

Platform IT for an Analysis of Systems in Telecommunications: propagation computation, electromagnetic compatibility and optimization of wireless telecommunication networks

National Institute of Telecommunications (Poland)

Spectrum Engineering and Management Section

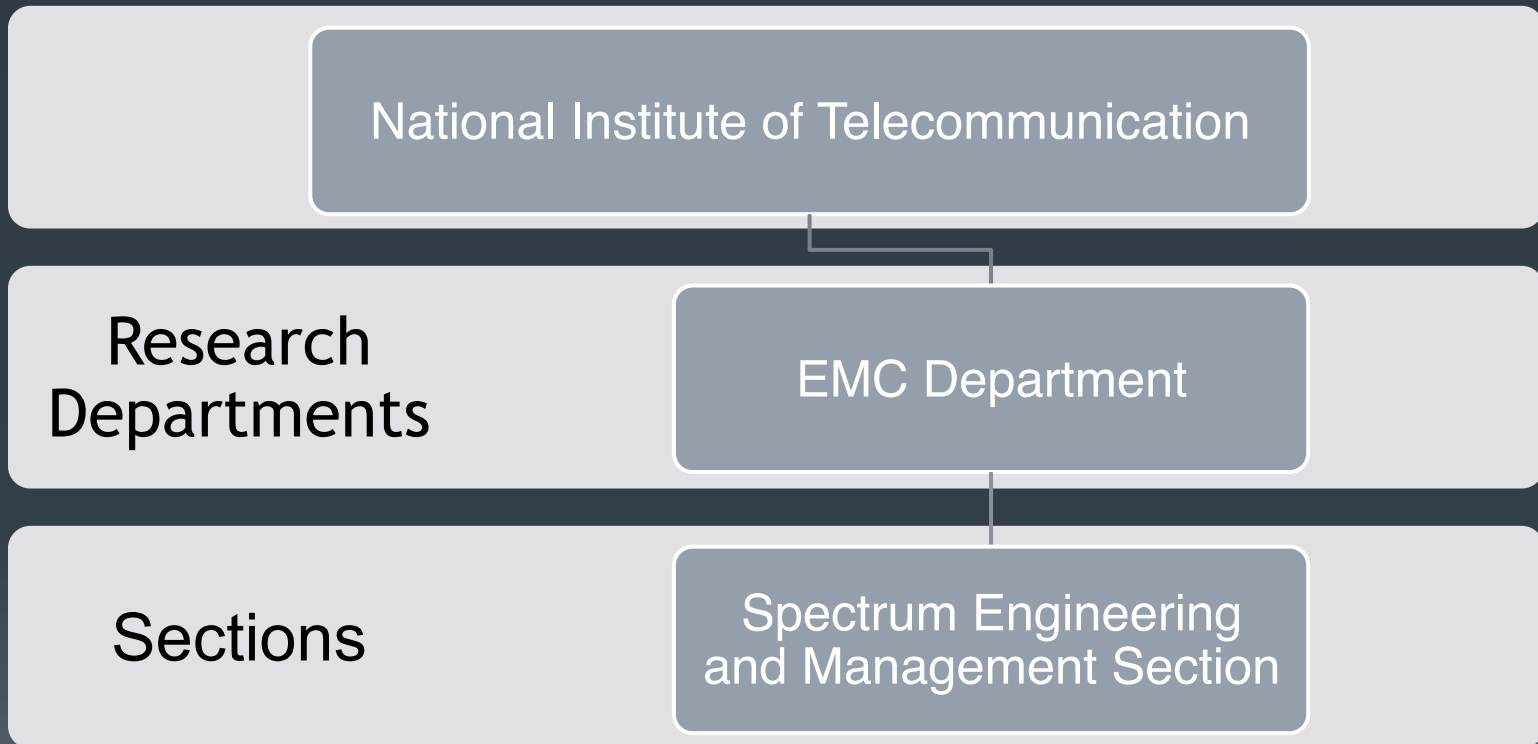
(Presentation at CEBIT 2013 by Dr Dariusz Więcek)



EUROPEAN UNION
EUROPEAN REGIONAL
DEVELOPMENT FUND



NIT - Spectrum Engineering and Management Section



Spectrum Engineering and Management Section

R&D

Government Projects

COST

UE (2.3)

Statute work

Publications & Conferences

Regulatory activity

Support of National Authorities (MAiC, UKE, KRRiT)

Participation in CEPT WG, WRC

Business cases

Planning for operators and broadcasters

EMC analysis of radio system

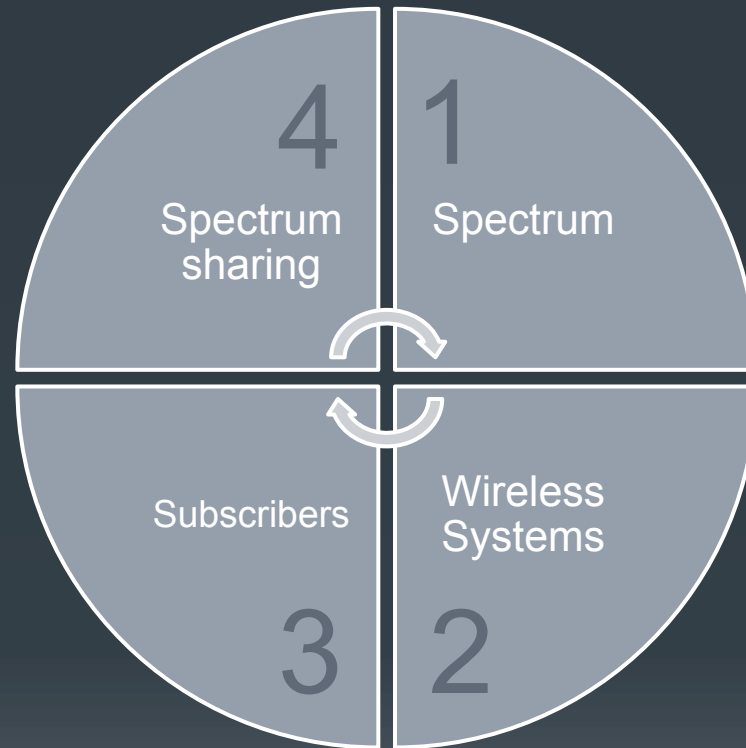
Searching for desirable frequency

Educational support

Assistance in diploma thesis

Student Internships

Project PIAST – Background



NIT has a large portfolio of diverse tools for radio network planing and analysis purpose.

