TeraFlow

Contents

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101015857

Project updates

WP2 Use cases, requirements, architectures, business models analysis and data models

We have updated and improved the list of use cases for TeraFlow OS controller release 2. Some new device configuration use cases have been proposed including multilayer IP over optical topology discovery and inventory, vendor agnostic integration of disaggregated IP routers from ADVA using openconfig device models, full standard integration of microwave links from SIAE through ONF 532 SBIs and IETF NBIs, automated control of XR point to multipoint optical pluggables from Infinera and P4 routers.

New services include ACL (Access Control List) management, location aware context in flow management and optimal slice grouping of multiple tenants. Several topics have been updated, including QoS control and monitoring, traffic engineering including PCEP support for Segment Routing and compute integration. Moreover, functional requirements have been updated to match the new use cases.

Furthermore, we have suggested five preliminary business model canvases for four actor roles (HW provider, Netapp provider and TeraFlow SDN controller provider). They all indicate potential ways to extract revenues from potential customers also in a regime with full compatibility, e.g., enabled by TeraFlowSDN.

The providers of SW – NetApps - and TeraFlowSDN related services have two main business models. One is labour intensive addressing a market for consulting and integration. The other relies on IPR where it may be possible to use a license revenue model. We anticipate that the market for integration will be a mass market in the sense that most operators are potential customers. For NetApps and specific SDN features we assume that the potential customers are narrower, and that this is will be a niche market, potentially with a premium price.

WP3 – Life-cycle automation and high performance SDN components

WP3 is shaping the core modules of the TeraFlow SDN controller, aiming at a network operating system with advanced capabilities that will address deployment requirements beyond 5G networks.

The first version of the TeraFlow SDN controller was released in February 17, 2022 with the key highlights being:

- Network configuration storage (Context) microservice with persistent capabilities
- Network monitoring microservice following a distributed pub-sub architecture
- Support for OpenConfig, Transport API (TAP), and emulated SDN devices through a modular Device microservice
- Support for L3-VPN and TAPI connectivity services through a modular Service microservice
- Zero-touch device onboarding through the Automation microservice

Since the first release, WP3 is focusing on new exciting features in the core of the TeraFlow SDN controller:

- Redesigned Context and Monitoring microservices aiming at higher performance and scalability
- A new alarm subsystem provided by the Monitoring microservice
- A new Path Computation microservice handling network resource selection for one or more network connectivity services

- A new Traffic Engineering (TE) microservice based on Segment Routing (SR)
- New device drivers for P4 whiteboxes, ONF TR-532 microwave devices, and Infinera routers as well as OpenConfig updates for supporting ADVA routers and Access Control Lists (ACLs)
- Improved scalability of the Device microservice
- New connectivity services (i.e., L2-VPN, P4, Microwave) and support for Path Computation and TE
- A new Policy microservice based on the event-condition-action (ECA) policy model
- A new Slicing microservice focusing on transport network slices coupled with service-level agreements (SLAs)

WP3 plans to release this major TeraFlow SDN controller release before the end of 2022, stay tuned!

WP4 - Network security and interworking across B5G networks (NEC)

This work package deals with the design and development the TeraFlow OS components that are essential for network security, as well as with interfacing and integrating these components to other components in B5G networks. The following outcomes summarize the recent activities carried within WP4:

- In Task T4.1, a significant effort has been devoted to enhancing the initial design and integrating the distributed attack architecture with the rest of Teraflow core components (e.g., Service, Context, Monitoring and Device). In addition, the specification of how the centralized cybersecurity component will interact with other core components of the TeraFlow OS has been refined. This refinement resulted in input to the design of core components in WP3. Moreover, we have been working on defining mitigation strategies, both in the optical and packet layers, and how these strategies will leverage core components' functionalities. Finally, a complete set of experiments have been designed to demonstrate that SoTA attack-detectors based on ML can be compromised when exposed to black-box attacks that leverage Generative Adversarial Networks. Two different datasets were used (cryptomining and botnet attacks). We are working on a solution in the context of the Teraflow architecture to design new generation ML-based attack detectors that are resilient to the aforementioned sophisticated evasion strategies.
- Task T4.2 is developing the Distributed Ledger Technology (DLT) component of the Teraflow OS. We have implemented a permissioned distributed ledger based on the NEC blockchain, and we have validated read and write operations enabling clients to retrieve from and record data on the blockchain. Major effort was devoted to the integration and use-case demonstration that utilizes blockchain for network management in an automotive scenario. The latter (ongoing) activity faces the challenge of combining the transparency of blockchains with privacy requirements restricting the visibility of data to dedicated network entities.
- In T4.3, L3VPN service creation between the NFV Orchestrator implementation (OSM) and Compute component has been validated and currently is being enhanced to support other capabilities (e.g., L2VPN services, Transport API, advanced lifecycle management operations). Service activation between peering TF OSs to roll out inter-domain network services has been deployed. Additionally, studies on support of deterministic and performance isolated inter-domain traffic services has been investigated.

