The evolution in **AI technology**

Increasingly sophisticated hardware and software make it easy to tailor AI systems to agencies' needs

THERE ARE MANY WAYS for government agencies to quickly build and deploy an infrastructure that powers artificial intelligence workloads. In fact, we're seeing this happen at scale and in a faster way than we've seen in the past.

AI and high-performance computing are intrinsically tied together. To process data and AI algorithms at the speed the technology requires, agencies need to upgrade their hardware. HPC architectures are the natural choice.

Today agencies can essentially buy HPC systems for AI workloads that are scalable, flexible and efficient right off the shelf. Dell Technologies and other companies are building infrastructure solutions, and customers are layering on the software stack from places like GitHub. Companies are also creating composable architectures with virtual workloads across compute, memory, networking, storage devices and software.

Flexibility and built-in security

Alternatively, many customers simply want to deploy an AI-ready architecture that gives them the flexibility they need across their workloads. Such an architecture allows them to quickly start getting answers from their data because the vendor has already done the work of researching the best components and making sure everything works together seamlessly and efficiently.

As agencies think about choosing an infrastructure for AI capabilities, they should consider new architectures and compute capabilities from accelerator companies, which are constantly evolving. For example, early Dell PowerEdge platforms had only three accelerators, but today, the number of accelerators has increased to seven. And that is a trend across the industry. We've also seen the rise of GPUs, intelligence processing units and field-programmable gate arrays.

Many of these solutions have built-in security capabilities so agencies can quickly layer on FedRAMP requirements or the appropriate Defense Department standards.

### From data lake to federated learning

To optimize the performance of their AI workloads, agencies need fast, secure access to data and the ability to glean intelligent insights across complex IT environments. Many agencies are creating massive data lakes and transferring data from the edge to those central locations before they conduct analysis on the data. That approach delays decision-making and requires paying for costly networking services.

By contrast, federated learning allows agencies to set up containers with AI algorithms at the edge so they can train machine learning models and analyze data right where it is
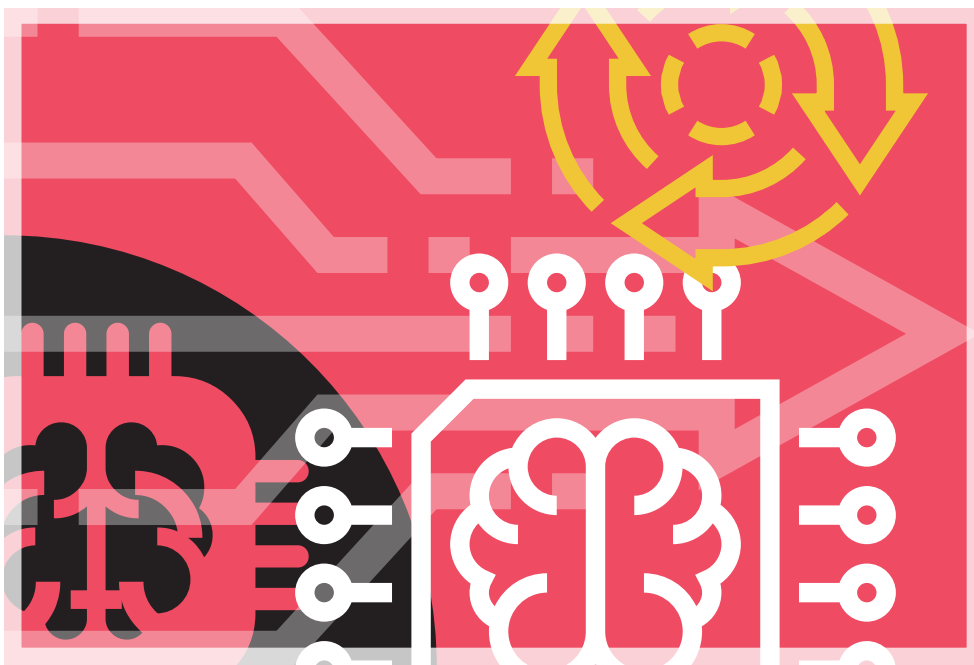
Shutterstock/FCW Staff

> ## Federated learning allows agencies to train models using historically valuable data and then **push the algorithm to the edge where it can process new data fast.**
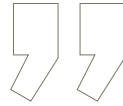
generated. That approach reduces bandwidth requirements and helps agencies achieve what AI promises, which is faster and more accurate decisions.

For any AI project, agencies need to identify the data that is immediately actionable and the data that is historically valuable. Not all historically valuable data is immediately actionable, but all immediately actionable data is historically valuable.

Federated learning allows agencies to train models using historically valuable data and then push the algorithm to the edge where it can process new data fast. It allows agencies to leapfrog the technical debt and network latency that are associated with moving data. And it allows them to make smart decisions on which data to move, which data is time sensitive and, better yet, which data can

be processed at the edge.

Industry leaders like Dell can help agencies sort through their many options for quickly deploying scalable architectures so they can incorporate AI into their daily operations. ■

Al Ford is AI alliances manager and **Brian Carnell** is chief AI architect at Dell Technologies.