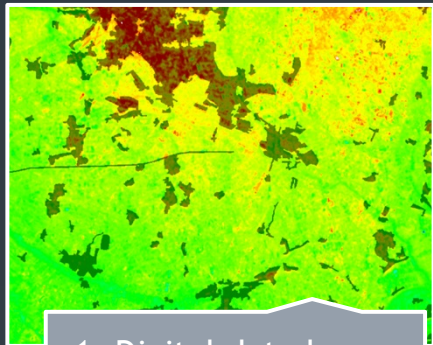
PIAST – Target Groups

1. Radio Planning engineers
2. Business stakeholders
3. RD teams
4. Administration
5. Students

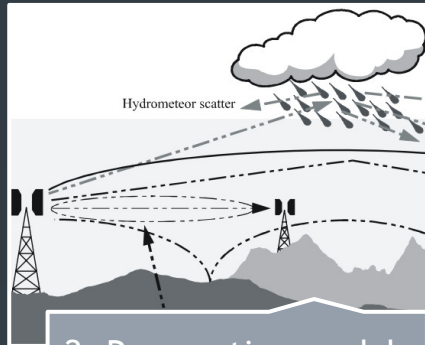
Project PIAST – Main goals

Access to an advanced IT infrastructure (1) and providing an advanced ICT services and applications (2) for the **scientific** and **businesses** community

