The National Data Exchange (Nâ€“DEx) System is the central informational hub located at the Federal Bureau of Investigation (FBI). Its purpose is to provide network subscriptions to all Federal, state and local level law enforcement agencies while increasing information collaboration across all domains. The National Data Exchange users must satisfy the Advanced Permission Requirements, confirming the terms of Nâ€“DEx information use, and the Verification Requirement (verifying the completeness, timeliness, accuracy, and relevancy of Nâ€“DEx information) through coordination with the recordâ€“owning agency (Management, 2018). A network infection model is proposed to simulate the spread impact of various cyberâ€“attacks within Federal, state and local level law enforcement networks that are linked together through the topologies merging with the National Data Exchange (Nâ€“DEx) System as the ability to manipulate the live network is limited. The model design methodology is conducted in a manner that creates a level of organization from the state level to the local level of law enforcement agencies allowing for each organizational infection probability to be calculated and entered, thus making the model very specific in nature for determining spread or outbreaks of cyberâ€“attacks among law enforcement agencies at all levels. This research will enable future researchers to further develop a model that is capable of detecting weak points within an information structure when multiple topologies merge, allowing for more secure operations among law enforcement networks.