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Principles of Operation for the TPC.INT Subdomain:  
General Principles and Policy

Status of this Memo

This memo provides information for the Internet community. It does not specify an Internet standard. Distribution of this memo is unlimited.

Abstract

This document defines the initial principles of operation for the tpc.int subdomain, a collection of service listings accessible over the Internet infrastructure through an administered namespace contained within the Domain Name System [1,2].

This document is informational and applies only to those Internet sites that choose to register themselves within the tpc.int subdomain. The tpc.int subdomain is organized as a cooperative of the sites that provide access within the context of the subdomain. Policy for the subdomain is set by a board responsible to the cooperative.

The primary purpose of the tpc.int subdomain is to provide transparent mapping between general-purpose computers on the Internet and special-purpose devices directly connected to the telephone network. Initially, a remote printing service is defined [3,4] which ties together G3-compatible facsimile devices on the telephone network with users of electronic mail in the Internet and associated message-handling domains connected to the Internet by application-layer gateways.

It should be noted that remote printer gateways have long been technically feasible and have become an integral part of many individual networks. The tpc.int subdomain integrates individual sites into a common namespace, transforming remote printing from a single-site, value-added service into an integral transparent service in the global Internet.

## Overview of Services in the TPC.INT Subdomain

The tpc.int subdomain is organized as a cooperative, an association organized for the purpose, without gain to itself, of rendering service as defined in this document and as further defined by the membership of the cooperative. Members of the tpc.int subdomain cooperative are defined as those Internet sites who provide access to services as defined in this document and as periodically amended by the membership as represented by the Board of Arbitration and Conciliation for the tpc.int subdomain.

The primary purpose of the tpc.int subdomain is to provide transparent mappings between users of general-purpose computers on the Internet and special-purpose devices directly connected to the telephone network. This mapping extends the population reachable from the Internet by providing a communications path to devices not otherwise directly addressable.

The initial remote printing facility is built on top of the electronic mail protocols of the Internet, including RFC 822 [5] and MIME [6]. Because the remote printing service uses the message-handling facilities of the Internet, this service is also available to message-handling domains that are connected to the Internet through application-layer gateways (e.g., X.400-compatible systems [7], UUCP-based message-handling environments [8], and commercial services such as AT&T Mail), MCI Mail), SprintMail), and CompuServe) [9]).

## Operation of Name Service in the TPC.INT Subdomain

Services in the Internet are identified with a service target name as listed in the Domain Name System (DNS). These target names are looked up in the DNS and the appropriate resource records associated with the name are returned. After the name lookup has been completed, the initiator exchanges a series of IP packets with an Internet site which provides access to a service accessible through the tpc.int subdomain.

In the case of remote printing, the DNS MX resource record is used to register those Internet sites that provide access to the remote printing facility. Specifically, an Internet site running a remote printer server registers itself in the DNS as being willing to provide access to some portion of the telephone system numbering plan as registered by one or more MX records within the tpc.int subdomain.

For example, if the host hewes.radio.com is willing to provide remote printing to devices with telephone numbers beginning with the prefix +1-415-336, the host would be listed in the Domain Name System with

the following MX resource record:

```
*.6.3.3.5.1.4.1.tpc.int.      IN MX      10 hewes.radio.com.
```

Note that the resource records can have an arbitrary level of precision. For example, the North American numbering plan (IDDD country code 1) is structured by a 3-digit area code, followed by a 3-digit exchange prefix, followed by a 4-digit station number. As such, one might expect that resource records in this zone would be similar to

```
*.5.1.4.1.tpc.int.           IN MX      10 hewes.radio.com.
```

which accesses any printer with a telephone number prefix of +1-415 (i.e., any printer in area code 415). Another record might be similar to

```
*.8.6.9.5.1.4.1.tpc.int.     IN MX      10 hewes.radio.com.
```

allowing access to any printer in area code 415, exchange prefix 968. However, the level of precision is arbitrary. For example, if all of the printers in an organization had a telephone number prefix of +1-415-96, the following resource record could be used:

```
*.6.9.5.1.4.1.tpc.int.       IN MX      10 hewes.radio.com.
```

It is the responsibility of administrators of the tpc.int namespace to register only those Internet sites that are willing to confirm to the principles of operation as defined in this document and as periodically amended by the Board of Arbitration and Conciliation for the tpc.int subdomain.

It is a key principle in the tpc.int subdomain that all Internet sites meeting the principles of operation as stated in this document shall be registered in the tpc.int subdomain without bias and that the subdomain should encourage the largest number of Internet sites possible.

If multiple Internet sites are willing to provide access in the same area, multiple resource records for the same target name are maintained. In response to a query, the Domain Name System returns the resource records in an unordered list. In practice, however, the initiator will consult the list in the order returned. To provide an unbiased environment, an authoritative name server for the tpc.int subdomain shall alternate the ordering of the list frequently, and shall return a small TTL with the resource records.

## Policy Determination in the TPC.INT Subdomain

The tpc.int subdomain is organized as a cooperative, an association organized for the purpose of rendering service, without gain to itself, within the scope of service defined in this document and as further defined by the membership of the cooperative. Members of the tpc.int subdomain cooperative are defined as those Internet sites who provide access to services as defined in this document and as periodically amended by the membership as represented by the Board of Arbitration and Conciliation for the TPC.INT Subdomain.

