Protocol To Access Spectrum Database

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Database Interface Protocol

- IETF is defining a Protocol to Access Spectrum Database in PAWS (Protocol to Access White Space) WG
  - http://tools.ietf.org/wg/paws/

- Important Characteristics
  - Interface agnostic- can be wired or unwired
  - Spectrum agnostic – protocol should be able to be used in any spectrum
  - Globally applicable - a common messaging interface between device and database that can operate in different countries and with different regulators
  - Flexible and extensible data structures – should support different device characteristics

- http://www.ietf.org/id/draft-ietf-paws-problem-stmt-usecases-rqmts-15.txt

EEE 802

High Level Architecture
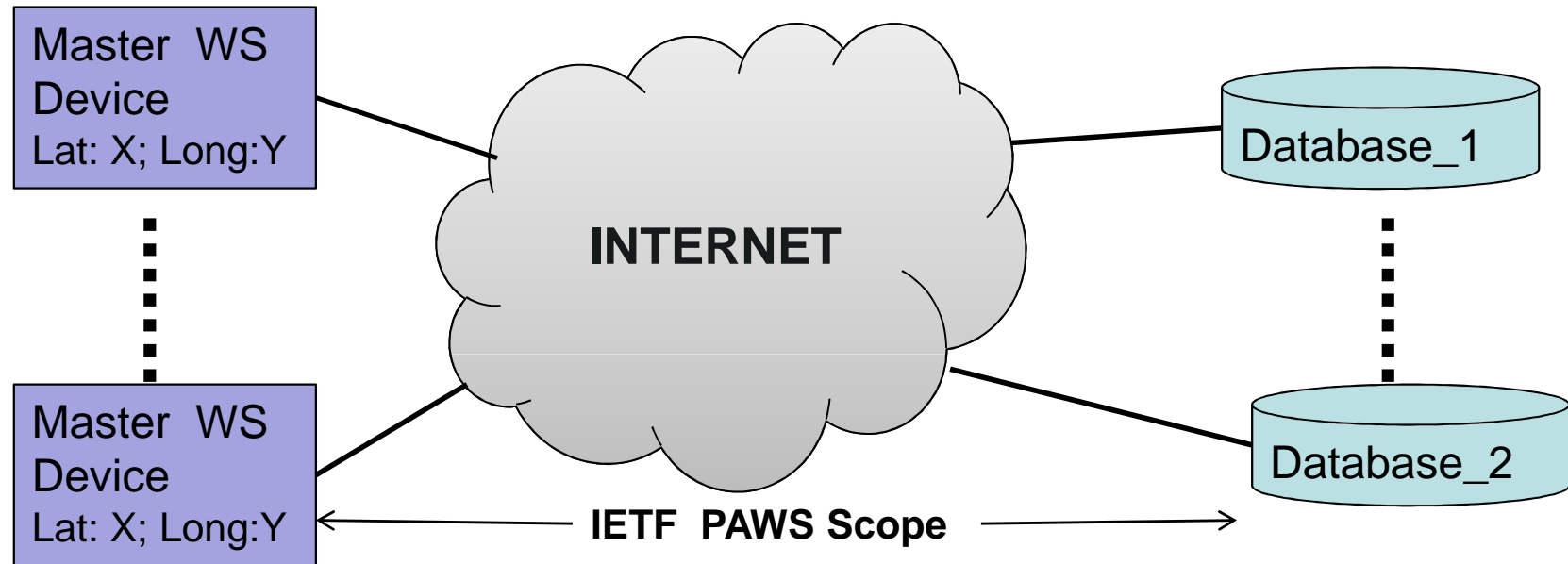
- **Master Device:** A device that queries the database, on its own behalf and/or on behalf of a slave device, to obtain available spectrum information (e.g., AP or BS)
  - Slave Device: A device that queries the database through a master device (e.g., STA, UE)

Interface Protocol Features

- **Protocol supports the capability for the**
  - devices and the database to authenticate each other
  - devices to identify the database to register with
  - devices to find out the available spectrum use
  - database to inform the devices of regulatory rule set
  - database to inform the devices of changes to spectrum availability
  - database to track the spectrum usage
- **All protocol messages exchange are integrity protected**

Sequence of Operation

- The Master Device obtains (statically or dynamically) the URI for a Database appropriate for its location to send subsequent PAWS messages.

- The Master Device establishes an HTTPS session with the Database.

- The Master Device optionally sends an initialization message to the Database to exchange capabilities.

- If the Database receives an initialization message, it responds with a message in the body of the HTTP response.

- If required by regulatory domain, the Database registers the Master Device.

Sequence of Operation Contd..

- The Master Device sends an available-spectrum request message to the Database.

