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The Recent Activities on Cognitive Radio System(CRS) in APT

Talking to the future

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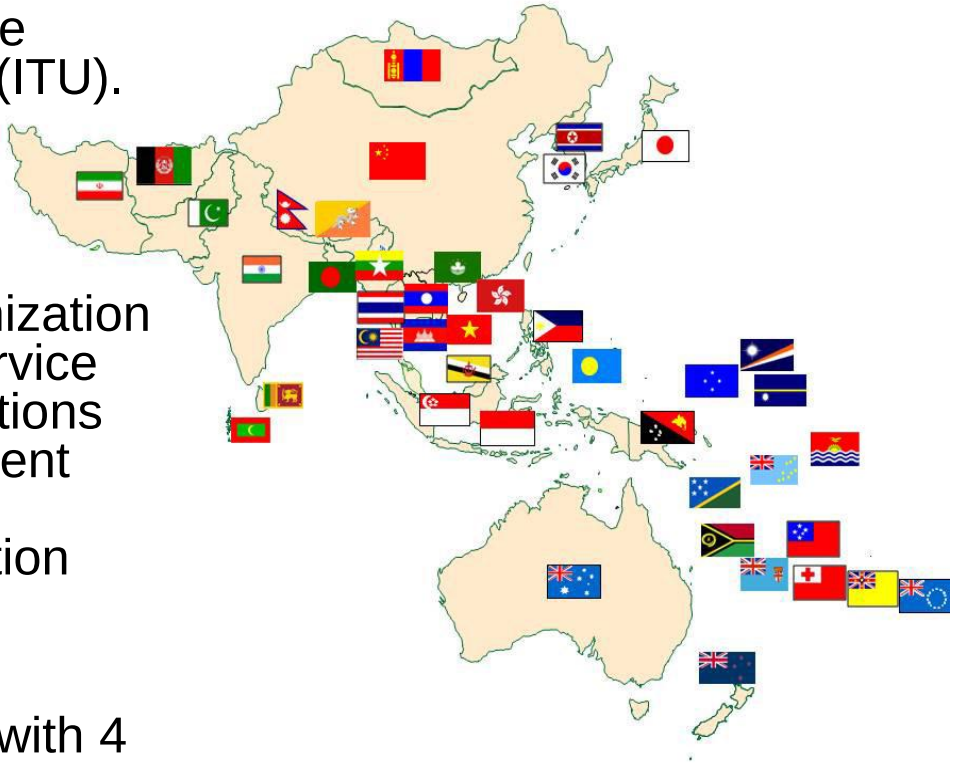
Overview

- Introduction of APT
- Research activities of APG and AWG on CRS
- Research activities of CRS in APT countries
- Research activities of CRS in ZTE

APT(1)

ASIA-PACIFIC TELECOMMUNITY

The Asia Pacific Telecommunity (APT) was established in Bangkok in July 1979, and founded on the joint initiatives of the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) and the International Telecommunication Union (ITU).



The APT is an Intergovernmental Organization operates in conjunction with telecom service providers, manufacturers of communications equipment, and research and development organizations active in the field of communication, information and innovation technologies.

The APT covers 38 member countries, with 4 associate members and 130 affiliate members.

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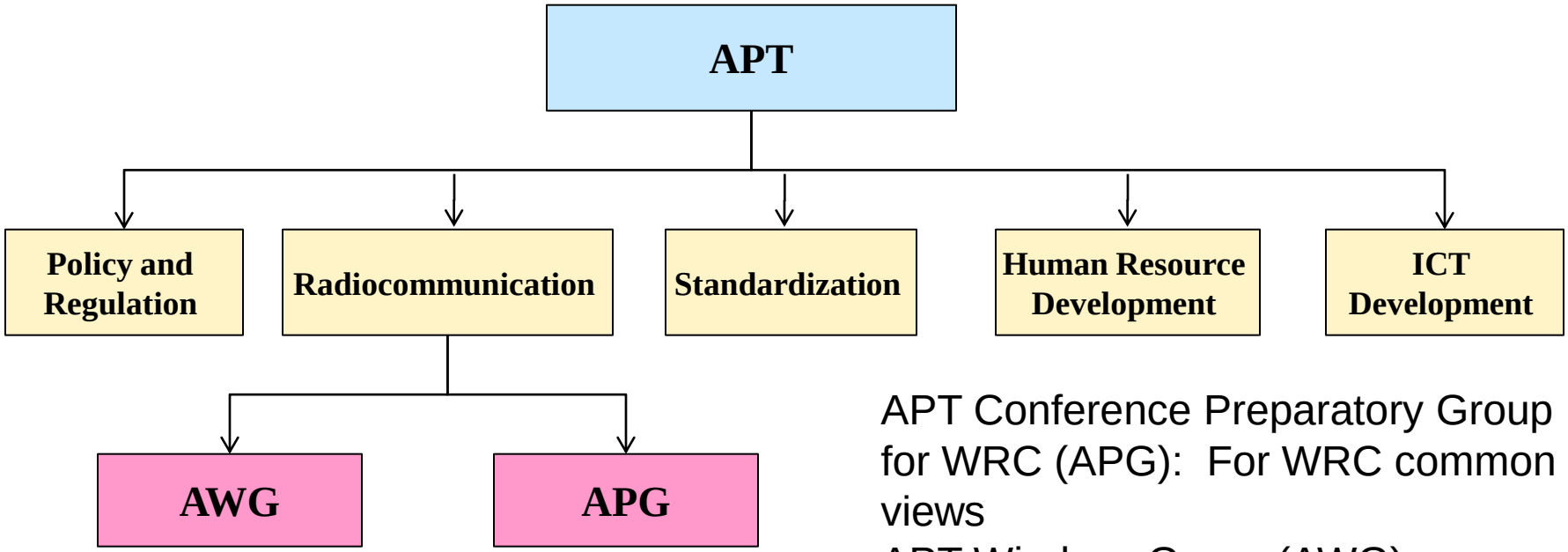
APT(2)

APT Work Program Areas



APT Conference Preparatory Group for WRC (APG): For WRC common views

APT Wireless Group (AWG): formerly known as APT Wireless Forum (AWF)

As a promising and evolving technology, the discussion on CR/SDR has been mostly discussing in AWG and APG separately.