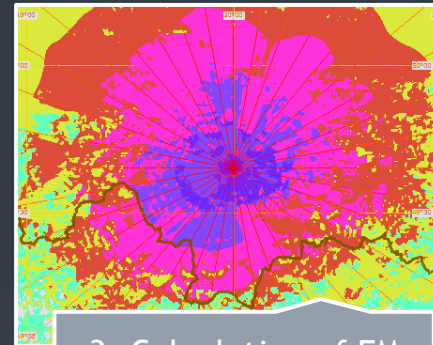
Example of PIAST Services



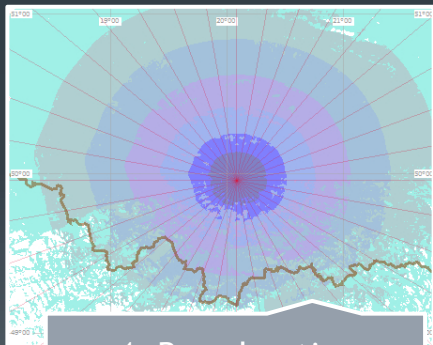
1. Digital data layers servers



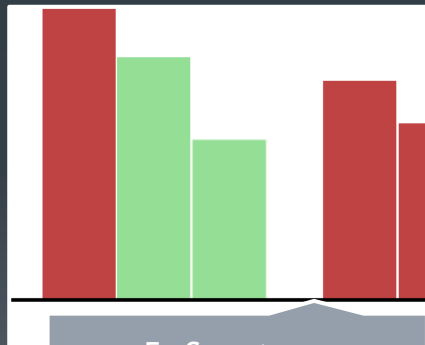
2. Propagation models servers



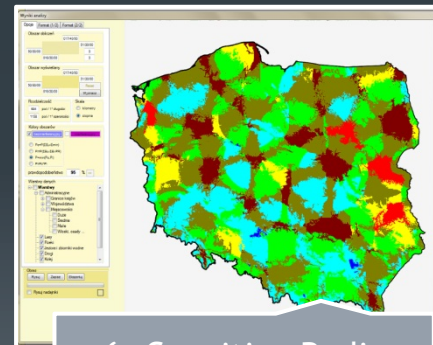
3. Calculation of EM field distribution



4. Broadcasting networks planner



5. Spectrum occupancy analyzer



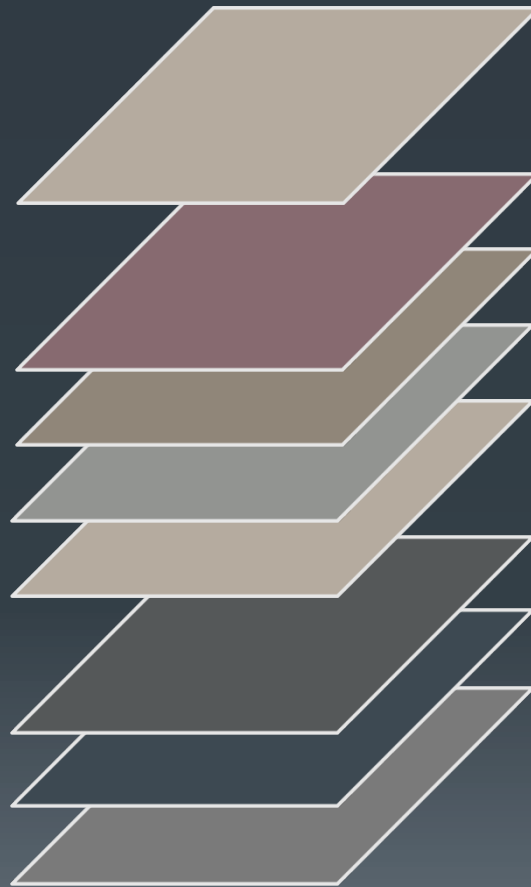
6. Cognitive Radio analysis tool

1. Digital data layers servers

- 3. add-ons

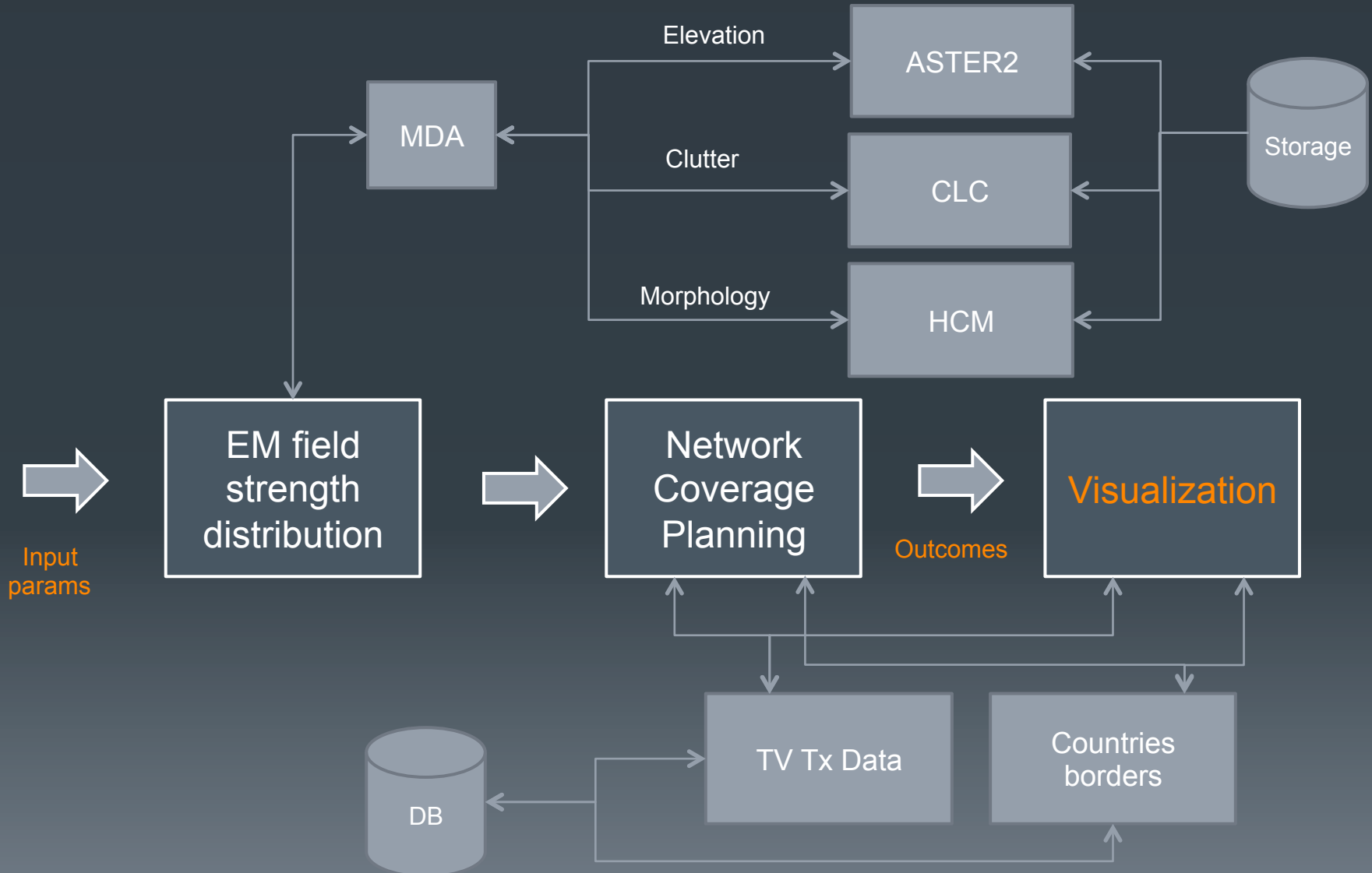
- 2. network planning and optimization

- 1. propagation calculation



- 8. Borders, roads, Areas, rivers..
- 7. Cost data (CAPEX, OPEX)
- 6. Population distribution
- 5. Network structure and parameters
- 4. Transmitters params
- 3. Land use data
- 2. Morphology data
- 1. Terrain elevation map

