

HANDLE.NET REGISTRY SERVICE AGREEMENT (Ver. 2)

This *Handle.Net Registry Service Agreement (ver. 2)* ("Service Agreement") is between Corporation for National Research Initiatives ("CNRI"), having an office at 1895 Preston White Drive, Reston, VA 20191-5434, and the Individual or Organization that has registered at CNRI's Handle.Net Registry ("HNR") website at: <http://handle.net> and applied for authorization to provide identifier and/or resolution services as a local handle service provider ("LHS") (collectively the "Parties"). LHS shall be deemed to have entered into, signed and agreed to be bound by the Service Agreement as of the date LHS clicks to accept the terms and conditions of the Service Agreement where indicated at the HNR website (the "Effective Date").

1. Prefix(es). Subject to the terms and conditions as set forth herein, unless otherwise agreed to in writing by the Parties, CNRI hereby authorizes LHS to provide identifier and/or resolution services only with respect to identifiers that start with the prefix or prefixes allotted to LHS by CNRI. The HNR Administrator will notify LHS of the prefix or prefixes allotted to LHS and register each such prefix in the HNR. This notification will be sent by electronic mail to the administrator designated by LHS for each prefix ("LHS Administrator").

LHS acknowledges and agrees that the authority granted to LHS to use the prefix(es) allotted to it by CNRI hereunder is personal to LHS and that this authority may not be assigned or transferred by LHS to any other party without the prior written consent of CNRI. Without limiting the generality of the preceding sentence, LHS further acknowledges that the allotment of a prefix to LHS by CNRI, as provided herein, confers no property, ownership or proprietary rights on LHS with respect to such prefix.

2. HNR Procedures. LHS hereby agrees that the use of the Handle.Net technology and software, including the running of Handle.Net software, and any LHS deposit data, administrative data, or prefix data that have been entered into the Handle.Net Registry shall be subject to the Handle.Net Registry Policies & Procedures ("HNR Procedures") attached hereto as Appendix A, and incorporated herein by reference. LHS agrees to make reasonable good faith efforts to provide identifier and/or resolution services in accordance with the HNR Procedures. The HNR Procedures may, from time to time, be modified by CNRI; and any such modifications made during a given Term and posted at the Handle.Net Registry website shall become effective for LHS on the next following renewal date of the Service Agreement, unless otherwise agreed to in writing by the Parties.

3. Administrative data. Other than the information provided by the HNR in ordinary resolution requests, the collection of administrative data associated with each prefix is considered confidential by CNRI and will not be released in any form unless ordered by a court or governmental agency of competent jurisdiction, or unless otherwise agreed to in writing by the Parties. Administrative data, other than LHS's account information, that have been received by CNRI from LHS and are required to maintain the overall integrity of the HNR shall be retained in the HNR. LHS shall be solely responsible for the accuracy or completeness of any data or other information provided to the HNR by LHS.

4. Alternate party. In the event LHS is unable or no longer intends to provide identifier and/or resolution services for identifiers starting with the prefix or prefixes allotted to LHS by CNRI, LHS shall promptly notify CNRI and shall take steps to find an appropriate alternate party to provide such identifier and/or resolution services and notify the HNR Administrator of the alternate party. If CNRI, at its sole discretion, consents to the alternate party, then once the alternate party is authorized by CNRI to use the Handle.Net technology and software, and enters into a Service Agreement with CNRI to act as a LHS, the relevant set of records shall be transferred by LHS to that alternate party for such identifier and/or resolution services. Unless otherwise agreed to in writing between CNRI and LHS, if no alternate party is designated by LHS, LHS agrees that CNRI, at its sole discretion, may elect to provide such services itself,

or through another party, or may record and/or otherwise make known that the relevant identifiers, if any, are no longer resolvable.

