CBRS RELEASE 2 STANDARDS

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• Release 1 requirements are in WINNForum Technical Specification TS-0112
• Spectrum Access Systems (SASs) were certified by FCC against Release 1 standards
• Release 2 requirements are contained in TS-1001
• Release 2 represents the innovation and evolution of SAS control of shared spectrum in CBRS
• The Release 2 TS is designed to be easily extensible
  • All Release 2 features (except for capability exchange) are implemented as separate Annexes to the document, and can therefore be added and balloted separately from the remainder of the contents
• Some applications of some Release 2 features could impact protection of protected entities
  • Regulatory certification of such applications of such features is TBD
  • Many applications of Release 2 features do not have regulatory impacts
• The following is a high-level overview of Release 2 features that have been adopted in the current version of Release 2 (v 1.2.0)
• Capability exchange allows SASs and CBSDs to understand which (if any) Release 2 features are mutually supported

• Currently, capability exchange is the only required feature under Release 2

• If any Release 2 feature (including capability exchange itself) is not understood by either the SAS or the CBSD, then SAS management of the CBSD defaults to Release 1
  • In any geographic area with a mix of Release 1 and Release 2 SASs, the SAS operators shall cooperate as needed, with the default being Release 1
  • “[A]ny Release 2 entity must support backward compatibility to Release 1 entities using SAS-CBSD and SAS-SAS protocols, and any feature requiring coordination among SASs.”
• Many Release 2 features are related to support for “groups” of CBSDs
  • Groups allow multiple CBSDs to identify themselves to a SAS as being as being related (or grouped) with other CBSDs to enable implementation of certain use cases
  • The SAS can use grouping information to handle those CBSDs belonging to a particular group in a coordinated manner when needed

• Release 2 Feature: Enhanced CBSD Group Handling
  • This Release 2 feature implements the necessary hooks to allow CBSDs to identify themselves to a SAS as a member of one or more groups

• Release 2 Feature: Principal-Subordinate Single Frequency Group (SFG)
  • Supports one or more instances of CBSDs that are connected as BTS-CBSD/CPE-CBSD pairs (for example, a central hub CBSD providing Internet backhaul to one or more CPE CBSDs in a rural broadband deployment)
  • The SAS attempts to move all members of the group to the same frequency when a frequency change is needed, although it’s possible that not all CPE-CBSDs may be accommodated

• Release 2 Feature: Interdependent Single Frequency Group
  • An interdependent SFG is a set of CBSDs that are required by their hardware to operate on a single frequency
  • If all members cannot be accommodated, then no members receive a grant

• Release 2 Feature: Separable Frequency Group
  • Similar to Interdependent Frequency Group, but individual members can be denied grants

• A member of a group is not afforded any special treatment by SASs in calculation of protection of protected entities
Enhanced Antenna Patterns

• Enhanced antenna patterns refers to the SAS using both azimuth and elevation in its determination of antenna gain for the purpose of co-existence, incumbent protection, etc.
  • Note: Many entities incorrectly refer to such patterns as “3D antenna patterns.” The proper term is 2D, since two dimensions are taken into account (azimuth and elevation)

• Release 2 provides methods for estimating the antenna gain at an arbitrary azimuth and elevation when only the principal-plane horizontal and vertical antenna patterns are available
  • The algorithm also provides for estimation when a nominal mechanical downtilt is used. Equations to support large mechanical downtilt scenarios are for future study.

• Release 2 provides methods for interpolating antenna gain at an arbitrary azimuth and elevation when a gridded 2D pattern is available to the SAS, and the desired azimuth and elevation do not correspond to specific data points in the provided pattern

• Enhanced antenna pattern implementation is currently being reviewed by FCC. Changes may be forthcoming.
CPE-CBSD Indicator

- Enables a CBSD to identify itself to a SAS as a CPE-CBSD
- The CBSD must meet the Release 1 requirements of a CPE-CBSD
  - A CPE-CBSD may “bootstrap” its registration through another CBSD
- A CPE-CBSD is not afforded any special treatment by SASs in calculation of protection of protected entities
Passive DAS

• Release 2 supports a passive DAS architecture in which a central radio unit provides signals to multiple transmission points via splitters, etc.
  • Each TP is considered an individual CBSD

• Members of the passive DAS chain declare their association to the DAS using the Release 2 Enhanced Group Handling feature

• All CBSDs in a passive DAS group must be professionally installed regardless of Category

• All members of a passive DAS group must be granted the same frequency(s)

• If one member of a passive DAS is not authorized to transmit, the other CBSDs must cease transmission within 60 seconds
Grant Update (in progress)

- **Provide ability to update certain parameters of a grant without requesting a new grant**
  - Enables SASs to replace a CBSD’s existing grant by a new grant with the same frequency range without a grant relinquishment process.
  - An example use case is reduction of EIRP due to need to protect incumbent from aggregate interference.
More Info on WiInnForum Release 2 Standards

Please visit:

https://cbrs.wirelessinnovation.org/enhancements-to-baseline-specifications

Thank you!