CROATIAN ACADEMIC AND RESEARCH NETWORK
CARNET

Darko Parić

CARNET
znanje povezuje

About CARNET

- Founded by the Croatian Government in 1995.
- Under the Ministry of Science and Education

- Located in six Croatian cities
  - Headquarters in Zagreb
  - Regional centers - Rijeka, Osijek, Split, Pula and Dubrovnik

- 148 employees
- Annual budget (state budget) approx 15 mil. Euros

Services are **free for the users**

CARNET

And who are the Users?

- HE institutions

- Scientific and research institutes

- Primary and secondary schools

- Student residence halls

- Ministry of Education and Science

- Ministry's agencies

- Students, pupils and employees of these institutions

- Institutions of the Ministry of Demographics, Family, Youth and Social Policy

- Institutions of the Ministry of Health

- HZMO - Croatian Pension Insurance Institute

- Ministry of Environmental and Nature Protection

Connectivity

- Over 1800 institutions connected on over 3600 locations.

- Access speed from 2 Mbps to 10 Gbps, using a combination of technologies depending on availability and prices in a certain region/area

  - xDSL, leased capacity, dark fiber, own fiber

- Connectivity costs for full-membership institutions are **covered by CARNET** (leased links, **central procurement**)

- Connecting schools since 2006. – **2286 locations** (approx. 1400 schools)

CARNET

Optical Network Infrastructure

- Signed agreements with City Councils allows CARNET to use existing cable ducts and build its own optical network infrastructure.
- CARNET member institutions connected to the private network via one-time investment lines **instead** of leased lines.
- Radical per-year savings in those cities allows CARNET further network development in other regions

- Split
  - 120 member institutions connected to CARNET network
  - Common, interlaced network infrastructure for CARNET and City of Split

- Opatija
  - 12 member institutions to be connected to CARNET private network
- Rijeka
  - 100 member institutions to be connected to CARNET private network

CARNET

CARNET network

School and content filtering

- More than 550 000 pupils have the network access from the PC labs in primary and secondary schools.

- Websites are filtered in 14 categories:

- Drugs
- Gambling
- Gambling Related
- Gruesome Content

- Hacking
- Hate speech
- Malicious Sites
- Nudity
- Pornography
- Profanity

- School Cheating Information
- Spam
- Tobacco
- Violence

VAŽNO !!!

U skladu sa odlukom Ministarstra
znanosti, obrazovanja i športa o
filtriranju sadržaja u okriru
Hosting usluge za srednje i osnovne
škole, web stranica koju ste
namjeravali posjetiti

NIJE DOSTUPNA

CARNET

Network operation Center - NOC

Since 2009. CARNET NOC does following activities by itself:

- Building, developing, maintaining, operating, and supervising country-wide private computer network:
    - In its core, distribution, aggregation and access
    - CARNET network is the infrastructure for all CARNET services
    - Based on IPv4 and IPv6

- Provides second-level and third-level helpdesk

CARNET

Services

Internet access:

Permanent connection
(for member institutions)
Individual user access
(fixed and mobile)

Internet services:

HUSO - hosting service for schools

CMS for schools

e-Classbook

DNS

voopIX

MM services:

Videoconferences
Internet streaming
Media on Demand
Adobe Connect
Radio on Demand
Baltazar portal

CARNet services and projects
Over 70 services + 10-15 active projects at all times

(ICT in) Education:

Education programs:

MOOCs, online courses, ICT
Edu, F2F workshops, CUC
conference, CISCO academy,
webinars...

Educational tools and content:

Moodle (Loomen), Edu.hr, Portal
for schools, Distance learning
portal "Nikola Tesla",
eduBookstore...

Computer Security:

National CERT
content filtering for schools
server certificates
vulnerability check
security recommendations
abuse service

User Support:

User Support
Service (helpdesk)
CARNet system
engineers helpdesk
Educational System
Support

CARNET

AAI@EduHr – a necessary preconditions for all services!

- Project for acquiring virtual electronic identity
  - Distributed LDAP directories for member institutions from academic community
  - Centralized LDAP directory for member institutions from educational community – Hosting service for Secondary and Primary Schools

- Unique identifier of every CARNET user

- **950 000+** electronic identities in AAI@EduHr system today

CARNET

DNS - .hr Croatian Internet Address

- CRO-DNS service

- CARNET controls the .hr top-level domain

- Almost 73 000 registered domains

- Rules and regulations on the domain space organization and management of the .hr top-level domain

National CERT

- National "point of contact" for incident reporting for foreign and Croatian CERTs and Abuse Services.

