SA2 and JRA4: Network Services

P. Clarke
J-P. Gautier
K. Kavoussanakis

Introduction

- **2 network-related activities in EGEE**
  - SA2: Network Resource Provision
  - JRA4: Network Services Development
- **This talk:**
  - Overview of activities
  - Successes and Issues
  - External relationships and collaborations

Activities

- **SA2**
  - Technical Network Liaison Committee
  - SLAs EGEE ⇔ Network (Geant + NRENs)
  - Requirements Survey & Network Services Survey
  - QoS Experiment

- **JRA4**
  - Bandwidth Allocation and Reservation
  - Network Performance Monitoring
  - IPv6 Uptake

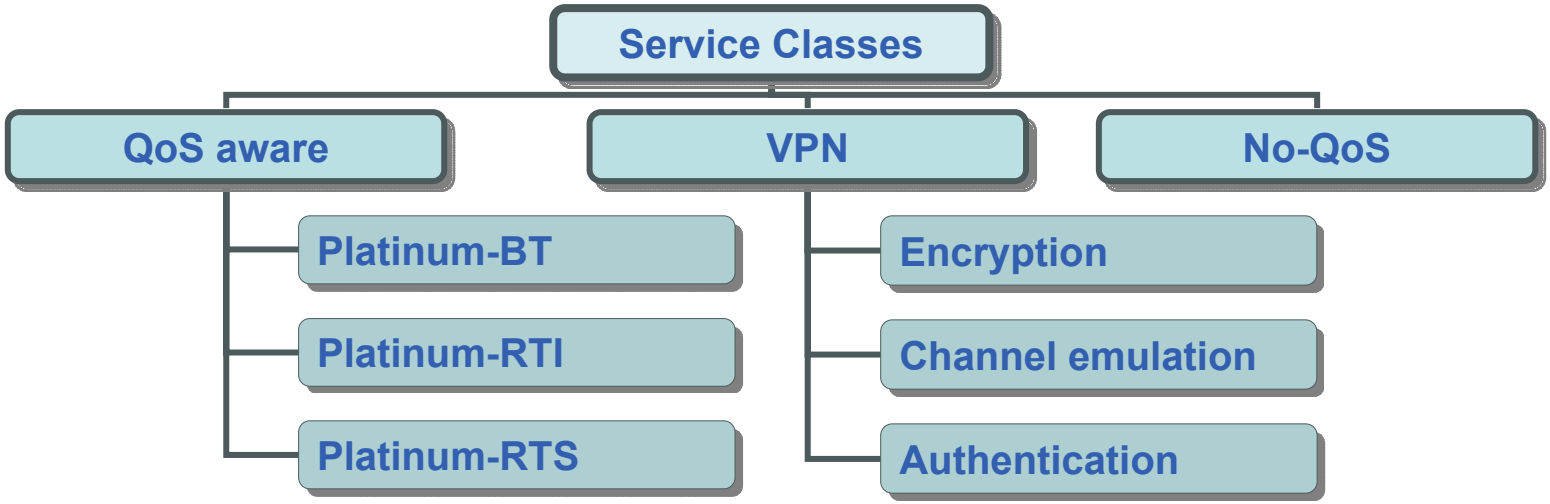
Building important working relation between EGEE and the network providers (Geant + NRENs)

SA2 Activity

- **SA2 ensures EGEE access to network services provided by Geant and the NRENs to link users, resources and operational management:**
  - To go beyond existing best effort IP service to meet the needs of a production-level grid network
  - To arrange Service Level Agreements (SLAs) between applications, SA2 and DANTE/NRENs
  - To define and implement a network operational interface between GN2 and EGEE.
- **Does this by managing the relationships between EGEE and Geant/NRENs:**
  - Technical Network Liaison Committee set up (MSA2.1)
    - To provide an efficient place to deal with “practical” issues of interface between NRENs and EGEE (Network SLAs, Network Services)
    - 8 members: EGEE (SA2, SA1, JRA4), Geant/NRENs (DANTE, DFN, GARR, GRNET), CERN
    - 2 meetings in Cork and Den Haag.