1. Digital data layers - Sample

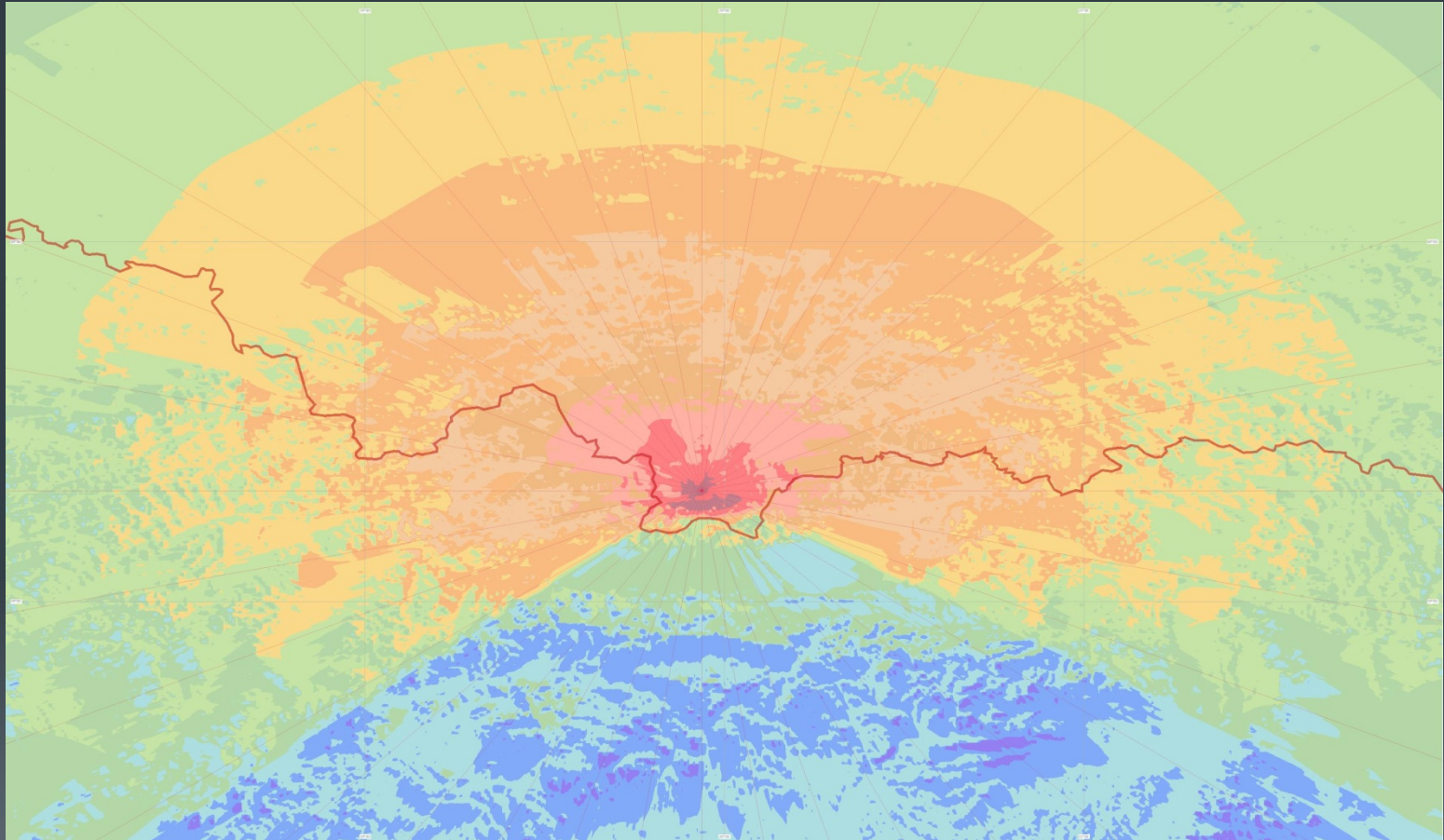


2. Calc. of EM field distribution

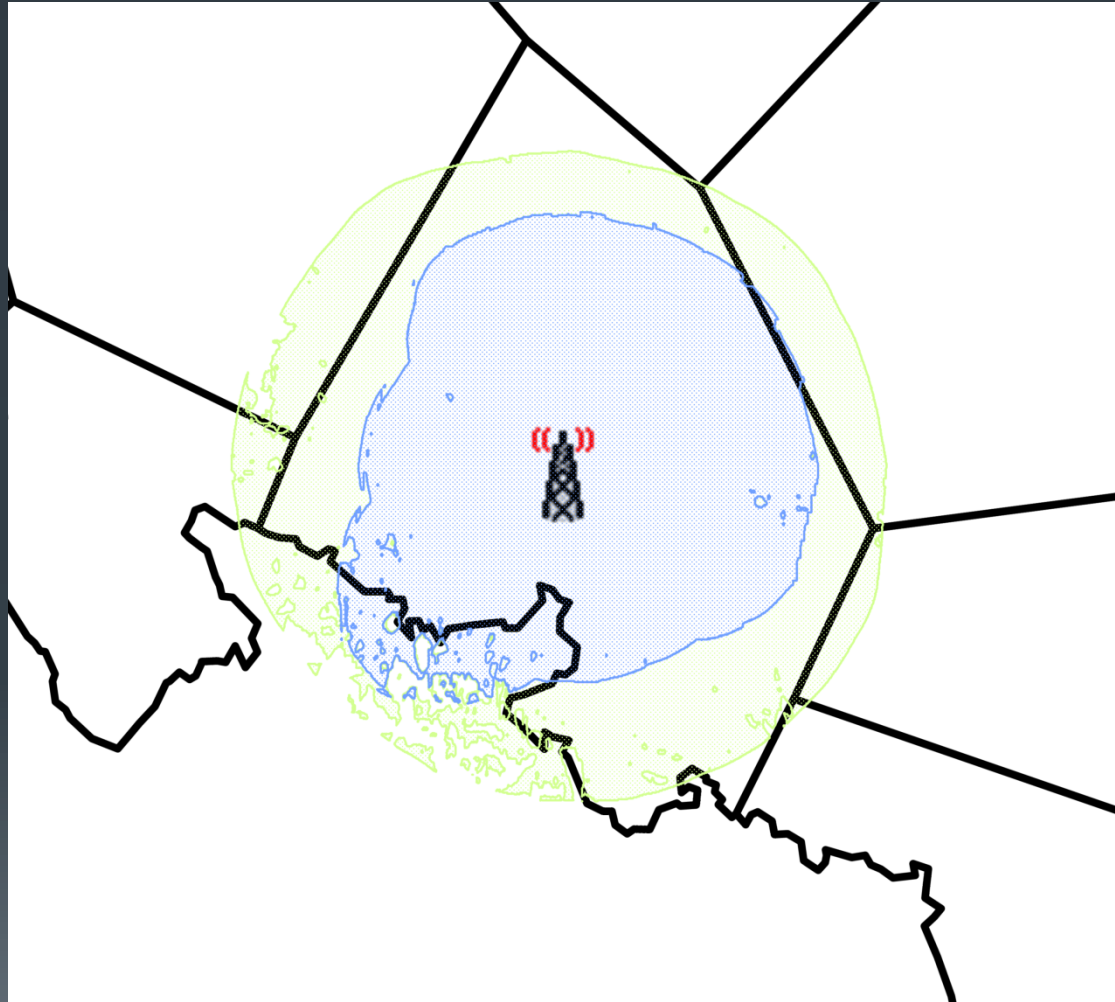
One of the basic analysis in terms of:

- Network coverage planning
- Interference assessment
- EM Compatibility analysis