The primary purpose of the tpc.int subdomain is to provide transparent mappings between users of general-purpose computers on the Internet and special-purpose devices directly connected to the telephone network. The listing of services in the tpc.int subdomain is for the necessity and convenience of the general public with special emphasis on providing a general-purpose link between the Internet infrastructure and communications devices connected to the telephone network.

Policies for the tpc.int subdomain are determined by its Board of Arbitration and Conciliation. A Board of Arbitration and Conciliation has its roots in English law, which permitted members of a trade to appoint masters and workmen among them to serve as councils of arbitration and conciliation for matters incapable of being otherwise settled [10]. The Board of Arbitration and Conciliation in the tpc.int subdomain consists of members of the tpc.int subdomain cooperative appointed to hear and determine all questions between members which may be submitted to them arising out of the operation of services listed in the subdomain.

The initial Board of Arbitration and Conciliation is defined in this document. Members of the Board shall serve for two-year terms except that 50 percent or more of the initial Board shall serve for a one-year term. The Board shall determine and publish procedures which allow members of the tpc.int subdomain cooperative to select new members of the Board as their terms expire.

If an issue relating to the definition of service or operation of service listed within in the subdomain is raised and is incapable of being settled otherwise, the matter shall be submitted by a member to the Board of Arbitration and Conciliation. The Board shall hear the question, making provisions for comments by other members of the tpc.int subdomain cooperative and by the general public and shall make and publish a determination of policy.

Secretariat services for the tpc.int subdomain are initially provided by the Internet Multicasting Service, a non-profit corporation

located in Washington, D.C. The tpc.int subdomain cooperative may contract with other groups for the provision of secretariat services at any time.

The tpc.int subdomain is organized as a cooperative to encourage policy determination to be in the hands of those that are offering the services. The subdomain encourages the establishment of a large number of sites, combining the distributed local efforts of many individuals and small groups into a global service.

#### Provision of Services Listed in Other Subdomains

The primary purpose of the tpc.int subdomain is to provide transparent mapping between the Internet and telephony environments. Other logical subdomains may be established to provide similar mappings. The Internet sites participating in those other subdomains might also be registered under the tpc.int subdomain, or could choose to be registered solely within those other subdomains with different policies.

It is the policy of the tpc.int subdomain cooperative to encourage the establishment of other service listing domains, either as a public trust or cooperative or as a purely commercial venture.

#### Initial Board of Arbitration and Conciliation

The following are the initial Board of Arbitration and Conciliation for the tpc.int subdomain:

Dr. Rob Blokzijl  
NIKHEF  
Amsterdam,  
The Netherlands

Dr. Jun Murai  
Keio University  
Fujisawa  
Japan

Geoff Huston  
AARNET  
Canberra  
Australia

Dr. Marshall T. Rose  
Dover Beach Consulting  
Mountain View, CA  
United States

Carl Malamud  
Internet Multicasting Service  
Washington, D.C.  
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## References

- [1] Mockapetris, P., "Domain Names"Concepts and Facilities", STD 13, RFC 1034, USC/Information Sciences Institute, November 1987.
- [2] Mockapetris, P., "Domain Names"Implementation and Specification", STD 13, RFC 1035, USC/Information Sciences Institute, November 1987.
- [3] Malamud, C., and M. Rose, "Principles of Operation for the TPC.INT Subdomain: Technical Procedures", RFC 1528, Internet Multicasting Service, Dover Beach Consulting, Inc., October 1993.
- [4] Malamud, C., and M. Rose, "Principles of Operation for the TPC.INT Subdomain: Administrative Policies" RFC 1529, Internet Multicasting Service, Dover Beach Consulting, Inc., October 1993.
- [5] Crocker, D., "Standard for the Format of ARPA Internet Text Messages", STD 11, RFC 822, UDEL, August 1982.
- [6] Borenstein, N., and N. Freed, "MIME (Multipurpose Internet Mail Extensions) Part One: Mechanisms for Specifying and Describing the Format of Internet Message Bodies", RFC 1521, Bellcore, Innosoft, September 1993.
- [7] Hardcastle-Kille, S., "Mapping Between X.400 (1988)/ISO 10021 and RFC 822", RFC 1327, May 1992. See also M.T. Rose, The Message Book, Prentice Hall (Englewood Cliffs, NJ: 1992).
- [8] Horton, M., "UUCP Mail Interchange Format Standard", RFC 976, February, 1986. See also Tim O'Reilly and Grace Todino, Managing UUCP and Usenet, O'Reilly & Associates (Sebastapol, CA: 1986).
- [9] See Frey and Adams, !%@:: A Directory of Electronic Mail Addressing and Networks, 3rd ed., O'Reilly & Associates (Sebastapol, CA: 1993).
- [10] See Acts 30 and 31 Vict., c. 105 as quoted in Black's Law Dictionary, 5th ed., West Publishing (St. Paul, Minn: 1979), p. 313.

## Security Considerations

Security issues are not discussed in this memo.

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