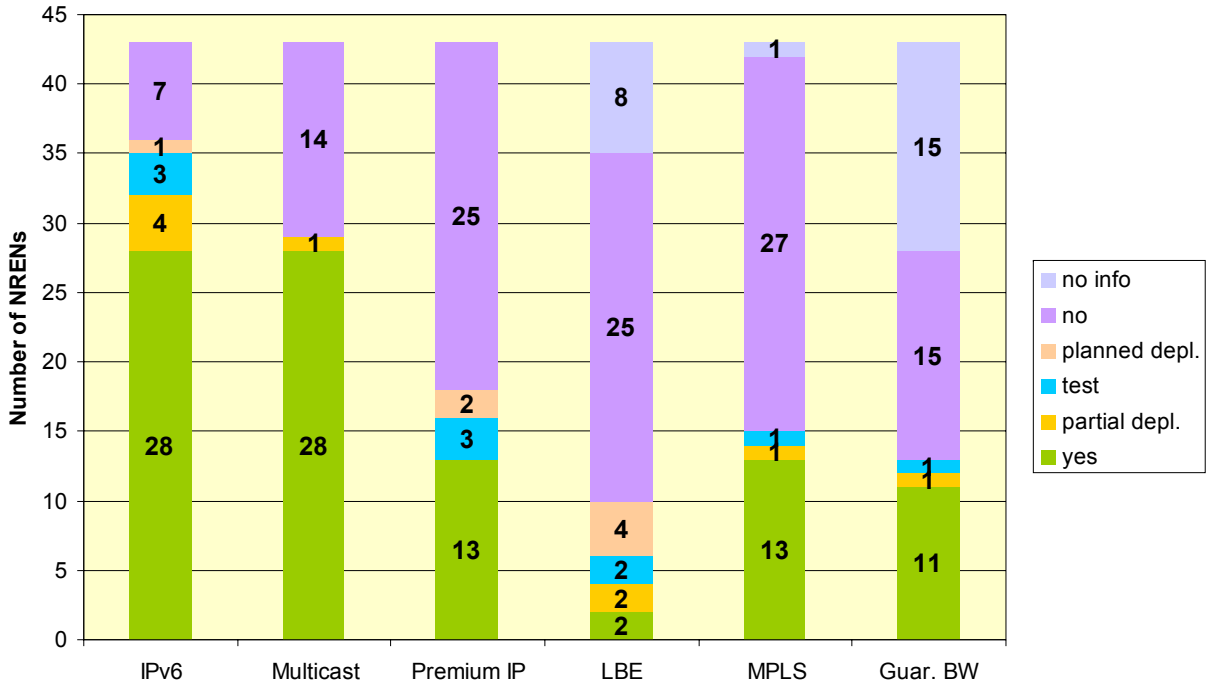
1st steps towards SLAs (DSA2.1)

- **First survey of network requirements complete**
  - A SA2-JRA4 workgroup has gathered 36 requirements, mainly on QoS, Bandwidth allocation and Network Performance Monitoring
  - Common SA2/JRA4 PM6 deliverable (DSA2.1/MJRA4.2), updated PM10 https://edms.cern.ch/document/495204/
  - These requirements are available in Savannah.
- **First service classes identified**
  - "User oriented" service classes, not "network classical classification",
  - These classes are applicable on the interface between the application and the middleware.



EGEE and NRENs services

- **European network services survey, 43 NRENs concerned:**
  - Questionnaire sent to Geant/NRENs; Data extracted from the TERENA compendium



- **Situation of some EGEE sites in this context:**

EGEE sites	IPv6	Multicast	Premium IP	LBE	MPLS	Guar. BW
20 “big” RCs 8 countries	Today: 100%	Today: 100%	Today: 20% Plan: 60%	Today: 0% Plan: 35%	Today: 40% Plan: 10%	Today: 50% Plan: 0%
12 Biomed RCs 4 countries	Today: 100%	Today: 100%	Today: 42% Plan: 58%	Today: 0% Plan: 25%	Today: 42% Plan: 17%	Today: 42% Plan: 0%

Network actions

- **A real network QoS use case in EGEE**
  - Application: GATE (Geant4 Application for Tomographic Emission)
  - NRENs involved: Renater, RedIris, Geant
  - Aim:
    - To have a better approach for the SLA processing
    - To get better specifications for network requirements to the middleware (JRA1/4)
    - To allow JRA4 to validate the Bandwidth and Allocation model.

- **Initial model for network service usage (MSA2.2)**
  - A mapping of the EGEE services classes to the NRENs services classes:
    - Platinum-RTI and Platinum RTS to Premium IP (PIP) service
    - Platinum-BT to the Best Effort Service or LBE service
    - No available solution for VPN Encryption and Authentication
    - For channel emulation, the service is only available in some parts of the networks.
  - A generic model for network resource management taking into account different provisioning mechanisms from GN2
  - A Service Level Specification (SLS) template which will be the basis of the technical part of SLAs.

SA2 actions for the next period

- **SLA definition, implementation:**
  - Based on the previous work and the responses from EGEE and GN2 to some open issues (procedures, demarcation point…),
  - Definition in cooperation with GN2 (DSA2.2 for M12),
  - Implementation and revised SLAs in the 2nd year of EGEE.

