

The Comprehensive MAC Taxonomy Database: comatose

A Survey on Wireless MAC Protocols

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The comprehensive MAC taxonomy database (comatose) is a collection of 327 wireless media/medium access protocols published between 1970 and 2017. The latest version is available [online](#).

Additional Key Words and Phrases: MAC, WSN, survey, database

1 INTRODUCTION

Since the publication of the ALOHA MAC protocol in 1970 [1] the scientific community has proposed a large number of wireless medium access control (MAC) protocols. This results in two issues. Firstly, name collisions: Most of the single-letter abbreviations like *L MAC*, *M MAC*, *O MAC* and so on are already used multiple times, some up to five times. Even two-letter abbreviations like *AS MAC* are used three times. This makes it harder than necessary to distinguish different protocols purely based on their name. Secondly, it is very likely that some of these publications are (unintentional) reinventions of previous protocols.

Surveys like [3; 4; 6; 8; 9] and many more are usually limited to a small subset of protocols due to time constraints and their target medium, printed journals, which limits the page count. They are static in two ways: Once published they cannot be modified or updated. And secondly printed surveys cannot provide interactivity like feature-based filtering and searching. Additionally their results are not reusable and extendable since they are not machine-readable.

The comprehensive MAC taxonomy database (comatose), aims to fix these problems. It lists most known scientific MAC protocol proposals including their short and long name, a description and references the publication it originated from. Its code is public and open source and thus can be updated whenever new research appears. The database is machine-readable and searchable by humans through a browser interface. It also assigns tags or features to each protocol to aid finding protocols with specific properties. These features are grouped into 13 categories, with the most distinctive listed below. For some categories features are mutually exclusive.

Channel access E.g. Random access, polling, slot assignment [2; 5]

Deployment Ad hoc or static

Routing Uni-, multi- or broadcast

Topology Star or cluster, single- or multihop [6]

Time model Depends on channel access, either continuous (random access) or discrete (slotted)

Real-time capabilities Guaranteed worst-case delivery time or probabilistic real time [10]

Reliability mechanism Channel hopping, error correction, retransmissions

Application domain E.g. Sensor network, industrial control

2 IMPLEMENTATION

Comatose uses two separate databases. The first one contains basic information about a protocol, like name, description and features, in a YAML file. This file format is human and machine-readable at the same time and thus easy to maintain. Additional software like an SQL database server is not required. The second database is a standard B_IB_TE_X file. Since T_EX is used for a lot of scientific publications these records usually exist already and can be copied, as well as reused for new publications. Therefore, both databases should provide value beyond the scope of this project.

The online version of this document is generated with an HTML renderer written in Haskell. It reads both databases and transforms them into a single-page HTML document. Additional JavaScript code provides client-side filtering and searching.

3 CONTRIBUTING

As mentioned earlier, this database is not an exhaustive list of MAC protocols as long as new protocols are invented. Due to the large number of protocols listed some of them are still lacking descriptions and tags. If you want to help [send an email](#) with your suggestions or clone the [repository](#) from GitHub, edit the database and create a pull request.

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