

## LEGO-NETBOOT: Scalable TFTP Network-Booting Enhanced with a Deduplication of Boot-Packet

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The Internet of Things(IoT) infrastructure is a dynamic environment where organic communication occurs between IoT devices and servers. Data produced during operation is collected on the server, and each IoT device creates a new behavior. We have focused on the boot process of this infrastructure to apply network booting technology to the IoT infrastructure so that each IoT device can control every process of system operation. However, there are some issues with applying network booting technology to the IoT infrastructure. As the number of IoT devices in operation increases, it is difficult to control all devices from one server because the resource usage consumed by the server increases to handle frequent network boot requests. In this paper, we propose LEGO-NETBOOT, a scalable trivial file transfer protocol for network booting that deduplicates the boot packet to solve this problem. The proposed framework allows the server to dynamically control the system image of all devices via network booting. We also propose data redundancy technology, network boot request monitoring, and block distribution scheduling to address the increased traffic and server resource usage that apply to the network booting process. Our proposed framework expects servers to control all devices in the IoT infrastructure, resulting in efficient and flexible infrastructure usage.



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