- **Operational interface between EGEE and Geant/NRENs**
  - SLA agreements processing, SLA monitoring
  - Trouble Ticket system & reporting procedures.
  - Aiming for a theoretical schema approved by the partners (M12)
    - Mainly we work with the prospect of having a single user-support in EGEE (GGUS by FZK) and a single interface with GN2,
    - Nevertheless we are aware that not all the NRENs will be handled by this single entry-point.
  - To implement the operational model in order to have a mature network operational interface.

Network Performance Monitoring (NPM)

- **JRA4 is standardising access to NPM across different domains and frameworks.**
  - Potentially a world first
  - GGF NM-WG recommendation is the selected basis for standardisation

- **Various implementations of monitoring tools and frameworks are available; we are not building another one.**
  - e.g. EDG::WP7, SARA
  - e.g. Geant's perfmonit, Internet-2 PiPES)

NPM Status

- **User requirements capture documented PM6, together with SA2**
  - MJRA4.2: https://edms.cern.ch/document/476742/
  - Further refined, together with SA2, PM10
- **Interfaces to Network Monitoring tools and User/Middleware defined PM9**
- **Architecture defined PM9**
- **First prototype produced PM9**
  - Proves we can harness backbone and end-site tools together and demonstrates type of data available from such a tool
  - Not integrated into gLite; it is a behavioural study
  - DJRA4.2: https://edms.cern.ch/document/533215/
- **Currently working on enhanced prototype, due PM12 (MJRA4.3)**

Bandwidth Allocation and Reservation (BAR)

- **To allow reservation of a network service between two endpoints**
  - Assuming underlying functionality from the network providers
- **For EGEE-1 the network service will be “IP-Premium”**
- **Goal is to show first programmatic interface between EGEE and Geant**

BAR Status

- **Interfaces to Network and to Middleware defined PM6**
  - DJRA4.1: https://edms.cern.ch/document/501154/
  - Refined PM10

- **Working towards a first prototype for PM11**
  - Architecture drafted
  - Prototype not to be included in gLite; this will only implement interfaces with Network Plane and with Middleware
  - Compliant with JRA1 Software Engineering recommendations
  - On course for fully functional prototype, as per MJRA4.4 and MJRA4.5, due PM15

IPv6 Activities

As a matter of policy EGEE wishes to help the commission to promote the uptake of IPv6

- **Looking at lightweight activities**
- **Talking with 6NET to achieve a common purpose**
- **Awareness raising**
  - NA3 will organise IPv6 awareness raising sessions from 6NET
  - At CERN to start with, then elsewhere
  - 6NET have training courses as well
- **Limited testbed work if possible**
  - Cannot divert scarce effort
  - Demonstrate some elements of EGEE running over IPv6 ?
  - Perhaps JRA4 software ?
  - Perhaps something else ?

Standards and Relationships

- **Using GGF Network Monitoring WG (NM-WG) schemas for the definition of the standard interfaces**
  - Additionally feeding back into NM-WG with our experiences
- **NPM and BAR webservice-based**
  - Compliant with WS-I standards, as per JRA1 recommendation
  - Collaboration with JRA1 to emulate (if not adhere to) WS-Agreement behaviour for BAR
- **Collaboration with GN/GN2 across SA2 and JRA4**
  - E.g.: GN instrumented their perfmonit backbone-monitoring tool with our NM-WG based webservices interface
- **Relationship with 6NET for IPv6**

SA2 Issues

- **Limited network support at the middleware level**
- **The diversity of the site connectivity and the associated network services can make more complex the network user support.**
- **The fact that GN2 began six month after EGEE adds a difficulty for the EGEE networking activities.**
  - Collaboration so far has been good

JRA4 Issues

- **No provision in the EGEE contract for the maintenance or deployment of NPM tools on the EGEE fabric.**
  - JRA4 is currently short-listing available NPM tools to be deployed on the fabric.
  - JRA4 will collaborate with JRA1 to substantiate the need and location for the deployment of these tools and also with SA1 for their deployment.
  - Deployment central aspect of MJRA4.3 prototype (due PM12)

- **WS standards moving too fast**
  - JRA4 will aim to follow JRA1's recommendations in that aspect

Network Activities Summary

- Both activities running according to plan
- Good progress translating application requirements to network SLAs
- QoS experiment invaluable to both activities
- Aim to build on early NPM success, with prototype demonstrating our interfaces can accommodate heterogeneous types of network performance data
- Gaining from and feeding back to GGF NM-WG
- Building working relationship with Geant/NRENs