Threats Presented by 5G Wireless

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About Me

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- M.S. Computer Information Systems / Information Assurance Focused, UDM

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- Obviously a huge computer nerd which is why I am here, but also a fitness enthusiast which is why I am also mentioned the health risks associated with 5G Networks.

What is 5G?

- 5G is the latest generation of cellular mobile communications and the successor of 4G.

- 5G performance targets high data rate, reduced latency, energy saving, cost reduction, higher system capacity, and massive device connectivity.

  - https://en.wikipedia.org/wiki/5G

- The technology uses an untapped bandwidth and is known as MMW (Millimeter Wave) with frequencies between 30 and 300 GHz.

  - https://prepforthat.com/5g-health-risks/

- Based on studies from AT&T download speeds reached up 14 gigabits per second in lab trials.

  - http://fortune.com/2017/01/04/att-5g-directv/

Expansion of Interconnected Technology

- With 5G technology there will be improvements to existing technology such as VR, AR, AI, ML, automation, robotics, and self driving/running vehicles.

    - https://securingtomorrow.mcafee.com/consumer/mobile-and-iot-security/5g-security-risks-you-need-to-know/

- In March of this year during the NSBE Convention I attended a talk with GM as they discussed the improvements being made with self driving cars and how employees with administrative rights as well as automated systems can call the cars back to centers for maintenance and repairs which removes some worry from the owner/rider, but at the same time raises security risks from hackers with elevated rights. To mitigate risks they are implements multiple layers of security and redundancy fail safe measures.

5G Security and New Network Architectures

- Network Function Virtualization (NFV) and Software-Defined Networking (SDN) along with other new cloud and virtualization technologies are growing with the expansion of 5G networks.

- Due to their open, flexible, programmable nature they open up new areas for security threats.

  - Example: A network element of an SDN could be used to attack the SDN controller or management system and bring down the system.

- https://www.sdxcentral.com/5g/definitions/top-5g-security-challenges/

A Hotbed of Security Risks

- According to Inverse (and other sources) many cybersecurity experts see 5G as a hotbed of security risks.

- MIT professor Stuart Madnick has even said, "It's like going from fireworks to dynamite sticks. 5G encourages further evolution and expansion of Internet of Things related networks. All of the good news and bad news that comes along with this technology gets magnified."

- Madnick is especially concerned about denial of service attacks with the expansion of IoT devices, which could mean that attackers can now turn off the lights and appliances of someone they don't like, or perform other unwanted activities with connected devices.

  - Past events such as the 2016 DYN Cyberattack make this a concern. < https://en.wikipedia.org/wiki/2016_Dyn_cyberattack >

- https://www.inverse.com/article/48293-5g-future-cybersecurity-risks

Recent Cyber Threats

- In a report issued on March 28, 2019 the Huawei Cyber Security Evaluation Centre (HCSEC) oversight board warned that Huawei had failed to make long-promised changes to its software development and engineering practices needed to improve security.

  - While Huawei had promised to make major investments in correcting its problems, promising to invest $2 billion in security engineering improvements over five years, the board remained unconvinced based on their review.

  - This means there devices could be hacked by anyone who is willing enough to put in the effort. Furthermore due to how Huawei runs its software development, it's impossible to give blanket certification for any one product's security.

  - Huawei's network gear still relies on version 5.5 of Wind River's VxWorks real-time operating system (RTOS), which has reached its "end of life" and will soon no longer be supported, which adds even another layer of issues.

- https://arstechnica.com/information-technology/2019/03/uk-cyber-security-officials-report-huaweis-security-practices-are-a-mess/

Help Vs. Harm

Health Risks Associated with 5G

- In some parts of the world 5G tower waves are being linked to cancer, immune system compromises, and numerous other health issues.

- Many professionals believe these threats exists due to increases of radiation and EMFs (electromagnetic fields) from these towers.

- These factors can also interfere with human reproduction some individuals, along with headaches, fatigue, and cognitive dysfunction for people with electrohypersensitivity.

  - https://prepforthat.com/5g-health-risks/

- There was also the study from 2018 about brain tumor increases in England from increased cell phone usage: https://www.cnn.com/2018/05/02/health/brain-tumors-cell-phones-study/index.html

Millimeter and Submillimeter Waves are Biologically Active

- New investigations of wireless frequencies in the millimeter and submillimeter range confirm that these waves interact directly with human skin, specifically the sweat glands.

- Dr. Ben-Ishai from the Hebrew University Department of Physics detailed how human sweat ducts act like an array of helical antennas when exposed to these wavelengths.

- Furthermore for years defense departments in the US, Russia and China have been developing weapons that rely on capabilities of the same electromagnetic range used for 5G to induce unpleasant burning sensations on the skin as a form of crowd control. Millimeter waves are currently being used by the US Army in crowd dispersal guns known as Active Denial Systems.

- https://ehtrust.org/key-issues/cell-phoneswireless/5g-networks-iot-scientific-overview-human-health-risks/

Conclusion

- While 5G presents many new advances in technology it also presents many new risks both in cyber and health.

- Questions????????????????