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MINISTRY
OF ENTREPRENEURSHIP
AND TECHNOLOGY



POLISH
SPACE
AGENCY

**The space system of integrated information support "Mosaic"
based on a distributed satellite.**

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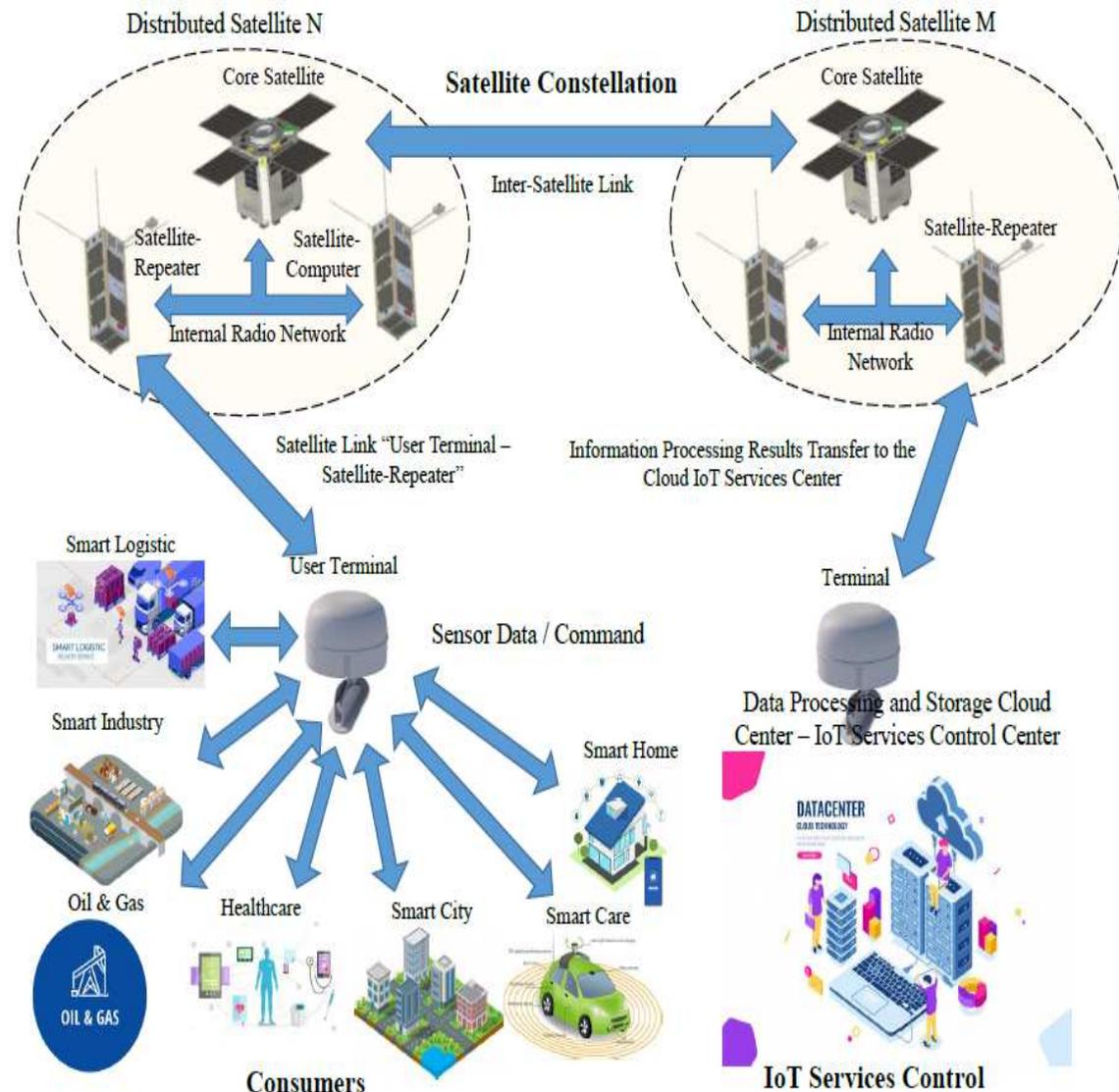
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Introduction

- IoT is becoming an important factor in the development of the IT industry and will have a serious impact on almost all areas of activity: industry and mining, transport and logistics, healthcare and medicine, environmental monitoring, including meteorology, smart cities and smart homes, education, entertainment and retail, etc.
- The development of IoT is an incentive to increase the demand for the capacity of communication / data channels. An effective method of constructing a telecommunication system that can provide global coverage for the provision of IoT services is the creation of a satellite communications system in Low-Earth-Orbit (LEO).
- Recently, there have been reports on the development of LEO IoT systems based on CubeSats. An example is the GloT (Global Internet of Things) project.
- The mostly of developed LEO satellite communications systems do not take into account the features of IoT traffic and do not imply optimizing the use of the band-width of the satellite segment of the system.
- Topics that we are interested in **Space technologies, science and exploration**
SPACE-29-TEC-2020: Satellite communication technologies

The Structure of the LEO IoT Satellite System



LEO IoT Satellite System consists of **Space Segment** and **Ground Segments**.

