Strategy area: network technologies

> **Mission:** To future-proof the Janet network and fundamental network services.
>
> We will deliver this by maintaining relevant technological expertise and development capability within the group and focusing resources to create innovation in line with customer requirements. We will fully exploit the capability of the Janet6 optical infrastructure to support high capacity data projects along with more unconventional uses such as alien waves.

Context

Important science and 'big data' research projects, requiring dedicated multi-domain Lightpaths, continue to expand in both their number and size of their data. Such users are also beginning to seek service establishment in a more flexible, on-demand manner together with visibility of key network performance metrics. This is also true of general HE/FE customers wishing to better understand the performance of their Janet connections and network services. Correspondingly, Janet needs to progress from existing manual provisioning techniques and simplistic SNMP-based monitoring in favour of more dynamic, vertically integrated practices.

Some major trends and technologies also present Janet with imminent challenges:

- Recent standardisation efforts for carrier-grade service monitoring in Ethernet and MPLS;
- The popularity of Cloud services and ubiquitous mobile access, which may have implications for network architecture;
- Ever-increasing cyber security threats underline the importance of deploying and advocating secure standards and technologies such as DNSSEC and BGPSEC;
- The emergence of Software Defined Networking as a practical reality, together with major vendor support and standardisation of OpenFlow.

Customer requirements

- Practical, up-to-date advice and best practice guidance for new networking technologies in a fast-changing environment;
- Foresight across a range of key networking technologies to help plan networking strategy;
- A trusted partner for co-development and exploration of state-of-the-art network technologies;
- Support for establishing and maintaining excellence in networking research;
- Access to a rich set of network services beyond traditional layer 3, best-effort IP;
- The ability to monitor and manage network services with respect to utilisation, performance, traffic analysis and cyber security;
- High-performance, resilient and secure networking infrastructure to support world-leading educational services.

Strategic responses

- Maintain an expert overview of the technology landscape and identify networking technology trends, opportunities and ideas with the potential to meet community needs;
- Test and evaluate relevant networking technologies to assess their potential benefits and create a knowledge base from which to advise our community;
- Engage with internal stakeholders and our community to identify strategic networking requirements;
- Engage the market as an intelligent customer to influence provider roadmaps and behaviour, securing advantage for our community;
- Engage with relevant standardisation bodies to both track and influence developments in networking standards;
- Facilitate community members' network planning, and provide appropriate visibility into our own modelling;
- Sustain close relationships with core providers to help facilitate exploratory work in optical and IP technologies.

Current programme 2012-13

Project	Description	Priority
Automated provisioning	Delivering quick, direct, on-demand access to guaranteed bandwidth Janet Lightpath services.	High
Ethernet OAM	Leveraging new Ethernet standards to bring carrier-grade quality to wide-area Ethernet infrastructure.	High
Network monitoring strategy	Harmonisation of network monitoring and reporting needs across both internal and external stakeholders.	High
Service assurance	Validation and assurance of network services, with a particular focus on multi-domain Lightpaths.	Medium
IPv6 promotion	Supporting customers in deployment and management of IPv6 across their networks.	Medium
Transmission capabilities	Investigating techniques to sustain the agility and cost effectiveness of the transmission infrastructure.	Medium
Software Defined Networking	Keeping abreast of developments in SDN and OpenFlow with a view to supporting our network research community.	Low
Future Routing and Addressing	Tracking routing and addressing developments for the future Internet and trialling appropriate technologies	Low