NEC

WP5: Prototype integration, demonstration and validation

CHALMERS UNIVERSITY OF TECHNOLOGY

The first half of 2022 had several activities related to WP5.

First, we released the first version of TeraFlow OS available to the public fully open-source. All the different components were integrated. Moreover, the code is fully tested following a Continuous Integration/ Continuous Deployment (CI/CD) pipeline developed within WP5 and integrated with the GitLab repository.

Second, TeraFlow OS was featured as a demo at OFC, the 2022 Optical Fiber Communication Conference and Exhibition (https://www.teraflow-h2020.eu/events/optical-networking-and-communication-conference-exhibition-ofc2022), which is the premier global event for optical communications and networking. The demo showcased TeraFlow OS zero-touch capability to manage devices and L3-VPNs. The audience could interact with the demo through a custom-made Web user interface that integrated Grafana showing the interactive and real-time monitoring of the created L3-VPNs. Internally, the demo fostered the integration of several components as well as the use of TeraFlow OS to control real equipment in CTTC and Telefónica premises. The video of the demo is available in our YouTube channel.

Finally, the activity on scenario integration and demonstration was kicked off by refining the workflows to be implemented, and the KPIs to be monitored by the end of the year. All the project partners are involved in at least one of the scenarios.

WP6 – Standardization, Dissemination and Exploitation

Atos

In terms of communication and dissemination, we have moved from the phase of raising awareness to that of keeping our growing community informed and engaged during these months. Our social media channels count already with 240 followers on Twitter and 120 followers on LinkedIn, that are being well informed about TeraFlow's published papers and participation in relevant conferences like FlexNGIA, OFC22, Layer 123 reunion congress, INFOCOM, EuCNC and NetSoft. We have also participated in external events and have organised own events/workshops in collaboration with other initiatives and projects (OSM ecosystem day in March or ICT-52 Workshop on 6G with Hexa-X, for example) or co-located within bigger and renowned venues (like MWC 22).

TeraFlow has continued closely monitoring standardization activities to assist with forming strategies and ensure that TeraFlow objectives are met, guaranteeing overall applicability and coherence of the project results. Partners are active in multiple groups in the IETF, which has already yielded results with two standards published and more on the way, and also in ETSI, ONF, TIP and OpenConfig. 2022 is being an outstanding year in terms of open source relations, as TeraFlowSDN has been launched as the new ETSI open source group end of May 2022. TeraFlowSDN group will be a valuable tool for several ETSI industry specification groups working on network transformation. Collaboration around the software will enable the alignment of goals, mutual feedback and will help to achieve TeraFlow's sustainability vision, as well as the fulfilment of partners' exploitation prospects.

Highlights of the period

TeraFlowSDN in ETSI

ETSI officially announced their hosting of the TeraFlowSDN open-source group. ETSI is officially recognized by the European Union as a European Standards Organization (ESO). With the participation of more than 950 member organizations worldwide - from industry, operators, academia, research, users and government agencies - ETSI provides a flexible platform to produce ICT standards and a space accessible to all market actors whose expertise and technical input is pooled to produce reliable technical norms for all, including industry, consumers and policy makers.

TeraFlowSDN will contribute to align common goals, get mutual feedback and accelerate standardization cycles and also aims to gain support and trigger collaboration with existing and future research projects in the 5G PPP and the Smart Networks and Services Joint Undertaking (SNS JU).

The kick-off meeting of this new group took place on 20 June 2022.

Check the TeraFlowSDN open-source group website

TeraFlow's contributions to technology benchmark and standarisation

Technology standards organisations are defining parameters indicative of new network characteristics to be achieved at an operational level; these are known as benchmark key performance indicators (KPIs). The definition of these KPIs helps to improve communication infrastructure and ensures interoperability by facilitating scalation and reducing deployment times and operation costs.

