

# Colony Intersection Handling Specification: Buddy System

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## 1 Overview

The buddy system is a proposed robustness improvement to the linked list traffic handling system. While it may not handle high degrees of failure e.g., over half the colony bots eliminated, it will make the linked list system more impervious to random failures.

## 2 Specification

### 2.1 findBuddy

When a bot enters the list or becomes unpaired, it will attempt to find an unpaired bot. If it no such partner is found, the bot will pair when an entering bot invokes `findBuddy`.

#### 2.1.1 findBuddy Pseudocode

```
{ send packet expressing wish to pair up }
{ wait for 10 ms }
if response with bot id  $n$  and back pointer  $n.next$  then
   $buddy \leftarrow n$ 
   $buddy.next \leftarrow n.next$ 
  { send packet with id and  $next$  }
else
   $buddy \leftarrow -1$ 
   $buddy.next \leftarrow -1$ 
end if
```

### 2.2 checkBuddy

This function is called when there is a need to reconstruct the list. This usually happens when bots fail to respond during regular linked list operations. The bot will ping its partner. If there is no response, then the bot will send out a packet

stating that its partner is the lost partner along with relevant information. Other bots will use the information to fill in gaps in the list due to the lost partner.

### 2.2.1 checkBuddy Pseudocode

```
{ receive packet stating buddy is down }  
{ ping buddy }  
{ wait for 10 ms }  
if no response then  
  { send packet with buddy and buddy.next }  
  findBuddy  
end if
```