

PCP Working Group
Internet-Draft
Intended status: Standards Track
Expires: September 8, 2011

M. Boucadair
France Telecom
R. Penno
Juniper Networks
D. Wing
Cisco
R. Dupont
Internet Systems Consortium
March 7, 2011

**Port Control Protocol (PCP) NAT-PMP Interworking Function
draft-bpw-pcp-nat-pmp-interworking-00**

Abstract

This document specifies the behavior of a PCP NAT Port Mapping Protocol (NAT-PMP) Interworking element, for instance embedded in Customer Premise routers.

Status of this Memo

This Internet-Draft is submitted in full conformance with the provisions of [BCP 78](#) and [BCP 79](#).

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at <http://datatracker.ietf.org/drafts/current/>.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on September 8, 2011.

Copyright Notice

Copyright (c) 2011 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to [BCP 78](#) and the IETF Trust's Legal Provisions Relating to IETF Documents (<http://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must

include Simplified BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Simplified BSD License.

Table of Contents

- [1.](#) Introduction [3](#)
- [2.](#) TODO [3](#)
- [3.](#) Link IWF [3](#)
- [4.](#) Result code mapping [4](#)
- [5.](#) Home IWF [4](#)
- [6.](#) multicast announces [4](#)
- [7.](#) IANA Considerations [5](#)
- [8.](#) Security Considerations [5](#)
- [9.](#) Acknowledgments [5](#)
- [10.](#) References [5](#)
 - [10.1.](#) Normative References [5](#)
 - [10.2.](#) Informative References [5](#)
- Authors' Addresses [6](#)

1. Introduction

The NAT Port Mapping Protocol (NAT-PMP [[I-D.cheshire-nat-pmp](#)]) provides LAN based NAT control features which are a subset of the new Port Control Protocol (PCP [[I-D.ietf-pcp-base](#)]).

This document is about an Interworking Function (IWF) between NAT-PMP clients on internal hosts and a PCP server running on a ISP Carrier-Grade NAT.

Two kinds of IWFs are described:

- Link IWF which serves only clients attached to a LAN

- Home IWF which serves directly or indirectly through Link IWFs all the clients of the Home domain

The Home IWF can be integrated with a UPnP IGD IWF

[[I-D.bpw-pcp-upnp-igd-interworking](#)] and/or a PCP Proxy

[[I-D.bpw-pcp-proxy](#)]. Because NAT-PMP does not work through routers, an IWF is REQUIRED to serve any LAN where a NAT-PMP client is attached. A Home IWF is REQUIRED per Home domain where a NAT-PMP client is to be served.

Note the NAT-PMP IWF architecture is closed to the PCP Proxy one so a knowledge of [[I-D.bpw-pcp-proxy](#)] is assumed.

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [[RFC2119](#)].

2. TODO

To be filled (imports from UPnP IGD IWF / PCP Proxy)

3. Link IWF

A Link IWF is used to cross routers, i.e., it allows a NAT-PMP client attached to a link where the Home IWF is not connected to get the service.

The Link IWF keeps:

- the IP address of the Home IWF

- a service socket per link where it offers the service

- the source address and port of pending requests

- the operation code of pending requests

Pending requests are expired after a reasonable timeout, e.g., 30 seconds.

NAT-PMP port requests and responses are mapped to PCP MAP4 requests and responses. A THIRD_PARTY option is used to carry the client address.

public address requests and responses are not mapped to PCP messages but are sent to and received from the Home IWF.

4. Result code mapping

PCP result codes and error conditions are mapped to NAT-PMP result codes following this table:

- a bad version in NAT-PMP request is mapped to code 1 "Unsupported Version"

- a bad opcode in NAT-PMP request is mapped to code 5 "Unsupported Opcode"

- to have no external address and similar conditions are mapped to code 3 "Network Failure"

- NO_RESOURCES and USER_EX_QUOTA are mapped to code 4 "Out of resources"

- NOT_AUTHORIZED is mapped to code 2 "Not Authorized/Refused"

- SUCCESS is mapped to code 0 "Success"

[I-D.woodyatt-spnatpmp-appl]

5. Home IWF

At the exception of public address request handling, a Home IWF works as a Smart PCP Proxy. In particular the Epoch handling is a REQUIRED service.

When the Epoch value is reset, a multicast public address announce SHOULD be sent on served links with a multicast capability.

A Home IWF MUST deal with public address request and response internally, i.e., it gets the Epoch value and the external address from its internal state.

The request/response caching and retransmission services SHOULD be supported as the IWF adapts retransmission scheduling between protocols.

6. multicast announces

To be filled.

7. IANA Considerations

This document makes no request of IANA.

Note to RFC Editor: this section may be removed on publication as an RFC.

8. Security Considerations

To be filled.

9. Acknowledgments

To be filled.

10. References

10.1. Normative References

- [I-D.cheshire-nat-pmp]
Cheshire, S., "NAT Port Mapping Protocol (NAT-PMP)",
[draft-cheshire-nat-pmp-03](#) (work in progress), April 2008.
- [I-D.ietf-pcp-base]
Wing, D., Cheshire, S., Boucadair, M., Penno, R., and F.
Dupont, "Port Control Protocol (PCP)",
[draft-ietf-pcp-base-06](#) (work in progress), February 2011.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate
Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.

10.2. Informative References

- [I-D.bpw-pcp-proxy]
Boucadair, M., Penno, R., Wing, D., and F. Dupont, "Port
Control Protocol (PCP) Proxy Function",
[draft-bpw-pcp-proxy-00](#) (work in progress), March 2011.
- [I-D.bpw-pcp-upnp-igd-interworking]
Boucadair, M., Penno, R., Wing, D., and F. Dupont,
"Universal Plug and Play (UPnP) Internet Gateway Device
(IGD)-Port Control Protocol (PCP) Interworking Function",
[draft-bpw-pcp-upnp-igd-interworking-02](#) (work in progress),
February 2011.

[I-D.woodyatt-spnatpmp-appl]

Woodyatt, J., "Applicability of NAT-PMP with Service Provider Deployments of Network Address Translation", [draft-woodyatt-spnatpmp-appl-01](#) (work in progress), November 2008.

Authors' Addresses

Mohamed Boucadair
France Telecom
Rennes 35000
France

Email: mohamed.boucadair@orange-ftgroup.com

Reinaldo Penno
Juniper Networks
1194 N Mathilda Avenue
Sunnyvale, California 94089
USA

Email: rpenno@juniper.net

Dan Wing
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, California 95134
USA

Email: dwing@cisco.com

Francis Dupont
Internet Systems Consortium

Email: fdupont@isc.org