TeraFlow is involved in the TMV WG - Test, Measurement and KPIs Validation Working Group - founded as part of the 5G PPP effort. This group promotes commonalities across projects with a strong interest in Testing & Monitoring.

TeraFlow has actively contributed to the recently published - June 2022 - 5GPPP TMV WG White Paper "Beyond 5G/6G KPIs and Target Values". This paper provides an overview of standard network KPIs with defined target values for 5G systems plus KPIs collected from ICT-52 research projects aimed at B5G and 6G systems - including availability, policy, security conformance and network slicing. Read more in our blogpost.

Over the coming months, these KPIs will be used by the TeraFlowSDN controller framework and disseminated to the broader industry. In addition, TeraFlow will continue participating in several 5GPPP TMV WG activities during the project's life.

News & Events

ICT-52 Workshop on 6G

3 Feb 2022- Virtual

This workshop was organised by Hexa-X, the European 6G Flagship project, together with other 6G projects belonging to the 5G PPP – Smart Connectivity beyond 5G (ICT-52), which have the common challenge to go well beyond the 5G capabilities developed under 3G PPPP release 16 while also advancing on the development of Smart Connectivity systems as a platform for a Next-Generation Internet to support highly flexible connectivity infrastructure. Within the event, TeraFlow showed the presentation "TeraFlow use cases for a novel cloud-native SDN controller for beyond 5G networks".

MWC 2022 - FIRA Barcelona

28 Feb 2022 - Barcelona

MWC Barcelona is attended by global mobile operators, device manufacturers, technology providers, vendors, and content owners. MWC Barcelona is the place to be seen, exhibit ground-breaking products and technologies, and make remarkable connections with senior decision-makers, creators, and innovators in the industry. TeraFlow was exhibited in CTTC's booth (Hall 4 Stand 4C1 Booth 27).

OFC Conference 2022

06 March 2022 - San Diego, California, US

OFC is the largest global conference and exhibition for optical communications and networking professionals. For over 40 years, OFC has drawn attendees from all corners of the globe to meet and greet, teach and learn, make connections and move the industry forward. TeraFlow participated with the presentation of three papers and a demo titled "Demonstration of Zero-touch Device and L3-VPN Service Management using the TeraFlow Cloud-native SDN Controller".

OSM12 Ecosystem Day

09 Mar 2022 - Virtual

The OSM Ecosystem Day allows organizations in the OSM Ecosystem to share about their Open Source MANO experience and how OSM is helping them to achieve their goals. TeraFlow project was featured by Lluis Gifre and Ricard Vilalta from CTTC with the presentation "Demonstration of Zero-touch Device and L3-VPN Service Management Using the TeraFlow Cloud-native SDN Controller".

2022 Layer123 Reunion: Intelligent Network Automation Congress

26-28 Apr 2022- Madrid, Spain

Layer123 Reunion Congress examined the strategies of various sectors in the telecoms industry. It presented a balanced and objective perspective that exposes the real-world considerations and innovations evident throughout the entire ecosystem. TeraFlow was showcased in this event on 27th April in Track Two - Artificial Intelligence in the session "TeraFlow SDN: smart open-source connectivity form research to industry PoCs and standards" by Ricard Vilalta (CTTC), Oscar Gonzalez de Dios, (Telefónica) and Sergio González (Atos).

TeraFlow at 2nd IFIP/IEEE International workshop

29 Apr 2022 - Virtual

The 2nd IFIP/IEEE International workshop on Fully-Flexible Internet Architectures and Protocols for the Next-Generation Tactile Internet (FlexNGIA 2022) was collocated with IEEE/IFIP Network Operations and Management Symposium (NOMS2022). The goal of FlexNGIA project is to design a novel Internet architecture that harnesses recent technological advances in terms of virtualization, network softwarization and Artificial Intelligence (AI). TeraFlow was mentioned in Technical Session 1 which included a paper presentation of joint work of Telenor and NTNU carried out during our project "QoS-Aware Inter-Domain Connectivity: Control Plane Design and Operational Considerations" and in the Special panel on research projects on the design, management and security of future internet , 5G and beyond.

IEEE INFOCOM 2022

IEEE International Conference on Computer Communications 2022

02-04 May 2022 - Vritual

IEEE INFOCOM is a top-ranked conference on networking in the research community that covers both theoretical and systems research. TeraFlow project was featured with the Demo track paper: "Demonstrating QoE-aware 5G Network Slicing Emulated with HTB in OMNeT++", written by our partners Marija Gajic (NTNU), Marcin Bosk, Susanna Schwarzmann, Stanislav Lange (NTNU) and Thomas Zinner (NTNU).

