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ECIAO: Bridging EU-China Future Internet Common Activities and Opportunities

26.1 Introduction

The ECIAO project (August 2013 to July 2015) supported EU-China co-operation on activities related to Future Internet Experimental Research (FIRE) and IPv6 deployment.

In particular, the project explored EU-China co-operation on the following topics:

- Strengthening EU-China joint research efforts on the Future Internet by facilitating the trialling of interoperable solutions and common standards, and exchanging best practices on the federation of testbeds.
- Reinforcing academic and industrial co-operation on Future Internet experimental research, through a better networking between European and Chinese actors. The ECIAO web portal at <http://www.euchina-fire.eu/>, linked also to leading social networks and – with a dedicated helpdesk service – offered an efficient Co-operation Platform stimulating collaboration between EU and China researchers.
- Exchanging best practices for IPv6 deployment and supporting the creation of interconnected IPv6 pilots between Europe and China.

26.2 Problem Statement

Among the salient problems which existed prior to ECIAO were the differences in experience and contexts regarding testbeds and their federation between Europe and China. This was coupled with the added factor of technology constantly evolving at a fast pace.

Therefore, a common action on testbed federation was seen as a necessary requirement. ECIAO looked at both global and EU/China research on federation, taking into account the existing work being done on the Chinese testbeds through PTDN (Public Packet Telecom Data Network) and the Internet Innovation Union (IIU), and in EU projects such as OFELIA, BonFIRE, OpenLab and Fed4FIRE.

Interoperability was seen as another important step to bring key technical areas of interest for both Europe and China from research to the market.

Contributions to standards in the domain of Future Internet was an area in which there was no optimal communication between EU and Chinese standardisation experts. In China, a main focus of standardisation was on PTDN, but on the EU side, the equivalent topics were being followed in ETSI by the AFI (Autonomic Future Internet) NTECH Technical Committee.

The massive adoption of IPv6 in China requires experience from complex deployments including IPv4 and IPv6 transitions. This expertise is available in Europe.

26.3 Background

In 2009, the first EU-China Information Society Dialogue between the DG Information Society and the Chinese Ministry for Industry and Information Technology (MIIT) took place. This Dialogue was in addition to the EU-China Information Society Dialogue that started one year earlier. The new Dialogue focused on topics of policy-making in the area of the telecommunications and information society framework.

One of the key topics that arose from this Dialogue in 2010 was the need to exchange experiences and plans on further developing the overall policy framework for the Information Society. The European Commission was working on the policy framework to succeed the i2010 programme (“A European information society for growth and employment”), and was calling for input from experts and stakeholders, domestically and abroad, whilst at the same time the Chinese government was conducting research and internal consultations on Information Society-related elements of its forthcoming 12th 5-Year-Plan to guide the Chinese industrial and social policy over the next years.

During this period of important strategic decisions, both for the EU and China, the Information Society Policy Dialogue sought to improve mutual

understanding of the respective approaches and support the development of global strategies for global information and communication networks.

To help provide inputs related to the “Internet of the Future” for the Dialogue, an EU-China expert group was established in 2010. The expert group met twice – in July and September 2010 – and had regular exchanges which led to recommendations in important areas including IoT, FIRE and IPv6.

The ECIAO project was designed to follow-up on the recommendations from this expert group.

26.4 Approach

The project targeted five actions:

- The analysis of Future Internet research topics in Europe and China and the identification of common topics for co-operation. These were: IPv6, SDN, NFV, IoT, 5G, Cloud and AFI-PTDN.
- The identification and documentation of common ongoing technical collaborations that were ready to move to the stage of interoperability testing between Europe and China. The interoperability testing of IoT and IPv6 was facilitated.
- The facilitation of joint contributions to standards in the domain of the Future Internet (AFI-PTDN).
- The exchanging of best practices in IPv6 deployment between Europe and China, including the setting up of a common pilot.
- Ensuring a better networking and enhanced co-operation between European and Chinese organisations, through the creation of an interactive web portal, the provision of helpdesk services and the organisation of dedicated events.

