

Presse release

## Reuse of telecom standards to boost mega constellations take-off

**A new Danish R&D project will reduce the complexity of satellite mega constellations by exploiting existing standards from cellular networks. The project is headed by network operations software specialist 2operate in collaboration with nanosatellite pioneer GomSpace and Aarhus University.**

Satellite mega constellations are about to revolutionize satellite-based telecommunications services. Traditional satellite communication based on geo-stationary satellites in orbit at 36,000 km. above the Equator imply a roundtrip delay of at least half a second. Mega-constellations of satellites in low orbit (around 1.000 km.) will reduce roundtrip delay to less than 100 ms. between most locations on earth. Moreover, the coverage, scalability, and flexibility properties of mega constellations outperforms geo-stationary satellites.

One of the great challenges of mega constellations, however, is the increased complexity of system operations. The satellite operator will need to establish strong processes for monitoring and operating thousands of interconnected satellites, where new satellites will be deployed over time for added capacity. Furthermore, faulty satellites may need to be taken out of service.

The new project “MegaMan” (**Mega-Constellations Services Management**) will exploit the fact that cellular networks share many properties with mega constellations in terms of the number of network elements and the need for continuous performance/fault monitoring, remote configuration, and tracking of service quality of users. During the past 25 years, the operations of cellular networks have led to a range of concepts, best practices, and standards under e.g. ITU and 3GPP. Many of these concepts are directly applicable to mega constellations operations, and the MegaMan project will adopt and adapt these for future mega constellations.

- *It is obvious that the solutions and standards developed for the operations of “constellations” of cellular network elements may be reused for mega constellations, said MegaMan project manager, **Lars Moltzen**, who is also the **Chief Science Officer at 2operate**. By doing so, we expect to skip 2-3 years of maturity time compared to the default approach of re-inventing everything. Right now, focus is to ensure connectivity, but we know that as soon as the new mega constellations enter operation, the operators will start demanding efficient solutions for daily operations.*
- *It is extremely interesting for 2operate to get involved early in the market of operations support systems for mega constellations, said **Christian Ingerslev Sørensen**, CEO at 2operate. This is an industry which will be experiencing explosive growth in coming years, and due to foresighted entrepreneurs and researchers at our universities, Denmark is in a favorable position to be a leading nation in this field.*
- *GomSpace has great expectations for this new collaborative project that will bring innovative capabilities to the market, allowing mega-constellations to be managed much more cost-effectively through reliance on established standards and approaches from the mature telecom market, said **Niels Buus**, CEO at GomSpace. This is important as it will reduce the total cost of ownership of space-based infrastructure in the same manner as nanosatellites have helped reduce cost for the space segments of such infrastructures.*

- *At Aarhus University, we have a strong strategic desire to strengthen our position within advanced technology, said **Thomas S. Toftegaard, professor and head of Department of Engineering at Aarhus University**. We are right now in the middle of our preparations for the launch of the Delphini-1 satellite in 2018, which will be a milestone for the university and for Danish space science. The new project will both strengthen the collaboration between several research units involved in development and application of space technology and increase the level of collaboration with some of Denmark's most innovative commercial players in the industry.*

#### Socio-economic benefit:

It is estimated that the project will save the industry 2-3 years of development/maturity time for mega constellations.

The project will take part in the development of global telecommunications coverage.

The project will position Danish innovation in the space industry, resulting in high-tech job creation.

#### Fact box:

**Project title:** MegaMan – Mega-Constellations Services Management

**Investment by Innovation Fund Denmark:** 7,5 million DKK

**Total budget of the project:** 11 million DKK

**Duration of the project:** 2 years

**Partners:** 2operate, GomSpace and Aarhus Universitet

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