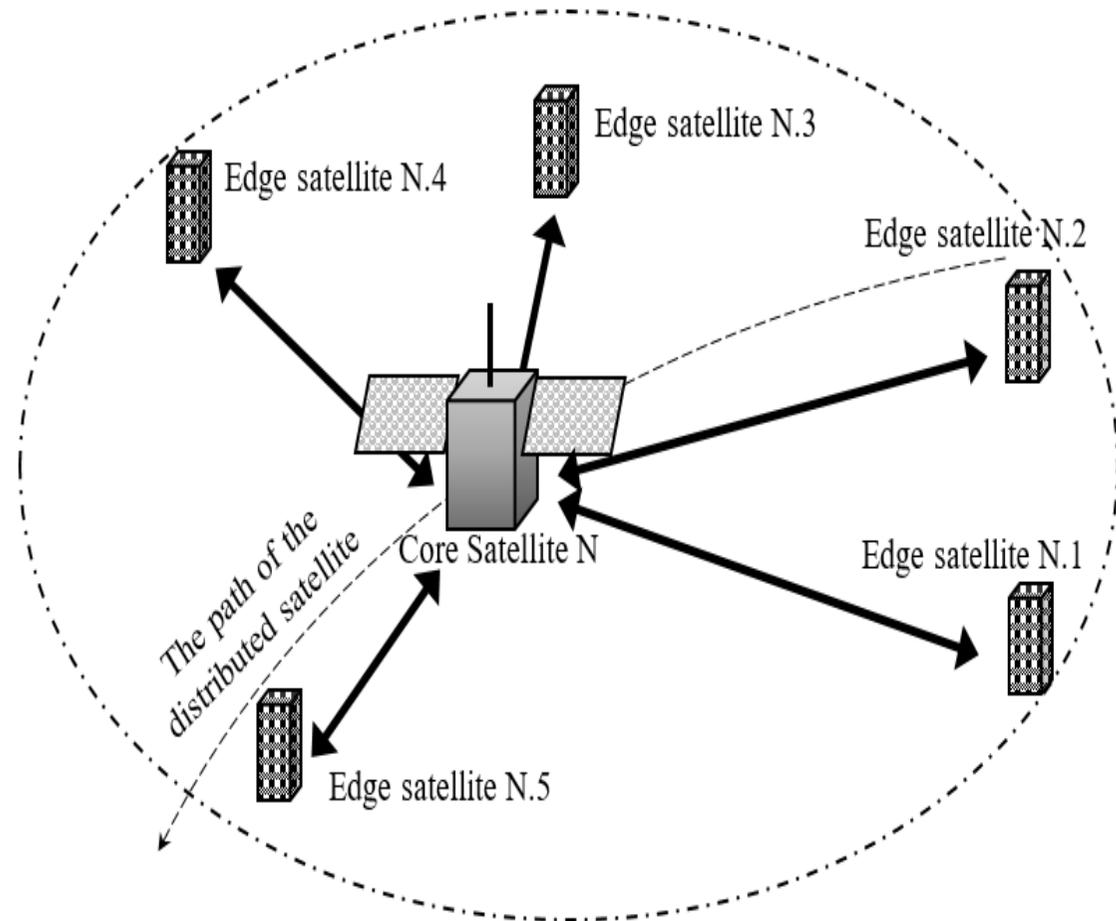
The **Space Segment** provides telecommunication solution for transmitting IoT information and contains Computing Capacity for implementation concept of Fog Computing.

The **Ground Segment** includes components designed to provide IoT Services and control of the System operation.

The Distributed Satellite Architecture

The concept of the Distributed Satellite Architecture is based on the distribution of the payload between several satellites. The satellites are moving together in the immediate vicinity of one another and establish Formation Flying - micro constellation, that determines the relative position of the satellites for the joint execution of a functional task.

The Distributed Satellite Architecture allows the use of microsatellite satellites and CubeSats to create LEO communication systems.



The centralized architecture of Distributed Satellite is used in LEO IoT Satellite System: one satellite – microsatellite, is the Core Satellite, performs the Formation Flying control and operation functions; Edge Satellites - CubeSats.

Conclusion:

1. The LEO IoT Satellite System is built using standardized information technologies of satellite communications and the Internet of Things and implements mechanisms aimed to meet the requirements of international regulatory documents in the field of Radio Regulation, access to space, space debris, etc.
2. The proposed technical solutions make it possible to provide end users with not only the Internet of Things services, but also the services of satellite broadband Internet access.
3. We are looking for partners interested in creating the «**The space system of integrated information support "Mosaic" based on a distributed satellite**» within Space technologies, science and exploration
 - SPACE-10-TEC-2018-2020: Technologies for European non-dependence and competitiveness