

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

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In the Matter of )

Unlicensed Operation in the TV Broadcast )  
Bands )

ET Docket No. 04-186

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**REPLY COMMENTS OF NEUSTAR, INC.**

On January 4, 2010, NeuStar, Inc. (Neustar) and six other parties, in response to a *Public Notice* issued by the Office of Engineering and Technology on November 25, 2009,<sup>1</sup> submitted proposals to be designated as a TV Band Device Database Manager. In early February, various parties submitted comments regarding those proposals. Neustar respectfully submits this reply to those comments.

**I. WSDB OPERATOR AS ENFORCER OF COMMISSION RULES**

A number of proposals and comments discuss the issue of how much the Whitespace Database (WSDB) should enforce Commission rules on TVBDs. Most of the discussion is whether the WSDB ought to validate the FCC ID of a TVBD before giving it service.<sup>2</sup> The wide disparity of opinions on this issue indicates a lack of clarity in the rules. Because of this obvious uncertainty, the Commission should clarify what role the WSDB takes in the enforcement of rules on the TVBDs.

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<sup>1</sup> *Public Notice* (DA-09-2479) *Unlicensed Operation in the TV Broadcast Bands* (ET Docket 04-186) released November 25, 2009 (“*Public Notice*”). See also *Second Report and Order and Memorandum Opinion and Order in ET Docket No. 04-186*, 23 *FCC Rcd* 16807 (2008), reconsideration pending (“*Order*”).

<sup>2</sup> See, e.g., Comments of MSTV and NAB at 11

Neustar observes that there are many systems that require both a “master” and a “slave” system where the slave must have a valid FCC ID. Two examples are the relationship between a mobile network and a handset, and the relationship between a WiFi endpoint and an access point. In both cases, the end device is required to have an FCC ID, the master device is intelligent, and there is a complex interchange of information between the master and the slave before service is obtained. In no other case is the master device required to verify the FCC ID. This would be a significant change in Commission practice.

There are three specific issues to be covered in this area:

**1. Must the WSDB check the validity of the TVBD’s FCC ID prior to allowing registration of the device, where registration is required or used?**

Neustar notes that the current registration requirements are unnecessary because t all of the information in the query operation duplicates the information in the registration operation with the exception of some contact information that is best obtained in what most call “enrollment” (a once per device per service provider operation, rather than once every time the device boots, etc). Since the device gets no information from the database from registration, enforcement action at this point is at best marginal value

**2. Must the WSDB check the validity of the TVBD’s FCC ID prior to returning any response to a query operation?**

Neustar notes that the WSDB has a required enforcement mechanism to return no channels available to specific devices identified by FCC ID and optionally serial number. Colloquially, this is termed a “blacklist”. Adding a check against the Commission database of IDs could be implemented as part of the query, with a failure of the check resulting in a “no channels available response.” If the Commission requires a check of the FCC ID, it would be best, in Neustar’s opinion, to do it as part of the query.

**3. Must a fixed device, serving a set of Mode I TVBDs, query the WSDB on behalf of each of its clients, with the client's FCC ID and serial number, so that the WSDB could validate the FCC ID?**

Neustar notes that the enforcement mechanism that must be implemented (the “no channel available” response to specific FCC IDs and serial numbers) could not be enforced by the WSDB, unless the “on behalf of” query was completed. Enforcing both blacklist and validity checks could be accomplished at the same time, as above.

Neustar's proposed system is fully capable of implementing the validity check if the Commission requires it. Regardless of how the Commission resolves the three issues above, Neustar will provide a WSDB that is compliant with the Commission's decisions.

## **II. CLEARINGHOUSE**

Several of the proposals<sup>3</sup>, including Neustar's, suggested that the Commission consider a single authoritative “Clearinghouse” which would provide a single place to register protected entities, a coalescing of all the data needed to perform the calculation of protected contours, and a common interface to what Neustar calls a “White Space Service Provider” (WSSP) which would compete to provide the WSDB service to service providers and consumers.

Not all clearinghouse proposals were identical, and Neustar's specifically proposed that the clearinghouse provide a common algorithm and reference software implementing that algorithm.

Many comments were filed on this subject, both for and against it. There are several specific areas to which Neustar wishes to reply:

**1. All WSDBs must return the same results as any other WSDB for the same query**

It is essential that the same channel list be provided to a query from a specific location for a specific device class (Mode I/II/fixed). Neustar understands that there is likely some very small

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<sup>3</sup> See, e.g., Proposal by Google, Inc. at 14 and Comsearch Proposal at 46.

variation at the boundaries of the contour areas that are due to calculation accuracy, round-off, and very small differences in software implementations. However, there is no reason why there should be more than tiny differences. It would be very undesirable, for example, for one WSDB to have a more lenient algorithm, which offered more available channels than other implementations.

