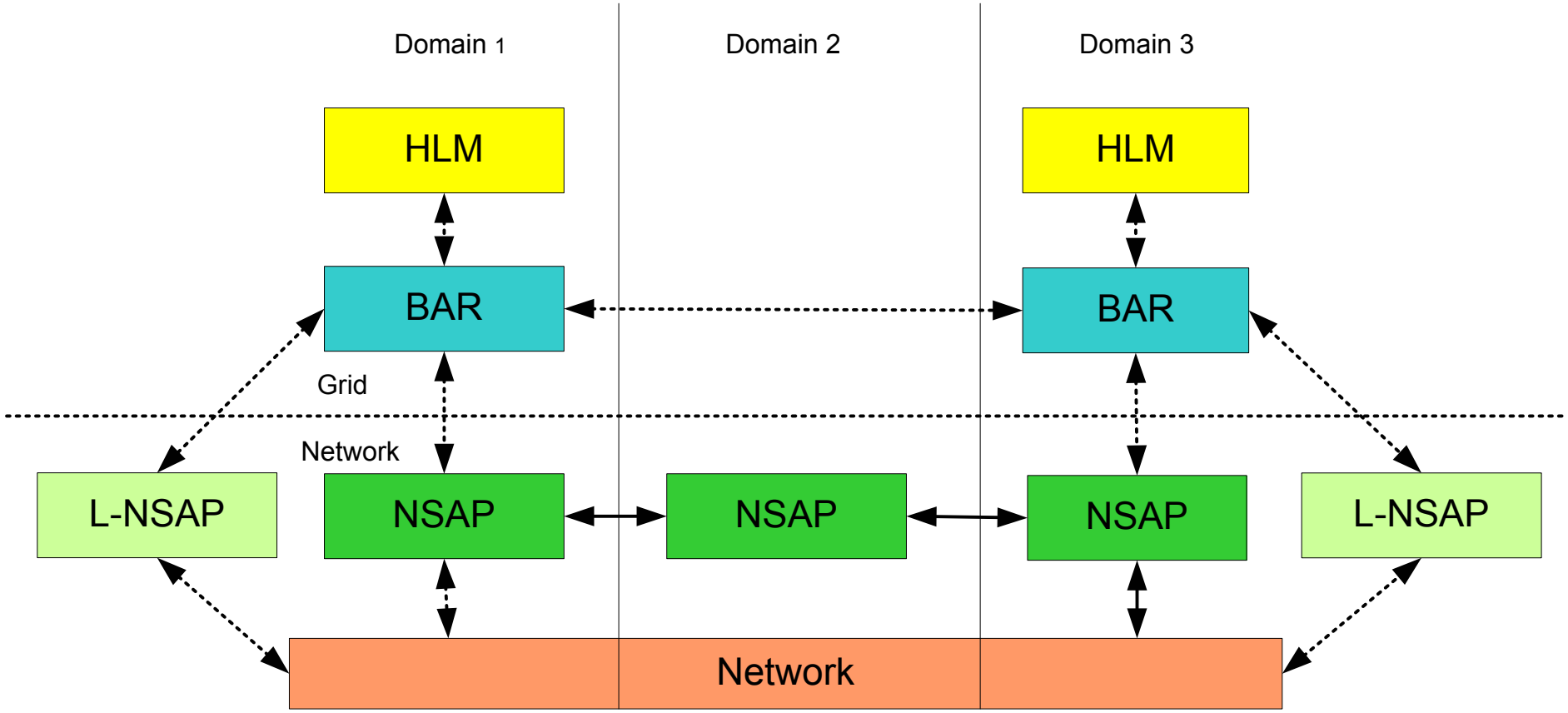
BAR Requirements

- **Confidential transport**
  - Implement a high confidentiality connection option.
  - ‘Encryption During Transmission’ requirement from the joint document.
- **Long term mission critical transport**
  - Minimum possible latency and very high reliability over a long period.
  - ‘Long Term Low Latency Low Bandwidth QoS’ requirement from the joint document
- **Time-windowed delay/jitter sensitive transport.**
  - Low latency and jitter, starting at time S and ending at time E.
  - ‘Long Term Low Latency Low Bandwidth QoS’ requirement from the joint document

