Problem

Plasma Cash (or XT/MVP) pushes every block root/SMT root to Root chain. As per current average Ethereum block time, one could use minimum block time, say around 15 seconds - not less than that. Block time can go up but the user experience will take a hit. Less than 30 seconds block time introduces the cost and time in terms of ETH fees and ETH block confirmations. In near future, with multiple plasma chains, most of Ethereum transactions will be checkpoint transactions only.

Alternative

Small block-time, periodic checkpoints (e.g. Merkle root of recent 100 blocks) and bonded operator or PoS (credit goes to @alex-miller-0). Idea is to have partial confirmation quickly and achieve finality using checkpoints. Plasma MVP may not work as it requires confirmations but David's no-confirmation may work.

Two stages can be added while finalizing a checkpoint - propose and commit. Between these two stages, anyone can challenge double spend or invalid TX (or a TX state in state-based plasma) using direct fraud proofs or (bonded) interactive fraud proofs (similar to the third type from Plasma Cash). The proposed checkpoint will be reverted and the operator will be slashed if fraud-proofs are valid.

Block withholding - Operator/Stakers will be slashed if the new checkpoint is not created in a certain amount of time (say, 5 * checkpoint period).

Censorship - One can submit a transaction on root chain and if next 5 checkpoints don't include the transaction, the operator gets slashed.

Limitations

- The time window between "propose" and "commit" stage must be long enough for challenges.
- Chain restart (reorgs) will be required in case of fraud or everyone must exit using the last checkpoint.
- Data availability will be the issue in Plasma Cash/XT while challenging the checkpoint.

Again, thanks @alex-miller-0, @esteban , @sg for the ideas.