2022 EuCNC & 6G Summit

07 Jun 2022- Hybrid Conference – Grenoble, France

The 2022 EuCNC & 6G Summit put together two successful conferences in the area of telecommunications: EuCNC (European Conference on Networks and Communications), supported by the European Commission, and the 6G Summit. The conference is sponsored by the IEEE Communications Society and by the European Association for Signal Processing and focuses on telecommunications from 5G deployment and mobile IoT to 6G exploration and future communications systems and networks, including experimentation and testbeds, and applications and services. It brings together research and industries and businesses. TeraFlow had a very active participation on this event. The project was invited to participate in a workshop, hosted a special session and was exhibited in booth #30.

OMS13 Ecosystem Day

15 Jun 2022 - Virtual

The OSM Ecosystem Day was organized by our sibling project Open Source MANO and TeraFlow was there with the presentation: “Launching a new ETSI Open Source Group for TeraFlowSDN (OSG TFS)”.

ETSI TeraFlowSDN Kick-off Meeting

20 Jun 2022 - Virtual

The kick-off meeting of TeraFlowSDN open-source group hosted by ETSI took place remotely on 20 June 2022.

8th IEEE International Conference on Network Softwarization (IEEE NetSoft’22)

27 Jun 2022 - Milan, Italy

NetSoft is dedicated to the theme of Network Softwarization, involving topics such as Software-Defined Networking (SDN), Network Function Virtualization (NFV), Cloud-Edge-Fog Computing, and Network Automation. It serves as a forum for researchers and international experts to discuss the latest trends, research directions, and leading-edge solution proposals related to this theme. Lluis Gifré presented the demo “Experimental Demonstration of End-to-end NFV Orchestration on Top of the ADRENALINE Testbed”.

Upcoming Events

OECC/PSC 2022

3-6 July 2022 -Toyama International Conference Center, Japan

The 27th OptoElectronics and Communications Conference is one of the foremost international conferences held annually in the Asia-Pacific region for the researchers and engineers working in the fields of optoelectronics, optical fiber transmission, and photonic network systems. This year, the 27 edition of the conference will be held jointly with Photonics in Switching and Computing (PSC). This joint conference attracts a lot of related engineers and researchers for most of the opto-electronics and communication field.

SIGCOMM 2022/FIRA Workshop

22-26 August 2022 - Amsterdam, The Netherlands

ACM SIGCOMM is the flagship annual conference of the ACM Special Interest Group on Data Communication (SIGCOMM). The 1st Workshop on Future of Internet Routing & Addressing (FIRA)will be co-located to this event.

ECOC2022 European Conference on Optical Communication

18-22 September 2022 - Basel, Switzerland

The 48th edition of the European Conference on Optical Communication (ECOC) returns this year to the heart of Europe This is the continent's largest event in the field and one of the most prestigious and traditional events on optical communications worldwide.

Meet our partners

IN THIS SECTION WE WILL BE PRESENTING THE PARTNERS OF THE CONSORTIUM, THEIR PROFILE, MAIN EXPERTISE AND CONTRIBUTION TO THE PROJECT. IN OUR THIRD NEWSLETTER YOU CAN KNOW MORE ABOUT TELENOR, TELEFÓNICA I+D, ATOS AND OLD DOG CONSULTING. SEE THE REST OF THE PARTNERS HERE.

TELENOR

Telenor is an international provider of high-quality telecommunications, data and media communication services to customers in 9 markets across Asia and Scandinavia with headquarter in Oslo, Norway. Telenor is also a leading provider of fixed-line and media services to the Scandinavian countries. Telenor is one of Norway's largest companies with revenues in 2019 of approx. NOK 114 billion and a work force of more than 20 000 domestically and abroad.

Xie Min

Olai Bendik Erdal

Håkon Lønsethagen

Hanne-Stine Hallingby

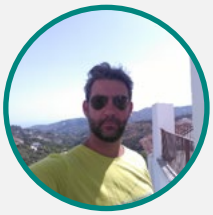
Telenor Research conducts research on new technology and service opportunities, changing consumer behaviour, changing regulatory regimes, the competitive environment and new technology platforms driving changes in the eco-system. Telenor Research has extensive cooperation with industry and other research establishments at home and abroad, securing access to leading edge knowledge. Telenor has experience in running experiments on wireless technologies, ranging from RAN and Core as well as impact from technology on business and ecosystems. Telenor also has experience in designing, building, testing and validating technologies and systems such as 3GPP, transport, NFV, SDN, Orchestration, operating support systems, business support systems, satellite systems and their interworking. Telenor are also involved in relevant SDOs such as 3GPP, ETSI NFV ISG and IETF, and in open source communities such as Open Source MANO (OSM). Finally, Telenor has experience in business model development and business validation.