This approach was accompanied by a solid dissemination strategy that comprised three consecutive phases:

- *Awareness-oriented phase*: At the start of project, this phase raised public, industry and research community awareness about the project and the problems that it aimed to address. During this phase of the dissemination, the tasks involved the setting up of the basic marketing materials and awareness-raising presentations at various related events.
- *Result-oriented phase*: During this phase the results of the project were published to promote these to stakeholders in EU and China.

- *Exploitation-oriented phase*: Specific activities were undertaken in order to improve the online Co-operation Platform and to increase the co-operation in standardisation, testbed federation and resource sharing, IPv6 education and best practices, etc.

26.5 Achievements

The success of the ECIAO project manifested itself in several important achievements:

-  An online *Co-operation Platform* helping EU and Chinese organisations network together and discuss co-operation on Future Internet topics.
-  An online *Support Desk* for EU and Chinese researchers and industries looking for background information in the area of FIRE, or for support in establishing contacts in this field.
-  *9 articles on EU-China Future Internet co-operation* sent by experts from both Europe and China in response to the project call for articles.
-  *Two conferences* supporting EU-China co-operation on IPv6 and Future Internet testbeds and strengthening collaboration on AFI-PTDN standardisation.
-  *Two webinars* imparting knowledge on Public Packet Telecom Data Network (PTDN) and AFI.
-  *Two workshops* discussing AFI standardisation and SDN, NFV and IPv6 impacts, as well as EU-China testbeds federation, including a *Fed4FIRE tutorial* on how to use worldwide federation techniques.
-  *Improvement of interoperability* between European and Chinese developments due to successful *interoperability events in IPv6 and SDN* organised or supported by the project.
-  A successful *EU-China IPv6* pilot set up between partners sites in Beijing (the Beijing Internet Institute and the Beijing University of Post and Telecommunications) and Paris (Mandat International and France Telecom/Orange).
-  Increased awareness on *testbed federation techniques* preparing the ground for worldwide federation between GENI (USA), Fed4FIRE (Europe) and CENI (China).

-  *Promotion of important standards for AFI and co-operation in standardisation mainly with active dialogues between ETSI NTECH and CCSA (China Communication Standardisation institute).*
-  *The creation of an ETSI Industry Specification Group to promote IPv6 and its impact on IoT, Cloud Computing, SDN-NFV and 5G.*
-  Important contribution to the Fed4FIRE architecture implementation.
-  *The launch of the IPv6 education programme in Europe and China introducing IPv6 educational best practices in curriculum and course definitions, and stimulating the uptake of IPv6 deployment in the education sector.*
-  *Two eBooks on IPv6 best practices written by experts in the field offering deployment recommendations (1st eBook) and providing an IPv6 Roadmap exploring the transition process (2nd eBook).*
-  *A virtual community of stakeholders supporting EU-China co-operation on FIRE on LinkedIn, Twitter and Weibo.*

26.6 Conclusions

The ECIAO project successfully built a sustainable partnership between European and Chinese organisations in order to foster co-operation in the domain of Future Internet research experimentation and IPv6. This was achieved by facilitating the development of interoperable solutions and common standards, reinforcing academic and industrial co-operation, the exchanging of good practices for IPv6 deployment and supporting the creation of interconnected IPv6 pilots between Europe and China.

ECIAO exploited work done in several past and on-going FIRE projects and took into account various experiences from them.

Six Chinese testbeds began the process of federating with EU testbeds, using the Fed4FIRE specifications.

The impact of ECIAO reaches not only into the scientific and technical communities but also fosters social and political information exchanges and co-operation between EU and China. Research organisations, regulators, policy-makers, enterprises and consortia have taken advantage to build on our work, which will be continued through a similar initiative in H2020, focussing on EU-China collaboration for IoT and 5G.

