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BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
Washington D.C. 20554

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MAY 20 2013

Federal Communications Commission
Office of the Secretary

In the Matter of)	
)	
Proposals to Develop and Manage an)	DA 04-672
Independent Database of Site Registrations)	
By Licensees in the 71-76 GHz, 81-86 GHz)	WT Docket No. 02-146
and 92-95 GHz Bands)	WT Docket No. 13-291

**KEY BRIDGE GLOBAL LLC PROPOSAL TO DEVELOP AND MANAGE
AN INDEPENDENT DATABASE OF SITE REGISTRATIONS
BY LICENSEES IN THE 71-76 GHZ, 81-86 GHZ AND 92-95 GHZ BANDS**

Key Bridge Global LLC (Key Bridge), hereby submits a proposal to develop and manage an independent database of site/link registrations by FCC licensees in the 71 – 76 GHz, 81 – 86 GHz and 92 – 95 GHz (“70/80/90 GHz”) bands.¹ The public interest will be served by the approval of Key Bridge as a new spectrum manager in the 70/80/90 GHz bands. The Commission expressly contemplated authorizing additional spectrum managers in its original grant of authority approving the current managers and there is established precedent to support designating an additional database administrator. To the extent necessary, Key Bridge seeks a waiver of the Commission’s original deadline to submit proposals for development and management of the 70/80/90 GHz bands.

I. Key Bridge Background

Key Bridge is a trusted, neutral supplier of on line information systems and services to Commercial, Government and U.S. Military customers with a focus on wireless

¹ See Wireless Telecommunications Bureau Opens Filing Window for Proposals to Develop and Manage Independent Database of Site Registrations By Licensees in the 71-76 GHz, 81-86 GHz and 92-95 GHz Bands, *Public Notice*, DA 04-672 (March 12, 2004).

communications. We provide open, secure, standards-based technologies to foster and support our Customer's success and help them develop and promote their own products and services.

Key Bridge Spectrum Services include the Key Bridge White Space System, a robust, secure, neutral platform for open innovation in cognitive radio and White Space spectrum sharing. Key Bridge Web Services, a component of our White Space System, enable remote, programmatic access to our data and databases with a comprehensive portfolio of advanced web services and software technologies that may be embedded into third party educational, non-commercial and commercial systems and solutions.

Key Bridge also operates and maintains one of the largest private databases of wireless service licenses, frequency assignments and spectrum occupancy information in the world. We make this information available through a large and growing portfolio of well-documented, standards-compliant web services and open-source data models, empowering clients to accelerate development and delivery of their own wireless products and services.

II. Software and Database Experience

Key Bridge develops and provides a portfolio of technologies, products and services that enable licensed and unlicensed spectrum sharing and coordination, and that foster accelerated development of third party applications and products.

Our software team is highly skilled in Object Oriented Design (OOD), as well as many different computer languages, including: SHELL scripting, PERL, Python, C, C++,Java and various Unix flavors and platforms. Key Bridge has extensive knowledge in database design and maintenance including relational systems such as MySQL, Oracle and PostgreSQL and big data platforms such as Hadoop, as examples.

The following are examples of Key Bridge software and database products that currently

support the wireless communications industry and which may demonstrate relevant expertise in operating a 70/80/90 GHz registration system and database:

The Key Bridge White Space System²

The Key Bridge White Space System is comprised of a White Space Database and White Space Portal. The System is in the final stage of receiving approval by the Commission for nationwide deployment. The Key Bridge White Space System dynamically allocates unused television broadcast spectrum in near-real time for unlicensed use.

Key Bridge pioneered the incorporation of interference mitigation solutions in to a White Space Database and was the first administrator to propose near-real time synchronization of database systems to ensure maximum availability of spectrum for new entrant technologies while assuring incumbent spectrum users may continue to operate without interference.

The White Space Portal is publicly available at <http://whitespace.keybridgeglobal.com> and is provided by Key Bridge in furtherance and compliance of our obligations and responsibilities as a designated White Space administrator. Secure user accounts are free of charge, easy to create and manage, and enable all basic White Space registrations and transactions without a fee.

