**Hash table vs balances allocation vs cuckoo hashing:**

1. Balanced allocation uses two hash functions. It allocates an item to a bin empty. Compared to hash table, it requires much less bin capacity, i.e. exponentially smaller (see phasing paper [1] page 10).

On page 11 it is said the PSI protocol using cuckoo hashing has (i.e. simple hash table) the same asymptotic overhead as the protocol that uses simple hashing. Also, according to table 4, it seems the cuckoo hashing one has even worse cost than the simple hashing. It’s only advantage is that it has slightly lower communication cost.

Therefore, simple hash table seems a right choice.

[1] <https://eprint.iacr.org/2014/447.pdf>