- Cooperation with other Croatian ISPs in area of information security.

- Continuous monitoring of the security information technologies, new types of attacks and dissemination of related information.

- Media campaigns - raising the awareness of the importance of computer security.

- Coordination and cooperation with the governmental bodies on information security.

CARNET

e-Schools -
establishing a system for developing digitally mature schools

Comprehensive digitalization of school operation processes and teaching processes aimed at the development of **digitally mature schools** for the 21st century."

First phase - results

101 ELEMENTARY SCHOOLS

50 SECONDARY SCHOOLS
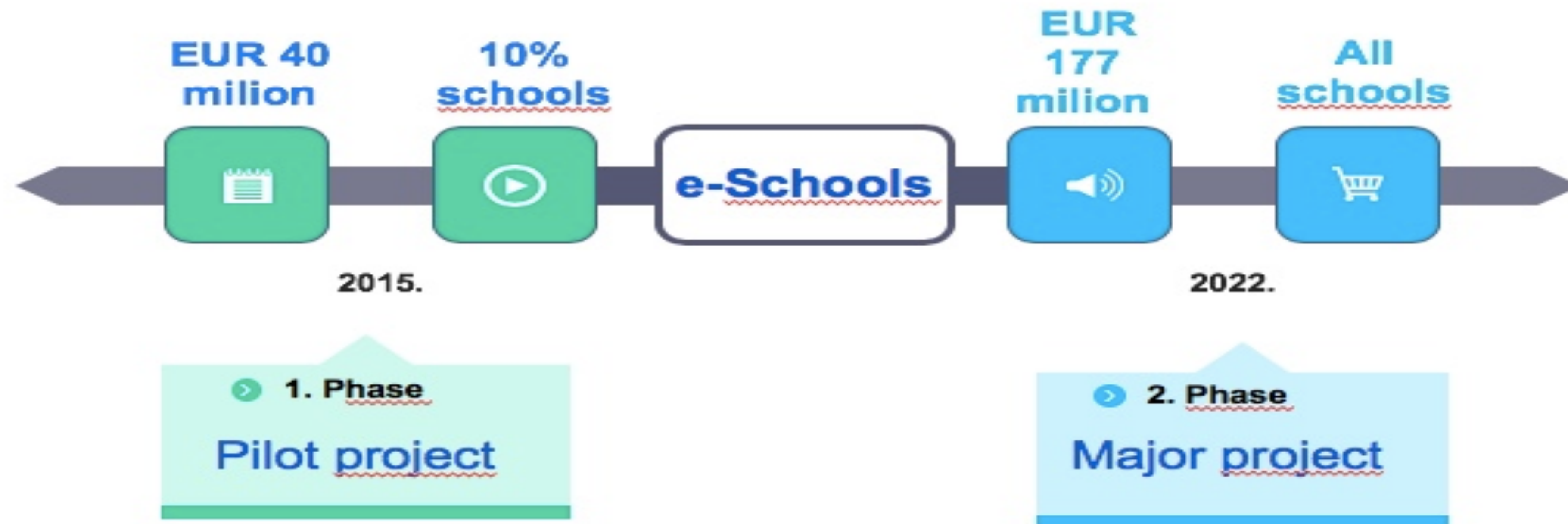
151 SCHOOLS

This is from where we started…

- ☑ **197** **Local area networks**

- ☑ **12 224** **Laptops, tablets and hybrid computers**

- ☑ **2** **equipped classrooms in every school**

- ☑ **5** **regional training centres**

CARNET

First phase - results

- Increased digital maturity of schools

- Adequate ICT infrastructure and equipment

- E-services for school administration

- ICT in teaching and learning

- Education and support

- Community of practice

CARNET

NEXT PHASE: MAJOR PROJECT

2019. – 2022.