The White Space Portal system, including the network, computer systems, application software, and operational capability are directly relevant to operating a 70/80/90 GHz registration system and database. The secure acceptance and management of user-submitted wireless service registrations is equally of direct relevance and further demonstrates our expertise and capability to successfully implement a 70/80/90 GHz registration system and database.

² An Internet portal is a software platform for building and presenting websites and on line applications, and software as a service (SaaS), sometimes referred to as "on-demand software", is a software delivery model in which software and associated data are centrally hosted on the cloud. Key Bridge Portal Products are offered under the SaaS model and are accessed by users using a thin client via a web browser.

The Key Bridge White Space System is not limited to TV bands or to 6 MHz channels. Our spectrum administration software and database systems are designed to accommodate a wide variety of wireless service configurations including point to point, point to multipoint and mesh, as examples. Variable channel widths are supported including sub-channelization. The System can also be outfitted to support multiple co-existence strategies and dynamic scheduling. Geographic intelligence also ensures compliance with regional regulatory authorities and spectrum sharing Rules. This extensive flexibility enables us to re-use many core systems and services and to rapidly implement a sophisticate, robust, Rules compliant 70/80/90 GHz registration system and database.

Spectrum Situational Awareness

Key Bridge Spectrum Mapping technology provides quick and detailed visual inspection of spectrum environments, allowing for informed choices and better deployment planning by spectrum users. Similar to our White Space portal, Key Bridge intends to integrate spectrum mapping resource and applications into our 70/80/90 GHz registration system, where we expect they will be equally well received.

Key Bridge Data and Databases

Key Bridge offers free public access to many of our databases through the Database Browser, a rich Internet application accessible through any modern web browser.

Key Bridge also offers programmatic access to our data and databases through a set of robust and well-documented open-source data models and sophisticated search, query and retrieval web services for analysis and data access from within third-party services and applications.

The Key Bridge Data Browser and API Service will provide new and innovative tools to help users, licensees and the public better utilize the 70/80/90 GHz frequency bands.

III. Other Relevant Experience

In our capacity as a White Space database administrator Key Bridge has already demonstrated many of the required duties and already developed most or all of the necessary systems and technologies to successfully operate a registration database for the 70/80/90 GHz bands. For example:

- *Develop and manage a link registration database*

Key Bridge is the editor and continuing sponsor of the *Wireless Service Information Format (WSIF)*, an open, standards-based data model for the description and inter-exchange of wireless service-related information that is based upon and extends the MCEB Pub 8 Standard Spectrum Resource Format to accommodate White Space and other commercial implementation requirements.³ Key Bridge uses the WSIF specification to describe and exchange TV-band wireless services, including broadcast, point-to-point and point-to-multipoint links, in our White Space database. Based upon its heritage and our experience using its in the Television bands, we believe the *WSIF* specification can readily accommodate all current and envisioned link types in the millimeter wave bands without modification.

- *Develop and manage a link registration portal*

The Key Bridge White Space portal includes a number of highly automated on line web forms integrating into a seamless work flow for the description and registration of point-to-point

³ Standard Spectrum Resource Format (SSRF) is the US counterpart to NATO's Spectrum Management Automated Data Exchange Format (SMADEF). SSRF is the mechanism by which U.S. and NATO spectrum management systems exchange data.

wireless links. This registration capability can be easily modified to support registration of links in the millimeter wave bands. All of the supporting portal apparatus, including user account management, security, etc. can be directly applied to a new Key Bridge registration database for the 70/80/90 GHz bands without modification.

IV. Database Manager Duties and Responsibilities

Key Bridge is willing and able to perform all of the duties and responsibilities of the Database Manager found in the *RFP PN* and listed below. In each case we have included a statement of compliance and in some cases additional pertinent comments.⁴

- *Develop, manage and use link registration databases in coordination with all Database Managers, together which will serve as the clearinghouse and repository of current and historical link information for all registered non-Federal Government links. Database Managers will not be responsible for assigning frequencies, but will be responsible for establishing and maintaining their individual databases as described in detail in the Report and Order and reiterated in this Order. A Database Manager may offer additional services, such as frequency coordination and other services to assist a licensee in designing a link and resolving any interference disputes;*

Response: Key Bridge will comply with this requirement. Key Bridge understands that the current database managers have developed and implemented a scheme to facilitate inter-manager database synchronization. Key Bridge is able to support the existing peering scheme between the current database managers.

