

# PAWS WG

## IETF-83

Device to Database Protocol for White  
Space

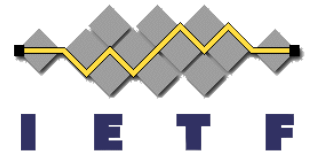
<draft-das-paws-protocol-01.txt>

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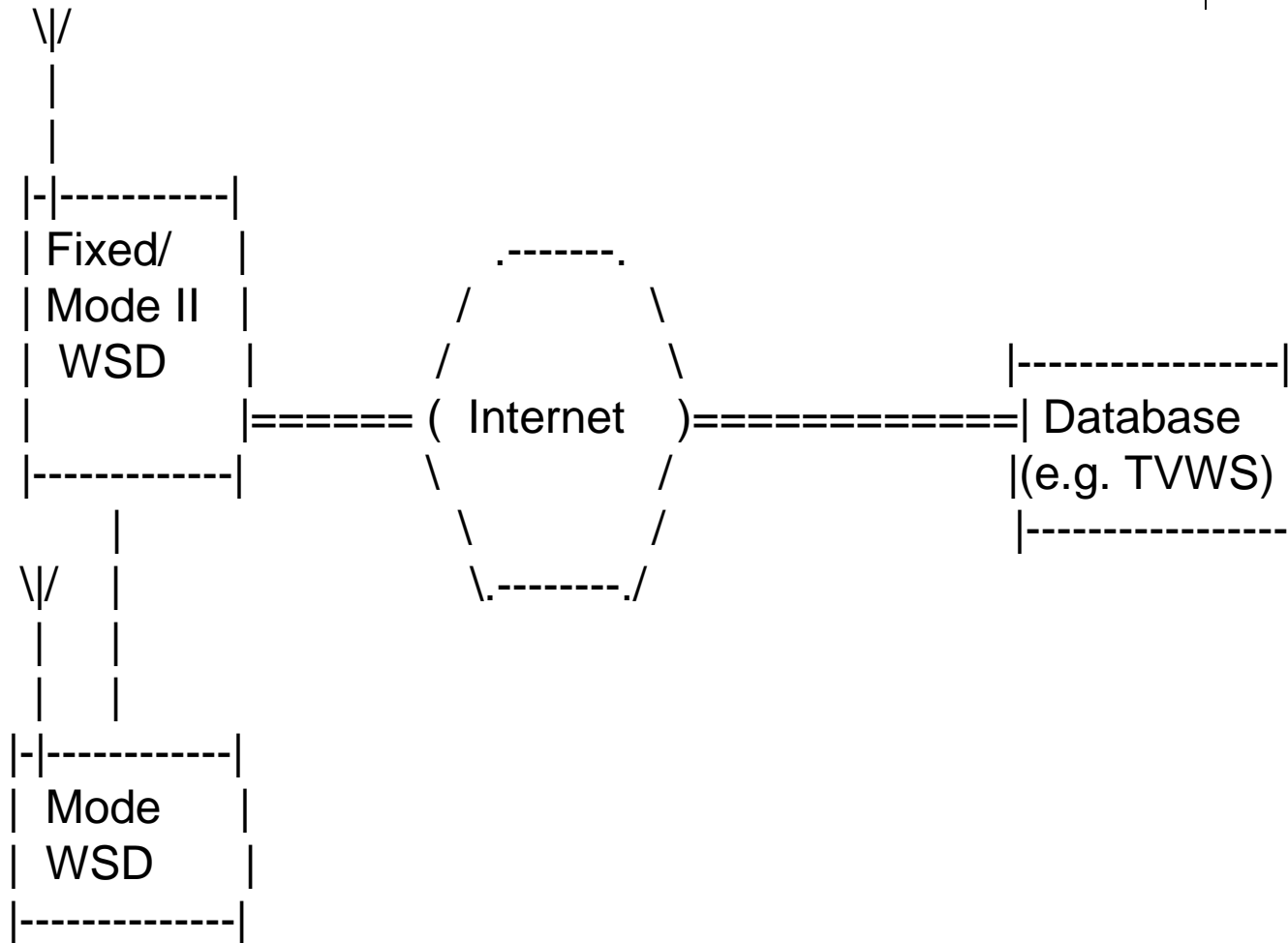
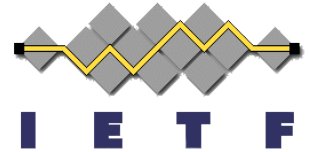
Applied Communication Sciences



