

DELL TECHNOLOGIES

Moving data analysis and innovation to the edge

Federated learning allows AI to inference and train at network endpoints — cloud, core and edge — speeding insights while protecting data



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Artificial intelligence helps federal agencies take full advantage of edge computing. Federated learning in particular represents a move away from more specific distributed and centralized machine learning (ML) models. Both centralized and distributed learning require data to be located on a primary server or computer to process. With a federated model, the ability to train and inference at the edge offers tremendous possibilities.

There are several key advantages to this approach, including increased security of critical data and decreased bandwidth.

Leveraging larger datasets with less bandwidth

Federated models require significantly less bandwidth than other models because the information isn't being sent back to a data center for processing. If an

Given its security and flexibility, federated learning is beginning to gain traction in the public sector. The federal government has started to put some governance and controls around AI and is encouraging agencies to build federated models.

When agencies are thinking about applying AI at the edge, we recommend taking a solutions-based approach. The first consideration should be what the end goal of the AI/ML model will be and how it will be utilized by the agency. Other key questions include how much data an agency is trying to process and how quickly it needs the results. Some models, especially ones with a large amount of data concentrated in one place, may take hours or days to process.

The answers to those questions help agencies understand their workloads and match them to the proper architecture.

Creating a roadmap to AI success

At Dell Technologies, we embraced AI many years ago, and as government requirements change, we can help agencies comply with all the guidelines. We provide federated learning and analytics to agencies that require a strong

security capability. We also provide a validated, containerized solution that agencies can use to quickly and easily deploy a federated learning solution in a Kubernetes environment.



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agency has a rich dataset in the cloud and a small amount of compute at the edge, it can use federated learning to train the edge device without having to move all the data from the cloud.

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When agencies come to us for help incorporating AI at the edge, we walk them through a roadmap that addresses what they're trying to accomplish, where they are in the journey and how they can get where they want to go while having the ability to scale to meet future challenges.

We also look for innovative ways to ensure agencies can make the most of their data. For example, the "extract, transform and load" approach to gathering data from multiple

sources can inadvertently limit the data available for analysis. By contrast, when we extract and load the data and then manipulate it in the AI platform, agencies have access to data that wasn't available before because it was filtered out in the extract and transform step.

The sudden popularity of generative AI tools has many people voicing concerns about the security and privacy of personal information, which underscores the need for federated

learning. Making sure AI systems can protect against security vulnerabilities from day one is the kind of work that Dell has been doing all along. ■

Ed Hicks is business development manager for federal and artificial intelligence at Dell Technologies.

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