Key Bridge has already implemented an automated scheme for inter-administrator

⁴ See Allocations and Service Rules for the 71-76 GHz, 81-86 GHz and 92-95 GHz Bands, *Order*, 19 FCC Rcd 20524, at ¶ 10 (2004) (“2004 Approval Order”).

peering and synchronization in the TV Bands. This demonstrates our capability to successfully implement a third-party-originated data exchange scheme.

- *Make all Database Manager services available to all parties on a first come, first-served and non-discriminatory basis, and provide public access to the link registration database at no charge;*

Response: Key Bridge will comply with this requirement. The Key Bridge millimeter link registration system will offer all services on a non-discriminatory basis. Registrations will be handled on a first-come, first-served basis.

- *Ensure that non-Federal Government links are coordinated with Federal Government operations through NTIA's automated coordination mechanism, and promptly notify the licensee when a link submission receives a green- or yellow-light response from NTIA;*

Response: Key Bridge will comply with this requirement. Key Bridge understands that the NTIA system is fully operational. Key Bridge will implement an automated software link to communicate in near-real-time with the NTIA system.

- *Verify whether individual link registrations are subject to Commission filing requirements, and are otherwise compliant with Part 17 of our rules, including where required, registration in the Commission's Antenna Structure Registration Database;*

Response: Key Bridge will comply with this requirement. In support of our White Space Database Key Bridge maintains a complete copy of the ULS database, including Antenna Structure Registrations, which is synchronized daily with the FCC. We will employ this existing capability to implement Part 17 verification of individual link registrations.

- *Update its link registration database based on FCC actions affecting licenses and links in*

these bands, such as registration deletion, or license expiration, renewal, transfer or assignment;

Response: Key Bridge will comply with this requirement. As mentioned above, Key Bridge already processes all ULS daily updates for addition, modification, deletion, license expiration, renewals, transfers and assignments, etc. We thoroughly understand the Commission's licensing actions and ULS record life-cycle.

- *Add or delete link information to its database based upon review and processing of link submissions from licensees on a nondiscriminatory, first-come, first-served basis, and maintain a complete and accurate history of all links;*

Response: Key Bridge will comply with this requirement. All registrations will be automatically time stamped. All Key Bridge servers have their system clocks regularly synchronized with the U.S. Naval Observatory Master Clock and the Key Bridge registration systems will identify and differentiate time-based precedence with an accuracy of +/- one millisecond.

The current Key Bridge White Space system includes a comprehensive registration and action log that provides a comprehensive history of all wireless service registration activities in our database. This capability will be extended to include user and administrator actions on our registration database for the 71 – 76 GHz, 81 – 86 GHz and 92 – 95 GHz bands.

- *Modify its database when it is determined that a licensee has not met construction and loading requirements, and maintain documentation of such actions (with notice to WTB for links also registered in ULS);*

Response: Key Bridge will comply with this requirement.

- *Administer the formal interference protection procedures, based upon "first-in-time" information recorded in the database*

Response: Key Bridge will comply with this requirement. Upon notification of a case of harmful interference we will identify the conflicting link, determine first-in-time status between the links, and, if appropriate, notify the interfering link operator of the complaint.

Key Bridge will accept user-generated interference analyses through the link registration process and will retain these documents electronically for subsequent review by the public. Key Bridge also intends to offer an automated pre-registration interference analysis capability to registrants which should simplify a registrant's interference analysis by providing a comprehensive report of conditions at the time-of-link-registration that may be dispositive in any subsequent dispute.

- *Provide all interested parties access to the link registration system at all times, except where maintenance and system upgrades require short periods of down time to complete;*

Response: Key Bridge will comply with this requirement. Key Bridge Systems are architected to provide and have demonstrated high availability in production environments. Our non-public portal applications have demonstrated uninterrupted availability exceeding 12 months, while the public White Space Portal has been fully available since the beginning of our public trial on March 11, 2013, excepting for scheduled maintenance.

