

Janet End-to-End Performance Initiative (e2epi) – Project Overview

Janet is a state-of-the-art national research and education network infrastructure, connecting millions of users who use a wide range of applications and services.

There is an increasing desire within the research and education communities served by Janet to use more demanding networking applications, such as real-time media or data streaming, low latency haptic applications, or bulk transfers of research data in the order of Terabytes or more.

Recognising this, Jisc launched the Janet End-to-End Performance Initiative (E2EPI) to support communities in making optimal use of the Janet network.

While some high performance networking requirements have been historically met through the our Netpath service (formerly the Lightpath service), Jisc also wishes to encourage communities to use the Janet IP network for such applications.

The Janet End-to-End Performance Initiative aims to:

- Identify existing and emerging communities that are running or seeking to run more demanding network applications on (and beyond) Janet;
- Seek out communities that are unaware the network is an option for their large-scale data transfers;
- Establish and share best practices in high performance networking with and between Janet's user communities, computing service departments and academic network researchers, encouraging greater levels of communication between these stakeholders;
- In doing so, raise awareness of the issues and factors affecting end-to-end network performance, including the transfer tools used, application behaviour, end system configuration and tuning, network protocols, local site network architectures, and the Janet infrastructure;
- Work with all interested parties to raise the 'high water mark' for network-intensive applications, in so doing promoting awareness of what is possible on the Janet infrastructure;
- Grow pockets of good practice on Janet, such that a UK Research Data Transfer Zone (UK RDTZ) is established within and between an increasing number of universities and research organisations connected to the Janet network
- Explore and seek to optimise the network performance characteristics for connectivity from Janet to cloud computing resources, such as AWS and Azure;
- Ensure that community expectations are realistic, providing the tools, information and assistance required to allow users to determine and manage those expectations;
- Offer specialist assistance to communities seeking to obtain better network performance for applications, either before a specific project starts or while a project is running;
- Establish and promote the use of appropriate Jisc-supported network monitoring tools, such as perfSONAR, to assist in the visualisation and, where necessary, troubleshooting of application performance across the Janet network;
- Consult with projects and communities, provide online resources, run mail list(s), and host workshops and meetings to support all the above.

Jisc recognises that there are a number of established communities with high-performance network requirements, which are already running such applications and achieving good results. In particular, GridPP is a very good example.

The Janet End-to-End Performance Initiative is seeking to build on this experience, and share best practices from it, with the goal of improving network performance for a wide range of applications run by a wide range of disciplines.

We will promote good principles as exemplified in ES.net's "Science DMZ" design pattern¹ as we seek to help establish and grow a UK RDTZ within and across Janet-connected sites.

We encourage all interested parties to engage with the initiative by:

- Contacting Jisc to discuss your specific high performance networking requirements, or for advice on any performance issues you are experiencing;
- Sharing your success stories with Jisc, so that we can document, share and promote them to other Janet communities;
- Joining the Janet End-to-End Performance Initiative email list, e2epi@jiscmail.ac.uk², where open discussion is encouraged on all aspects of network performance;
- Joining the Jisc Community group³ for the Janet End-to-End Performance Initiative, where we are building resources, advice and material on various aspects of network performance;
- Attending future Janet End-to-End Performance Initiative workshop meetings.

Presentations from workshops we have already held are available on the Jisc website, specifically from our End-to-End Performance workshop⁴, and our Campus Network Engineering for Data-Intensive Science workshop⁵. More events are being planned for 2017, including a hands-on perfSONAR workshop, and a second community-oriented end-to-end performance workshop.

Our end-to-end performance initiative is open to contributions from all of Janet's research communities, its connected site network operators, and network research academics. We also welcome input from communities beyond Janet.

Further information can be found on the Jisc project web site at:

<http://www.jisc.ac.uk/rd/projects/end-to-end-performance>

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¹ <https://fasterdata.es.net/science-dmz/>

² <https://www.jiscmail.ac.uk/cgi-bin/webadmin?A0=E2EPI>

³ <https://community.jisc.ac.uk/groups/janet-end-end-performance-initiative>

⁴ <https://www.jisc.ac.uk/events/janet-end-to-end-performance-initiative-workshop-19-oct-2015>

⁵ <https://www.jisc.ac.uk/events/campus-network-engineering-for-data-intensive-science-workshop-19-oct-2016>