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M. Stahl
SRI International
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DOMAIN ADMINISTRATORS GUIDE

STATUS OF THIS MEMO

This memo describes procedures for registering a domain with the Network Information Center (NIC) of Defense Data Network (DDN), and offers guidelines on the establishment and administration of a domain in accordance with the requirements specified in RFC-920. It is intended for use by domain administrators. This memo should be used in conjunction with RFC-920, which is an official policy statement of the Internet Activities Board (IAB) and the Defense Advanced Research Projects Agency (DARPA). Distribution of this memo is unlimited.

BACKGROUND

Domains are adminstrative entities that provide decentralized management of host naming and addressing. The domain-naming system is distributed and hierarchical.

The NIC is designated by the Defense Communications Agency (DCA) to provide registry services for the domain-naming system on the DDN and DARPA portions of the Internet.

As registrar of top-level and second-level domains, as well as administrator of the root domain name servers on behalf of DARPA and DDN, the NIC is responsible for maintaining the root server zone files and their binary equivalents. In addition, the NIC is responsible for administering the top-level domains of "ARPA," "COM," "EDU," "ORG," "GOV," and "MIL" on behalf of DCA and DARPA until it becomes feasible for other appropriate organizations to assume those responsibilities.

It is recommended that the guidelines described in this document be used by domain administrators in the establishment and control of second-level domains.

THE DOMAIN ADMINISTRATOR

The role of the domain administrator (DA) is that of coordinator, manager, and technician. If his domain is established at the second level or lower in the tree, the DA must register by interacting with the management of the domain directly above his, making certain that

his domain satisfies all the requirements of the administration under which his domain would be situated. To find out who has authority over the name space he wishes to join, the DA can ask the NIC Hostmaster. Information on contacts for the top-level and second-level domains can also be found on line in the file NETINFO:DOMAIN-CONTACTS.TXT, which is available from the NIC via anonymous FTP.

The DA should be technically competent; he should understand the concepts and procedures for operating a domain server, as described in RFC-1034, and make sure that the service provided is reliable and uninterrupted. It is his responsibility or that of his delegate to ensure that the data will be current at all times. As a manager, the DA must be able to handle complaints about service provided by his domain name server. He must be aware of the behavior of the hosts in his domain, and take prompt action on reports of problems, such as protocol violations or other serious misbehavior. The administrator of a domain must be a responsible person who has the authority to either enforce these actions himself or delegate them to someone else.

Name assignments within a domain are controlled by the DA, who should verify that names are unique within his domain and that they conform to standard naming conventions. He furnishes access to names and name-related information to users both inside and outside his domain. He should work closely with the personnel he has designated as the "technical and zone" contacts for his domain, for many administrative decisions will be made on the basis of input from these people.

THE DOMAIN TECHNICAL AND ZONE CONTACT

A zone consists of those contiguous parts of the domain tree for which a domain server has complete information and over which it has authority. A domain server may be authoratative for more than one zone. The domain technical/zone contact is the person who tends to the technical aspects of maintaining the domain’s name server and resolver software, and database files. He keeps the name server running, and interacts with technical people in other domains and zones to solve problems that affect his zone.

POLICIES

Domain or host name choices and the allocation of domain name space are considered to be local matters. In the event of conflicts, it is the policy of the NIC not to get involved in local disputes or in the local decision-making process. The NIC will not act as referee in disputes over such matters as who has the "right" to register a particular top-level or second-level domain for an organization. The NIC considers this a private local matter that must be settled among

the parties involved prior to their commencing the registration process with the NIC. Therefore, it is assumed that the responsible person for a domain will have resolved any local conflicts among the members of his domain before registering that domain with the NIC. The NIC will give guidance, if requested, by answering specific technical questions, but will not provide arbitration in disputes at the local level. This policy is also in keeping with the distributed hierarchical nature of the domain-naming system in that it helps to distribute the tasks of solving problems and handling questions.

