

COMP 9331 CDHT Assignment Report

The programme is written in Python3.

The programme concerns circular P2P network. In P2P systems, a peer can come or go without warning. Thus, when designing a DHT, we also must be concerned about maintaining the DHT overlay in the presence of such peer churn.

First use Class in Python to initialize the peer: including id, pred(predecessor), succ1(successor1), succ2(successor2), MSS, drop_pro(drop probability). Set 5 threads to input, ping to successor 1, ping to successor 2, listen to UDP and listen to TCP receptively. The ping messages use UDP protocol. We assume that a peer whose identity is i will listen to the UDP port 50000 + i for ping messages. 6 control messages type were used when printing information, see as follows.

Msgtype(str)	usage
'pingreq'	Send a UDP ping request to two successors to see whether they are alive
'pingres'	Receive a UDP ping response message from a success peer
'filereq'	Request a file with filename X
'fileres'	Response to the file requester that the file was found
'kill_peer'	Mark of ungraceful exit CDHT network
'quit'	Mark of graceful exit CDHT network

2 UDP functions was used to send pings via UDP to successors and listen to UDP message and return messages.

Function	1.send_ping(self,indicator)	2.listen_UDP(self)
Receiving msg	msgtype =pingres, responseID,seqNo	msgtype =pingreq, senderID, indicator,seqNo
Sending msg	msgtype = pingreq, senderID, indicator,seqNo	msgtype=pingres, responseID,seqNo
Indicator	Indicator is 1 or 2	if Ping is from first successor, update the predecessor
timeout	When timeout, calculate ACK;when ACK > ACK_MAX, the target peer is dead and could raise "kill peer" and update the info of successors.	

Function peer_departure is used to inform the peers of departure;function file_request to begin to find file if file request is called in input and if it is not found,if forward the message to the next peer,otherwise the target peer will tell the requesting peer that the file

is here. When ping timeout more than certain times, function kill_peer was used to . And function send_TCP is used to send TCP messages.

Function	peer_departure(self)	kill_peer(self, succ_number)	file_request(self, filename)
input	'quit'	Keyboard interrupt or timeout	'request X'
target & methods	Send 'quit' message and update successors	When timeout occurs in UDP ping and ACK is big; Send 'killpeer' message and update successors	Calculate hash value; Use file_locate function to judge whether peer is the closest or not

For listen_TCP function, there are 4 probable message type to choose when receive data.

Msg type	usage	Connected function	Message
'quit'	quit message received and update successors	peer_departure	leaving_peer, new_succ1, new_succ2
'killpeer'	lost peer message receive	kill_peer	kill_peer
'fileres'	file response from peer	file_request	reponsing_peer, filehash, filename
'filereq'	file request from peer	file_request	, requesting_peer, filehash, filename

Video link:

<https://www.youtube.com/watch?v=BVMunGCAMgU&feature=youtu.be>1080p

<https://www.youtube.com/watch?v=kMKBxhhIoMA&feature=youtu.be>480p