Supply Chain Risk

Technologies, framework can help agencies automate and manage the third party lifecycle

Organizations can rely on machine learning techniques to help uncover weaknesses and vulnerabilities in their supply chain and reveal if a potential adversary has infiltrated their enterprise.

Government agencies are constantly evaluating the risks in their supply chain, focusing on the contractors they are doing business with, as well as the platform and actual technology they want to buy from these suppliers.

Machine learning can help them evaluate the risk associated with each of these areas, by analyzing different types of data to uncover that risk, said Erik Ekwurzel, chief technology officer, at Dun & Bradstreet.

Agencies can use behavioral counterparty data, such as global accounts receivable data, to reveal information on who their prime contractors are, and what related resilience and potential adversarial influence might pose a problem.

Behavioral inquiry data (when one counterparty requests information on another counterparty) works better when evaluating risk to platforms or systems. Open web data combined with behavioral counterparty data or inquiry data work better when evaluating technology provided by different suppliers, he said.

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>
> **– ERIK EKWURZEL, CHIEF TECHNOLOGY OFFICER, DUN & BRADSTREET**

Data is at the heart of successful machine learning techniques. "Supply chain machine learning definitely requires a lot of accurate global data," Ekwurzel said.

Dun & Bradstreet relies on its global data cloud that includes public data, such as business registries; proprietary data like maritime shipping; entrusted data, such as accounts receivables, and behavioral data, which includes inquiries and device fingerprints. It makes use of "below the waterline data," which is the data that the company is contractually obligated

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to protect, but can use to find information derivitives.

This approach helps evaluate procurement activities that create a cascade of behavioral signals that could introduce supply chain risk, Ekwurzel said. One contract award for a weapons system for instance, "creates a ripple of activities throughout all of the signal and behavioral data systems" that Dun & Bradstreet has.

These inquiries extend from a prime contractor on down the line to purchasing the actual raw materials. "It would be nice if that signal was all by itself, carefully amplified, and there was no noise involved," he said. "But there is a fantastic amount of noise" because the government and private industry are constantly making purchases.

The company is regularly training and teaching the machine learning engine to highlight the signals that are important to that supply chain as they relate to a particular purchasing event, he said.

First, the company "primes the machine learning pump" by looking for the actual suppliers that are publicly available in a supply chain. The machine learning engine continues to search for additional suppliers based on behavioral signals, then calculates the strength of any identified connections. The last step is using researchers to separate the positives from the false positives.

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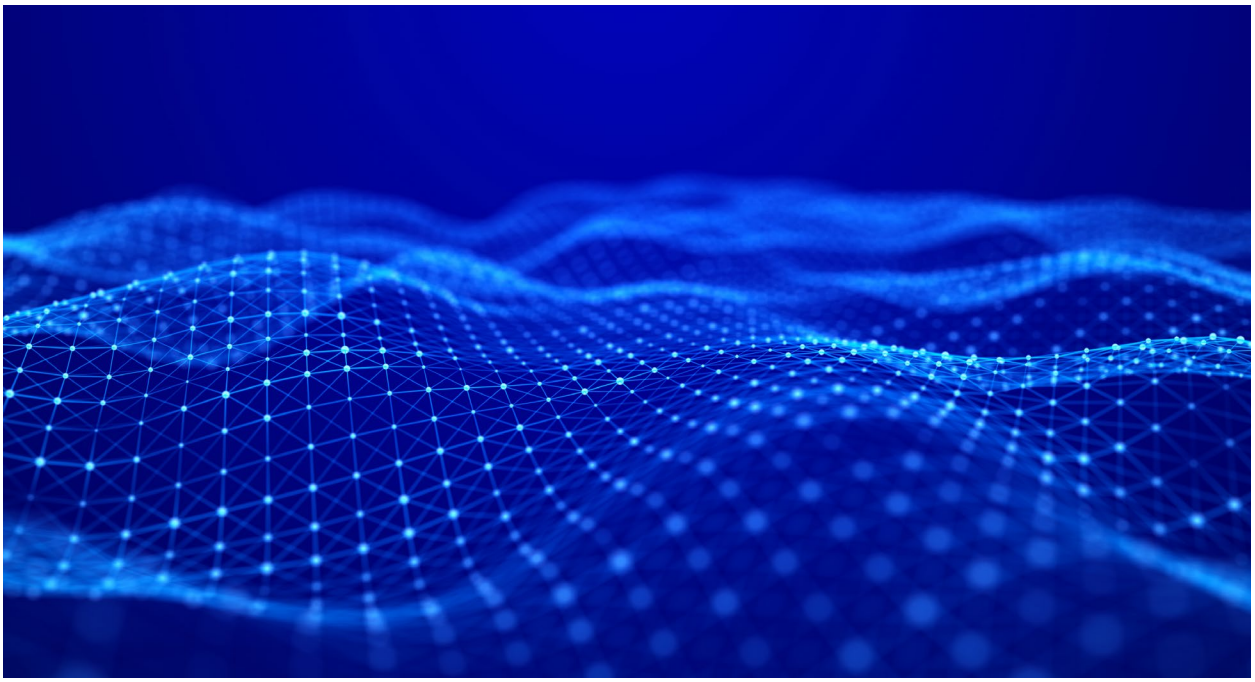
"We continue to turn the crank as many times as it takes to get a very clear picture of the supply chain," Ekwurzel said. "The next step is to figure out where the weaknesses are in resilience and where there is adversarial influence."

This approach can be applied to numerous scenarios, including building the Apache attack helicopter. For instance, Dun & Bradstreet discovered public information on 51 known tier one, and a few tier two, suppliers. It continued to analyze tiers one, two and three, and discovered 177 confirmed participants in the supply chain, and over 111 potential suppliers. It also discovered a number of foreign suppliers in the supply chain providing everything from environmental controls to navigation subsystems.

Agencies need to pay attention to supply chain resilience as well, which means knowing whether or not there is more than one sub supplier for a particular system. The danger is that if that one supplier is unavailable, one or more prime contractors may be unable to fulfill their contract obligations.

Dun & Bradstreet's offering, he said, is an important tool in an agency's toolbox. "We see it being part of a solution where in a very efficient way you can get a very clear landscape… (of) a lot of the players in the supply chain."



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