Naming conventions for hosts should follow the rules specified in RFC-952. From a technical standpoint, domain names can be very long. Each segment of a domain name may contain up to 64 characters, but the NIC strongly advises DAs to choose names that are 12 characters or fewer, because behind every domain system there is a human being who must keep track of the names, addresses, contacts, and other data in a database. The longer the name, the more likely the data maintainer is to make a mistake. Users also will appreciate shorter names. Most people agree that short names are easier to remember and type; most domain names registered so far are 12 characters or fewer.

Domain name assignments are made on a first-come-first-served basis. The NIC has chosen not to register individual hosts directly under the top-level domains it administers. One advantage of the domain naming system is that administration and data maintenance can be delegated down a hierarchical tree. Registration of hosts at the same level in the tree as a second-level domain would dilute the usefulness of this feature. In addition, the administrator of a domain is responsible for the actions of hosts within his domain. We would not want to find ourselves in the awkward position of policing the actions of individual hosts. Rather, the subdomains registered under these top-level domains retain the responsibility for this function.

Countries that wish to be registered as top-level domains are required to name themselves after the two-letter country code listed in the international standard ISO-3166. In some cases, however, the two-letter ISO country code is identical to a state code used by the U.S. Postal Service. Requests made by countries to use the three-letter form of country code specified in the ISO-3166 standard will be considered in such cases so as to prevent possible conflicts and confusion.

HOW TO REGISTER

Obtain a domain questionnaire from the NIC hostmaster, or FTP the file NETINFO:DOMAIN-TEMPLATE.TXT from host SRI-NIC.ARPA.

Fill out the questionnaire completely. Return it via electronic mail to HOSTMASTER@SRI-NIC.ARPA.

The APPENDIX to this memo contains the application form for registering a top-level or second-level domain with the NIC. It supersedes the version of the questionnaire found in RFC-920. The application should be submitted by the person administratively responsible for the domain, and must be filled out completely before the NIC will authorize establishment of a top-level or second-level domain. The DA is responsible for keeping his domain's data current with the NIC or with the registration agent with which his domain is registered. For example, the CSNET and UUCP managements act as domain filters, processing domain applications for their own organizations. They pass pertinent information along periodically to the NIC for incorporation into the domain database and root server files. The online file NETINFO:ALTERNATE-DOMAIN-PROCEDURE.TXT outlines this procedure. It is highly recommended that the DA review this information periodically and provide any corrections or additions. Corrections should be submitted via electronic mail.

WHICH DOMAIN NAME?

The designers of the domain-naming system initiated several general categories of names as top-level domain names, so that each could accommodate a variety of organizations. The current top-level domains registered with the DDN Network Information Center are ARPA, COM, EDU, GOV, MIL, NET, and ORG, plus a number of top-level country domains. To join one of these, a DA needs to be aware of the purpose for which it was intended.

"ARPA" is a temporary domain. It is by default appended to the names of hosts that have not yet joined a domain. When the system was begun in 1984, the names of all hosts in the Official DoD Internet Host Table maintained by the NIC were changed by adding of the label ".ARPA" in order to accelerate a transition to the domain-naming system. Another reason for the blanket name changes was to force hosts to become accustomed to using the new style names and to modifiy their network software, if necessary. This was done on a network-wide basis and was directed by DCA in DDN Management Bulletin No. 22. Hosts that fall into this domain will eventually move to other branches of the domain tree.

"COM" is meant to incorporate subdomains of companies and businesses.

"EDU" was initiated to accommodate subdomains set up by universities and other educational institutions.

"GOV" exists to act as parent domain for subdomains set up by government agencies.

"MIL" was initiated to act as parent to subdomains that are developed by military organizations.

"NET" was introduced as a parent domain for various network-type organizations. Organizations that belong within this top-level domain are generic or network-specific, such as network service centers and consortia. "NET" also encompasses network management-related organizations, such as information centers and operations centers.

"ORG" exists as a parent to subdomains that do not clearly fall within the other top-level domains. This may include technical-support groups, professional societies, or similar organizations.

One of the guidelines in effect in the domain-naming system is that a host should have only one name regardless of what networks it is connected to. This implies, that, in general, domain names should not include routing information or addresses. For example, a host that has one network connection to the Interent and another to BITNET should use the same name when talking to either network. For a description of the syntax of domain names, please refer to Section 3 of RFC-1034.