Architecture and Interface

An architecture for BAR

- **An overview of how BAR fits into rest of the architecture**

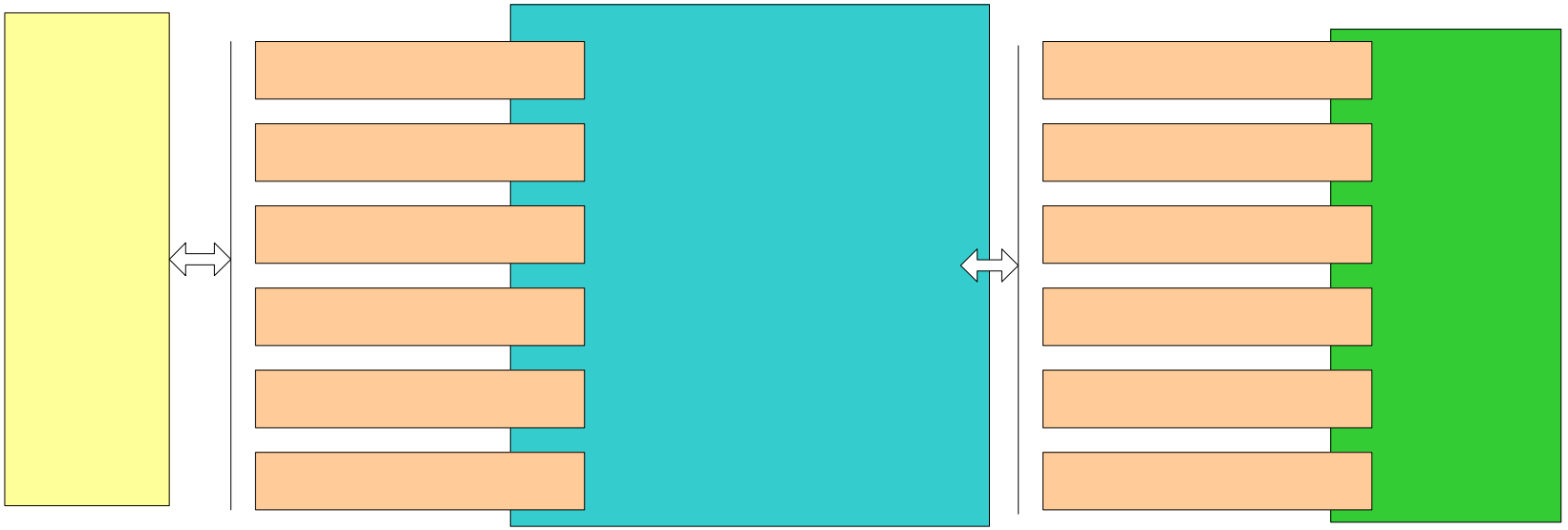


Interface to BAR

- **The document DJRA4.1, "Specification of Interfaces For Bandwidth Reservation Service", shows the current view on the BAR interface.**
  - Absolutely not cast in stone
  - https://edms.cern.ch/document/501154/1
- **The document gives detailed explanation of types of reservation services offered by BAR**
- **Please send comments to:**

  project-eu-egee-jra4@cern.ch

BAR Web Services



- **JRA4 BAR translates HLM to NSAP and vice versa**
  - It assumes the HLM (JRA1) and the NSAP (GN2) functionality.
  - As a result, some of the requirements may not be possible to be catered for, as the necessary Network facilities may not be available within the EGEE timeframe

RequestS

ModifyS

CancelS

Port Types

- **RequestService makes initial request**
  - E.g., to reserve a guaranteed bandwidth between two end points.
- **ModifyService**
  - Complex task we need to understand better
  - Prototype due Feb ’05 will help
- **CancelService**
- **QueryService**
- **Notification**
  - Start/end times
  - Failure of request

Issues

Issues

- **Requirements clarification and prioritisation**
  - Collaboration with GN2, EGEE::SA2 and EGEE::JRA1 mainly
- **Authorisation and Authentication**
  - JRA1 will use VOMS
  - Network is likely to use Shibboleth or PERMIS
- **WS-Agreement**
- **To integrate or not to integrate?**
  - BAR and NPM should share AAA architecture, perhaps implementation
  - Do they really have anything else in common?