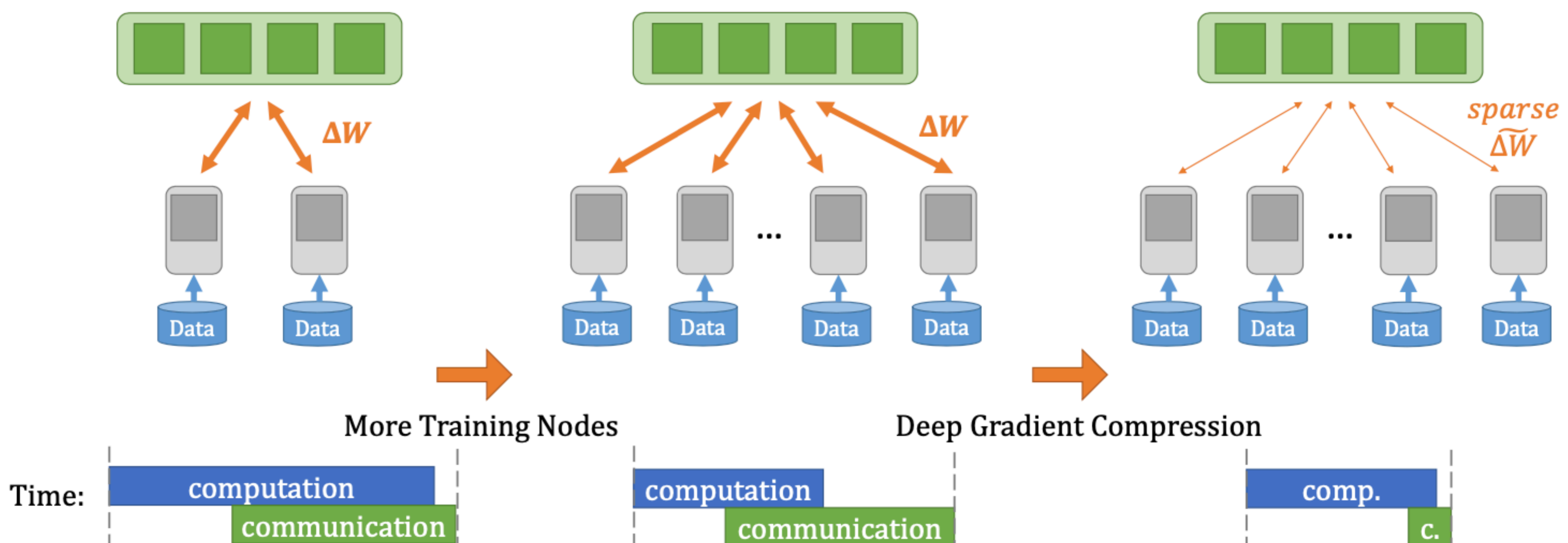


Implementing Collaborative Decentralized Machine Learning for Internet of Things

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Federated Edge Learning (FEL) is a novel technique for collaborative machine learning through distributed edge devices. However, existing implementations suffer from high communication overhead between edge devices and a dependency on a centralized aggregating server. In this project, we proposed an implementation that aims to solve these issues through a blockchain-empowered FEL (BFEL) framework.



Project Objectives:

This project consists of two main components – exploration and analysis of FEL hyperparameters and gradient compression schemes, and synchronization with the BFEL framework. Deep Gradient Compression (DGC) was implemented and benchmarked against Top- K and Random- K compression schemes to analyze the trade-offs between each scheme against global model accuracy. The FEL implementation was then integrated with a private blockchain where local model updates would be ingested onto the private model training blockchain to demonstrate the viability of the BFEL framework.