2. Calc. of EM field distribution



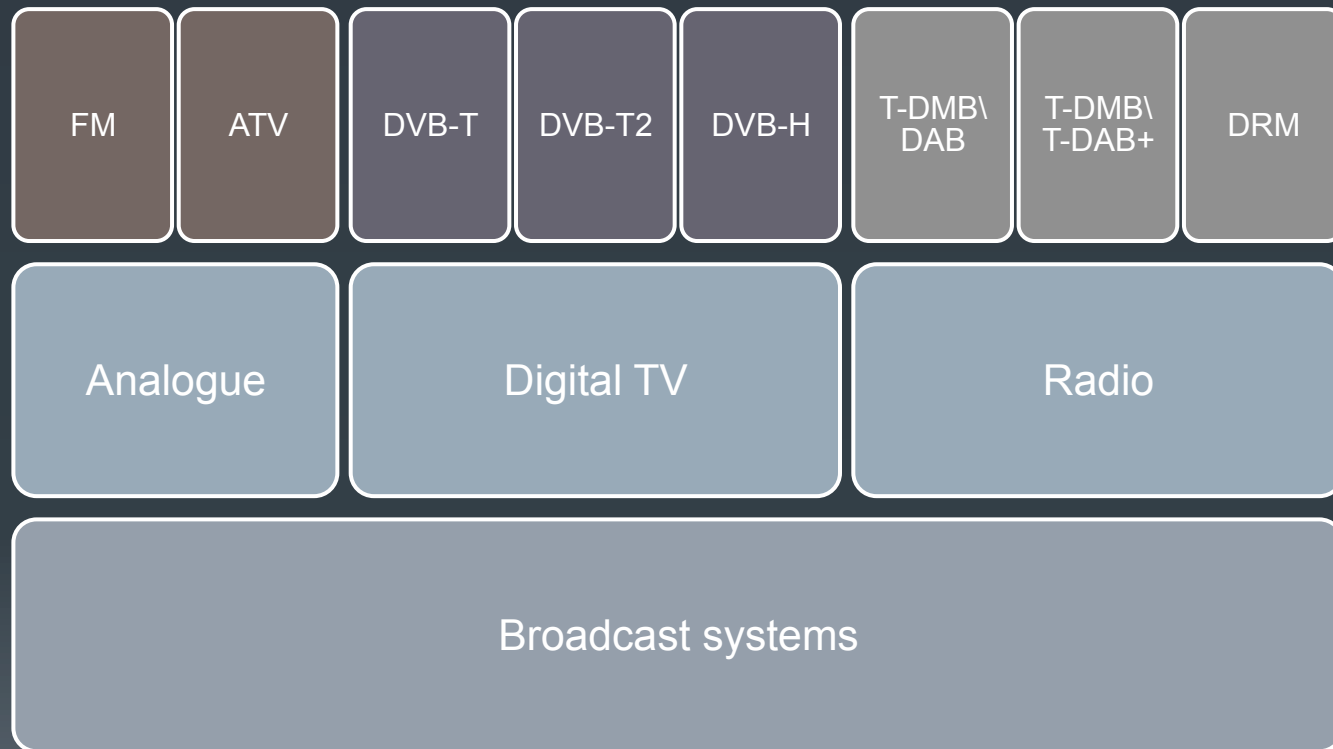
2. Calc. of EM field distribution



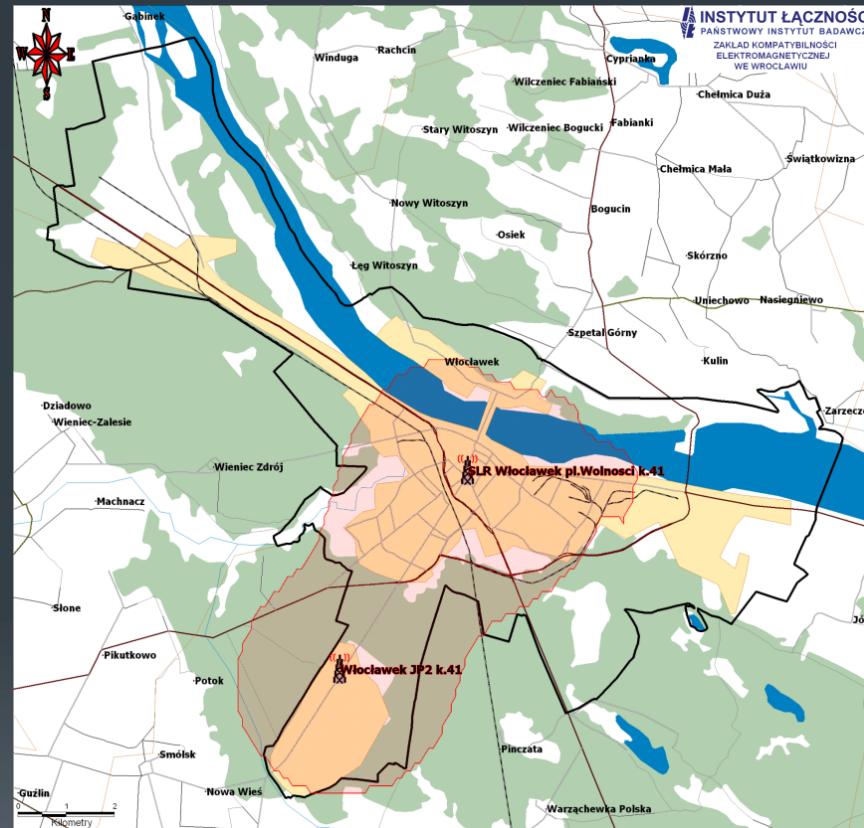
3. Examples of the major propagation model servers