ALL SCHOOLS IN CROATIA

177 M EUROS
(ESF+ERDF)

CARNET
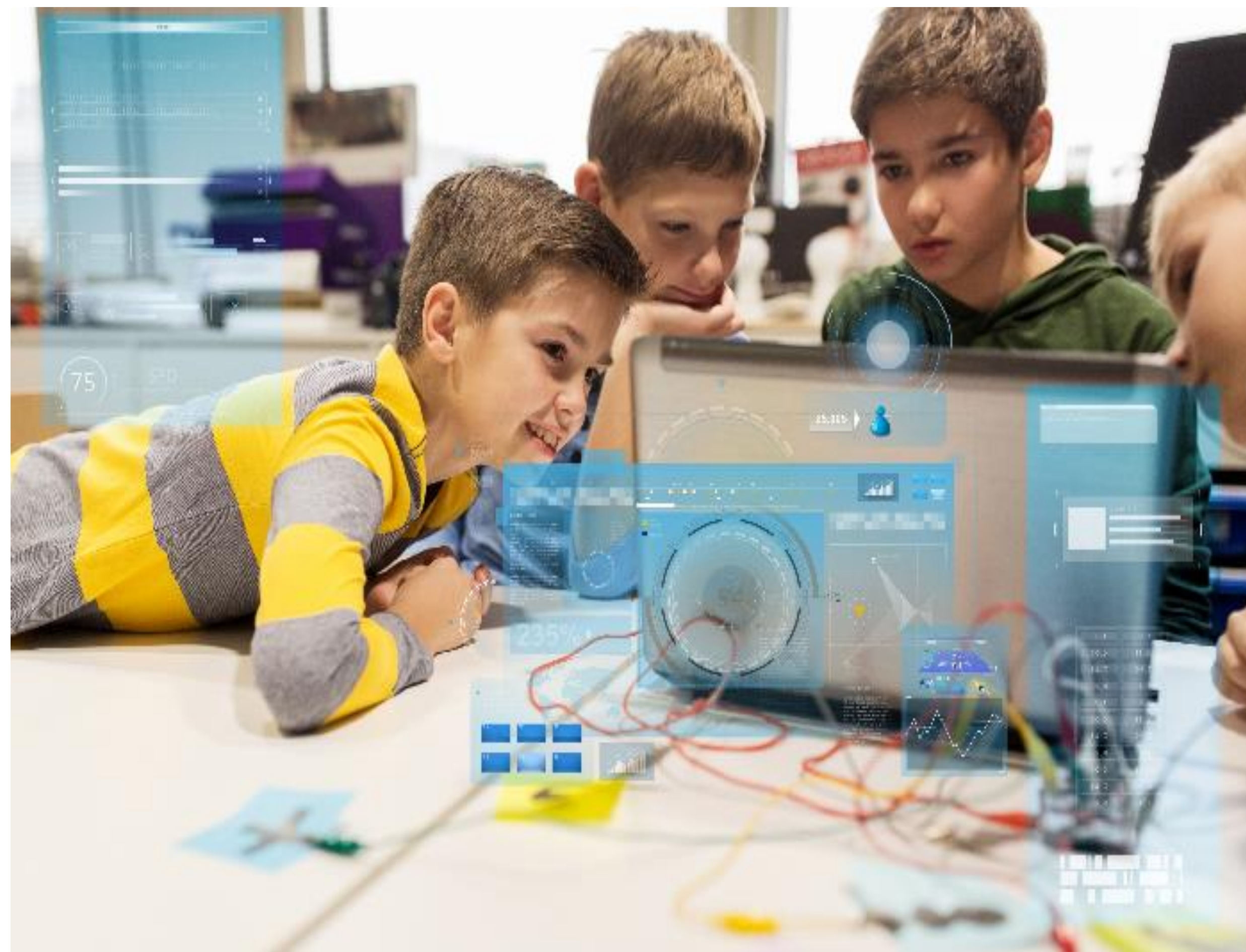
NEXT PHASE: MAJOR PROJECT

1166
schools

803 elementary schools

314 secondary schools

49 music schools

1493
locations

CARNET

e - services

- Digital Content Repository
- Education Management Application
- Enterprise Resource Management System
- Ecosystem
- Classroom Management System
- Learning Analytics and BI systems
- Sensors and Smart Management

The use of e-Class registry (e-Dnevnik)

CARNET

Why comprehensive national approach to digitalization through CARNET?

1. As a central government agency for ICT infrastructure in Education CARNET combines **expertise** in networking, software and user support **that schools (or the MoE) do not have**, but need.

2. CARNET already ran high speed and overprovisioned network with a series of national services that could be extended to schools.

3. Central procurement ensures better quality, professionally designed, standardized infrastructure for a lower price (saving government money for other investments).

4. Central planning enables development of standards, compatible **and scalable** systems.

CARNET

Darko Parić

Darko.Paric@CARNET.hr

Thank you!

CARNET