# Outline

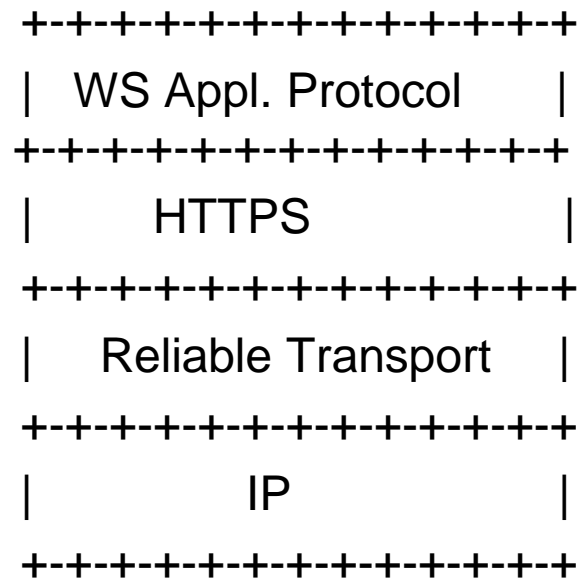
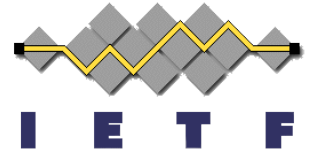
- Introduction
- Protocol layer
- Protocol Features/Functionalities
- Q & A

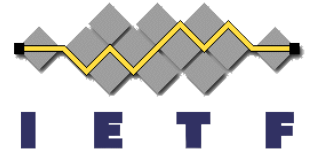
# Introduction



< --Device-to-Database Interface (scope) - >

# Protocol Layer

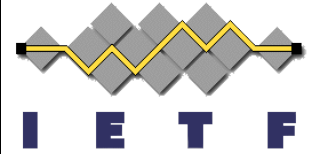




# Protocol Features/Functionalities

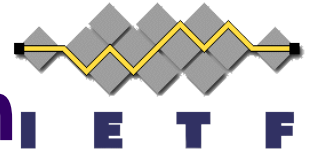
- WSD Bootstrapping/Initialization
- WSD Registration
- Database Query
- WSD Validation

WSD → White Space Device



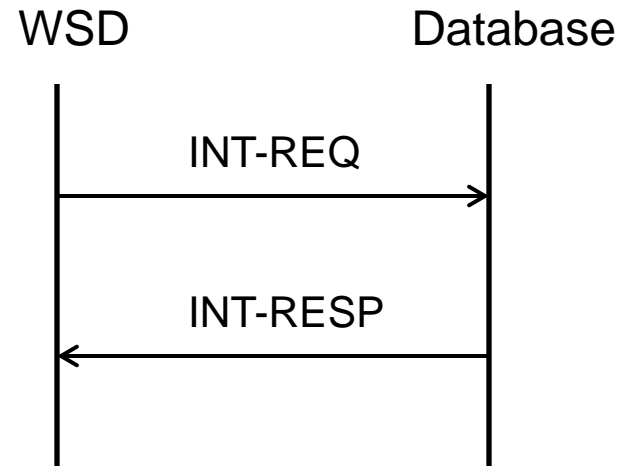
# Protocol Operation Steps

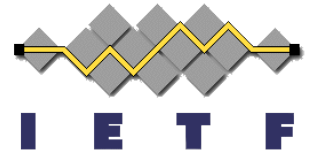
- The White Space Device (WSD) requests service from the White Space (WS) database by sending a message in the HTTPS requests
  - E.g., it can be XML and/or JSON encoded to a known URL in the body of an HTTP request
- The database then responds with the message in the body (with the same encoding) of the HTTP reply
- A TLS with TCP or DTLS over DCCP connection is used for underlying transport each time WSD contacts with the database
  - With the use of server-only certificate, WSD authenticates the database
- The initialization operation provides the authentication information that WSD obtains from the database and uses for 'Registration' and subsequent protocol operation 'Request' messages



# Device Bootstrapping/Initialization

- Device bootstrapping is the process whereby device establishes an initial connection to the database