- *Provide the Commission and NTIA access to the link registration system at all times, and establish, at a minimum, the following report capabilities for NTIA and FCC:*
 - *Ability to query on basic link elements such as licensee name, FCC call sign, registration number, transmit coordinates and transmit frequency or frequency band;*

- *Ability to query and retrieve all link registrations associated with a specific licensee or FCC call sign;*
- *Ability to retrieve all link registrations within a specified geographic area;*
- *Ability to retrieve all link registrations filed or accepted within a specified time period;*
- *Ability to retrieve or request a report of all links removed from its database within a specified time period;*
- *Provide automated interface or reports as required by NTIA to allow them to maintain an accurate and complete database;*
- *Upon request, a complete download of the registration database in a format specified by FCC;*
- *Ability to provide other reports to NTIA and FCC and respond to information requests as necessary;*

Response: Key Bridge will comply with these requirements. Key Bridge will also provide a publicly available instance of our Data Browser application to enable browser-based access to our (to be developed) millimeter link database. FCC, NTIA and other interested parties may then use any modern, standards-compliant web browser to survey, search, query, sort and review all records in our (to be developed) millimeter link database Based upon the specified criterion. The Data Browser instance will be coupled with a map-based visualization panel and enable users to search based upon a specified geographic area (e.g. the visible map).

Key Bridge will extend our existing API to enable the FCC, NTIA and other interested parties to access and interrogate our (to be developed) link registration database

programmatically using secure and standards-based web services.

Key Bridge currently provides a daily export from our White Space database to enable third party evaluation, bulk comparison of records with other White Space administrators, and to encourage educational and non-commercial investigation and oversight by the public community. Key Bridge will implement a similar daily export of the service registrations from our (to be developed) millimeter link database.

- *Implement procedures and execute related documents required by NTIA to access its automated system;*

Response: Key Bridge will comply with this requirement.

- *Monitor and implement Commission rules and policies, including any changes thereto, pertaining to these frequency bands, including but not limited to those contained in or referenced by the Commission under WT Docket No. 02-146, including the Report and Order, Interim Public Notice, and any subsequent notices implementing the link registration process*

Response: Key Bridge will comply with this requirement.

- *Enter into a Memorandum of Understanding (MOU) with the United States Government memorializing its duties and responsibilities, and agreeing to serve a five-year term, which could be renewed by the Commission.*

Response: Key Bridge will comply with this requirement.

V. Security Measures and Capabilities

Key Bridge partners and teams with the best and most agile companies in their respective industries to deliver cutting-edge technology, robust services and high-quality products. The Key

Bridge security portfolio includes products, services and professional engineering support resources from Oracle for data and database-related security issues. Fortinet provides Key Bridge with hardware-based firewall, VPN, antivirus, intrusion prevention (IPS), Web filtering, anti-spam, and traffic shaping for multi-threat response and in-depth threat intelligence. Symantec provides security, storage and systems management solutions including PKI, two-factor authentication, and digital certificates that have been certified to meet the highest technical and policy standards of the United States Government. They are approved for deployment to Federal, state, and local agencies and government contractors.

The Key Bridge White Space System, the foundation upon which we will build a new link registration capability for the 70/80/90 GHz bands, addresses all of the known system threats with a standards compliant security framework that provides robust message security, information assurance, mutual authentication and non-repudiation.

The Key Bridge 70/80/90 GHz registration and database system will build upon the same technology foundation as our existing White Space System and will exhibit the same robust security capabilities including user authentication, authorization and information assurance.

VI. No Conflict of Interest

The Key Bridge commitment to neutrality is a guiding company principal and one that we believe provides the trusted foundation necessary for open and trustworthy spectrum administration. We maintain a corporate code of conduct designed to guide and protect our continued neutrality. Relevant passages of this policy include:

- We do not, directly or indirectly, prefer or privilege any consumer or business above another when accessing the same service;

- We do not engage in or operate commercial wireless systems, access networks, or other communications service that utilize the same spectrum we administer;
- We do not develop, operate, promote or sell transmitting hardware devices that utilize the same spectrum we administer;

The Key Bridge link registration system will offer all services on a non-discriminatory basis. Registrations will be handled on a first-come, first-served basis in a fair and transparent manner.

