

Before the  
Federal Communications Commission  
Washington, D.C. 20554

In the Matter of )  
 )  
Unlicensed Operation in the TV Broadcast ) CC Docket No. 04-186  
 )

**REPLY COMMENTS OF TELCORDIA TECHNOLOGIES, INC ON THE WHITE  
SPACE BANDS DATABASE PROPOSALS**

Telcordia Technologies, Inc. (“Telcordia”) welcomes the opportunity to submit reply comments on the White Space Bands Database proposals Public Notice.<sup>1</sup> Telcordia submitted comments in response to the Notice with a proposal to be named as a White Space DataBase (WSDB) administrator<sup>2</sup>. Telcordia is responding to three primary issues raised in the comments. First, Telcordia addresses the core issue of single monopolistic clearinghouse architecture versus a competitive multiple administrator architecture. Second, we address a number of technical, privacy and security issues raised in the comments. Third, we address some business model and charging for administration questions raised in the comments.

**Benefits of Multiple Competitive Database Administrators**

Telcordia notes that the vast majority of comments support Telcordia’s position in favor of the Commission authorizing multiple database administrators.<sup>3</sup> As Nokia puts it, “there should

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<sup>1</sup> Public Notice (DA-09-2479) Unlicensed Operation in the TV Broadcast Bands, November 25, 2009.

<sup>2</sup> Comment of Telcordia Technologies – Proposal Seeking To Be Designated As a TV Band Device Database Manager, January 4, 2010 (Telcordia Proposal)

<sup>3</sup> Comments of Nokia, Inc, p.5; Comments of Atheros Communication Inc., Broadcom Corp., Dell Inc., Hewlett-Packard Co., Marvell Semiconductor, Inc., Microsoft Corp., Nokia, Inc, Phillips Electronics North America Corp., and The Wireless Internet Service Providers Assoc.(collectively the TVWS Group), p. 2; Comments of WSDB, LLC, p.1; Comments of Key Bridge Global, LLC p. 2; Comments of Shure Incorporated, p. 7; Comments of IEEE 802.18, p.2; Ex-Parte Submission of WSdb LLC, Frequency Finder, Inc., KB Enterprises LLC, Key Bridge Global LLC, Spectrum Bridge, and Telcordia Technologies, p.1. In addition the Comments of The National Cable &

not be an environment where any one entity is or becomes a single monopolistic operator. That would hurt consumers<sup>4</sup>.” The position of the Commission has consistently found in all areas of telecommunications that competition is the preferred policy and the greater the level of competition, the greater the benefit to the public.

No comments have demonstrated that full competition between multiple database administrators which exchange registration information in near real time is not feasible. Rather, as noted by several comments, having multiple administrators provides for a more reliable long term solution that does not have a single point of failure from a network or business perspective. While a single vendor may be able to provide a network with appropriate diversity and reliability, if that monopoly is set up, there is no redundancy if that vendor or (one or more of) its sub-contractors fail economically or technically. In a diverse vendor environment, if one vendor falters, customers will migrate quickly to another vendor as market forces dictate.

Only three comments suggest that a single top level administrator would be preferred.<sup>5</sup> Neustar (the incumbent monopoly NPAC operator) seeks to leverage that experience and business model into the much more dynamic WSDB arena. Neustar argues that the simplicity of having a single administrator in a so called “bifurcated” process outweighs the benefits of competition. Neustar’s argument is deficient, however. Having a single administrator provide “the same list of channels . . . for a given location regardless of WSSP” only provides value to the extent that the model for determining channel availability is the best and most accurate available. With a single administrator, there is no incentive for vendors to compete based on

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Telecommunications Association (NCTA) and the Comments of Association for Maximum Service Television Inc., and The National Association of Broadcasters (MSTV and NAB) both contemplate multiple administrators.

