Cloudlets: at the Leading Edge of Cloud-Mobile Convergence

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Since the dawn of mobile computing two decades ago, the unique constraints of mobility have shaped the software architectures of systems. We now stand at the threshold of the next major transformation in computing: one in which the rich sensing and interaction capabilities of mobile devices are seamlessly fused with compute-intensive and data-intensive processing in the cloud. This heralds a new genre of software that augments human perception and cognition in a mobile context. Major obstacles to realizing this vision are the large and variable end-to-end WAN latency between mobile device and cloud, fierce demand for ingress bandwidth into the cloud, and the hazard of WAN disruptions. *Cloudlets* have emerged as an architectural solution to these problems. A cloudlet represents the middle tier of a 3-tier hierarchy: mobile device --- cloudlet --- cloud, and can be viewed as a "data center in a box" whose goal is to "bring the cloud closer". A cloudlet-based hardware/software ecosystem inspires futuristic visions such as real-time cognitive assistance on wearable hardware for attention-challenged mobile users, edge analytics in the Internet of Things, ubiquitous mobile access to one's legacy PC world, and robust access to cloud services in hostile environments. Realizing these visions will require many technical challenges to be overcome. It will also require us to rethink a wide range of issues in areas such as privacy, software licensing, and business models.

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