VII. Optional Services

Key Bridge intends to develop an interference analysis and pre-registration validation service to be offered as part of our registration workflow. This interference analysis will automatically identify and notify the registering user when the following Rules (and any others) apply to a registration:

§101.105 Interference protection criteria

§101.147 Frequency assignments

§101.1523 Sharing and coordination among non-government licensees and between non-government and government services

§1.928 Frequency coordination, Canada

§1.924 Quiet zones

Part 17 Antenna structure registration based on tower height and proximity to airport facilities⁵

⁵ We will also include references to FCC Form 854 *Application for Antenna Structure Registration* and FAA

VIII. Time Table

Key Bridge will begin work on a 70/80/90 GHz registration and database system immediately upon notification of pending approval from the Commission. Because of our extensive inventory of ready technology and expertise from the TV Bands we anticipate not more than three calendar months to complete and launch our 70/80/90 GHz registration and database system. We believe this is sufficient time for us to complete a detailed requirements analysis; new software component design, development, integration, and testing using an Extreme/Agile coding strategy; operational testing; and public service launch.

IX. Grant of Key Bridge's Proposal Serves the Public Interest and is Consistent with FCC's Stated Goal of Promoting Competition Between Spectrum Resource Managers

The authorization of Key Bridge as a database administrator for 70/80/90 GHz site/link registrations serves the public interest. Authorizing Key Bridge to offer a 70/80/90 GHz system will increase the number of databases from three to four, increasing competition.

Key Bridge will bring to market a suite of tools and capabilities that will better enable licensees, the Commission and the public to more efficiently and more dynamically manage their networks and to more easily self-identify potential interference conflicts during the preliminary design stages of a new link, thus saving time and engineering resources that may be wasted today with manual coordination. Sophisticated and flexible tools that describe the surrounding ambient RF and potentially interfering signals is necessary for designing and optimizing networks in a dynamically changing and increasingly crowded RF environment. Such resources can be critical for networks in the 70/80/90 GHz band that must provide services with carrier-grade quality of

service.⁶ Key Bridge has a demonstrated history of responsiveness to community needs and of rapidly developing and deploying new technologies, tools and resources to meet those needs and requirements. Approving Key Bridge as a database administrator for 70/80/90 GHz site/link registrations will stimulate innovation in these bands and serves the public interest.

X. The Commission has the authority to designate Key Bridge as a 70/80/90 GHz database administrator.

The Commission expressly stated in its 2004 Order designating the existing 70/80/90 GHz database managers that it “reserve[d] the discretion to designate additional managers.”⁷ Beyond expressly reserving the authority to delegate additional database administrators the Commission further elaborated in 2004 that “[e]xperience has shown that the introduction of competition in the frequency coordination process, such as for PLMR services, has brought significant benefits in terms of cost-based pricing for coordination and the incentive to enhance customer services. We believe that designating a single manager would not achieve those efficiencies, nor do we believe designating a single manager would significantly simplify the link registration process... Therefore, increasing the number of managers with such expertise should enhance the industry’s ability to successfully resolve technical disputes.”⁸

The FCC’s outlook on competition between frequency managers promoting innovation and driving down coordination costs has been validated over the course of the last decade, as may be evidenced by the FCC’s decision to tentatively authorize ten (10) database administrators to serve the television white spaces.

⁶ For example, Key Bridge understands that financial institutions and traders have developed 70/80/90 GHz for the purpose of minimizing trading delays, and that these networks operate as private high-speed, low latency backbones between New York, Chicago and other commerce hubs.

⁷ 2004 Approval Order at ¶ 1.

⁸ *Id.* at ¶ 6.

Given that the designation of additional database managers was contemplated by the Commission Key Bridge does not believe that a waiver is required for the Commission to act on the instant proposal and we urge the Commission to exercise the authority expressly retained and promptly approve Key Bridge as the fourth database administrator for the 70/80/90 GHz band. To the extent that a waiver is required from the original filing deadline of March 26, 2004, however, Key Bridge requests the grant of such a waiver.

The Commission may grant a waiver of the application of any of its rules "for good cause shown" pursuant to Section 1.3 of the Commission's Rules.⁹The Commission may also waive a rule where the specific facts make strict compliance with the rule inconsistent with the public interest.¹⁰In addition, the Commission may take into account considerations of hardship.¹¹Thus, the Commission may waive its rules if special circumstances warrant such a waiver, and the waiver will serve the public interest.

