



FUTURE INTERNET TESTBEDS  
EXPERIMENTATION BETWEEN  
BRAZIL AND EUROPE

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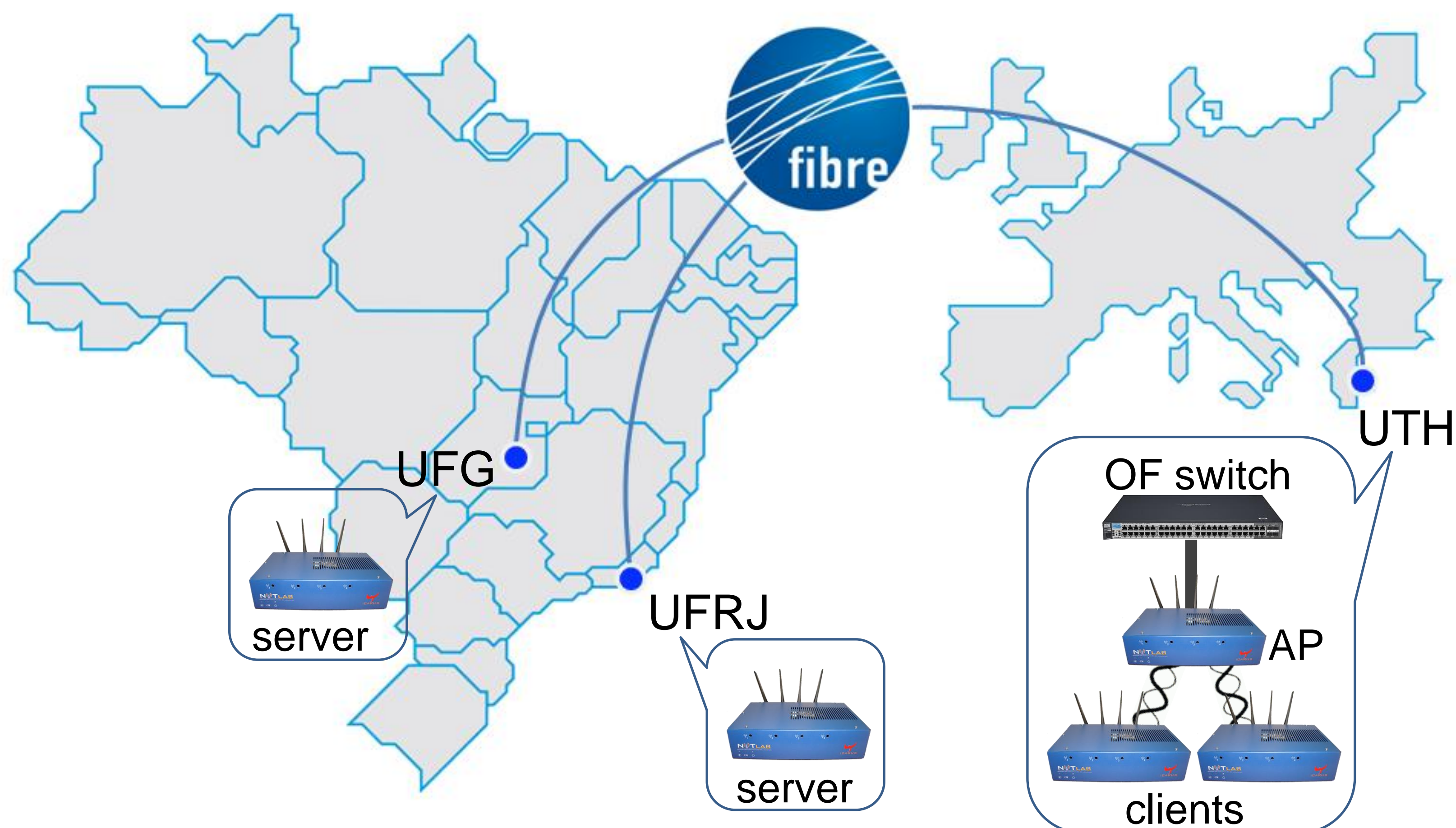