4. Broadcasting networks coverage planner



4. Broadcasting networks coverage planner

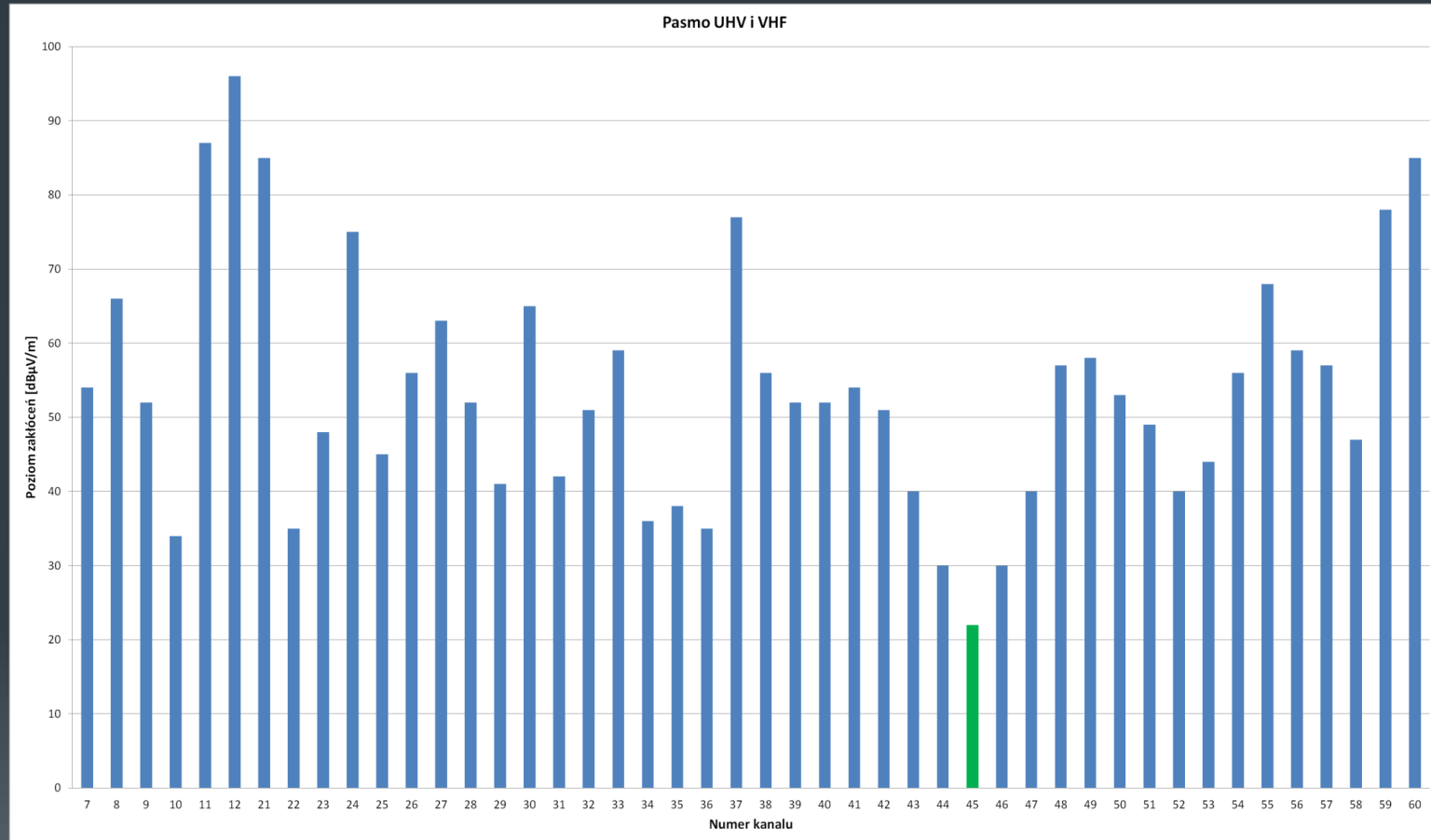


TV SFN example

4. Broadcasting networks coverage planner

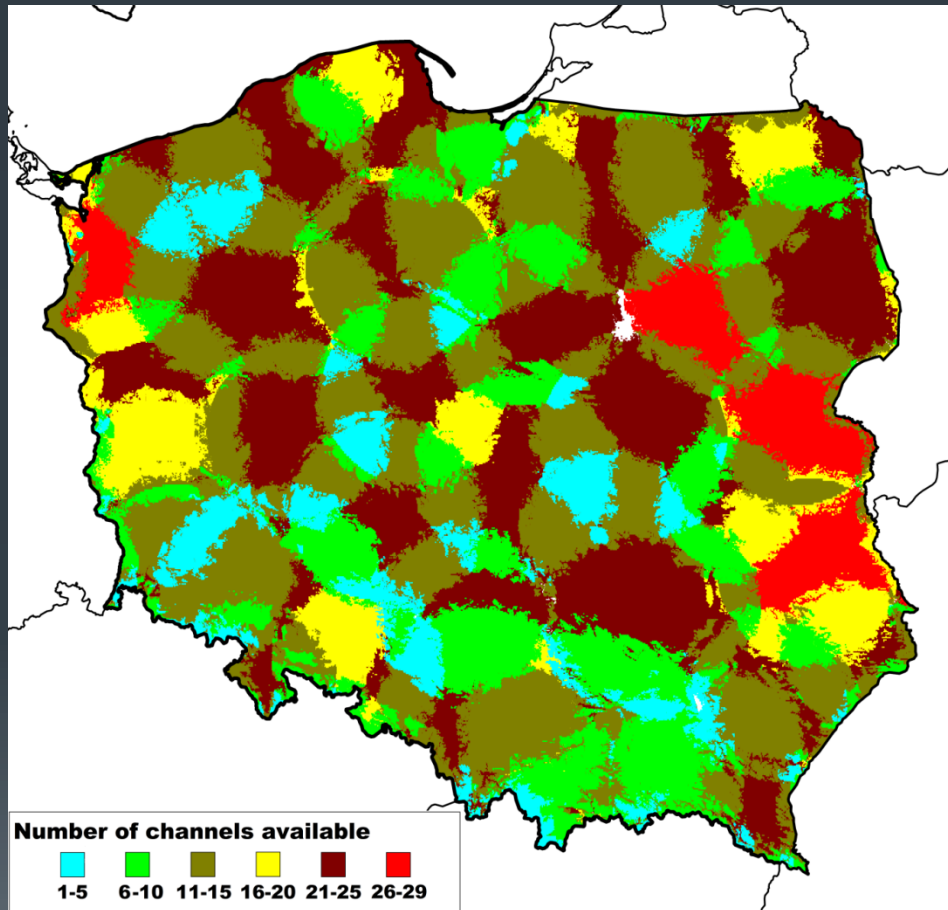


5. Spectrum occupancy analyzer



Signals Level in UHF/VHF band

5. Cognitive Radio analysis tool



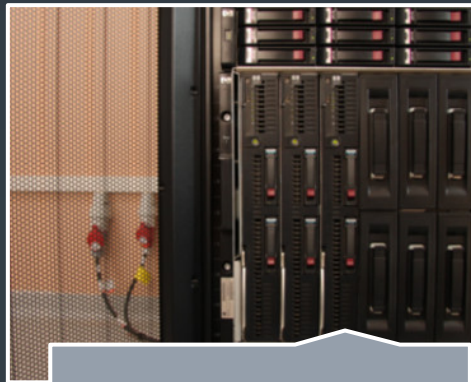
TV White Space availability

h_{CPE} : 1.5m agl

ERP: 20dBm

DVB-T Protection level: 56dB(uV/m)