<sup>4</sup> Comments of Nokia, Inc., submitted 9 February 2010, p. 5

<sup>5</sup> Comments of NeuStar, Inc., Comment of the Coalition of Wireless Microphone Users and Comments of the Public Interest Spectrum Coalition. Two other vendors (Comsearch and Google) also seek to become the sole provider via a monopoly clearinghouse approach and list similar “benefits” of such approaches in their proposals. As a general matter, there is no need to evaluate other company’s specific proposals. Telcordia is addressing the policy and technical issues with regard to provision of WSDB services via a competitive multi-vendor environment,. Telcordia supports permitting vendors to alter their proposals to comply with a multi-vendor approach if necessary.

providing the best and most up to date data to its customers. Propagation of registrations and any authorized device information has not been found to be an impediment to any of the multiple administrator technical proposals and the purported benefits of providing that data via a clearinghouse have not be effectively demonstrated as outweighing the benefits of broad competition. While Telcordia could, of course, provide either side of the suggested bifurcated process, it is clear that this process adds an unnecessary level of complexity and delay to the process rather than simplifying it. For all devices to properly receive the information in a bifurcated process, the data would have to be provisioned at both tiers within the architecture rather than just at one tier. A registration query/registration will take only hundredths of a second and will propagate to other WSDBs just as quickly. Adding a layer will only serve to increase time and latency and not decrease it.

Neustar’s claim of a single administrator more accurately providing protected entity registration is overblown and needs to presume laxity of a registrar. If a registrar in a competitive environment is lax in its procedures, it will soon find itself without customers. If a monopoly provider is lax, the industry will suffer with no alternative except to pay that vendor monopoly rates to fix its solution.

While none of the supporters of a single vendor clearinghouse describe any certain benefits for that approach, several comments note real and significant benefits of a multivendor approach. The Commission has long recognized that competition provides for pricing and innovation benefits, and the TVWS Group notes that “the existence of multiple database providers will spur competition and innovation in the rapidly developing field of database services, allowing consumers to enjoy continually improving services at the lowest possible market-determined prices.”<sup>6</sup> The TVWS Group goes on to note that multiple vendors naturally

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<sup>6</sup> TVWS Group p. 2.

allow the avoidance of a single “choke-point” in the overall architecture and that “a solution with multiple independent database providers will result in the highest overall TVWS system reliability.”<sup>7</sup> They also note that naming multiple qualified vendors to compete will prevent the industry being held hostage to a single vendor that delay its deployment or fails to meet test criteria determined by the Commission and/or recommended by an industry body.<sup>8</sup> The IEEE recommends avoiding architectures with “sole providers, or other single transaction entities that may . . . become bottlenecks.”<sup>9</sup> In addition, Key Bride notes that adopting a single vendor may “significantly stifle investment in TV bands administration and infrastructure,” and further that such a monopoly could “directly harm consumers by unnecessarily raising administrative costs and thereby reducing broadband deployment.”<sup>10</sup>

#### Comments on Technical Issues

The Telcordia proposed solution will comply with all Commission rules and industry agreed open standards for WSDB administration. As an initial matter, Telcordia believes that its proposal provided a sufficient level of information to demonstrate compliance with the published requirements and FCC rules. If the Commission, as suggested by a couple of commenting parties, requires additional information with greater specificity how we will comply, Telcordia will be glad to amend or add to its proposal. Telcordia provides the following specific responses with regard to technical issues raised in the comments.

#### Near Real Time Synchronization

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<sup>7</sup> TVWS Group p. 3.

<sup>8</sup> TVWS Group p. 3. The Commission experienced such a situation in the original number portability deployment where two vendors were selected for this reason among others and one of the two selected vendors failed to deploy. Number portability began nationwide on time solely because of a multiple vendor environment.

<sup>9</sup> IEEE p. 2.

<sup>10</sup> Keybridge at p.3.

A number of comments reinforced the need for near real time synchronization of data in any multiple administrator environment.<sup>11</sup> The Telcordia proposed solution provides for such near real time synchronization (data should propagate to all vendors in less than a second via the interfaces) via open standards based APIs as recommended by several commenting parties including the IEEE.<sup>12</sup>

### Reference Data

A number of comments noted that all vendors in a multiple vendor environment should work from certain reference data for provisioning of the WSDB administrators' databases. In particular several comments note that the FCC Consolidated Database System (CDSB) should be the reference data source for WSDB administrators.<sup>13</sup> The Telcordia proposal notes that we would collect reference data from FCC sources and specifically cites CDSB as an example source.<sup>14</sup> To the extent that improvements are necessary to any of the Commission's source data, Telcordia does not object to any such improvements to the CDSB or other Commission source data as authorized by the Commission.