5. Fees. In consideration for the Handle.Net Registry services ("HNR Services") provided by CNRI under this Service Agreement, LHS will pay the following fees to the HNR Administrator:

- For a single allotted prefix, a one-time registration fee of \$50 ("Registration Fee"), plus an annual service fee of \$50 ("Annual Service Fee"). For prefixes derived from the single allotted prefix, the Registration Fee shall be waived if the LHS remains the same; however, the Annual Service Fee shall apply for each derived prefix.
- For each additional consecutive twelve-month period after the first year, there is no Registration Fee, only the Annual Service Fee. The amount of the Annual Service Fee may be reasonably adjusted by CNRI from time to time.
- LHS may choose to pre-pay the Annual Service Fee for up to five (5) years in advance.
- CNRI reserves the right to waive the Registration Fee and/or Annual Service Fee on a case-by-case basis at its sole discretion. A request for waiver shall include the reasons for such request and shall be made in writing addressed to the HNR Administrator at: hldadmin@cnri.reston.va.us. Such a request for waiver would generally be made for a period of experimental testing and evaluation of the Handle.Net software.

6. Technical Support. CNRI personnel will provide LHS via electronic mail with occasional, limited consultation on routine technical matters during CNRI's normal business hours during the Term of this Service Agreement, and LHS will inform CNRI of the LHS's technical point of contact for this purpose. At its sole discretion, CNRI may provide additional technical assistance to LHS under a separately negotiated Technical Support Agreement.

7. HNR Services. In accordance with the terms of this Service Agreement, CNRI shall make reasonable efforts to provide LHS with reliable HNR Services on a 24-hour, 7-day a week basis and to maintain the overall operational integrity of the Handle.Net Registry. It is understood and agreed, however, that, unless otherwise agreed to in writing by the Parties, CNRI does not guarantee any specific level of HNR availability or performance. Without limiting the preceding sentence, CNRI shall not be liable for any HNR availability or performance failures or delays in the performance of any of its obligations hereunder due to causes beyond its reasonable control (force majeure condition), including, but not limited to, fire, strike, electrical or computer failure, war, riots, terrorism, judicial action, government sanctions, shortages of labor, materials or equipment, failures or delays in delivery by CNRI's vendors or suppliers. If, despite the reasonable efforts of CNRI and LHS, the force majeure condition persists beyond sixty (60) days, either CNRI or LHS may send a written notice to the other terminating this Service Agreement.

8. Disclaimer. CNRI IS MAKING THE HANDLE.NET REGISTRY TECHNOLOGY AND SERVICES AVAILABLE TO LHS HEREUNDER ON AN "AS IS" BASIS. CNRI EXPRESSLY DISCLAIMS AND EXCLUDES ALL WARRANTIES (INCLUDING WITHOUT LIMITATION MERCHANTABILITY, SATISFACTORY QUALITY, AND FITNESS FOR A PARTICULAR PURPOSE OR USE) AND REPRESENTATIONS, WHETHER EXPRESS OR IMPLIED, IN RELATION TO LHS'S USE OF THE HANDLE.NET REGISTRY TECHNOLOGY AND SERVICES, INCLUDING SOFTWARE, INFORMATION, AND PREFIX(ES), OR IN RELATION TO CNRI'S PERFORMANCE OF ANY SERVICES IN CONNECTION WITH THE HANDLE.NET REGISTRY.

9. Limitation of Liabilities. CNRI WILL NOT BE LIABLE TO LHS OR TO ANY THIRD PARTY (INCLUDING WITHOUT LIMITATION USERS OF LHS IDENTIFIER AND/OR RESOLUTION SERVICES), FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, OR PUNITIVE DAMAGES OF ANY CHARACTER INCLUDING, WITHOUT LIMITATION, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES, LOSS OF USER DATA OR PROFITS, OR BUSINESS INTERRUPTION, HOWEVER CAUSED AND ON ANY THEORY OF CONTRACT, WARRANTY, TORT (INCLUDING BUT NOT LIMITED TO NEGLIGENCE AND INFRINGEMENT OR MISAPPROPRIATION OF INTELLECTUAL PROPERTY RIGHTS), PRODUCT LIABILITY OR OTHERWISE, BASED ON OR ARISING IN ANY WAY OUT OF THE PERFORMANCE OF THE RIGHTS AND OBLIGATIONS OF THE PARTIES UNDER THIS AGREEMENT, EVEN IF CNRI IS ADVISED OR IS OTHERWISE AWARE OF THE POSSIBILITY OF SUCH DAMAGES. LHS AGREES THAT THE ENTIRE LIABILITY OF CNRI WILL IN NO EVENT EXCEED AN AMOUNT EQUAL TO THE FEE PAID BY LHS UNDER THIS SERVICE AGREEMENT.

