   A Standard for the Transmission of IP Datagrams over NetBIOS Networks

Status of this Memo

   This document specifies a standard method of encapsulating the
   Internet Protocol [1] (IP) datagrams on NetBIOS [2] networks.
   Distribution of this memo is unlimited.

Introduction

   The goal of this specification is to allow compatible and
   interoperable implementations for transmitting IP datagrams over
   NetBIOS networks.

   NetBIOS is a standard which specifies a means of creating virtual
   circuits and of transmitting and receiving point-to-point, multicast,
   and broadcast datagrams. This specification uses only the datagram
   services.

   Previous versions of this memo specified the use of the NetBIOS
   broadcast datagram services instead of the NetBIOS group name
   services to implement IP broadcasting. These versions are now
   obsolete.

Description

   NetBIOS networks may be used to support IP networks and subnets [3]
   of any class. By means of encapsulating IP datagrams within NetBIOS
   datagrams and assigning IP numbers to the hosts on a NetBIOS network,
   IP-based applications are supported on these hosts. The addition of
   a router capable of encapsulating IP packets within ordinary data-
   link protocols (such as 802.3 [4]) as well as within NetBIOS
   datagrams allows these NetBIOS hosts to communicate with the Internet
   at large.

Address Mappings

   In general, NetBIOS names may be any series of 16 bytes, however, a
   few values are reserved or used by common networking packages.
   NetBIOS names for the IP applications on each host are chosen on the
   basis of the internet number of that host. Since NetBIOS names are a
   mapping of IP addresses, no physical address query mechanism (e.g.,
   ARP [5]) is required.

For these internet protocol applications, IP.XX.XX.XX.XX is the
NetBIOS name for any IP over NetBIOS host where XX represents the
ascii hexadecimal representation of that byte of the internet
address.

This addressing scheme allows for the multiplexing of standard
datagram protocols over NetBIOS as well as easy visual confirmation
of the correctness of a given packet's address.

Broadcast and Multicast Addresses

   Broadcast Internet addresses are represented by the NetBIOS group
   name IP.FF.FF.FF.FF. Currently, no attempt is made to provide
   support of IP multicast addresses using NetBIOS group names.

Maximum Transmission Unit

   The maximum data size of a NetBIOS datagram, and therefore the
   Maximum Transmission Unit (MTU) for IP over NetBIOS networks, is 512
   bytes. Therefore, any hosts communicating with a host on a NetBIOS
   network may be required to reassemble fragmented datagrams.

Implementation

   To support IP on a NetBIOS host for any given IP address the
   initialization code must:

        1) Add IP.XX.XX.XX.XX to the host's NetBIOS name table.

        2) Add IP.FF.FF.FF.FF to the host's NetBIOS group name table.

        3) Submit a receive datagram request for the reception of NetBIOS
           datagrams destined for IP.XX.XX.XX.XX.

        4) Submit a receive datagram request for the reception of NetBIOS
           datagrams destined for IP.FF.FF.FF.FF.

   When a NetBIOS datagram to either address is received, it is
   processed by the protocol stack and another receive datagram request
   is submitted.

   When an IP datagram is sent, it is considered to be NetBIOS datagram
   data and sent by a send datagram request to either IP.XX.XX.XX.XX or
   IP.FF.FF.FF.FF.

   Optionally, the IP software may desire to make adapter status queries
   of the NetBIOS network. As support for SNMP becomes a requirement
   for IP hosts, these adapter status queries may become mandatory.

Finally, when the IP support for a given NetBIOS host is
discontinued, a cancel command request should be submitted for every
pending receive datagram, and a delete name request should be
submitted for both the IP.XX.XX.XX.XX and IP.FF.FF.FF.FF address
added during initialization.

Acknowledgements

This document would not have been possible without the efforts of
John Bartas, James Davidson, and Dan Ladermann in the early design
and implementation of IP over NetBIOS.

References

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   [5] Plummer, D., "An Ethernet Address Resolution Protocol",
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