

HANDLE SYSTEM POLICIES & PROCEDURES

(as of September 21, 2005)

a. Overview

The Handle System[®] is a component of the Digital Object Architecture developed by CNRI. It provides a means for uniquely identifying Digital Objects (“DOs”) and other network resources, and for using the identifiers to store and retrieve records containing state information about the DOs. It also provides an administrative mechanism for managing identifiers over time.

The term Digital Object is used to denote structured data in the form of a set of bit sequences that can be interpreted 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, they are generally assumed to be accessible from one or more known locations.

One form of state information is the location(s) of the DO. Another form is selected metadata about the DO, generally known as key metadata. Type information is an example of key metadata. Type information itself is stored as DOs and can be retrieved by a formula that converts type strings into identifiers. Types used in identifier records must be resolvable in the Global Handle Registry[®] (“GHR”). The types intended for general use by the public are stored in the GHR, but may also be stored by a Resolution Service Provider (“RSP”), if desired.

Each identifier consists of a prefix and a suffix separated from the prefix by a slash “/”. The prefix is not permitted to contain a slash; and the suffix may be any string selected by the Administrator for that prefix. The top level of the Handle System, known as the Global Handle Registry, contains all the prefixes, and may contain all, some or none of the identifier records associated with each prefix. Prefixes derived from allotted prefixes are known as derived prefixes. Each derived prefix is also considered an allotted prefix, and, unless otherwise authorized by the Handle System Administrator, each such derived prefix must be registered in the GHR.

Specific prefixes have been reserved by the Handle System Administrator for certain general categories. Apart from such prefixes, prefixes shall generally be allotted in order beginning with unassigned five digit numbers and increasing thereafter.

RSPs may wish to operate identifier and/or resolution systems using the Handle System technology that have different interface specifications. To operate such a system, RSP must request a waiver from the Handle System Administrator of the requirement that RSP services be compatible with the Handle System interface specification. As part of the registration procedure, RSP should request such a waiver and provide the requested information necessary for the GHR to have an effective means of responding to resolution requests relating to RSP's alternative identifier and/or resolution system. There may be additional fees associated with the registration process in this case. The GHR will allocate a prefix (or its functional equivalent) for the alternative system that will be used by the GHR to respond to resolution requests involving the alternative system. The Handle System Administrator will work with RSP to install the alternative interface software in the GHR. Compliance with these procedures will enable interoperability with the Handle System, even though the interface specifications may differ.

Information about the Handle System has been documented in IETF RFCs 3650, 3651, and 3652 which may be found at the Handle System Internet site: <http://www.handle.net>. This work was supported in part by the Defense Advanced Research Projects Agency under Grant No. MDA 972-99-1-0018 and Grant No. MDA 972-92-J-1029.

b. General Service Considerations

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

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

In the event RSP enters into an agreement with a third party to provide its identifier and/or resolution services using a prefix allotted to RSP, or derived from such prefix for which the RSP has paid the requisite fee, the third party is not required to enter into a separate service agreement with CNRI for this purpose, but must register with CNRI and agree to be bound by the Handle System Public License. In addition, RSP 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 RSP.

c. Specific Operational Considerations for an RSP

Resolution of an identifier with a given prefix produces an identifier record containing state information, such as location information for RSP services. Accordingly, RSP shall:

- Maintain all such identifier records at a single identifying address (e.g., IP Address, service identifier or other system coordinates), which shall be provided by the RSP Administrator to the Handle System Administrator, and which is sufficient to permit the GHR to redirect a client application to the RSP service where the identifier records will be resolved;
- Provide identifier and/or resolution services at the single identifying address for RSP's identifiers; such services shall be limited to those that are under the common ownership and control of RSP;
- Provide secure maintenance of Private Keys by each RSP Administrator; and
- Provide timely reports to the Handle System Administrator (hdladmin@cnri.reston.va.us) of service configuration changes, such as RSP moving its current identifier and/or resolution services location.

If RSP wishes to provide services that do not meet the criteria listed above, RSP should contact the Handle System Administrator to request permission for alternate arrangements, and, CNRI, at its sole discretion, reserves the right to determine whether to permit such services. For example, RSP may wish to operate its identifier and/or resolution services ("RSP Services") using multiple components (e.g., multiple machines, multiple software instances or mobile programs). Specifically, an RSP may wish to run a single resolution service, using a single prefix, where the

identifier records are distributed across multiple identifying addresses, or, where a single IP address is used with different network ports. In such cases, RSP shall provide to the Handle System Administrator sufficient information about the separate components of RSP Services; and additional charges may apply.

If RSP wishes to operate private identifier and/or resolution services (such as services maintained behind a firewall that are not publicly accessible), it must so notify the Handle System Administrator in advance. Upon notification, RSP's prefix(es) will be retained in the GHR, which will provide resolution information to the extent such information is made available to it by RSP. If no such information is provided by RSP, the GHR will state that identifiers beginning with RSP's prefix(es) are not publicly resolvable.

RSPs that wish to allocate derived prefixes to themselves or to third parties for purposes of providing identifier and/or resolution services, and not have such derived prefixes known to the GHR, must notify the Handle System Administrator for approval at the time of registration, or any time thereafter, provided that such notification is received and approved prior to using such derived prefixes. Permission for such delegation of authority will generally involve qualification of the RSP making the request, payment of additional service fees and compliance with procedures commensurate with such delegation of authority. Since these derived prefixes will not be known to the GHR, the RSP generating them must agree to provide resolution services for these prefixes and to maintain all the necessary information to assure that identifiers beginning with these prefixes are resolvable.

d. GHR Considerations

Although identifiers may be resolved by the GHR, RSP will generally choose to resolve identifiers directly from its own service without using the GHR after it has registered and been given a prefix from the Handle System Administrator.

In addition to each prefix and its related administrative data, RSP may, at CNRI's sole discretion, store a limited amount of additional identifier information in the GHR for resolution, backup or for other purposes under a separately negotiated Technical Support Agreement between CNRI and RSP.