

# 8th SIG-NGN Meeting

Monday 23rd May 2022

SIG-NGN is the Special Interest Group on Next Generation Networks.

This meeting of the 8th meeting of the SIG will be held virtually.

RECORDING

## Theme

### "Reaching where the fibre can't"

In this meeting we will consider connectivity technology and services for environments and applications where optical networking not possible or economically feasible. The includes low earth orbit satellite (LEOSAT) , packet networking architectures for 5G, and other mobile technologies. We will consider both the technologies and their applications.

## Quick Links

[All Presentations](#) (currently past meeting presentations.)

Checkout the discussion on [NREN.slack.com](#) ([sign up here](#))


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Contact the [NGN Steering Committee](#)

Registration (CLOSED)

Agenda (all times are in CEST)

Monday, 23 May 2022

Time	What's happening
14:45 - 15:00	Get a coffee - Testing audio & video
15:00 - 15:05 ('5)	<b>Introduction and welcome</b> - Rob Evans (Jisc) 
15:05 - 16:05 ('55)	<b>Low Orbit Satellites</b> <i>Host: Lars Fischer (NORDUnet)</i> <ul style="list-style-type: none"><li>HydRON project - Josep Maria Perdigues Armengol (ESA)</li></ul> <p>The ambition of the High throughput Optical Network (HydRON) project of European Space Agency (ESA) is to seamlessly extend terrestrial high-capacity networks into space. The concept aims to empower satellite networks by developing terrestrial networking capabilities and features, in order to interconnect all types of space assets by an "Internet backbone beyond the cloud(s)". Concretely, HydRON will take advantage of space assets to complement terrestrial high-capacity networks ultimately enabling the configuration of a worldwide and world-first 3-dimensional optical network interconnecting terrestrial networks with different (orbital) layers in GEO, MEO, LEO, and HAPS. The 3-dimensional optical network capabilities will revolutionize the SatCom sector and its related commercial business. This presentation will provide the current status of the planned HydRON Demonstration System (HydRON-DS) to be developed and launched by 2026. The HydRON-DS represents the initial stage serving the purpose to gradually demonstrate key technologies required to deploy a first (all) optical transport network at terabit-per-second capacity in space and the seamless extension of terrestrial fibre-based networks into space.</p>



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- Developing a simulation framework and efficient data transport for low-earth orbit (LEO) satellite constellations - George Parisi (University of Sussex)

In this work, we present our simulation framework for experimenting with LEO satellite networks that we built on top of the OMNeT++/INET framework, with support from the GEANT innovation programme. We discuss the various components of the framework along with challenges we faced in simulating network traffic and protocols with realistically sized constellations, and focus on related optimisations we introduced to eliminate substantial overheads associated with the constantly changing network topology. We present and discuss experimentation on network latency in different constellations and across different locations on Earth and describe significant challenges in designing efficient data transport protocols. Through experimentation we show potential limitations of existing data transport protocols when operating in LEO satellite networks. We propose a receiver-driven data transport protocol that combines in-network packet trimming with edge-disjoint path routing to provide efficient data transport and improve network utilisation. Finally, we discuss current and future work on delay-based congestion control and RaptorQ codes to efficiently support different types of communication.



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- Q&A discussion (15')

16:  
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16:  
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## 5G networks for R&E

Host: Mian Usman (GÉANT)

- Faelix / CloudNet - Marek Isalski

A reflection on helping to build and operate a 5G network to bring Internet access to some of the most challenging rural areas of the United Kingdom.



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- Extending ESnet to the Wireless Edge: Lessons Learned - Andrew Wiedlea (ESnet)

Science is increasingly moving outside of the boundaries of laboratories and fixed site user facilities - the proliferation of IoT and sensing capabilities is creating new opportunities to measure and understand complex environmental and energy systems. As the US Department of Energy's Research and Educational Network, ESnet started a program this year to study how we should integrate advanced wireless technologies and services into our capabilities. This talk will discuss that effort, as well as early lessons learned.



SIG-NGN May 2022-ESnet.pdf

- Q&A discussion (15')

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17:  
00  
(5)

**Wrap up, [Feedback](#), Summary and Next Steps - Rudolf Vohnou**  
(CESNET)



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17:  
00

***End***