Telenor Research has a lab focused on innovation, experimentation and testing of next generation network architectures leveraging NFV/SDN infrastructure, management and orchestration tools. A complete mobile network is running in the lab including vEPC and Cloud-RAN among other virtual network functions. The lab consists of one OpenStack cluster and 6 compute nodes. Additional servers are used for support services such as VPN and installation. The lab is available for use by TeraFlow. Telenor Norways owns and operates a mobile network in Norway consisting of 2G, 3G, 4G and the needed passive and active infrastructure for base stations, data centre and transport network.

Telenor brings network operator and service provider perspectives into TeraFlow. TNOR is contributing to analysis and studies both at technical and business level in order to leverage in a holistic way the components and mechanisms developed by TeraFlow, including integration of TeraFlow controller into an operational infrastructure, and the on-demand interaction with customers' application layer components. In particular, analysis in relation to traffic engineering, resource and admission control, as well as innovative ways of using analytics and smart contracts are being pursued. Real-time insights into QoE implications are driving these techniques. TNOR is leading the task on business and techno-economics.

TELEFÓNICA I+D

Telefónica I+D (TID) is the innovation company of the Telefónica Group. Founded in 1988, it contributes to the Group's competitiveness and modernity through technological innovation. To achieve this aim,the company applies new ideas, concepts and practices in addition to developing advanced products and services. It is the largest private R&D centre in Spain as regards activity and resources and is the most active company in Europe in terms of European research projects in the ICT sector.



Juan Pedro Fernandez Palacios

Antonio Pastor-Perales

Óscar González de Dios

Over the last few years, within the global market TID has grown to become a network of centres of technological excellence that stretches far beyond the Spanish borders. At the same time, it is working for the companies in the Telefónica Group in the rest of Europe, America and Asia. In addition to the numerous technical awards it has won since its foundation, the company received the Principe Felipe Award for Business Excellence in 2002. TID staff has a long experience in new network architectures, infrastructure security and security services, and is involved in several internal initiatives and collaboration projects related to them. The team also has a long experience in participating and contributing to standards organizations, reflected by the instrumental position played in the creation and the leadership in several ETSI committees and IETF WGs. Finally, our direct connection with a global organization providing Internet services at all levels will ease the collection of knowledge from additional experts, as well as the assessment and evaluation of results in real environments.

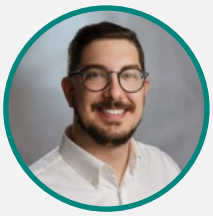
The test-bed at the TID labs (known as TID Future Network Lab) consists of three parts: an SDN/NFV test-bed, a metro-core network and a core control plane lab. The SDN/NFV test-bed deploys an environment for running virtualized network functions and NFV management software, SDN controllers and applications, as well as SDN-based forwarding elements. The infrastructure includes multiple high-end standard servers for NFV and SDN applications, five dedicated OpenFlow switches, and a scalable platform to support OpenVSwitch nodes on Intel-based micro-computers. The metro-core network setup is composed by IP/MPLS and optical devices with commercial products and white boxes.

TID is responsible to lead the project towards an industrial solution that will fulfil operators needs. To do so, TID is leading WP2 that deals with the use cases and requirements, architecture, techno-economic studies and data models. TID will contribute with the definition of TeraFlow architecture including YANG models to deal with the network functions for multi-layer and network slicing scenarios. TID is providing the facilities to demonstrate the use cases for Autonomous network B5G and Cybersecurity. As a key industrial partner, TID is also contributing to the standardization, dissemination and exploitation activities.

ATOS

Atos is a global leader in digital transformation with approximately 100,000 employees in 72 countries and annual revenue of around € 12 billion. The European number one in Big Data, Cybersecurity, High Performance Computing and Digital Workplace, The Group provides Cloud services, Infra-structure & Data Management, Business & Platform solutions, as well as transactional services through Worldline, the European leader in the payment industry.