10. Indemnification. LHS shall indemnify, defend, and hold CNRI harmless for and against all claims for personal injury, property damage, loss of profits, loss of use, or any indirect, consequential, punitive or special damages, whether based upon a claim or action in contract, warranty, negligence, or other tort, based on or arising out of or relating to LHS's provision of services pursuant to this Service Agreement.

11. Term & Termination. The term of this Service Agreement shall be for an initial one (1) year period which shall begin on the Effective Date of this Service Agreement ("Term"), and the Term shall automatically be extended for successive periods of one (1) year each, unless (a) either Party provides written notice to the other Party at least ninety (90) days prior to the renewal date that the Service Agreement shall not be renewed; (b) otherwise agreed to in writing; or (c) terminated by CNRI, at its sole discretion, upon a material breach of this Service Agreement by LHS. Parties that wish to have the Service Agreement extended for longer periods may request extensions for successive periods of up to five (5) years each, and, if approved, the service fees shall be adjusted accordingly.

Following termination of the Service Agreement, the records and other data associated with LHS prefix or prefixes may be maintained by CNRI in the HNR, at CNRI's sole discretion, at no fee to LHS. Further, it is understood and agreed that, following termination of the Service Agreement, unless otherwise agreed in writing by the Parties, CNRI is under no obligation to provide Handle.Net Registry services for prefix(es) previously allotted to LHS, and, at its sole discretion, CNRI may re-allot any or all of such prefix(es) to another party, who may thereafter use the same to provide identifier and/or resolution services, provided, however, that CNRI will not re-allot such prefix(es) to another party for a period of twenty-five (25) years following termination as provided herein.

12. Trademarks. Handle.Net, Hdl.Net, and CNRI are registered trademarks of CNRI, and CNRI may have or adopt other marks related to the Handle.Net Registry technology and services described herein ("CNRI Trademarks"). The CNRI Trademarks may not be used to endorse or promote any software, services or products of LHS, or any third party, except with prior written approval of CNRI, which it may grant or deny at its sole discretion. Inquiries concerning use of CNRI's Trademarks should be addressed to the HNR Administrator at hldadmin@cnri.reston.va.us.

13. Miscellaneous provisions.

a. This Service Agreement is transferable by CNRI provided that CNRI transfers and assigns all rights necessary to allow the transferee to fully perform CNRI's obligations hereunder, and that the transfer is to an organization that has agreed to operate the Handle.Net Registry in the public interest.

This Service Agreement is personal to LHS and, without prior written consent from CNRI, which consent may be granted or withheld in CNRI's sole discretion, shall not be assigned by any act of LHS, including without limitation, sale, merger, or other transfer of assets by LHS, bankruptcy, or by operation of law. Any purported transfer or assignment without CNRI's prior written consent shall be deemed a material breach of this Service Agreement.

b. This Service Agreement constitutes the entire and exclusive agreement and understanding of the Parties and merges all prior and contemporaneous discussions and agreements with respect thereto. Specifically, the Parties acknowledge and agree that, unless otherwise agreed in writing by the Parties, any Handle System Service Agreement ("HSSA") previously entered into between the Parties shall be deemed terminated as of the Effective Date of this Service Agreement. If any term or condition of this Service Agreement is found invalid or unenforceable by a court of law, the remainder of this Service Agreement shall continue in full force and effect unless the terms and conditions which are void or unenforceable shall substantially affect the rights or obligations granted to or undertaken by either Party.

c. In the event that LHS breaches this Service Agreement, CNRI and LHS agree that damages will not provide an adequate remedy for CNRI. Therefore, in the event of a breach or threat of breach, LHS acknowledges that CNRI shall be entitled to obtain injunctive relief, in addition to any other relief available at law or equity.

d. To the extent Federal law is not applicable, this Service Agreement shall be governed by and interpreted in all respects by the law of the Commonwealth of Virginia, excluding Virginia conflict of law provisions, and the courts within such State shall be the only courts of competent jurisdiction. Nothing in this Service Agreement shall be deemed to create any relationship of agency, partnership, or joint venture between the Parties.

