ZAKTILABS

## Deciphering the Various Webs – Deep Web vs. Dark Web vs. DarkNet

As cybersecurity and risk management professionals, one of our principal roles is to explain complex concepts to stakeholders who are not subject matter experts or technologists. Terminology and a shared vocabulary can facilitate simpler explanations depending on our shared understanding. Unfortunately, due to the rapid and frequent introduction of new attack vectors and rapid advancements in technology, new concepts do not always have a chance to be properly digested and validated. Then, pop culture starts using and promoting muddled definitions. These inaccurately defined terms are then used by the mainstream media and then seep into Hollywood and other entertainment media. We will clarify the distinctions and nuances among the different types of networks and webs, namely the Deep Web, Dark Web, and DarkNet.

Many of you have probably watched *CSI* or *Mr. Robot* and you may have heard the terms "Dark Web" or "Darknet" used in the shows. You may ask yourself (like David Byrne from Talking Heads), *why is there even a dark web or a deep web? Why isn't everything in one web?*

Technologies were required to protect the communications and browsing histories of dissidents and journalists residing in oppressive or non-democratic regimes. As with any innovation, multiple uses were spawned through this anonymizing technology. The most prevalent example of anonymous browsing is through the *Tor* (the onion router) browser. Enterprising criminals seized the opportunity to use this technology to sell their wares to a global market – e.g. hit men, drugs, and breached data in the form of credit card numbers and of course, protected health information (PHI). The inclusion of anonymous customer payment modes such as Bitcoin enabled any illicit business to put out a shingle and start transacting business.

The *Internet* consists of all globally routable addresses accessible through all protocols. The World Wide Web (WWW) is the Internet as accessible through any web browser.

Most of the WWW we see is a small portion of the actual content online.
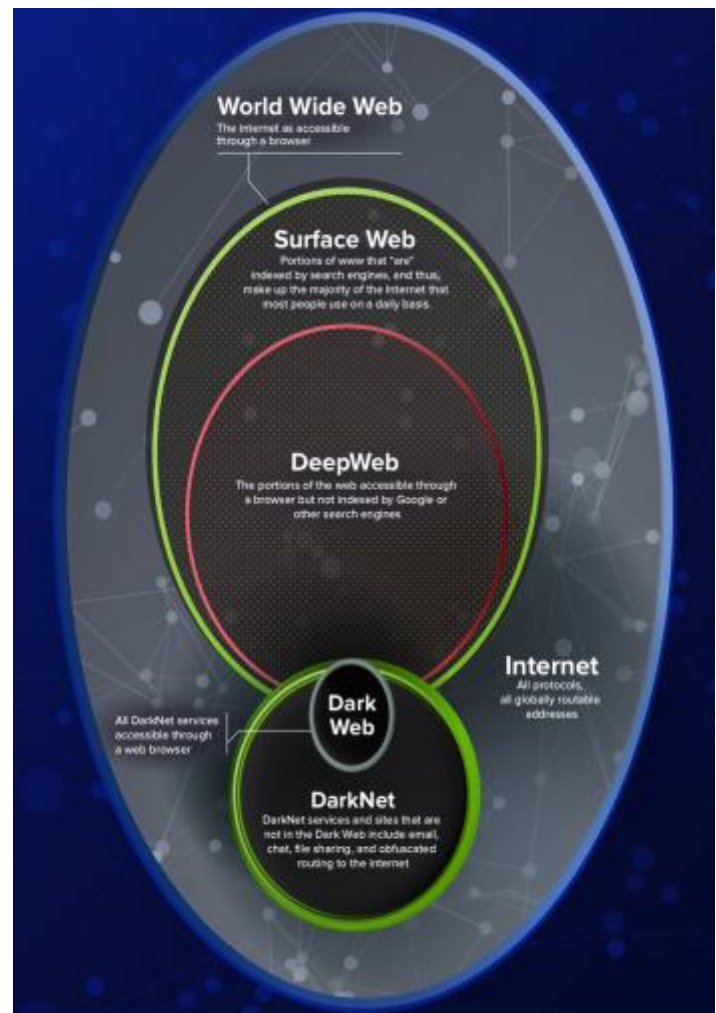
Google only captures a very small percentage of the content that exists on the internet. The **Surface Web** consists of sites that can be indexed by a typical search engine such as Google, Bing or Yahoo. This makes up most of the portion of the Internet that we use on a frequent basis.

Below the Surface Web is the **Deep Web**. The Deep Web is simply any content that a search engine cannot find. The Deep Web content consists of databases, dynamic content, some forums and any information you find when you navigate away from Google and do a search directly in a website, such as government databases and libraries – e.g. court record searches, medical license databases, pages behind paywalls, and password-protected content.

DarkNet is a network used for routing and content that all services and sites are accessible only through non-globally routable addresses or only through overlay networks such as Tor or I2P (Invisible Internet Project).

The **Dark Web** represents a subset of the Deep Web that has been intentionally hidden and is inaccessible through standard web browsers. The Dark Web consists of DarkNet services and sites that are only accessible through darknet networks, or "hidden services". The most famous content in the Dark Web is found using the Tor browser. This portion of the Internet is most widely known for its illicit offerings because of the anonymity offered by the Tor network. Not all Dark Web sites use Tor. Some use services such as I2P or Silk Road Reloaded, but the principle remains the same. The visitor or customer must use the same encryption tool as the site and most crucially, must know where to find the site to type the correct URL.

ClearNet consists of all portions of the Internet that are not in the DarkNet.

Mainstream news outlets regularly publish scary stories falsely indicating that "90% of the Internet is the Dark Web." They are confusing the generally illicit Dark Web with the generally benign and conventional Deep Web.

The **Dark Internet** is also a term used to describe other examples of networks, databases, or even websites that cannot be reached over the Internet. Dark Web and Deep Web are terms that are exploited by tabloid media to refer to dangerous and secret online worlds. The Dark Internet typically consists of a boring place where scientists and engineers store raw data for research.