VERIFICATION OF DATA

The verification process can be accomplished in several ways. One of these is through the NIC WHOIS server. If he has access to WHOIS, the DA can type the commmand "whois domain <domain name><return>". The reply from WHOIS will supply the following: the name and address of the organization "owning" the domain; the name of the domain; its administrative, technical, and zone contacts; the host names and network addresses of sites providing name service for the domain.

Example:

```
@whois domain rice.edu<Return>

   Rice University (RICE-DOM)
   Advanced Studies and Research
   Houston, TX 77001

   Domain Name: RICE.EDU

      Administrative Contact:
      Kennedy, Ken  (KK28)  Kennedy@LLL-CRG.ARPA (713) 527-4834
      Technical Contact, Zone Contact:
      Riffle, Vicky R.  (VRR)  rif@RICE.EDU
      (713) 527-8101 ext 3844

   Domain servers:

   RICE.EDU                      128.42.5.1
   PENDRAGON.CS.PURDUE.EDU       128.10.2.5
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Alternatively, the DA can send an electronic mail message to SERVICE@SRI-NIC.ARPA. In the subject line of the message header, the DA should type "whois domain <domain name>". The requested information will be returned via electronic mail. This method is convenient for sites that do not have access to the NIC WHOIS service.

The initial application for domain authorization should be submitted via electronic mail, if possible, to HOSTMASTER@SRI-NIC.ARPA. The questionnaire described in the appendix may be used or a separate application can be FTPed from host SRI-NIC.ARPA. The information provided by the administrator will be reviewed by hostmaster personnel for completeness. There will most likely be a few exchanges of correspondence via electronic mail, the preferred method of communication, prior to authorization of the domain.

HOW TO GET MORE INFORMATION

An informational table of the top-level domains and their root servers is contained in the file NETINFO:DOMAINS.TXT online at SRI-NIC.ARPA. This table can be obtained by FTPing the file. Alternatively, the information can be acquired by opening a TCP or UDP connection to the NIC Host Name Server, port 101 on SRI-NIC.ARPA, and invoking the command "ALL-DOM".

The following online files, all available by FTP from SRI-NIC.ARPA, contain pertinent domain information:

- NETINFO:DOMAINS.TXT, a table of all top-level domains and the network addresses of the machines providing domain name service for them. It is updated each time a new top-level domain is approved.

- NETINFO:DOMAIN-INFO.TXT contains a concise list of all top-level and second-level domain names registered with the NIC and is updated monthly.

- NETINFO:DOMAIN-CONTACTS.TXT also contains a list of all the top level and second-level domains, but includes the administrative, technical and zone contacts for each as well.

- NETINFO:DOMAIN-TEMPLATE.TXT contains the questionnaire to be completed before registering a top-level or second-level domain.

For either general or specific information on the domain system, do one or more of the following:

1. Send electronic mail to HOSTMASTER@SRI-NIC.ARPA

2. Call the toll-free NIC hotline at (800) 235-3155

3. Use FTP to get background RFCs and other files maintained online at the NIC. Some pertinent RFCs are listed below in the REFERENCES section of this memo.

REFERENCES

The references listed here provide important background information on the domain-naming system. Path names of the online files available via anonymous FTP from the SRI-NIC.ARPA host are noted in brackets.

1. Defense Communications Agency DDN Defense Communications System, DDN Management Bulletin No. 22, Domain Names Transition, March 1984.
[DDN-NEWS:DDN-MGT-BULLETIN-22.TXT]

2. Defense Communications Agency DDN Defense Communications System, DDN Management Bulletin No. 32, Phase I of the Domain Name Implementation, January 1987.
[DDN-NEWS:DDN-MGT-BULLETIN-32.TXT]

3. Harrenstien, K., M. Stahl, and E. Feinler, "Hostname Server", RFC-953, DDN Network Information Center, SRI International, October 1985. [RFC:RFC953.TXT]

4. Harrenstien, K., M. Stahl, and E. Feinler, "Official DoD Internet Host Table Specification", RFC-952, DDN Network Information Center, SRI International, October 1985.
[RFC:RFC952.TXT]

5. ISO, "Codes for the Representation of Names of Countries", ISO-3166, International Standards Organization, May 1981.
[Not online]

6. Lazear, W.D., "MILNET Name Domain Transition", RFC-1031, Mitre Corporation, October 1987. [RDC:RFC1031.TXT]

7. Lottor, M.K., "Domain Administrators Operations Guide", RFC-1033, DDN Network Information Center, SRI International, July 1987. [RFC:RFC1033.TXT]

8. Mockapetris, P., "Domain Names - Concepts and Facilities", RFC-1034, USC Information Sciences Institute, October 1987.