Neustar's proposal, and specifically, its proposal to have a common algorithm, with reference code available to all WSSPs, is the only practical way to achieve this objective because the basic propagation models have wide variation in results from different implementations. Further, if the source data – for example, the terrain data – is different, very different results will arise between implementations. Only by standardizing the algorithm, and the data that drives it, would it be possible to provide the same channel availability from every WSDB.

A specified algorithm would be straightforward for Commission to verify. Reference code provides a reasonable way to check an implementation, even one not using the reference code. Protected entities would only need to look at the results of one WSDB to have high confidence that the protected contour for their service is correct.

In reviewing all the proposals, Neustar was struck with the wide variation in proposals that in some way affected the available channel list. Most of these ideas expanded on what a protected entity could do while registering.<sup>4</sup> Neustar observes that any feature that changes the list of available channels requires that ALL retail providers of WSDB service produce the same result. So, for example, if one WSDB operator allowed a venue to be registered as a polygon, all WSDB operators have to implement that polygon feature, or the protected entity does not get the protection it thinks it is getting. This also applies to proposed mechanisms to expand the ability to handle schedule changes (discussed below). It may also be that if the feature changes the list of available channels, that rulemaking may be required.

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<sup>4</sup> See, e.g., Proposal of WSdb Inc, Attachment 2(a0) DB-2, item 2, page 2a-3

Neustar also wishes to point out that because the reference code would be fundamental to achieving high accuracy and repeatability from all WSDBs, the choice of implementer is important. One wishes to have a highly skilled team with vast experience writing propagation code to Commission requirements. Almost by definition, one wants to have someone heavily involved in the whitespace development to assure that the result is accurate. A completely disinterested party is likely not the one with the most skill in writing the code.

Neustar's choice of Shared Spectrum Company to provide the reference code for its proposal is significant. SSC is exactly the right kind of firm to implement the reference code. We also wish to point out that SSC's role is limited to providing reference code and assisting in the Neustar implementation of that code. SSC will not have access to the WSDB or any of the source protected entity registration code or data.

WSdb noted that although it "believes that open standards are essential to enable communications among multiple database administrators as well as between database administrators and TVBDs, the specific methods a database administrator develops to calculate white spaces and determine available channels should remain proprietary. This will enable database administrators to compete to develop systems that reduce channel query response times."<sup>5</sup>

In Neustar's view, it is much more important that WSDBs return the same, accurate results than responses that are fast but inaccurate. Neustar believes that channel query response times will be very fast, especially if the "precalculated" model described in Neustar's proposal is implemented. Neustar further believes that to be assured that the result is correct, the Commission must examine the algorithm and not just the results. We further observe that if there is one algorithm, the resources required at the Commission to validate multiple WSDBs will be manageable.

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<sup>5</sup> Comments of WSdb LLC at 3 fn 5.

## **2. Costs of the clearinghouse model are likely lower**

Some commenter's expressed concern that the clearinghouse model, because it has a single source of authoritative data and algorithm, will increase costs to consumers. Neustar believes that the clearinghouse model will actually lower costs. Since WSSPs will only need to handle the registration and query functions, and be given reference code for the contour calculations, it will be much less expensive to start up a new WSSP, and because the cost of running the protected entity registration (which is likely a "high touch" operation for many registrants), and the cost of maintaining the source data is absorbed by the clearinghouse and shared across all WSSPs, the actual run cost should be less than other models.

Historically, central clearinghouse charges are a very tiny fraction of the cost to a consumer for the service they provide. Regardless of whether the costs for the clearinghouse are more or less than other models, they won't have any appreciable effect on the cost to the consumer. The value is not in the common data.

Neustar agrees with many commenters that data sync can be used to make sure that protected entity registration data is shared with all other WSDB operators<sup>6</sup>. We point out, however, that unless there was a single protocol to exchange data, adding a new WSDB operator means every existing operator has to implement a new data exchange protocol. This is the model proposed by all other respondents. If each WSDB operator has its own sync protocol to send its data to other operators, then each operator must implement all protocols. In contrast, a single clearinghouse has a single protocol to disseminate data to all WSSPs, and WSSPs need only implement the one protocol.