- If required by the regulatory domain, the Master Device must verify with the Database that the Slave Device is valid.

- The Database responds with an available-spectrum response message in the body of the HTTP response.

- Depending on regulatory domain requirements and database implementation, the Master Device sends a spectrum-usage notification message to the Database.

- If the Database receives a spectrum-usage notification message, it responds by sending the Master Device a spectrum-usage acknowledgement message

Spectrum Query Call Flows
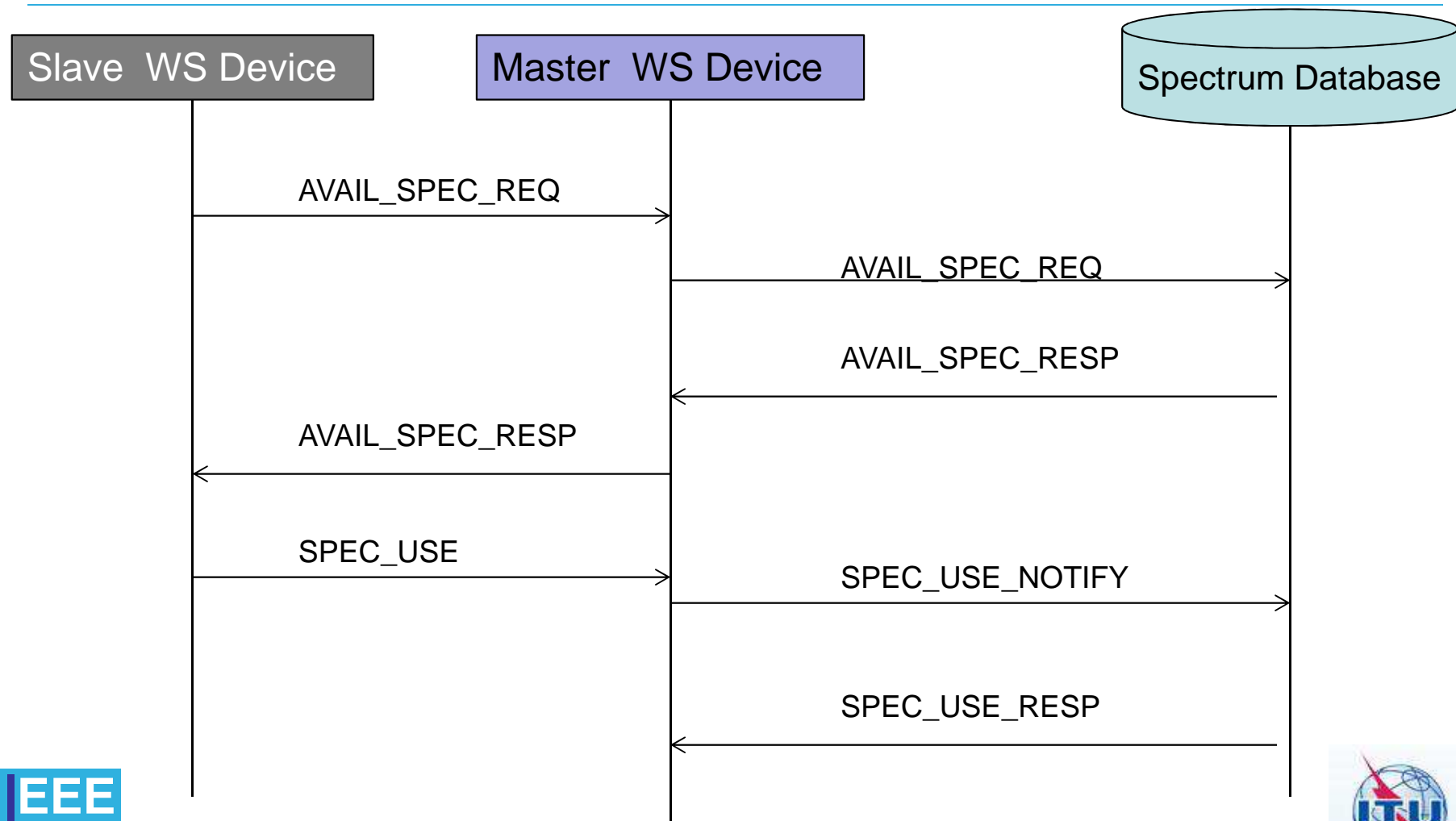
Data Model

- Data Model supports
  - geo-location of the device
  - rule set that applies to white space devices at a specific location (e.g., regulator specific)
  - device description (e.g., device serial number, manufacturer serial number, certification ID, and so on)
  - specifying antenna and radiation related parameters (e.g., antenna height, antenna gain, EIRP and so on)
  - owner and operator contact information
  - spectrum availability based on location
  - specifying the frequencies and power levels selected for use