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APG (APT Conference Preparatory Group)

As a platform for administrations to develop the common views on WRC Agenda Items.

Five APG meeting had been hold since WRC-07, and the last APT Conference Preparatory Group Meeting for WRC-12 was held from 29 August to 03 September 2011, in Busan, Korea.

The common views on WRC-12 AI 1.19 with regard to CRS as following:

✓ APT Members are of the view that CRS is not radiocommunication service as defined in Article 1 of the Radio Regulations, but CRS is technology that can be implemented in systems of any radiocommunication services.

✓ With respect to CRS (Issue B), APT Members support No change to the provisions of the Radio Regulations and suppression of Resolution 956 (WRC-07).

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AWG (APT Wireless Group) (1)

- Current research of CRS in AWG
  - A Task Group (TG) had been set up in AWF-6 meeting for the research of CRS specific to APT region.

- The TG supposed to(TOR):
  - Conduct surveys on CRS in APT region.
  - Study and discuss the possible applications, deployment environments and/or standardization processes etc..
  - Analyzes the possible harmonized spectrum usage of CRS implementation in APT.
  - Study the key techniques and system requirements of CRS
  - Other aspects

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AWG CRS/SDR Survey Result

✓ A survey (followed the TOR of TG) on CRS/SDR had been sent to APT administrations during the AWG-9 meeting.(AWF-9-OUT-18)

✓ Several administrations responded the questionnaire, including Australia, Brunei, China, Indonesia, Japan, Korea, New Zealand and Singapore, etc.

Based on the survey, most administrations hold the view that:

- They are conducting CRS research in their countries.
- Positive view on the commercial deployment of CRS(5-10 years).
- Considering or going to consider the possible frequency band(s) for the implementation of CRS technologies.
- Need further study (technology and regulatory perspective) on the main issues or challenges for CRS deployment.

The survey report was completed in AWG-12 meeting.
(AWG-12-OUT-07)

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AWG CRS/SDR future work

- The scope and timeline of a new study report on CRS in APT region was determined.
- It will start to draft the report in next meeting and plan to be finalized in AWG-16 meeting.
- The topics of CRS deploys in TVWS and TVWS in APT will be consided in the next AWG meeting.

The detailed scope and purpose of the drafted new report as following:

Scope: *To study CRS deployment scenarios in the APT region and associated key techniques, system characteristics and requirements. To identify the potential impact of exploiting CRS capabilities on existing radio services.*

Purpose: *To develop APT Technical Report providing the results of studies on cognitive radio systems (CRS) deployment scenarios and identify potential impact of exploiting CRS capabilities on exisiting radio services.*

Contributions from CEPT or other regions are welcomed.

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Current research of CRS in China

- CCSA (China Communication Standard Association)
  - CCSA sepctrum WG(WG8) leading the research.
  - Research on WRC-12 AI 1.19 (completed)
  - The report of CRS techniques and relevant regulation issues is on going

- Chinese National Project:
  - Chinese National 973 Program
  - Chinese National 863 Program
  - Chinese national science and technology major projects
  - Academic research of CRS by Universities or institutes

- The regulatory issues for Cognitive Radio is still under discussion.

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Current research of CRS in other APT countries

Many APT countris undertake the research on Cognitive Radio technology and, most of them believe with the CR cabalities, the systen could improve the overall spectrum efficiency.

- Australia
  - ✓ Universities and other research organizations have carried out research on various aspects of CRS and related topics.
- Japan
  - ✓ Telecommunication Operators, Manufacturers, Research institutes and Universities
- Korea
  - ✓ ETRI, Samsung Electro-Mechanics Co. and Universities have carried out research and development on various aspects of CRS and related topics including RF chips and test-bed to verify algorithms.

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Current research of CRS in APT countries

- New Zealand
  - ✓ Industrial Research Limited – Spectrum Sensing
  - ✓ Canterbury University – Capacity information
  - ✓ Victoria University – Capacity information
  - ✓ Auckland University – Interference mitigation
- Singapore
  - ✓ National research organizations are carrying out R&D on CRS

- For the regulatory issues, most APT countries hold the views that:
  - ✓ no need to change the Radio Regulations at the current stage.
  - ✓ the protection of the existing services need to be considered.
  - ✓ for the deployment of CRS, the corresponding regulatory implementation measures need to be taken into account domestically in future.
  - ✓ Still under the research and study.

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Current research of CRS in ZTE

ZTE's research activities related to CR could be summarized as follwing:

- Special research team has been set up for Cognitive Radio and its key techniques.
- Condsider its potential commercial deployment in future IMT systems (TDD, FDD).
- Work on link level or system simulation, demo, and prototype etc.
- Evaluate the impacts of Cognitive Radio (benefits and risks related to techniques and regulatory).
- Participate in SDOs for its standardization process.
- Support and participate Chinese National projects or programs.
- Collaberate with opeartors and coorperate with academic institutes or Universities.
- Other Aspects.

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Thanks for your attention!

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