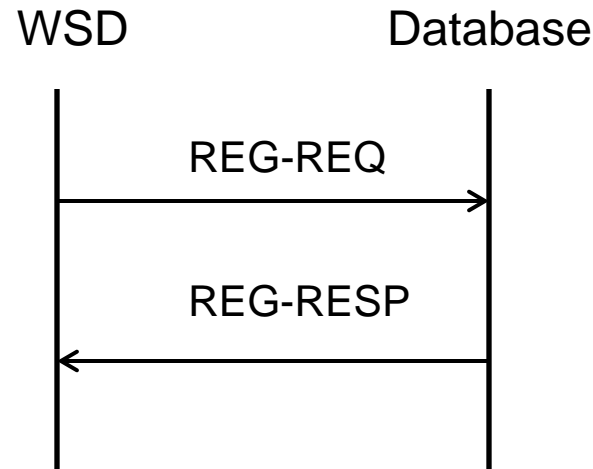
# Message Parameters and Type

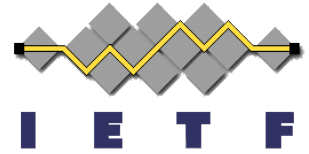
- INT-REQ
  - Protocol version, Message type, Authority, Device Type and Device Identity
- INT-RESP
  - Protocol version, Message type, Authority, Result code, Authentication Information
- Authority – ‘au’ – e.g., ‘US’ ‘UK’ (can start with ISO 3166 country list) ,
- Device Type – ‘devtype’ – e.g., ‘F’- Fixed Device, ‘M2’- Mode II device
- Device Identity – ‘devid’ – e.g., ‘FCC ID’ for US, ‘Serial no’
- Authentication Information- ‘authcode’ – information that authenticates the ownership and integrity of the message



# WSD Registration

- WSD registration is the process of a device establishing certain operational parameters with the database, as required by the spectrum management authority



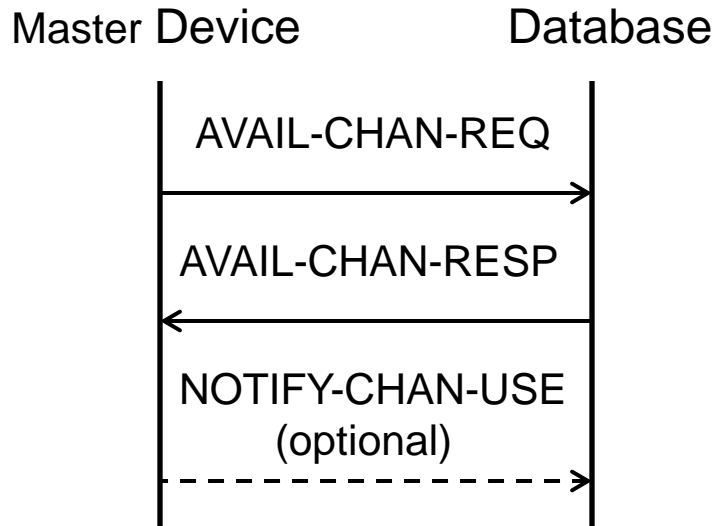


# Message Parameters and Type

- **REG-REQ**
  - Protocol version, Message type, Authority, Device Type and Device Identity, Device Location, Device Owner, Authentication Code
- **REG-RESP**
  - Protocol version, Message type, Authority, Sequence Number, Result code, Authentication Code
- **Device Location- 'lat', 'long', 'hagl', 'ant\_type' –**
  - Latitude, Longitude of the device with uncertainty value, Antenna height above ground level, type of antenna characteristics and so on (for location and resolution RFC 4119, RFC 3825, RFC 5491 can be used)
- **Device Owner – 'devinfo' – ownerinfo(name, addr, phone, email), Operatorinfo(name, addr, phone, email)**

# Database Query

- Master device queries the database to obtain channel and other information



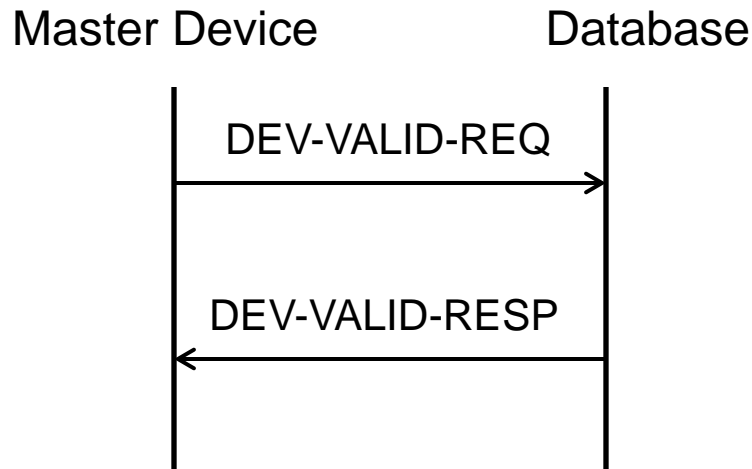
Note: We understand that 'NOTIFY-CHAN-USE' type of message is under scope discussion and we are ok with removing or keeping this message per WG decision

