

CLAIMS

1. A method (1300) of communicating discovery information in a wireless neighborhood aware network, NAN, comprising:
 - 5 receiving (1310), at a first wireless device, a message from a neighboring wireless device, the message comprising a data structure indicative of discovered device identifiers;
 - determining (1320) whether the data structure indicates an identifier of the first wireless device; and
 - 10 transmitting (1330) a message comprising the identifier of the first wireless device when the data structure does not indicate the identifier of the first wireless device;
 - wherein the data structure comprises a Bloom filter; wherein the Bloom filter is a bit array of m bits with k different hash functions associated with the bit array,
 - 15 wherein each hash function maps an input string to one of the m array positions with a uniform random distribution; and at least one of the k hash functions $H(j, X, m)$ is defined as $(CRC32(j || X) \& 0xFFFF) \bmod m$, wherein j is a modification string, X is the input string, and CRC32 is a 32 bit cyclic redundancy code.
- 20 2. The method of Claim 1, wherein the received message comprises a discovery query message.
3. The method of Claim 1, wherein the transmitted message comprises a discovery response message.
- 25 4. The method of Claim 1, wherein the data structure comprises a list of at least partial identifiers.
5. The method of Claim 4, wherein the partial identifiers comprise a subset of
- 30 bytes of the identifier.
6. The method of Claim 1, wherein the message further comprises a Bloom filter index indicating a specific set of hash functions associated with the bit array.

7. The method of Claim 6, wherein the Bloom filter index is updated in subsequent transmissions.
8. The method of Claim 1, wherein determining whether the data structure indicates the identifier of the first wireless device comprises:
5 mapping the identifier to each of the k hash functions to get k array positions;
and
determining whether the bits at all the k array positions are 1.
- 10 9. The method of Claim 1, wherein the parameter k of the Bloom filter has a value of 4, and the parameter m of the Bloom filter has a value being larger than 5 times the number of devices to indicate in the Bloom filter.
- 15 10. The method of Claim 1, further comprising:
receiving a second message comprising a second Bloom filter and a query index;
determining whether the data structure indicates the identifier of the first wireless device using a different set of hash functions; and
responding to the second message when the first wireless device has not responded to a query with the same query index and the data structure does not indicate the identifier
20 of the first wireless device.
11. The method of Claim 1, wherein the received message comprises a length field, a discovery control field, and a discovered addresses information field.
- 25 12. The method of Claim 11, wherein the discovery control field comprises a type flag indicative of the presence of a Bloom filter, an include flag indicative of a desired station response, and a Bloom filter index identifying a specific set of hash functions associated with an associated Bloom filter.
- 30 13. The method of Claim 12, wherein the length field is one octet, the discovery control field is one octet, the type flag is one bit, the include flag is one bit, the Bloom filter index is two bits, and the discovered addresses information field is a variable length.

14. An apparatus (202) for communicating discovery information in a wireless neighborhood aware network, NAN, comprising:

means (212) for receiving a message from a neighboring wireless device, the message comprising a data structure indicative of discovered device identifiers;

5 means (204) for determining whether the data structure indicates an identifier of the apparatus; and

means (210) for transmitting a message comprising the identifier of the apparatus when the data structure does not indicate the identifier of the apparatus;

10 wherein the data structure comprises a Bloom filter; wherein the Bloom filter is a bit array of m bits with k different hash functions associated with the bit array, wherein each hash function maps an input string to one of the m array positions with a uniform random distribution; and at least one of the k hash functions $H(j, X, m)$ is defined as $(CRC32(j || X) \& 0xFFFF) \bmod m$, wherein j is a modification string, X is the input string, and CRC32 is a 32 bit cyclic redundancy code.

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15. A computer program comprising instructions for carrying out a method according to any of claims 1 to 13 when run on a computer.