APPENDIX A

HANDLE.NET REGISTRY POLICIES & PROCEDURES

(as of November 23, 2015)

a. Overview

The Handle.Net[®] Registry (“HNR”), an activity of Corporation for National Research Initiatives (“CNRI”), is based on components of the Digital Object (“DO”) Architecture originally developed and deployed by CNRI. The DO Architecture provides a means for uniquely identifying “digital objects” (also known as “digital entities”), and for using the identifiers to store and retrieve records containing state information about the digital objects. These identifiers are generically known as digital object identifiers or, more colloquially, handles. The HNR Services provide a mechanism for the creation, administration, and resolution of such identifiers, and their associated handle records.

The term digital object is used to denote structured data in the form of a set of bit sequences that can be interpreted and otherwise processed by a computer or other computational facility. Each sequence consists of a type-value pair, at least one of which is the identifier for the DO. The sequences need not all be stored in one place, or stored at all, but if they are stored (as opposed to being computed on-the-fly), they are generally assumed to be accessible from one or more known locations.

Handles consist of a prefix and a suffix that is separated from the prefix by a slash “/”. A prefix containing one or more “dots” is described as a prefix with one or more delimiters. A prefix containing no dots is a zero delimiter prefix. The prefix for a handle is not permitted to contain a slash; and the suffix may be any string selected by an individual or organization authorized by the HNR to provide identifier and/or resolution services. Such an individual or organization is generally referred to as a local handle service provider (“LHS”).

b. Identifier Records

Identifier records (otherwise known as “handle records”) contain state information about the digital objects (DOs) to which they correspond. One example of state information is the location(s) of the DO. Another example is selected metadata about the DO, generally known as key metadata. Type information is an example of key metadata. Type information can itself be stored as a DO, having an associated unique identifier that can be resolved to relevant state information about the types, e.g., how to interpret the type’s values.

Except where an LHS notifies the HNR that it would like to continue to be allotted its existing prefix(es), or prefix(es) derived from such prefix(es) (known as “legacy prefixes”), initially, it is assumed that each new prefix allotted to an LHS by the HNR will begin with the HNR’s identifier “20.500” followed by a dot (“.”) followed by a number consisting of a 4 or more digits (e.g., “20.500.1234”). Prefix handle records for prefixes with two or more delimiters are maintained in the HNR. Each prefix handle record in the HNR contains the “service information” that client and server software need in order to locate the LHS responsible for handle records with identifiers beginning with the designated prefix. The required information in any prefix handle record created by the HNR shall typically include an HS_SITE value in the associated prefix handle record indicating where handle records beginning with such prefixes may be found or from which further relevant information may be available.

LHSs may wish to operate identifier and/or resolution systems using different interface specifications than that provided in the Handle.Net software made available by CNRI. To operate such a system, an LHS

must request a waiver from the HNR Administrator of the requirement that LHS Services be compatible with Handle.Net Registry Policies & Procedures as set forth herein. As part of the registration procedure, an LHS should request such a waiver and provide the requested information necessary for the HNR Services to have an effective means of responding to resolution requests relating to the LHS's alternative identifier and/or resolution services. There may be additional fees associated with the registration process in this case.

c. General Service Considerations

Each LHS shall maintain a reasonable quality of service, including, but not limited to, the following considerations:

- Compatibility and smooth interaction among LHS system components, and the interaction of those components with the HNR and with the Global Handle Registry (GHR) as well as with users of LHS's identifier and/or resolution services;
- Consistency and reliability in service performance;
- Proper system management and performance tracking;
- Non-interrupted access to/from the HNR Services and GHR Services; and
- Overall system security.