### Security

A number of comments noted that appropriate security mechanisms must be put in place in order to protect the data and querying devices to a WSDB.<sup>15</sup> In particular the WSDB LLC claims that TLS, which is a part of Telcordia's proposed security, is insufficient because of a

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<sup>11</sup> IEEE p.2; Shure pp.2-4; Nokia pp.5-6.

<sup>12</sup> IEEE p.2; Nokia p.5 and TVWS Group p. 4; Shure p. 4.

<sup>13</sup> See Comments of Cavell, Mertz & Associates, Inc.; and NCTA p. 5. NCTA is particularly concerned that proposals may not have specifically mentioned the entire universe of protected entities when citing examples, including cable headends. As noted above, Telcordia agrees that a WSDB administrators should use standardized authorized reference data. In addition, Telcordia specifically includes cable headends as an example of data to included in our Proposal p. 14.

<sup>14</sup> See Telcordia Proposal pp. 12-13.

<sup>15</sup> See WSDB LLC pp. 9-11.; TVWS Group p. 4; Nokia pp. 6-7, IEEE p. 2

recently discovered vulnerability<sup>16</sup>. Telcordia's proposal meets the security principles provided in IEEE's comments<sup>17</sup>. In addition, the vulnerability cited by WSDB LLC can be fixed by disabling the TLS "renegotiation" capability as mentioned in the cited reference. Several open source vendors (OpenSSL, Mozilla) have already released fixes that disable this capability (<http://www.phonefactor.com/sslgap/ssl-tls-authentication-patches>). This vulnerability was exploitable for the (cited) Twitter attack because Twitter allows storage of plain text passwords. (<http://thenextweb.com/2009/03/05/patricks-password-is-always-the-same/>). Password storage itself is outside the scope of the TLS protocol, and failure of a company to store or transmit passwords securely should not be confused with TLS as a viable security mechanism. Standard, open protocols, such as TLS, have received widespread, public scrutiny and as a result are robust

Telcordia's proposed approach for device authentication is intended to leverage existing capabilities available in this space.<sup>18</sup> Shared secret based authentication schemes have been proposed and are in widespread use within the wireless telecommunication community. An out of band (e.g. web-based) registration process to establish a shared key between the database provider and the device user is possible. The shared key is used to secure communications between the device and the provider. As an example, the Authentication Key Agreement (AKA) scheme used in 3G networks authenticates mobile handsets to a service provider using a long term key that is shared between the service provider and the handset.<sup>19</sup>

#### Access by Certified Devices

Several commenting parties raise concerns that some vendor proposals may not have been specific enough with regard to complying with the Commission's direction regarding

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<sup>16</sup> WSDB LLC pp. 9-10.

<sup>17</sup> IEEE p. 2.

<sup>18</sup> See Telcordia Proposal pp. 21-23.

<sup>19</sup> 3rd Generation Partnership Project, Security Architecture (Release 4), TS 33.102, December 2001.

access to the database(s) by only certified devices.<sup>20</sup> Telcordia notes in its Proposal that it would maintain “lists of devices that are required to receive ‘no channels available.’”<sup>21</sup> And Telcordia acknowledges that it will rescind such a designation only upon direction from the Commission per the Order.

### Public Availability of Information

Several comments note that information in the WSBD databases will contain some information that should be publically accessible as well as information that is personally identifying that should be maintained as confidential.<sup>22</sup>

The Telcordia proposal includes a Public Access Service providing the function to allow for the public to access the appropriate information, including all public information, via a Web based Portal<sup>23</sup>. This Service will not display private (e.g. personal information).<sup>24</sup>

### Standardization of Calculations and Testing

A number of comments noted that the Commission should specify both protected entity eligibility and interference algorithms and provide for testing of prospective WSDB administrator solutions before permitting those solutions to be deployed.<sup>25</sup>

The Telcordia proposal noted that it would use the Commission approved algorithms for interference calculations in compliance with 47§15.712 and using R-6602 (F-curves).<sup>26</sup> We

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<sup>20</sup> See MSTV and NAB pp. 11-14; Shure pp. 5-6

<sup>21</sup> Telcordia proposal p. 13.

<sup>22</sup> See Nokia pp. 7-8; TVWS p. 4, and Public Interest Spectrum Coalition pp. 9-14.

<sup>23</sup> See Telcordia Proposal p. 17.