[RFC:RFC1034.TXT]

9. Mockapetris, P., "Domain Names - Implementation and Specification", RFC-1035, USC Information Sciences Institute, October 1987. [RFC:RFC1035.TXT]

10. Mockapetris, P., "The Domain Name System", Proceedings of the IFIP 6.5 Working Conference on Computer Message Services, Nottingham, England, May 1984. Also as ISI/RS-84-133, June

1984. [Not online]

11. Mockapetris, P., J. Postel, and P. Kirton, "Name Server Design for Distributed Systems", Proceedings of the Seventh International Conference on Computer Communication, October 30 to November 3 1984, Sidney, Australia. Also as ISI/RS-84-132, June 1984. [Not online]

12. Partridge, C., "Mail Routing and the Domain System", RFC-974, CSNET-CIC, BBN Laboratories, January 1986. [RFC:RFC974.TXT]

13. Postel, J., "The Domain Names Plan and Schedule", RFC-881, USC Information Sciences Institute, November 1983. [RFC:RFC881.TXT]

14. Reynolds, J., and Postel, J., "Assigned Numbers", RFC-1010 USC Information Sciences Institute, May 1986. [RFC:RFC1010.TXT]

15. Romano, S., and Stahl, M., "Internet Numbers", RFC-1020, SRI, November 1987. [RFC:RFC1020.TXT]

APPENDIX

The following questionnaire may be FTPed from SRI-NIC.ARPA as NETINFO:DOMAIN-TEMPLATE.TXT.

To establish a domain, the following information must be sent to the NIC Domain Registrar (HOSTMASTER@SRI-NIC.ARPA):

NOTE: The key people must have electronic mailboxes and NIC "handles," unique NIC database identifiers. If you have access to "WHOIS", please check to see if you are registered and if so, make sure the information is current. Include only your handle and any changes (if any) that need to be made in your entry. If you do not have access to "WHOIS", please provide all the information indicated and a NIC handle will be assigned.

(1) The name of the top-level domain to join.

For example: COM

(2) The NIC handle of the administrative head of the organization. Alternately, the person's name, title, mailing address, phone number, organization, and network mailbox. This is the contact point for administrative and policy questions about the domain. In the case of a research project, this should be the principal investigator.

For example:

Administrator

Organization	The NetWorthy Corporation
Name	Penelope Q. Sassafrass
Title	President
Mail Address	The NetWorthy Corporation 4676 Andrews Way, Suite 100 Santa Clara, CA 94302-1212
Phone Number	(415) 123-4567
Net Mailbox	Sassafrass@ECHO.TNC.COM
NIC Handle	PQS

(3) The NIC handle of the technical contact for the domain. Alternately, the person's name, title, mailing address, phone number, organization, and network mailbox. This is the contact point for problems concerning the domain or zone, as well as for updating information about the domain or zone.

For example:

Technical and Zone Contact

Organization	The NetWorthy Corporation
Name	Ansel A. Aardvark
Title	Executive Director
Mail Address	The NetWorthy Corporation 4676 Andrews Way, Suite 100 Santa Clara, CA. 94302-1212
Phone Number	(415) 123-6789
Net Mailbox	Aardvark@ECHO.TNC.COM
NIC Handle	AAA2

(4) The name of the domain (up to 12 characters). This is the name that will be used in tables and lists associating the domain with the domain server addresses. [While, from a technical standpoint, domain names can be quite long (programmers beware), shorter names are easier for people to cope with.]

For example: TNC

(5) A description of the servers that provide the domain service for translating names to addresses for hosts in this domain, and the date they will be operational.

A good way to answer this question is to say "Our server is supplied by person or company X and does whatever their standard issue server does."

For example: Our server is a copy of the one operated by the NIC; it will be installed and made operational on 1 November 1987.

(6) Domains must provide at least two independent servers for the domain. Establishing the servers in physically separate locations and on different PSNs is strongly recommended. A description of the server machine and its backup, including

(a) Hardware and software (using keywords from the Assigned Numbers RFC).

(b) Host domain name and network addresses (which host on which network for each connected network).

(c) Any domain-style nicknames (please limit your domain-style nickname request to one)

For example:

- Hardware and software

  VAX-11/750 and UNIX, or
  IBM-PC and MS-DOS, or
  DEC-1090 and TOPS-20

- Host domain names and network addresses

  BAR.FOO.COM 10.9.0.193 on ARPANET

- Domain-style nickname

  BR.FOO.COM (same as BAR.FOO.COM 10.9.0.13 on ARPANET)

(7) Planned mapping of names of any other network hosts, other than the server machines, into the new domain's naming space.

For example:

```
BAR-FOO2.ARPA (10.8.0.193) -> FOO2.BAR.COM
BAR-FOO3.ARPA (10.7.0.193) -> FOO3.BAR.COM
BAR-FOO4.ARPA (10.6.0.193) -> FOO4.BAR.COM
```

(8) An estimate of the number of hosts that will be in the domain.

(a) Initially
(b) Within one year
(c) Two years
(d) Five years.

For example:

(a) Initially = 50
(b) One year = 100
(c) Two years = 200
(d) Five years = 500

(9) The date you expect the fully qualified domain name to become the official host name in HOSTS.TXT.

Please note: If changing to a fully qualified domain name (e.g., FOO.BAR.COM) causes a change in the official host name of an ARPANET or MILNET host, DCA approval must be obtained beforehand. Allow 10 working days for your requested changes to be processed.

ARPANET sites should contact ARPANETMGR@DDN1.ARPA. MILNET sites should contact HOSTMASTER@SRI-NIC.ARPA, 800-235-3155, for further instructions.

(10) Please describe your organization briefly.

For example: The NetWorthy Corporation is a consulting organization of people working with UNIX and the C language in an electronic networking environment. It sponsors two technical conferences annually and distributes a bimonthly newsletter.

This example of a completed application corresponds to the examples found in the companion document RFC-1033, "Domain Administrators Operations Guide."

(1) The name of the top-level domain to join.

COM

(2) The NIC handle of the administrative contact person.

NIC Handle JAKE

(3) The NIC handle of the domain's technical and zone contact person.

NIC Handle DLE6

(4) The name of the domain.

SRI

(5) A description of the servers.

Our server is the TOPS20 server JEEVES supplied by ISI; it will be installed and made operational on 1 July 1987.

(6) A description of the server machine and its backup:

(a) Hardware and software

DEC-1090T and TOPS20
DEC-2065 and TOPS20

(b) Host domain name and network address

KL.SRI.COM 10.1.0.2 on ARPANET, 128.18.10.6 on SRINET
STRIPE.SRI.COM 10.4.0.2 on ARPANET, 128.18.10.4 on SRINET

(c) Domain-style nickname

None

(7) Planned mapping of names of any other network hosts, other than the server machines, into the new domain's naming space.

SRI-Blackjack.ARPA (128.18.2.1) -> Blackjack.SRI.COM
SRI-CSL.ARPA (192.12.33.2) -> CSL.SRI.COM

(8) An estimate of the number of hosts that will be directly within this domain.

(a) Initially = 50
(b) One year = 100
(c) Two years = 200
(d) Five years = 500

(9) A date when you expect the fully qualified domain name to become the official host name in HOSTS.TXT.

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(10) Brief description of organization.

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