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Cloud Computing Infrastructure and Services

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This article surveys the development and state of the art in cloud computing infrastructure and cloud services, and how virtualized computing resources offered over the network have redefined enterprise IT. We drill down into the technical foundations of the three core service models (IaaS, PaaS, and SaaS) and explore the upcoming architectural trends like containerization, serverless computing, and edge computing. The research delineates multi-cloud and hybrid deployment's response to organizational needs for flexibility, cost-effectiveness, and risk management. We also discuss security frameworks and compliance mechanisms formulated to protect cloud-based assets. The turn towards financial transformation from capital to operating expense paradigms is discussed in light of resource optimization strategies. Finally, we present a framework to evaluate plans for cloud adoption against organizational objectives and technical constraints.