<sup>24</sup> The Public Interest Spectrum Coalition notes that the Telcordia Proposal “offers ‘wireless microphone IDs’ as an example of information that ‘may be kept confidential’” and goes on to note that the registration IDs themselves are publically available in ULS. Telcordia acknowledges that this was a poor example that was not detailed enough. In the case of wireless microphones the ID itself is not confidential however the specific location of an event that it registered for might be.

<sup>25</sup> See NCTA p. 5; Public Interest Spectrum Coalition pp. 15-17; and MSTV and NAB pp. 17-19.

<sup>26</sup> See Telcordia Proposal pp. 13-14. MSTV and NAB state that Telcordia’s proposal was vague in its performance of these calculation, Telcordia feels that the calculations per the FCC requirements are straightforward and will

further agree that the Commission (or its neutral designee) should perform tests, or at least review the results of tests, to determine that an approved WSDB is ready for deployment. Further, Telcordia does not object to establishing a technical advisory group “to develop procedures and appropriate test to confirm proper operation of the TVDB databases.”<sup>27</sup>

Telcordia, however, does believe that the Commission can and should name WSDB administrators based on their proposals but subject deployment of those solutions to passing of a set of acceptance tests.

### Comments on Business Issues

Telcordia notes that its proposal outlined a viable business model for provision of WSDB administration as requested by the requirements in the Notice, and we believe that our solution complies with the FCC rules for provision of such administration. We believe that pricing of actual services is and should be reserved until each WSDB administrator is authorized to provide services and then each administrator can seek clients with competitive pricing and service plans.

### Charging for Administration

Telcordia’s proposal includes compliance with the Commission rules with regard to entities that can and cannot be charged for registration or queries to the Telcordia WSDB. EIBASS notes in its comments that the *Second Report and Order* in ET 04-186 forbids charging operators of licensed stations any fee to appear in a WSDB.<sup>28</sup> Telcordia will comply with any and all Commission rules regarding entities that are eligible to be charged for data provisioning and maintenance.

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be glad to amend its proposal to include sample calculations should this be needed by the Commission to determine if Telcordia’s proposal is fully compliant.

<sup>27</sup> MSTV and NAB p. 19.

<sup>28</sup> Comments of EIBASS p. 1.

In addition, Nokia notes that in some of the proposed business models (including Telcordia's) the initial deployment of devices may not be large enough to offset start up costs immediately.<sup>29</sup> Telcordia believes that this is a risk that vendors must accept if they wish to become WSDB administrators in order to be able to compete for market-share in this new and exciting database administration service area. Nokia also notes a preference for a charging model that charges not for all devices manufactured but rather only for those devices that register with the database.<sup>30</sup> Telcordia believes that the Commission need not dictate charging rules to this level of detail but should allow WSDB administrators to develop compelling and competitive pricing options in order to attract customers like Nokia and others and to avoid unnecessary fees on the end users.

#### Charging for Added Value Service

With regard to Telcordia's proposal of potential value added services, CWMU noted that it "is concerned that if speed, accuracy, or reliability is increased for an additional charge, there may be a possibility of interference from users of the free service."<sup>31</sup> The Telcordia proposal is to provide the base set of all required WSDB administrative services including maintenance of all required data and device query responses at a competitive price to help ensure significant market share for Telcordia. Telcordia does not envision nor propose a separate slower interface or database solution for those entities or database entries that must be maintained but cannot be charged for (as noted above) under Commission rules. To be clear, Telcordia would provide access to white space devices on a non-discriminatory basis per 47§15.715(f). The excellent level of service that Telcordia intends to provide would be across its entire customer base. Rather, we envision some future potential extra added values services that we may provide our

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<sup>29</sup> Nokia pp. 4-5.

<sup>30</sup> Nokia p. 4.

<sup>31</sup> Comments of The Coalition of Wireless Microphone Users (CWMU), pp. 4-5.

customers as a service differentiator between us and other WSDB administrators. Our potential future services would go beyond the required services without degrading the quality of those required services. WSDB administrators should be able and in fact encouraged to compete on the speed, reliability, accuracy and feature richness of the services they provide.

### Conclusion

Telcordia believes that it has provided a fully compliant proposal to be designated a WSDB administrator as sought by the FCC in the Public Notice. Telcordia continues to support the designation of multiple administrators in accordance with long standing FCC pro-competition policy. Telcordia looks forward to working with the Commission and all interested parties in serving as a WSDB administrator.

Respectfully submitted,

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