Javier Moreno



Sergio González Díaz

Esther Garrido

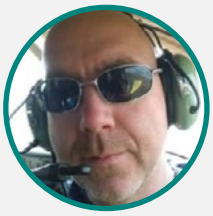
With its cutting-edge technologies, digital expertise and industry knowledge, Atos supports the digital transformation of its clients across various business sectors: Defense, Financial Services, Health, Manufacturing, Media, Energy & Utilities, Public sector, Retail, Telecommunications and Transportation. The Group is the Worldwide Information Technology Partner for the Olympic & Paralympic Games and operates under the brands Atos, Atos Consulting, Atos Worldgrid, Bull, Canopy, Unify and Worldline. Atos is a founding member of the European Technology Platform NESSI (Networked European Software and Services Initiative). Our company is a major partner in Future Internet-related initiatives, being member of the FI PPP Steering Board and Industrial Advisory Board. Since 2014, Atos is a founding member of the Big Data Value Association (BDVA), assuming the roles of Vice-presidency and Deputy Secretary-general. Additionally, Atos is a member of NetWorld2020, NEM, EFFRA, ERTICO, CELTIC, NIS, EOS, LSEC, ETSI, OW2, OASIS, Cloud Security Alliance, Eurocities, etc. Atos is a core member of the KICs EIT HEALTH and EIT DIGITAL. At national level, Atos is currently holding the Presidency and Secretary of PLANETIC for ICT, as well as the Vice-presidency of es. Internet for Future Internet technologies, and is member of several others, such as PESI, Logistop, eVIA for Health and Independent Living, NanoMed or the Spanish Railways Technology Platforms (PTFE).

ATOS is involved in WP2, leading task 2.4 and contributing to use cases definition and TeraFlow OS architecture. ATOS is participating in WP3, defining the high-performance SDN framework as task 3.1 leaders and contributing in the SDN automation and Transport network slicing tasks. ATOS is participating in WP4 in the interworking across beyond 5G Networks task. Besides, ATOS is working in WP5 providing support for the TeraFlow OS deployment in the testbeds and its integration, taking care of the CI/CD system and the three TeraFlow OS releases and is also contributing to the use cases integration and demonstration. ATOS as the WP6 leader is also focusing on the development and execution of viable plans for the TeraFlow communication, dissemination, and exploitation activities. It will help to achieve high measurable impact of the project results and to ultimately lead to a successful adoption of the TeraFlow innovative features for the operator's ecosystem. Furthermore, ATOS is supporting liaisons with other EU projects (using current collaborations), EU initiatives and 5GPPP, including standardisation bodies and opensource communities.

OLD DOG CONSULTING

Old Dog Consulting (ODC) is a privately held UK-based company founded in 2003 and incorporated in 2004. It provides guidance and leadership for researchers, implementers, and deployers of current Internet architecture, and emerging telecoms technologies. The core activity ODC provides includes five broad categories: Product Strategy, Research and Development, Standardisation, and Academic Contributions and Training. Old Dog Consulting also aids software and equipment vendors to develop product strategies. They provide user and market analysis to determine potential opportunities, then produce problem requirements specifications, definitions, functional architectures and product specifications.

Adrian Farrel



Daniel King

ODC research and development activities span a variety of organisations performing technology research, including academic institutes, early-stage tech companies, established commercial entities, service providers, and network operators. As organisations look to transition from research principles and concepts to product development, ODC provides leadership in the field of standardisation. Internationally recognised standardisation is critical for technology companies and includes advancing ideas, architectures, and protocols within multiple formal industry standards bodies, and informal (OpenSource) specification and software code ecosystems and forums. ODC also provides interpretations of existing and developing standards, gap identification and product planning and guidance to maximise the impact of emerging standards and specifications.

In TeraFlow, ODC is contributing to WP2 and WP3 chiefly within specific tasks (T2.2, T3.2, and T3.4. Within WP6 (in T6.2), ODC is taking a key role in steering and TeraFlow's participation in all standardization activities, advocating for work that supports TeraFlow's aims within international standards organisations, an activity that includes attendance at international standards meetings. An important contribution is to assist other partners in the interpretation of existing work within standards bodies. Within WP6 (T6.1 and T6.3) ODC contributes to dissemination and exploitation activities as minor co-authors and reviewers.

TeraFlow

linkedin.com/company/teraflow-h2020

twitter.com/TeraFlow_h2020

youtube.com/channel/UCz86mcBvscgA4tS_voXokyQ

teraflow-h2020.eu

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