## Exploiting OpenFlow and wireless resources using the BR-EU islands of the FIBRE infrastructure

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### Topology



### Description

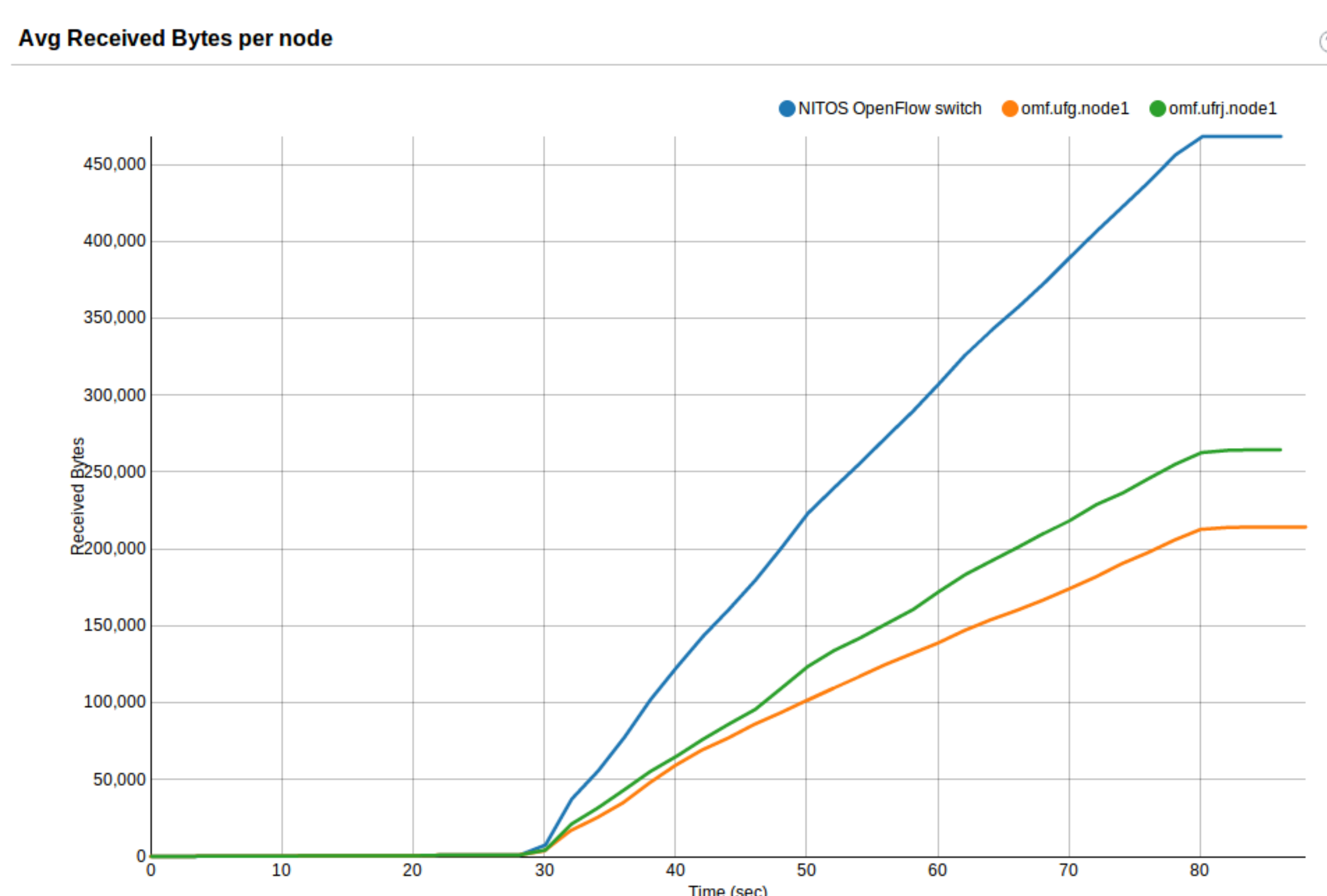
- Exploiting Content Delivery Networks (CDN) and Software Defined Networks (SDN).
- Several servers offering the **same services**, setup in a **Cloud Computing** system.
- End clients requesting the same service
- Our targets are:
  - Load balancing** of the requests among the available servers.
  - Overall procedure shall remain **transparent** to the end user.
- Resources from **multiple BR and EU islands**.
- All of them are controlled in one single experiment instance using **OMF (cOntrol and Management Framework)**.

### Demo setup

- VPN connection** interconnecting the UFG, UFRJ and NITOS testbed into a single virtual LAN.
- Three nodes from NITOS will be used, one as a wireless AP and two as wireless clients.
- Two nodes from different testbeds in Brazil are used, acting as content servers.
- All the Brazilian nodes (UFG and UFRJ nodes) are configured using the same IP address.
- NITOS **OpenFlow** switch is used to load balance the traffic generated from the NITOS wireless clients.
- Load balancing is achieved by changing the operation of **ARP protocol**.
- The OpenFlow switch consumes the ARP requests to the content servers and transparently issues ARP replies to the clients, indicating the least loaded server.
- Overall procedure is **totally transparent** to the end user.

### Results

- Results are depicted using the OMF Visualization tool:



- Figure shows the average number of received bytes per device overtime.

