RTDS
Resource Tracking Directory Server

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1.0 ABBREVIATIONS

RTDS   Resource Tracking Directory Server
ASCII   American Standard Code for Information Interchange
IP   Internet Protocol
SAP   Source Address Pair (IP address and port number)
BG   Broadcast Group
BGID   Broadcast Group Identifier
BGT   Broadcast Group Tag

2.0 INTRODUCTION

RTDS is a resource tracking server for computers, services, or other resources connected to the Internet. RTDS maintains a directory service which will keep track of the logical address of these resources on the internet. RTDS is built to ensure the persistence and integrity of distributed services without compromising the simplicity of the process. All RTDS commands and responses are strictly confined to ASCII character encoding. The RTDS server follows a command/response model in a strictly sequential order.

3.0 COMPONENTS

3.1 ARCHITECTURE
RTDS server follows server-client architecture in command-line mode. An IP address and port number together are known as the source address pair (SAP). Client's can join a broadcast group with some tag which will describe some property of the participating client.

3.2 COMMANDS
An RTDS server is governed using commands. RTDS command may be preceded by optional or mandatory arguments which are separated by white space (ASCII 32). A new command may only be issued after resolving the previous command. All commands must be in small letters and are case sensitive.

3.3 BROADCAST GROUP (default max 128 characters)
Every broadcast group is distinguished using a unique string termed as Broadcast Group Identifier. BGID can contain any ASCII printable character except a white space (ASCII 32). The BGID of a Broadcast Group can be anything including a URL, email ID, a phone number or even a torrent URI.

3.4 IP VERSION
IP version can have possibly two values as v4 representing IP version 4 and v6 representing IP version 6. IPv4 address is represented in dotted-decimal notation and IPv6 address is represented as eight groups of four hexadecimal digits, each group representing 16 bits separated by colons (:). Suitable abbreviations for the IP address shall be used in conformance with RFC 5156.

3.5 BG TAG (default max 32 characters)

Broadcast Group Tag is used to specify the subgroup within every individual Broadcast Group. BGT can contain any ASCII printable character except a white space (ASCII 32). BGT can be used to form sub-groups like server, client, moderator etc.…

3.6 RESPONSE

RTDS will respond to every request in a certain response format. Every response from RTDS is prefixed using a message specifier which will determine the type of response. The message specifier is enclosed in two square brackets "**[ ]**". The actual response will entail after the message prefix followed by a white space (ASCII 32).

Message Specifiers:

[M]	A broadcast message.
[R]	Response to an issued command.
[C]	A new peer joined the Broadcast Group.
[D]	A peer disconnected from Broadcast Group.

Response **[R]**:

ok_success	Command is successful.
bad_command	Bad command.
bad_param	Bad parameter provided with the command.
is_in_bg	Client is already listening to a Broadcast Group.
not_in_bg	Client is not listening to any Broadcast Group.

4.0 COMMANDS

4.1 PING
Ping command will return the public IP version, address and the port number of the command issuing system.
command format: **ping**

response format: **IP_ver IP_addr Port**

response example:
[R] v4 12.45.87.3 143
[R] v6 2001:0db8:85a3:0000:0000:8a2e:0370:7334 80

4.2 LEAVE
The leave command is used to exit from the Broadcast Group. If the client is not participating in any BG then a not_in_bg response will be returned by the RTDS.
command format: **leave**

response example:
[R] success
[R] not_in_bg

4.3 EXIT
The client system will be disconnected from the RTDS server. The client will be automatically removed from the directory when the TCP connection with the server is broken.
command format: **exit**

4.4 LISTEN
This command will add the client to a Broadcast Group under a certain tag. Parameters BGT and BGID are mandatory. A TCP connection can only participate in a single Broadcast Group. Leave command has to be used before switching to another broadcast group or tag. If the client is participating in any BG then an is_in_bg response will be returned by the RTDS
command format: **listen** bgid bgt

command example:
listen bitcoin@rtds server

response example:
[R] success
[R] not_in_bg
[R] wait_retry

4.5 BROADCAST (default max 256 characters)
The broadcast command is used to send a message across all the clients in the participating Broadcast Group. The optional tag can be used to specify for which sub-group the message will be delivered. If the client is not participating in any BG then a not_in_bg response will be returned by the RTDS. The message can contain any ASCII printable character except a white space (ASCII 32). For binary messages, any binary-to-text encoding can be used to broadcast the same.
command format: **broadcast** message tag*

command example:
broadcast Hello_world server
broadcast Hello_world

response example:
[R] success
[R] not_in_bg
[R] wait_retry