Quality of Service (QoS) Provision in WiMAX-EPON Integrated Networks

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Introduction

Both **fixed** and **mobile** broadband access technologies have been largely deployed in recent years. If on one hand, **optical fibers** make available huge amount of bandwidth, on the other hand this technology requires high deployment costs. Conversely, wireless access technologies do not provide such amount of bandwidth but have a **cost-effective** deployment and allows **mobility**. Despite these advantages, **wireless** techniques are constrained by limited spectrum shared by multiple users. Future broadband access networks should capitalize on the advantage of both of these techniques by integrating them in a single access network.

This work presents a proposal of integration of two broadband access technologies: **WiMAX** and **EPON**, to combine the large bandwidth availability of optical networks with the mobility given by the wireless technology. Furthermore, a bandwidth **scheduling** scheme will be developed to operate **effectively** in the integrated network.

WiMAX (*Worldwide Interoperability for Microwave Access*)

EPON (Passive Optical Network)

WiMAX-EPON Integration

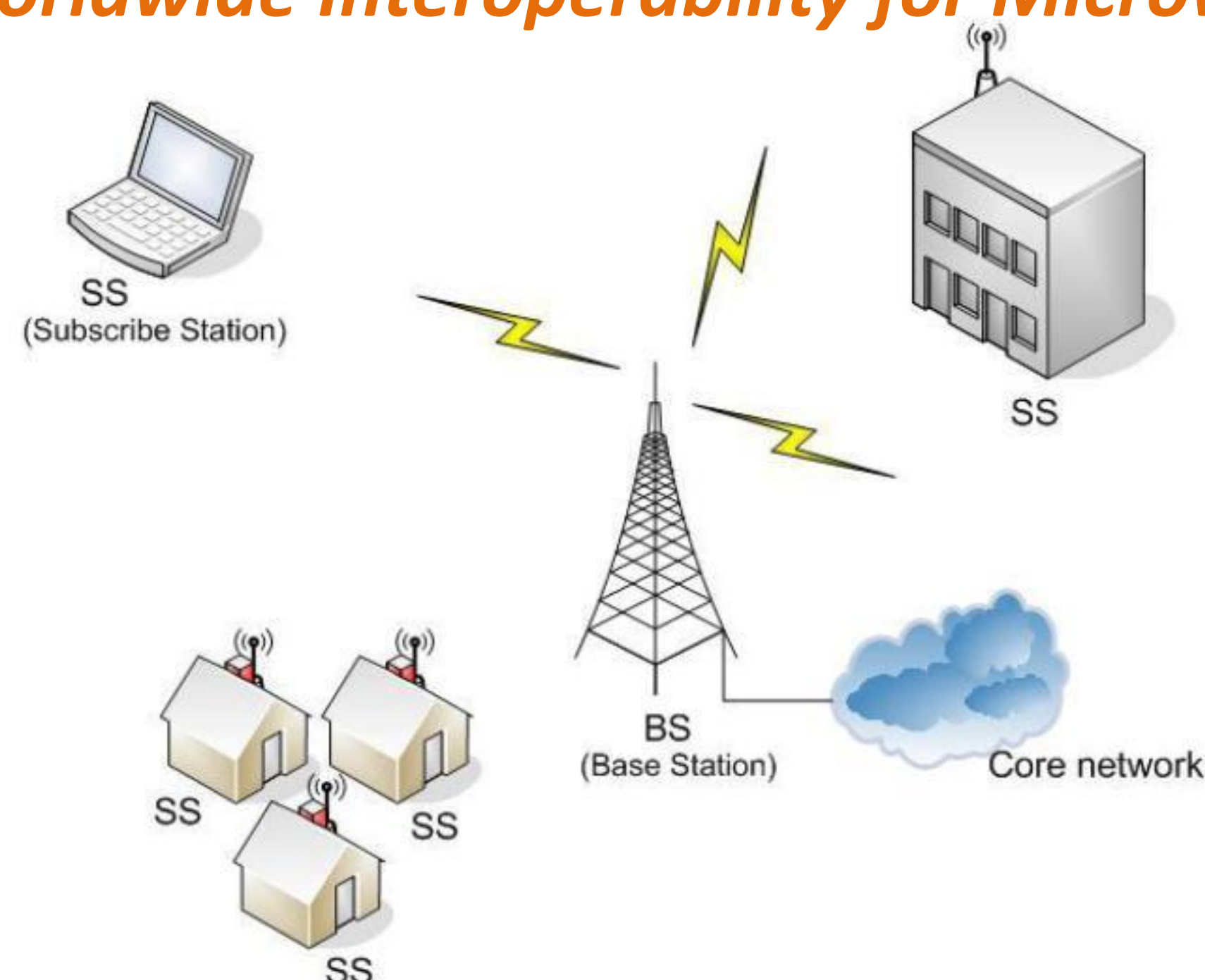## Scheduling Scheme for the Integrated Network