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<sup>6</sup> See, e.g., Proposal of WSdb, attachment 2a, DB-4, page 2a-5

### 3. Consistency of Protected Entity Registration is vital to the success of Whitespace

Many protected entities are not in the Commission databases. Registration processes for these entities must balance the need to be fair, and simple to the protected entities, while assuring that only legitimate entities register, and their data are accurate.

Many commenter's are concerned that registration processes for them be easy, free, and verifiable.<sup>7</sup> For example, EIBASS stated, "Since it is impossible to predict where a news event will occur -- for wireless microphones used in support of ENG operations, the entire licensed operational area is the "regularly used" area. Thus, should the decision that a licensed service (e.g., a Part 74 Subpart H LPA station) must accept interference from a Part 15, unlicensed WSD is not reversed, then a work-around for broadcasters would be to file with the WSD database administrator as many 1-km or 2-km radius circles as necessary to fill up the LPA station's operational area of record."<sup>8</sup>

Regardless of the merits of the particular issue raised here by EIBASS, the suggestion that a protected entity would register multiple times demonstrates the need for the registration process to have significant validation, as well as being easy and fair to register a bona fide entity.

In a similar vein, Shure asserted that registration "information is not subject to challenge or expansion at the whim of a database administrator regardless of the administrator's intentions or purpose."<sup>9</sup> Although Neustar agrees that registration must stay within the Commission's rules, we believe that "challenge" is vital to assuring that the data in the WSDB is accurate.

Clearly, if each WSDB operator has its own criteria for validating entry, then, inevitably, some will be more lenient and some will be stricter. The registrants will, quite rationally, migrate to the lenient one. If the leniency allows incorrect, misleading or outright fraudulent registration, then

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<sup>7</sup> See, e.g., Comments of Shure at 9 and Comments of EIBASS at 3.

<sup>8</sup> Comments of EIBASS at 3.

<sup>9</sup> Comments of Shure Incorporated at 10.

channels will be unavailable when they should be available. Conversely, if the registration process is made burdensome, protected entities may not be able to get all the protection they deserve without excessive effort and/or cost.

By centralizing the registration of protected entities, and placing it under a completely neutral third party, this issue is addressed. All protected entities are treated alike, appropriate validations can be completed, the Commission can easily monitor the process, and all parties will have confidence that the data is complete and accurate.

Neustar believes that it would be difficult for the Commission to set common standards and monitor such standards at several WSDBs. The range of sophistication of protected entities, the required validation processes, and the level of automation proposed make such standards complex, and thus difficult to establish and monitor. If there were to be common standards, they may need a complete rulemaking process to establish them, as opposed to reviewing and monitoring standards proposed by single clearinghouse.

#### **4. Neutrality**

Nearly all commenter's agreed that neutrality was a desired characteristic of a WSDB operator.<sup>10</sup> They differ on their definition of "neutral" and their evaluation of who is and who isn't neutral.

Neustar, as a proven neutral third party database operator would meet any objective definition of neutral. We wish to point out, however, that the neutrality really applies to the gathering of the data, and the way it is turned into channel lists.

If there are many competitive retail providers of WSDB service, but they all operate from the same data, using the same algorithms, then neutrality is not an issue for the users of that service. Indeed, as long as the WSDBs produce the specified channel lists, they don't really have to be neutral at all.

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<sup>10</sup> See, e.g., Comments of Key Bridge at 5.

This makes the possible list of WSSPs much larger, and the competition much more robust than requiring each WSDB operator to meet a very high standard of neutrality.

Several commenters were concerned about who would certify WSSPs.<sup>11</sup> Our observation is that if there is common data and common algorithms, the concern about certification is small. The WSSP must produce the results specified, including the required enforcement provisions of the *Order*, a standard much less than an entire WSDB operator not using a WSCH has to meet.

Neustar will provide WSCH services to WSSPs that could be certified in three possible ways:

1. The Commission could establish criteria and certify WSSPs;
2. An industry association, charged with overseeing the WSCH and WSSPs, could create WSSP criteria and use that criteria to certify WSSPs; and,
3. Neustar, as the WSCH, could create WSSP criteria and, with the Commission's approval, use it to certify WSSPs.

The Public Interest Spectrum Coalition (PISC) asserts that a "Clearinghouse entity should not be permitted to offer retail channel query or other value-added database services that would compete, or otherwise cause potential conflicts of interest, with the other retail database providers it serves."<sup>12</sup> Neustar understands the reasoning behind that comment. Neustar proposed a full WSDB solution – including both a clearinghouse (WSCH) and a retail provider (WSSP) in order to fully comply with the Commission's *Public Notice*. Neustar is willing to operate a single clearinghouse under restrictions such as PISC suggests.

