Abstract: SCautz: a fault-tolerant modular datacenter network

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Abstract

Modular datacenters (MDC) uses shipping containers, which encapsulate thousands of servers, as large pluggable building blocks for building mega datacenter. Its "service-free" model poses stricter demand on fault-tolerance of intra-container networks. Based on "scale-out" principle, this paper proposes SCautz, a novel hierarchical intra-container network for MDC, and designs a fault-tolerant routing algorithm on top of SCautz, called SCRouting+. SCRouting+ can use spare COTS switches to bypass failed devices, so SCautz is able to retain the throughput for processing one-to-x traffic in the presence of failures, and achieve much more graceful network performance degradation than computation and storage capacity do. Results from theoretical analysis and simulations show that SCautz is more viable for intra-container network.

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