In the event LHS enters into an agreement with a third party to provide its identifier and/or resolution services using a prefix allotted to LHS, or derived from such prefix for which the LHS has paid the requisite fee, the third party is not required to enter into a separate Handle.Net Registry Service Agreement ("Service Agreement") with CNRI for this purpose, but must register with the HNR and agree to be bound by the Handle.Net Public License Agreement. In addition, LHS shall flow down in its agreement with the third party the applicable terms and conditions of its Service Agreement with CNRI, it being understood that responsibility for fulfilling the obligations of the Service Agreement remain with LHS.

d. Specific Operational Considerations for an LHS

Client software is used to resolve identifiers with a given prefix; the resolution process produces an identifier record for a DO containing state information, such as location information for LHS Services, public keys, and authentication information. The prefix handle record is used by client software to determine the identifying address where the corresponding identifier record may be found.

Accordingly, the LHS shall:

- Maintain all such identifier records at identifying address(es) (e.g., IP addresses, service identifiers or other system coordinates), which shall be provided by the LHS Administrator to the HNR Administrator, as directed, and which is sufficient to permit the HNR Services to redirect a client application to the LHS Services where the designated identifier records are stored. The LHS shall be responsible for ensuring that authoritative resolution responses are generated from these identifying address(es);
- Provide identifier and/or resolution LHS Services at the identifying address(es) for LHS's identifier records; such LHS Services shall be limited to those that are under the common ownership and/or control of the LHS;
- Provide secure maintenance of related private keys;
- Use the secure channel set up by the HNR Administrator to send to the HNR information about its LHS Services configuration and other relevant issues;

- Provide timely reports to the HNR Administrator of service configuration changes, such as LHS moving its current identifier and/or resolution services locations.

An LHS may maintain one or more mirrors for its handle records. In such cases, the identifying address(es) of up to six (6) mirrors may be provided to the HNR Administrator for insertion in the appropriate prefix handle record; and requests for inclusion of additional identifying address(es) shall be addressed to the HNR Administrator at: hldadmin@cnri.reston.va.us. Responses from the mirrors are not considered authoritative, even if the responses are properly signed.

If an LHS wishes to provide services that do not meet the criteria listed above, the LHS should contact the HNR Administrator to request permission for alternate arrangements; and the HNR, at its sole discretion, reserves the right to determine whether to permit such services. For example, it is often the case that an LHS may wish to operate its LHS Services using multiple components (e.g., multiple machines, multiple software instances or mobile programs), where each component has its own identifying address. In this case, each machine would contain a subset of all the records and a hashing algorithm is used to access the specific machine holding the requested handle record. Such machines would not be mirrors of each other but rather each would contain a subset of the handle records at that site. In other words, an LHS that wishes to run a resolution service, using a single prefix, and have the identifier records uniformly distributed across multiple machines with different addresses, or where a single IP address is used with different network ports, shall provide sufficient information to the HNR Administrator about the separate components of the LHS Services to enable the capability from the HNR Services.

Further, if an LHS wishes to operate private identifier and/or resolution services (such as those maintained behind a firewall that are not publicly accessible), it must so notify the HNR Administrator in advance and request permission to do so. Various strategies have been discussed as to how best to accomplish this. For the present, if the HNR authorizes an LHS to provide such services, the LHS must either resolve the resolution request itself for the handle record or provide sufficient resolution information to enable the resolution request to be handled elsewhere.

Wherever feasible and economic to do so, both IPv4 and IPv6 addresses should be made available for use by client software to access each LHS.

LHSs that wish to allot derived prefixes containing three or more delimiters to themselves or to third parties for purposes of providing identifier and/or resolution services and not make them known to the HNR Services must notify the HNR Administrator and request approval at the time of registration, or any time thereafter, provided that such notification is received and approved prior to allotting such derived prefixes. Permission from the HNR to do so will generally involve qualification of the LHS making the request, payment of additional service fees and compliance with procedures commensurate with such authorization. Since these derived prefixes will not be known to the HNR, the LHS generating them must agree to provide resolution services for those prefixes and must store the associated handle records at that LHS or else provide useful information to client software as to how to access the associated handle records.