IN BRIEF 8 March 2017

Why the dark net is more resilient to attack than the internet

THE internet is amazingly robust, but it can still suffer big outages. The dark net – the internet's hidden underbelly, invisible to search engines – is less vulnerable, and network analysis tells us why.

Think of each site or server on the regular internet as a node, connected to numerous nodes in turn. Take out a node or two and the network continues to function just fine. But take out many at once, as happens in a distributed denial of service attack, and failure can cascade through the network. Hubs of particularly well-connected nodes increase this risk.

Manlio De Domenico and Alex Arenas of Rovira i Virgili University in Spain found that the dark net's unique topology makes it more resilient. It uses "onion routing", a way of relaying information that hides data in many layers of encryption. The information is bounced through intermediary nodes before being delivered to the desired location, and well-connected nodes are also more dispersed. These stop attacks from spreading so easily.

Through their analysis, the researchers found that an attack would need to hit four times as many nodes to cause a cascading failure on the dark net (*Physical Review E*, doi.org/b2hf).

This article appeared in print under the headline "What makes the dark net so resilient?"