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## **Key Issues and Comment**

### **TIP's packet transport group issues new RFIs in push towards open platforms**

One of the most important contributions that the Telecom Infra Project (TIP) is making to the push towards fully open, interoperable networks is to provide real world frameworks for deploying systems based on open specifications like those of the O-RAN Alliance.

Gathering and distilling detailed operator requirements, defining processes, facilitating reference designs, and enabling requests for information (RFIs) are just some examples of the valuable, pragmatic developments which are emerging from TIP's working groups, and which will make it more realistic and less risky for operators to start embarking on open networks.

We have already seen a series of RFIs and RFQs (request for quotes) in the small cell and 4G/5G RAN area, led by Vodafone and Telefónica. Now those two operators are joined by Deutsche Telekom, NTT Communications and Telia in issuing an RFI to transport network suppliers – traditional and new – to kickstart development of commercial optical systems based on disaggregated and open architectures.

The requirements for this technology have been synthesized from the activities of a project group codenamed Phoenix, which includes these five operators and other participants. Now vendors will be asked to submit information about products which could support those requirements while being open and interoperable.

The RFI will be designed to "evaluate industry readiness in upcoming months, with the target to have specification-compliant solutions ready for commercial deployments in the first half of 2021," according to a blog written by Víctor López Álvarez, a technology specialist at Telefónica, published by TIP last week.

The Phoenix group has published specifications and requirements related to transponders that can be deployed in open line system (OLS) architectures. Telia's Mattias Fridström said in an interview that the operators are hoping that new vendors will enter

the market to diversify the supply chain, with open specs important to lower barriers to that entry.

Phoenix is one of the projects taking place within TIP's Open Optical & Packet Transport (OOPT) group, of which López is the co-chair. Another is Cassini, which has focused on modular packet/optical transponders. The Open Networking Foundation (ONF) and IP Infusion both recently announced software support for Cassini, while Telefónica Perú is trialling a Cassini transponder from Edgecore Networks.

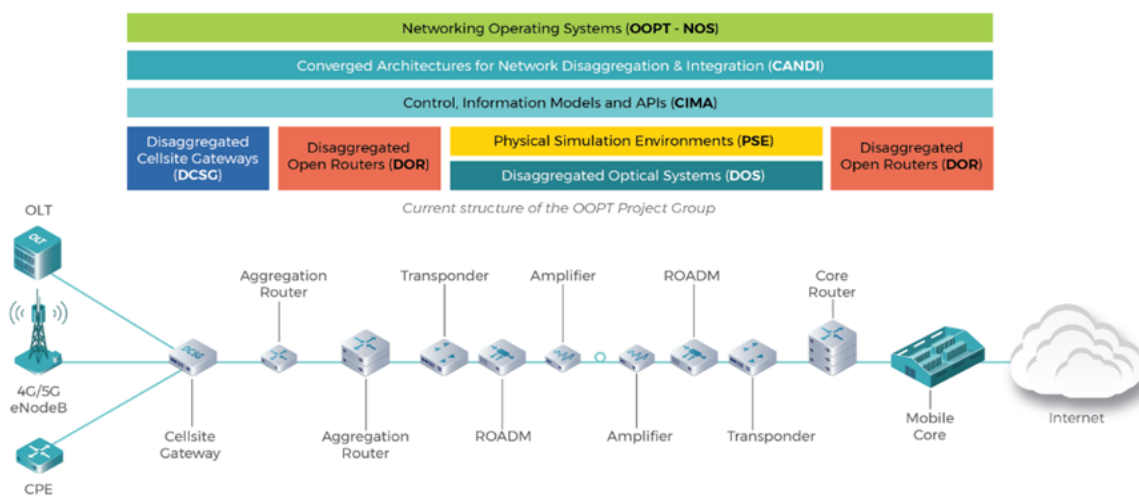
**The OOPT group has a broad remit and several projects:**

OOPT was established near the start of the TIP adventure, and has already increased its potential impact by collaborating with another high profile open effort in the same area, the Open Networking Foundation's (ONF's) ODTN (Open Disaggregated Transport Network), which is also led by Telefónica and NTT, plus China Unicom, Comcast and TIM.

The OOPT and the ODTN are focused on disaggregation of hardware and software, and on white box platforms, for the transport networks, focusing on technologies such as open transponders, disaggregated cell site gateways, software abstraction interfaces and routers. The founding product in the OOPT was the Facebook-designed Voyager, a DWDM optical transponder whose reference design has been adopted by several companies such as ADVA.

The OOPT's work also includes white box disaggregated cell site gateways (DCSGs), which are being trialled or deployed by Telefónica in Germany and Ecuador. Other leading operators in the DCSG sub-group include Vodafone, Orange and TIM Brasil, which are preparing a joint RFI for this technology, to assess what the vendors, new and old, can offer in compliance with the new specs.

**Building Open and Disaggregated Transport Networks**





Two vendors, Aviat and Metaswitch, have cooperated to develop a product based on TIP DCSG requirements. The gateway uses Aviat's network operating system, AOS, and a routing stack and network operating system toolkit from Metaswitch, an early pioneer in virtualized networks including the core. The combination of software runs on hardware which conforms with the TIP specs.

Two other partners, Volta Networks and Edgecore Networks, are also working on an open, virtualized cell site gateway. Volta's cloud-native virtual routing software, the Elastic Virtual Routing Engine (VEVRE), has now been implemented on Edgecore's AS7316-26XB open cell site gateway switch.

ADVA has been building a commercial product based on DCSG specs, which will be offered as a white box gateway, with the vendor adding value with installation, commissioning and monitoring services. ADVA has also been working with Edgecore on a product to conform to the DCSG specifications, called Odyssey-DCSG. This supports open operations and management (O&M) approaches in order to allow MNOs greater freedom to select different technologies for each layer of the stack. Edgecore contributed the hardware design of the cell site gateway to TIP and it is part of ADVA's integrated solution.

And OOPT recently added a new project, focused on Disaggregated Open Routers (DOR). That bid to enable open IP/MPLS routers is led by KDDI and Vodafone, with vendor support from ADVA, Delta, Edgecore Networks, Exaware, Infinera, Ufispac and Volta Networks, many of which are also participating in other OOPT initiatives.

Volta's co-founder and CEO Dean Bogdanovic said: "As the first company with cloud-native virtual routing software, we believe strongly in having open standards for disaggregated routing, which is better for everyone in the ecosystem – service providers and vendors alike ... Open networking will continue to be important as service providers look for new ways to improve the scale, performance, automation and economics of their networks."



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**Research team:**

Research Director: Caroline Gabriel [caroline@rethinkresearch.biz](mailto:caroline@rethinkresearch.biz)  
IoT Analyst Alex Davies [alex@rethinkresearch.biz](mailto:alex@rethinkresearch.biz)  
Analyst Tommy Flanagan [tommy@rethinkresearch.biz](mailto:tommy@rethinkresearch.biz)

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**Sales contact details:**

John Constant, +44 (0)1794 521411  
Email: [john@rethinkresearch.biz](mailto:john@rethinkresearch.biz)

**Web Site:** [www.rethinkresearch.biz](http://www.rethinkresearch.biz)