The original deadline should not preclude the Commission from considering and approving the Key Bridge proposal. In the instant situation the enforcement of a deadline established over nine (9) years ago would be inconsistent with the public interest. No policy justification is provided for the March 26, 2004 deadline for the submission of database administrator proposals for the 70/80/90 GHz band and the deadline appears to be ministerial and not an effort on the Commission's part to permanently preclude new database management proposals. Using this ministerial deadline as a gating item for the introduction of innovative new technology would be contrary to the Commission's stated position that competition and

⁹ 47 C.F.R. § 1.3.

¹⁰ *Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990).

¹¹ *WAIT Radio v. FCC*, 418 F.2d 1153, 1159 (D.C. Cir. 1969), cert. denied, 409 U.S. 1027 (1972); *Northeast Cellular*, 897 F.2d at 1166.

innovation promotes advances in spectrum management and coordination services. Rigidly enforcing a ministerial deadline could actually discourage competition and innovation: if the March 26, 2004 deadline were to serve as a permanent bar to entry for new competitors there would be little or no motivation for further investment, research and development, or innovation in the management of the band. This would not serve the public interest.

The Commission has also established precedent in accepting and approving a new database administrator after the original application deadline.¹² In a prior instance the Commission waived the application deadline stating “the rules do not prohibit additional parties from requesting designation ... after other parties have already been designated. In fact, the rules were designed with the expectation that there could be changes in database administrators over time”. In that instance the Commission further explained that “[t]he original filing deadline was established by OET to allow orderly processing of the initial prospective database administrators as a group. However, this deadline was not intended to preclude other parties from requesting designation as a database administrator at a later date.”¹³ The Commission further justified its decision to approve a new database administrator based upon the applicant’s “technical expertise to develop and operate a ... database”¹⁴ and the absence of any “concerns ... that [the applicant] is not capable of meeting all the requirements placed on database administrators by the Commission’s rules”.¹⁵ Key Bridge has demonstrated technical expertise sufficient to develop and operate a database and is fully capable of meeting all the requirements for operating a

¹² See *Unlicensed Operation in the TV Broadcast Bands Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band, Order*, 26 FCC Rcd 10599 (2011) (“Microsoft WSB Grant”) (conditionally designating Microsoft Corporation as a TV bands database Administrator).

¹³ *Id.* at ¶10

¹⁴ *Id.*

¹⁵ *Id.*

70/80/90 GHz link registration system.

XI. Summary

The public will be well served by the fresh investment of attention, energy and innovation that designating Key Bridge as a Database Manager for site registrations by licensees in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands will provide. The Commission expressly contemplated and reserved the authority to designate additional database managers and has established precedent for designating new database managers in other bands. Key Bridge does not believe that a waiver is required for the Commission to act on the instant proposal but to the extent that a waiver is required Key Bridge requests the grant of such a waiver.

The existing Database Managers have developed, documented and implemented an inter-party database synchronization and data exchange mechanism.¹⁶ Key Bridge can and will implement this existing procedure and method. Thus, approving Key Bridge as a database manager will not impose any new burden on the existing operators or in any way risk uninterrupted operation of the current link registration systems.

Key Bridge has already developed, integrated and launched a system similar to a 70/80/90 GHz link registration system supporting registration of protected wireless services in the Television broadcast bands. This system has undergone extensive Commission review and is currently awaiting final certification. Key Bridge has a deep understanding and proven operational knowledge of various FCC databases, including ULS. We are uniquely capable and qualified to act as a database manager for site registrations by licensees in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands, and intend to offer new capabilities, features and customer services

¹⁶ See Joint Submission of Comsearch, Frequency Finder, Micronet Communications: *Appendix A: 70-90 GHz Link Registration Process*, Docket No. 02-146, filed Sep. 9, 2004.

that will enhance competition for users of these bands, which is in the public interest.

Based upon our experience, resources and proven track record, Key Bridge is highly qualified to perform the duties and responsibilities of a Database Manager in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands and we urge the Commission to exercise the authority it expressly retained and to promptly approve Key Bridge as the fourth database administrator.

Submitted Monday, May 20, 2013.

/s/

A handwritten signature in black ink, appearing to be 'Jesse Caulfield', written over a horizontal line.

Jesse Caulfield, President

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