- Five types of **service flows**:
  - **UGS** (Unsolicited Grant Service)
  - **ertPS** (extended real time Polling Service)
  - **rtPS** (real-time Polling Service)
  - **nrtPS** (non-real-time Polling Service)
  - **BE** (Best Effort)

The designed **scheduler** in this work is an extension of that proposed by *Borin and Fonseca* [8]. The scheduling mechanism is **standard-compliant** solution for the uplink in **IEEE 802.16** networks.

The scheduler considers prioritized traffics and it accounts for instantaneous accumulated bandwidth deficit of each service class.

Metodology

The Network Simulator (**NS-3**) is the simulation tool to be used to assess the scheduler performance. The WiMAX module developed at UNICAMP Computer Network Lab will be used. An EPON module will be developed to evaluate the integrated network.

Conclusion

The integration between wireless and optical broadband access technologies presented in this work is a **promising and challenge research area.**

A WiMAX scheduling algorithm was developed based on existing mechanism to be used in the integrated network. Currently, this scheduling is under evaluation.
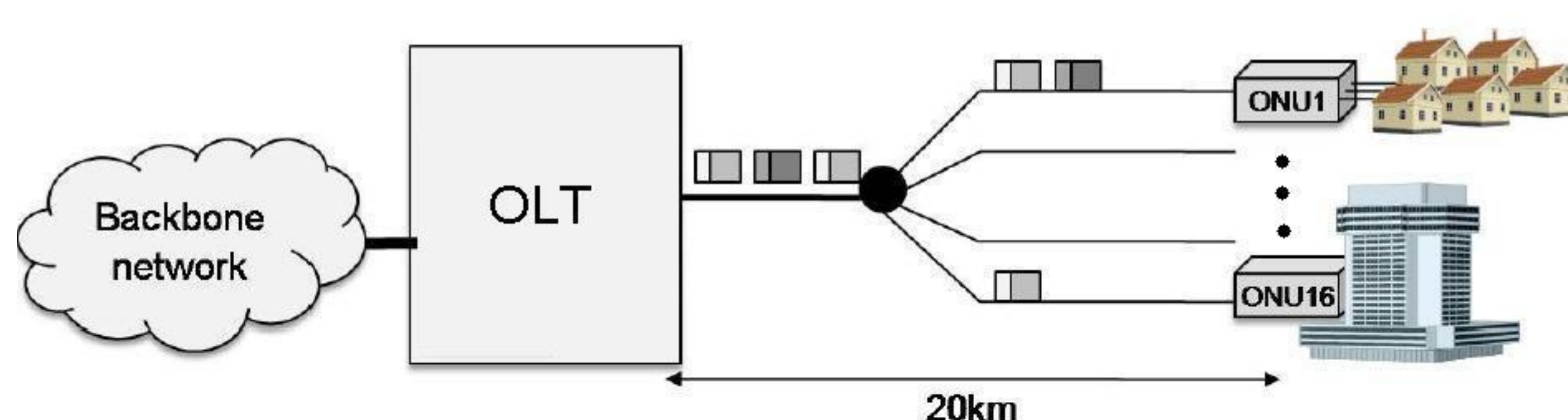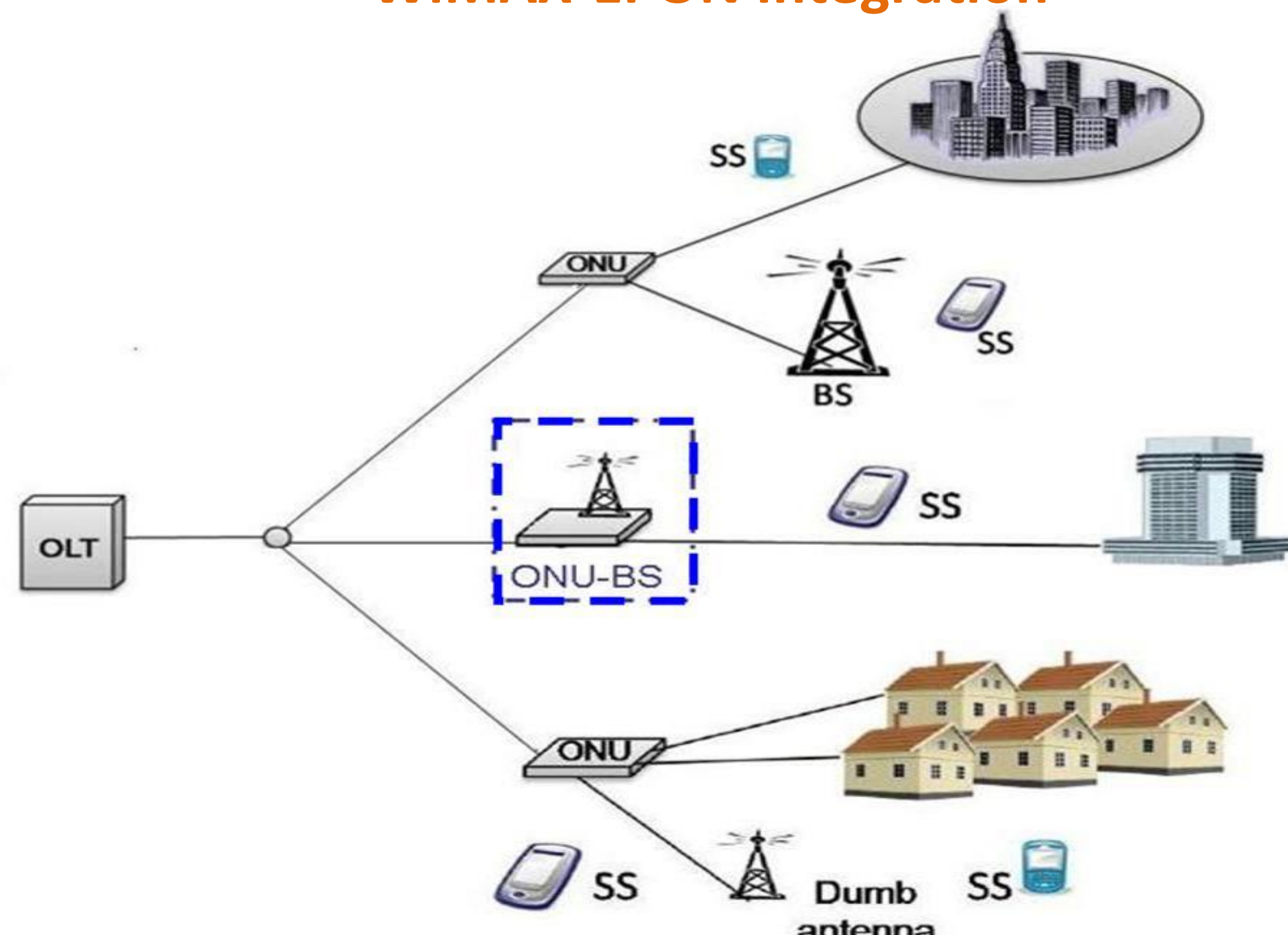
Acknowledgment

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