CYBER-PHYSICAL SYSTEMS AND THE INTERNET OF THINGS

HIGHLIGHTING TELOS CORPORATION'S WORK

Cyber-Physical Systems and the Internet of Things: Highlighting Telos Corporation's Work

AS COMPUTERS BECOME EVER FASTER AND BANDWIDTH EVER CHEAPER, computing and communication capabilities are being embedded within more and more objects and structures in the physical environment. Engineered systems, which bridge the cyber world of computing and communications with the physical world, are called cyber-physical systems (CPS). Recognizing the need to secure CPS both nationally and statewide, Virginia has developed a world-leading technology ecosystem founded on private industry innovation and public-private partnership. This publication highlights Telos Corporation's (Telos) work in Virginia at the intersection of cyber-physical systems and the Internet of Things (IoT).

THE CHALLENGE

Gartner, Inc. projected that 6.4 billion connected things would be in use worldwide in 2016, up 30 percent from 2015, with 5.5 million new things connected every day. By 2020, the use of connected things worldwide will reach 20.8 billion. Former stand-alone devices, such as televisions and refrigerators, are now internet-enabled—resulting in an attack surface that is expanding exponentially in new directions. The ramifications of this rapid growth in internet-enabled devices are not yet clear; however, the demand for a workforce trained in the IoT has already increased. Drawing on its research and experience, Telos provides advice, guidance, and recommendations that address the challenges of the IoT.

THE SOLUTION

Telos's work in the IoT falls into three different categories:

1. *Commonwealth of Virginia Cyber Security Commission:* In 2014, Governor Terry McAuliffe appointed Telos's chief executive officer and chairman of the board, John Wood, to serve on the Commonwealth of Virginia Cyber Security Commission. Established by executive order, the commission brings together public- and private-sector experts to determine ways to advance Virginia as a leader in cybersecurity. In 2015, the commission issued its first report with 29 recommendations to expand the state's cyber leadership in key areas such as the IoT. Mr. Wood was actively involved in the commission's discussions, particularly those related to increased investments in the state's higher education institutions to expand the cyber workforce and in advanced automation of physical systems such as automobiles.

2. *Telos's Innovation Committee:* This committee regularly analyzes new ideas and approaches from different areas, and then prioritizes resources to implement innovations. The committee is investigating the IoT effects of drone technology, especially as they relate to the prevention of malicious activity. Telos recently began research and development (R&D) in this area and plans to continue R&D in other areas

to inform its advice, guidance, and recommendations on various elements of the IoT.

3. *Telos's Internal Information Security Efforts:* Led by its chief security officer, Richard Tracy, Telos's internal information security efforts require a unique understanding of the hidden IoT effects of any device provided by a new vendor. For example, copy machines, security cameras, vending machines, and heating, ventilation, and air conditioning systems have become internet-enabled for troubleshooting, status, and/or maintenance purposes. To protect its network, Telos will thoroughly evaluate and often conduct extensive testing to determine the potential effects of these new devices before authorizing access.

With 20 years of experience, Telos has an outstanding reputation in the cybersecurity field. An example of Telos's work in critical infrastructure involves helping businesses understand, manage, and protect themselves from internet-enabled devices related to industrial control systems. In recognition of its expertise, Telos is increasingly approached by other organizations to advise on topics ranging from defining the IoT to improving information security efforts in an IoT environment. Telos is committed to helping organizations understand the risks associated with the IoT and how they can secure internet-enabled devices.

RECOMMENDATIONS

To protect their organizations in the age of IoT, leaders in government, higher education, and business should be aware that almost any device can be internet-enabled, make informed decisions about whether to use such devices, and, if so, evaluate the risks and proactively apply cybersecurity risk management practices to prevent malicious activity. These efforts can be supported by policies that require vendors to disclose the IoT technology used in devices, as well as provide options to enable or disable a device's internet capability.

It is also important to continue current efforts surrounding the IoT. For example, the Department of Defense's recent investment in research on the IoT will provide a better understanding of its potential ramifications. Virginia's leadership in cybersecurity through initiatives such as the Cyber Security Commission ensures that IoT issues remain a priority. Other organizations, such as the National Institute of Standards and Technology, will also provide critical guidance on IoT issues. In conjunction with these efforts, Telos will continue its work in the IoT and will help other organizations address the challenges of the IoT.

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ADDITIONAL INFORMATION
http://technology.virginia.gov/media/4396/cyber-commission-report-final.pdf

"**The threat from IoT is real.** Organizations are increasingly concerned and are asking questions about the impact of IoT. We will continue to factor this emerging threat into the solutions and guidance we provide to our constituents and customers."

RICHARD TRACY / CHIEF SECURITY OFFICER / TELOS CORPORATION

ABOUT THE BUSINESS-HIGHER EDUCATION FORUM

The Business-Higher Education Forum (BHEF) is the nation's oldest membership organization of Fortune 500 CEOs, college and university presidents, and other leaders dedicated to the creation of a highly skilled future workforce. BHEF members collaborate and form strategic partnerships to build new undergraduate pathways; improve alignment between higher education and the workforce; and produce a diverse, highly skilled talent pool to meet demand in emerging fields.

ABOUT TELOS CORPORATION

Located in Ashburn, Virginia, Telos Corporation (Telos) is a leading provider of continuous security solutions and services for government and commercial enterprises. Telos's work in the Internet of Things (IoT) falls into three categories: (1) the Commonwealth of Virginia Cyber Security Commission, (2) Telos's Innovation Committee, and (3) Telos's internal information security efforts. With its outstanding reputation and 20 years of cybersecurity experience, Telos serves as an invaluable source of expertise in the IoT for other organizations.

ACKNOWLEDGEMENTS