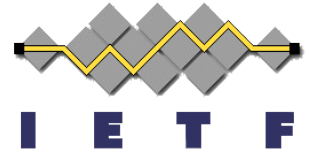
# Message Parameters and Type

- AVAIL-CHAN-REQ
  - Protocol version, Message type, Authority, Device Type, Device Identity, Device Location, Authentication Code
- AVAIL-CHAN-RESP
  - Protocol version, Message type, Authority, Sequence Number, Result code, Available Channel, Authentication Code
- Device Location- 'lat', 'long', 'hagl', 'ant\_type' –
  - Latitude, Longitude of the device with uncertainty value, Antenna height above ground level, type of antenna characteristics and so on (for location and resolution RFC 4119 and RFC 3825 can be used)
- Available Channel – 'channel' –
  - List of channel with true/false, maximum power, frequency range, available until this time, ...

# WSD Validation

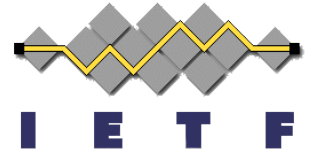
- WSD validation is the process by which devices can be validated by the database





# Message Parameters and Type

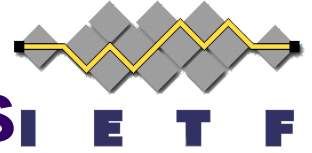
- DEV-VALID-REQ
  - Protocol version, Message type, Authority, Device Type, Device Identity, Device Location, Device List, Authentication Code
- DEV-VALID-RESP
  - Protocol version, Message type, Authority, Sequence Number, Result code, Device List, Authentication Code
- Device List – ‘devlist’ –
  - List of valid devices with device type, device identity, manufacturer serial number and so on



# Security Considerations

- The protocol framework assumes the WS protocol runs over HTTPS which can satisfy confidentiality and server authentication
- Some security requirements, such as, client authentication, message authentication, integrity and replay protections can be provided at the WS application protocol layer

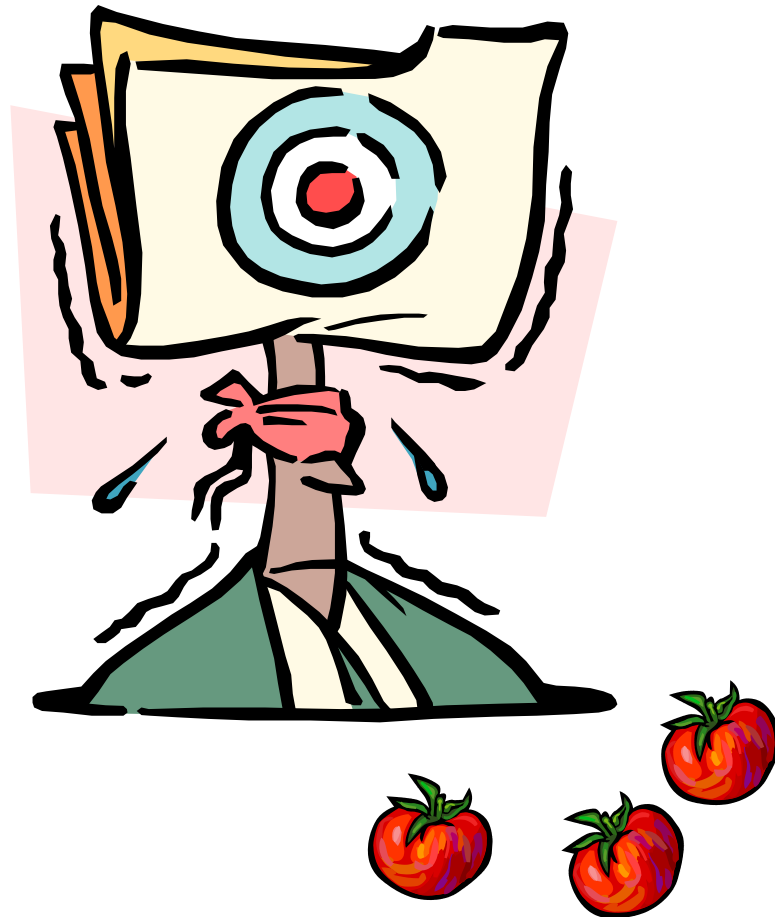
# Additional Thoughts/Considerations



- Capability Indication in 'Registration' response message
  - Supported features, mandatory, optional.....
- ...
- ...



# Questions? Feedback?



## Question to WG?

- Can WG consider this draft as a starting point for WSD to Database interface protocol specification?