Further, if the Commission does not follow the clearinghouse model, then the OET is placed in exactly the position the clearinghouse serves: it will be responsible for making sure that all providers offer comparable data, equitable and appropriate registration processes and uniform results.

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<sup>11</sup> See, e.g., Comments of WSdb at 7.

<sup>12</sup> Comments of Public Interest Spectrum Coalition at 7.

### III. SCHEDULING

Many commenters discussed the notion that a protected entity may need a change in its “schedule” of operation, which would change the list of channels.<sup>13</sup> These are unplanned events. Some proposals included ways for this to occur.

Neustar included a discussion of this issue in its proposal. We note that the requirement to query the database every 24 hours (and 48 hours in some circumstances) is contained in the *Order*, and without a change in the *Order*, it is not possible for a TVBD to be required to accommodate unplanned events, regardless of the features implemented in a particular WSDB.

In addition, as discussed above, all WSDBs must return the same results for the same query. If anyone implements a schedule change mechanism ALL must implement the same mechanism. It is not possible for one WSDB to have a feature involving schedule that is not implemented the same way at all other WSDBs if it affects the channel list returned.

If the Commission agrees with commenters that it is important to accommodate a protected entity unplanned event, then rules must be promulgated that should cover the following issues:

1. The advance notice time must be specified. A time in the range of 15 minutes should be achievable. Note that unless WSDBs implement some kind of broadcast mechanism, which is not required currently, each device affected would have to be notified individually. Even with high bandwidth in the TVBD, it may take several minutes to distribute information for a big event.
2. The range of channels may need to be limited. It may be unfair for a news event to be able to pre-empt all available channels in an area. We note that “frequency coordination” is often needed, and it would not be unreasonable to require that some channels be available for TVBDs.
3. The entities entitled to such service may need to be defined.

Unplanned events affect data synchronization. In the clearinghouse model, using the protocols defined in the Whitespace Database Group included in the Neustar proposal, dissemination of schedule

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<sup>13</sup> See, e.g., Comments of Shure Incorporated at 2.

updates to all WSSPs could occur in a very short time. Without a clearinghouse, data sync protocols between WSDBs have to be designed to sync within perhaps 2 minutes to allow all TVBDs to receive notice in 15 minutes.

#### **IV. COMPLETENESS OF PROPOSALS**

There are a number of comments that discuss completeness of proposals.<sup>14</sup> Most focus on the level of detail provided for calculating protected contours.

Neustar offers that the protected contour calculation is described completely in the *Order*, and what is required is a complete implementation of that. Illustrating that you understand the content of the *Order* is not necessary to demonstrate competence. Indeed, it is entirely too easy to show impressive prototypes and random, but unchallenging examples. It seems to us that experience in actually producing high volume, highly reliable production databases and accurate calculation code is much more relevant to the evaluation of WSDB operators.

Further, since the document Neustar provided that detailed its direction on calculation code was the subject of an intensive effort by a wide spectrum of interested, and competent participants, and yet some assert that “this document is incomplete and contains numerous areas where members of the group critique and dispute what processes and calculations should be used,”<sup>15</sup> it is clear that detailed descriptions of algorithms at this stage is not relevant, and OET must be involved in some forum where these issues can be resolved. Whatever differences in algorithm exist, they must be settled one way that all WSDBs implement. Indeed, experience suggests that those who implement early, before standards are clear, and complete, often have great difficulty meeting the eventual standards because of incorrect assumptions made, and development dollars expended in the wrong direction.

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<sup>14</sup>See, e.g., Comments of Key Bridge at 7 (incomplete or non-compliant proposals should be disqualified).

<sup>15</sup>Comments of MSTV and NAB at 8.

## V. PRIVACY

There is concern expressed that the database should reveal all of the source data used to calculate protected contours.<sup>16</sup> This comes from two sources: the protected entities wishing to verify their data and the protection they receive, and from the general public, who may wish to know which channels (or how many channels) they could use in a given location, and why there may be fewer than they expect. None of this is considered in the *Order*.

This discussion gives rise to a privacy issue regarding who is allowed to see what data. There is also the issue of what information a WSDB operator is obligated to provide to anyone other than a TVBD. Neustar will work within any reasonable privacy constraints the Commission wishes it to meet.

Respectfully submitted,



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<sup>16</sup> See, e.g., Comments of Public Interest Spectrum Coalition at 9 (All repository data should be Fully Transparent to the Public on an Open Online Interface).