1. **Network structure.**



1. **Database structure.**



Files tables and relationships will be added later.

1. **Connection between unreachable hosts.**

* Hosts "A" and "B" starting to ping reachable host "C"

Host C table “hosts” after registration of hosts A and B

|  |  |  |  |
| --- | --- | --- | --- |
| id | guid | ip | port |
| 0 | {00000000-0000-0000-0000-000000000002} | 42.10.1.10 | 5000 |
| 1 | {00000000-0000-0000-0000-000000000000} | 192.168.1.10 | 5000 |
| 2 | {00000000-0000-0000-0000-000000000001} | 192.168.1.10 | 5000 |

Host C table “host\_map” after registration of hosts A and B

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| src | dst | status | ping | ip | port |
| 1 | 0 | 3 | 50 | 32.27.42.25 | 10000 |
| 2 | 0 | 3 | 50 | 32.27.42.25 | 20000 |

Mapping from hosts which have static ip are not inserted because this information will duplicate info from table hosts.

Hosts "A" subscribe to events of host "C" and vice versa. Same for host "B".

* Hosts "A" and "B" receives event about tables "hosts" from host "C"

Host A table “hosts” after event

|  |  |  |  |
| --- | --- | --- | --- |
| id | guid | ip | port |
| 0 | {00000000-0000-0000-0000-000000000000} | 192.168.1.10 | 5000 |
| 1 | {00000000-0000-0000-0000-000000000002} | 42.10.1.10 | 5000 |
| 2 | {00000000-0000-0000-0000-000000000001} | 192.168.1.10 | 5000 |

After host "A" receives host "B" info it started to ping locally host "B". In our case host:port pair is equal for both hosts, so host "A" automatically mark host "B" as unreachable.

Host A table “host\_map” after event

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| src | dst | status | ping | ip | port |
| 0 | 1 | 3 | 50 | 42.10.1.10 | 5000 |
| 0 | 2 | 1 | NULL | 192.168.1.10 | 5000 |

* After unreachable detection host "A" send packet "SYN" to host "C".

SYN packet contains GUID of host to connect with. Host "C" receives packet and update table "host\_map" with port from incoming packet:

Host C table “host\_map” after SYN packet

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| src | dst | status | ping | ip | port |
| 1 | 0 | 3 | 50 | 32.27.42.25 | 10000 |
| 2 | 0 | 3 | 50 | 32.27.42.25 | 20000 |
| 1 | 2 | 2 | 50 | 32.27.42.25 | 30000 |

* Hosts "A" and "B" receives event about tables " host\_map" from host "C"

Hosts "A" and "B" auto notified about new record in table "host\_map"

Host B table “host\_map” after event

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| src | dst | status | ping | ip | port |
| 0 | 1 | 3 | 50 | 42.10.1.10 | 5000 |
| 0 | 2 | 1 | NULL | 192.168.1.10 | 5000 |
| 2 | 0 | 2 | 50 | 32.27.42.25 | 30000 |

Host "B" analyzes received record, and starting to send ping packets to 32.27.42.25:30000. After ping succeeded status of connection between hosts "A" and "B" sets to "3" in all hosts tables, hosts subscribe to events of each other.