

DoD Cloud Innovation: Research on Cloudlets

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The Department of Defense's efforts to utilize commercial cloud solutions over the last few years have received a decent amount of attention in the trade press and on the conference circuit. The reporting tends to evaluate the DoD's use (or non-use, as the case may be) of the cloud from the perspective of a standard commercial business use-case, meaning DoD customers are expected to either identify applications to migrate, solicit the work, and migrate the app to a commercial hosting solution, or to purchase a capability as a service from a commercial provider. It is against these standard approaches to cloud computing that the DoD's efforts have been judged. Cloud innovation at the DoD, however, is often more diverse and exploratory than industry is led to believe. This and next week's posts will examine two examples of innovative cloud use in the DoD in an effort to show that there can be business opportunities for vendors beyond the threshold of "ordinary" use-case expectations.

Mobile Cloudlets

The first area of innovation is in mobile cloudlets. What's a mobile cloudlet? Good question. Cloudlets are an approach to cloud computing in connection-challenged environments that is being pioneered by researchers at the Carnegie Mellon University's Software Engineering Institute. As [explained](#) by Grace Lewis, a Senior Member of the Technical Staff at the SEI, "cloudlets ... are lightweight servers running one or more virtual machines [that] allow soldiers in the field to offload resource-consuming and battery-draining computations from their handheld devices to nearby cloudlets. This architecture decreases latency by using a single-hop network and potentially lowers battery consumption by using WiFi instead of broadband wireless." This approach, which takes advantage of both cloud computing and mobile technology, provides mission capabilities more effectively to military personnel, and, potentially, law enforcement and first responders, in difficult environments where connectivity may be lacking.

Research on cloudlets in the DoD is currently focused in a couple of different areas. The first of these is funding for work at the SEI, which I won't go into here because of the limited addressability of these dollars. The second area is research being performed at the Army Research Laboratory (ARL) related to Mobile Ad-Hoc Networks, or MANETs. Specifically, in FY 2015, the ARL has requested \$6.1 million for the Information Protection for Mobile Ad-Hoc Networks project. The goal of this project as it relates to cloudlets is to "develop security protocols and processes for using tactical cloudlets as a shared resource among Warfighters and coalition forces." In addition, the ARL has also requested \$1 million for the Mobile Network Modeling Institute to examine the "impact of clouds and local tactical cloudlets on network behaviors." The final effort worth noting is the Heterogeneous Computing and Computational Sciences project. For this work, the ARL has requested \$1.67 million to "create new models to describe offered load and computational capacity within cloudlet-based services in Army-centric mobile and ad hoc networked technologies."

There is of course no guarantee that any of this money ever materializes into a contract. What's important to remember in this context is the direction of the DoD's efforts and the potential impact this could have on future business opportunities. As the DoD's use of cloudlet-based approaches evolves, it can translate into benefits for those who have positioned themselves to offer solutions that can operate in a cloudlet. This means potential opportunity down the road for software development and mobile application vendors. The winds are blowing toward cloudlets in connectivity-challenged environments, suggesting that those who tack into this wind will find interested customers in the DoD.