DISQUBE MESSAGE DESCRIPTION

Riccardo La Marca

Contents

1. Introduction

This document, also called DMD (**D**isqube **M**essage **D**escription), describes all messages exchanged between the workers, the manager and the client. There are two kind of interactions: Manager-Worker (and vice versa) and Client-Manager (and vice versa). There are no interactions between client and workers. Communication is performed as a combination of UDP and TCP messages. In particular, UDP messages are used when requesting information and other kind of unimportant data, while TCP is mainly used for job requesting and job results.

1.1. Common Header

All messages must have a common header, both TCP and UDP messages.

Byte 3	*Byte 2*	*Byte 1*			*Byte 0*
COUNTER		ID			
TYPE	SUBTYPE	UDP	TCP	X	X

Here is the description of all the fields

Byte Counter	**Field Name**	**Field Description**
[0-1]	ID	A unique identifier for a message exchange. Each different exchange of message must have a different value
[2-3]	COUNTER	The message counter. This value uniquely identify a single message in a message exchange.
[5]	UDP/TCP	Flag representing if the message is UDP or TCP
[6]	SUBTYPE	The message subtype. Possible subtypes are: - DISCOVER HELLO = 1 - DISCOVER RESPONSE = 2
[7]	TYPE	The message main type. Possible type are: - DISCOVER = 1

The message entire message type is defined as: TYPE (MSB) + SUBTYPE (LSB).

2. Messages

2.1. Qube Master - Qube Workers

This section describes all the messages sent and received by the master and all workers.

2.1.1. Discover Protocol

This protocol is used when the Qube master/manager first starts. If, in the configuration file, the DISCOVER flag is set to true, then the master given the subnet address and the subnet mask where the qube workers belongs, will send a number of UDP messages to all possible IP addresses in the specified subnet. This kind of message is known as *DISCOVER HELLO*. When a qube worker receives the HELLO message it will responds with the DISCOVER RESPONSE.

2.1.1.1. Discover Hello Message

The DISCOVER HELLO message is only sent by the Qube master to workers.

Byte 3	*Byte 2*	*Byte 1*	*Byte 0*
COMMON HEADER			
UDP PRT		TCP PRT	
IP ADDR			

Here is the description of the fields

Byte Counter	Field Name	Field Description
[0-7]	COMMON HEADER	The Common header of all messages exchanged
[8-9]	TCP PRT	The TCP Port on which the Manager has bind
[10-11]	UDP PRT	The UDP Port on which the Manager has bind
[12-15]	IP ADDR	The IP Address of the Qube Manager

2.1.1.2. Discover Response Message

The DISCOVER RESPONSE message is sent by the worker to the manager as a response to the related DISCOVER HELLO message. This response message should be sent on the UDP port specified on the received hello message. Since it is on the same message exchange, its ID must remain the same of the received message, while the counter should increase by one.

Byte 3	*Byte 2*	*Byte 1*	*Byte 0*
COMMON HEADER			
UDP PRT		TCP PRT	
IP ADDRESS			
FREE RAM [MB]			
FREE RAM [KB]			
X	X	X	CPU USG

Here is the description of the fields.

Byte Counter	**Field Name**	**Field Description**
[0-7]	COMMON HEADER	The Common header of all messages exchanged
[8-9]	TCP PRT	The TCP Port on which the Worker has bind
[10-11]	UDP PRT	The UDP Port on which the Worker has bind
[12-15]	IP ADDRESS	The Ip Address of the message sender
[16-19]	FREE RAM [MB]	The Amount of free RAM in MB
[20-23]	FREE RAM [KB]	The Amount of free RAM in KB
[24]	CPU USG	The percentage of CPU usage

The real total available RAM up to KB precision is computed as

$$FREE_{RAM_{MB}} * 1E3 + FREE_{RAM_{KB}}$$