Authorized Shared Access (ASA)

A New Licensed Model to Access Underutilized Spectrum

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Authorized Shared Access (ASA)

- Licensed Approach
  - Auctions of cleared Spectrum
  - Exclusive use
    - Predictable QoS

- Complementary licensed model (ASA)
  - Authorized shared access
  - ASA – Shared exclusive use
    - Exclusive licensed use on a shared and binary basis in time, location and/or frequency with incumbents

- Unlicensed approach
  - Shared use

Supplemental Downlink
ASA – Logical Architecture

- **Simple**
  - Focus on necessary components to enable licensed spectrum sharing
- **Facilitates ease and speed of deployment**
  - Network centric design
  - User terminals do not need any new radio protocol or functionality needing a lengthy development process (e.g. standards, conformance tests, performance tests)
  - Allows for a significant time-to-market advantage
ASA – Relationship between Licensee and Incumbent

**Cost-effective**
- Use available 3G/4G infrastructure
- Complements installed 3G/4G
- Leverages existing 3GPP standards

**Simple**
- Simple technology with defined interfaces
- Regulatory framework

**Controlled**
- Enables predictable quality of service
- Protects incumbent from interference

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1 No device impact due to ASA, just a regular 3G/4G device supporting global harmonized bands targeted for ASA. Carrier aggregation would be beneficial to aggregate new ASA spectrum with existing spectrum, but is not required.

2 The O&M system of the ASA rights holder enforces the permitted bands
ASA – Regulatory and Technology Framework

ASA-2 Interface
- Spectrum requests—location, frequency and time
- Spectrum grants/denials/updates
- Heartbeat message to verify connectivity

ASA Controller
- Can be managed by the incumbent, the regulator, the licensee or a third party.

ASA-1 Interface
- Information to protect Incumbent users—location, frequency and time
- Pre-calculated exclusion zones and online calculated protection zones
- Heartbeat message to verify connectivity

Network controls device spectrum access

Operation and Maintenance

Regulatory framework
- ASA spectrum to be licensed is identified by the government
- Subject to a private commercial agreement between incumbent and ASA licensee

Permitted ASA spectrum

Incumbent spectrum holder

ASA licensee

Grant/Award ASA rights

Administrator regulator

Long term sharing and commercial agreement
ASA – Licensed Harmonized Spectrum

Leveraging global, available 4G technologies to ensure economies of scale

<table>
<thead>
<tr>
<th>ASA CANDIDATE EXAMPLES</th>
<th>2.3 GHz (100 MHz)</th>
<th>2.6 GHz (100+ MHz)</th>
<th>~3.5 GHz (100-200 MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicable Regions</td>
<td>EUROPE (Traditionally licensed in e.g. India)</td>
<td>MENA (Traditionally licensed in e.g. Europe)</td>
<td>USA, EU, LATAM, SEAP</td>
</tr>
<tr>
<td>Incumbent Users</td>
<td>Telemetry, public safety, cameras</td>
<td>Various</td>
<td>Naval Radar (US) Satellite (EU, LATAM, SEAP)</td>
</tr>
<tr>
<td>Suitable Technology</td>
<td>LTE TDD</td>
<td>LTE FDD/TDD</td>
<td>LTE TDD</td>
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<tr>
<td>Possible Launch</td>
<td>~2015</td>
<td></td>
<td></td>
</tr>
</tbody>
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3.4-3.8 GHz
Key band for licensed small cells
Traditional licensed in most regions
ASA licensed in US

2.3-2.4 GHz
LSA (Licensed Shared Access)
Endorsed by EU 27 member states
Endorsed by CEPT
Standardized by ETSI

13GPP has already defined bands 42/43 for 3.4 GHz to 3.8 GHz, 3.5GHz in the US defined as 3550 – 3650 MHz, but up to 200MHz could be targeted for ASA in e.g. SEAP/LATAM. Note that ASA targets IMT spectrum bands, but the concept can be applied generally to all spectrum bands and other technologies.