PIAST IT overview

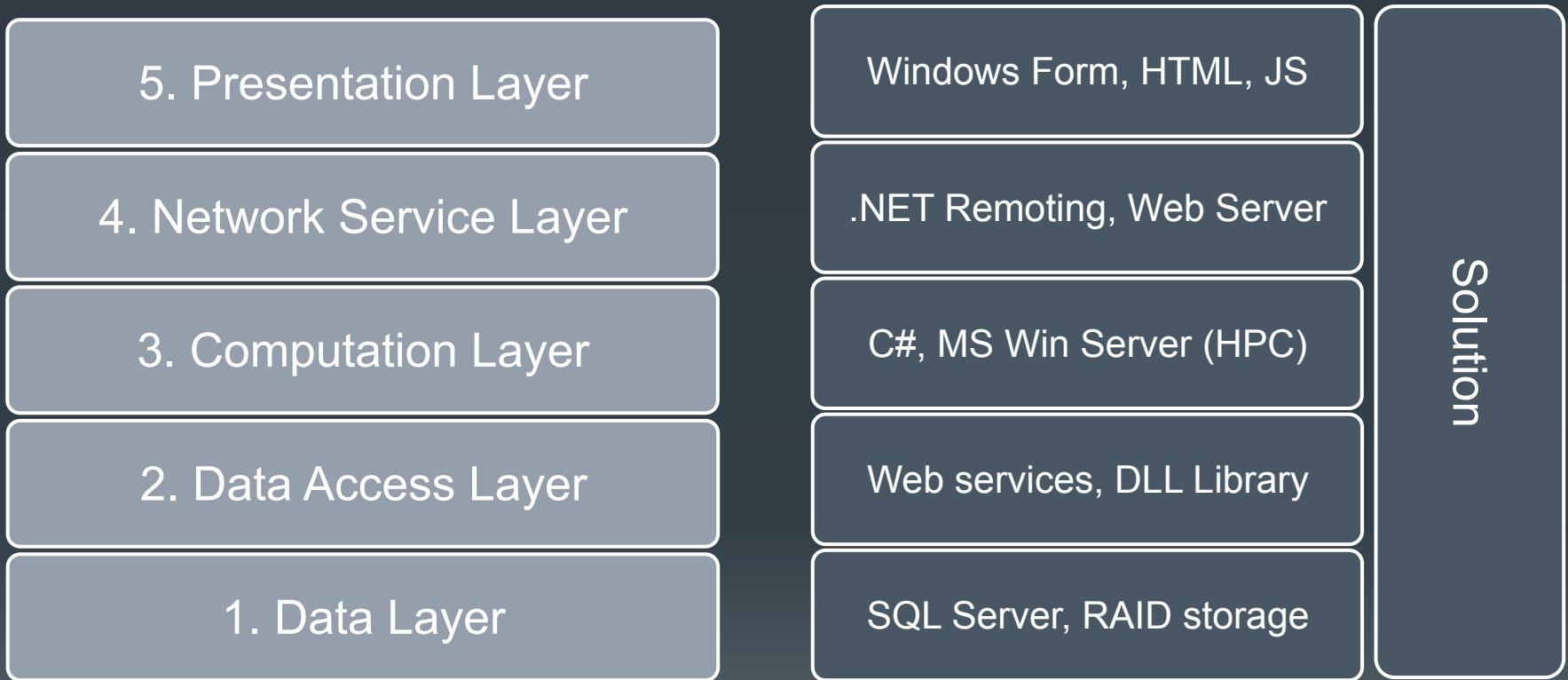


IT Infrastructure

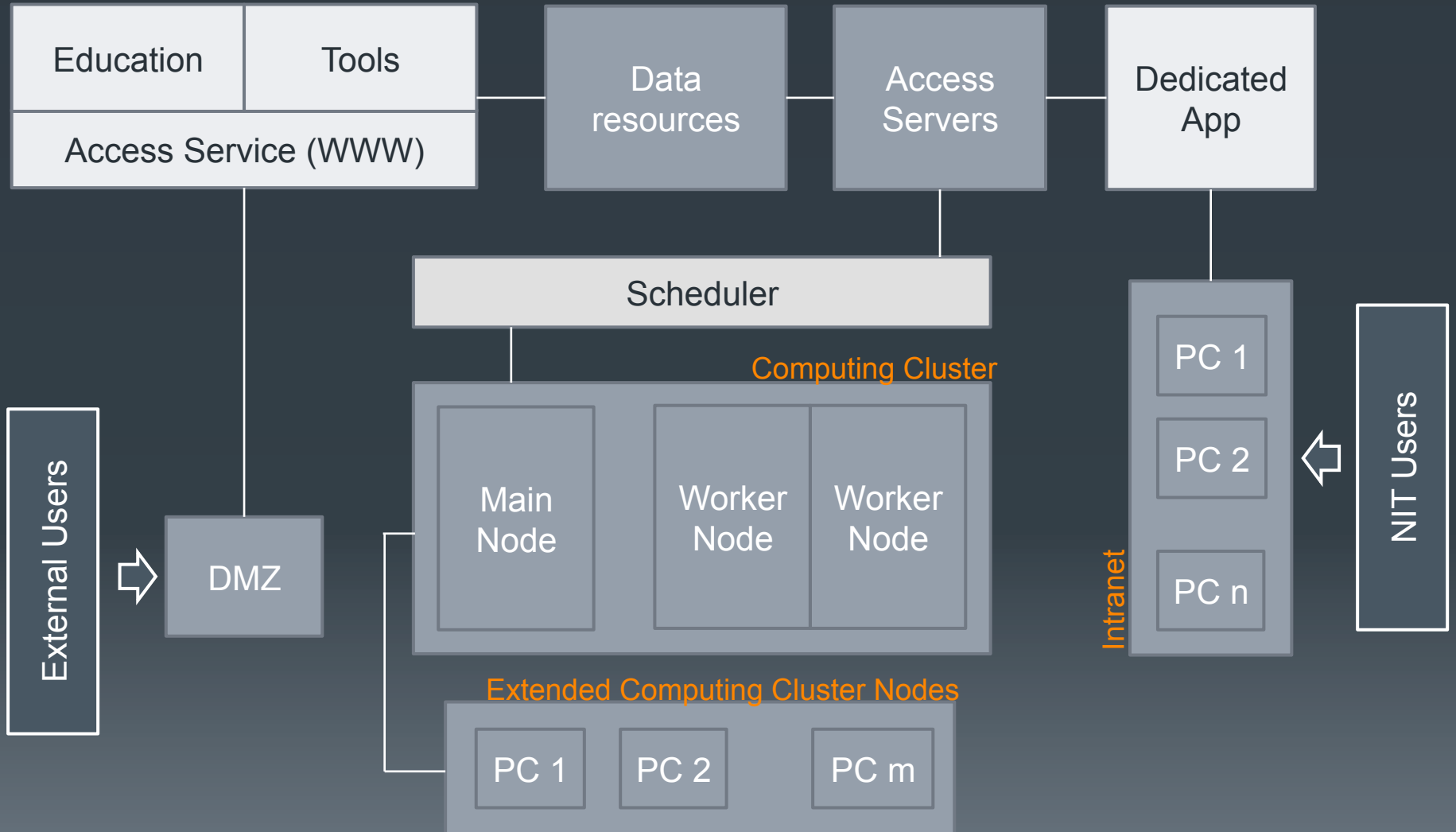


Data resources

Layer model - technologies



Functional scheme



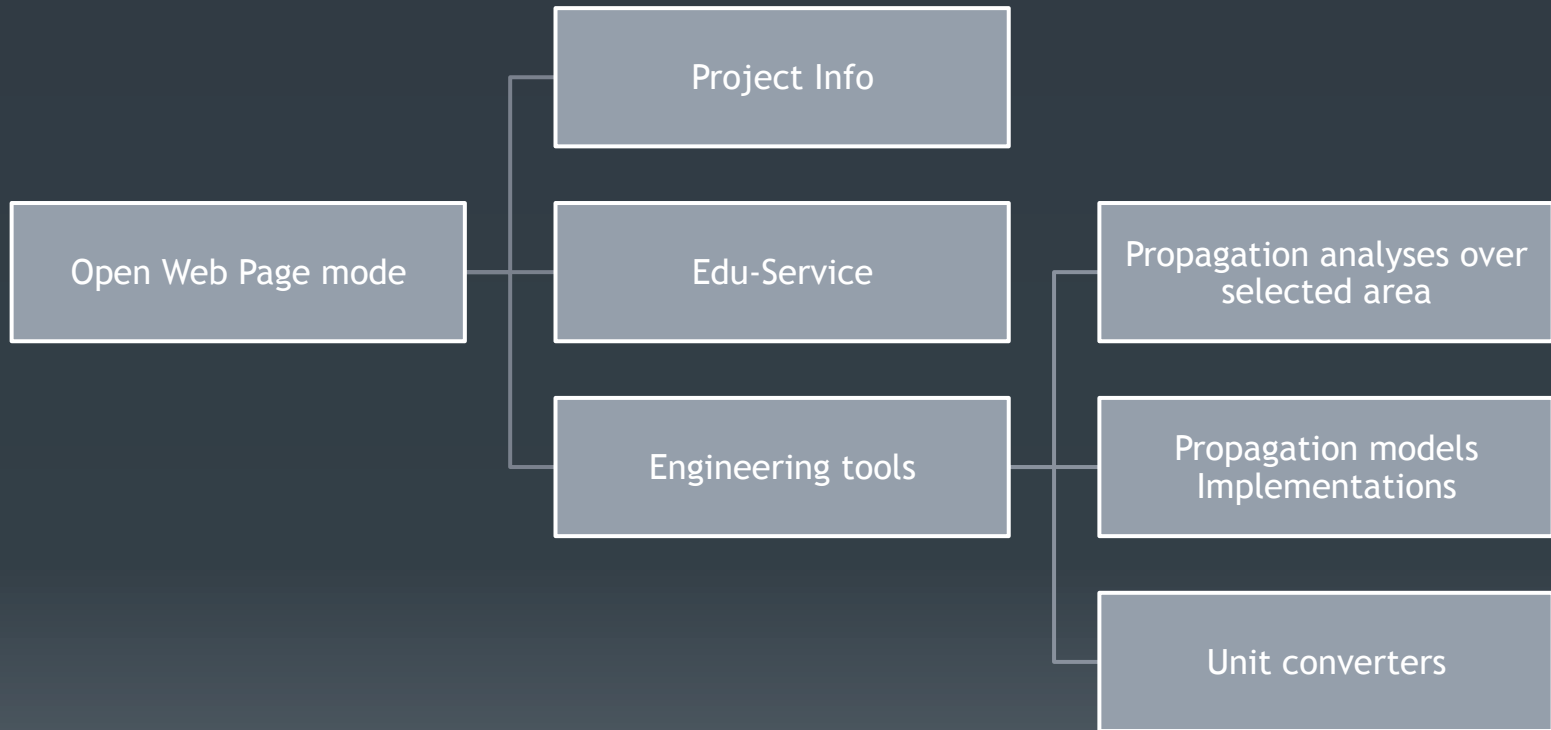
Current PIAST IT infrastructure



PIAST IT resources



PIAST – WebSite



(beta version) www.piastr.edu.pl

Thank you for your attendance

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