Department of the Navy SBIR/STTR Transition Program
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Topic # N212-122
Characterizing 5G vulnerabilities in an expeditionary environment
ObjectSecurity LLC

WHO

SYSCOM: ONR

Sponsoring Program: ONR

Transition Target: ONR, Code 311

TPOC: Waleed Barnawi
waleed.t.barnawi.civ@us.navy.mil

Other Transition Opportunities: The product (once completed) is widely applicable because 5G is poised to be implemented widely across DoN/DoD.

Char5G will transition into the commercially-available ObjectSecurity OT.AI™ Platform, which provides automated IT, OT, and ICS asset vulnerability analysis and reporting to proactively protect critical industrial and defense infrastructures from cyber attacks and production downtime.

Notes: Image: Char5G is a rugged, portable device mounted on Navy land vehicles, ships, and aircraft to secure next-generation battlefield communications, including private and commercial 5G networks.

Acronyms: Radio Frequency System on Chip (RFSoC); Software Defined Radio (SDR); Navy Specifications for size, weight, power, and cost (SwaP-C); Naval Mobile Construction Battalion (NMCB); Mine Resistant Ambush Protect (MRAP) Vehicles.

Creator: ObjectSecurity LLC. Three merged images. Image 1: FORT HUNTER LIGGETT, Calif. (Nov. 30, 2007). U.S. Navy photo by Mass Communication Specialist 2nd Class Dustin Coveny File# 071130-N-4198C-001. Credit: U.S. NAVY via Picryl.com Copyright: Public Domain. https://picryl.com/media/seabees-all-assigned-to-naval-mobile-construction-battalion-nmcb-3-stand-watch-1d8744. Image 2: 5G background image and Image 3: ground - Canva Pro Content free images. https://www.canva.com/licensing-explained/.

WHAT

Operational Need and Improvement: The DoN seeks a solution to secure next-generation battlefield communications, including private and commercial 5G networks. A lightweight, reliable portable vehicle-mounted system that can perform characterization, integrity checks, vulnerability discovery, detection, and verification upon entry into 5G networks in an expeditionary setting so warfighters can use these networks safely.

Specifications Required: The baseline for comparison is the current state of how the DoN characterizes 5G/4G/3G networks. Subject matter experts typically operate existing network systems and lack 5G signal analysis support and may need outside expertise to optimize areas applicable to raw/processed signal acquisition, processing, and analysis. Char5G will measure the advancement of the state-of-the-art in terms of the following:

Ease of use: How well can non-experts use Char5G?
Effectiveness: How well can Char5G characterize networks to support mission operations?
Scalability and automation: Will Char5G obtain, store, process, and analyze at a more efficient rate than current systems?

Technology Developed: Char5G is a rugged, portable device for non-expert and expert warfighters to automatically detect, analyze, and characterize 5G networks for security vulnerabilities in friendly and contested environments, including invited and uninvited users, and generate reports. Leveraging technologies like AI Signal Processing, RFSoC, and SDR, it offers an innovative and modular solution.

Warfighter Value: We are helping secure our next-generation battlefield communications, including private and commercial 5G networks.

Char5G will provide:
- Passive 5G network monitoring and active testing
- Vulnerability mitigation suggestions
- Hardening capabilities for emerging 5G technologies

WHEN

Contract Number: N68335-23-C-0011   **Ending on:** Nov 29, 2024

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Initial prototype completed and demo	Low	Passively monitor 5G signals.	4	1st QTR FY24
Prototype completed and demo, final report	Low	Passively characterize devices on 5G network	5	1st QTR FY25
Demonstration VPX card functionality	Low	Passively characterize devices on 5G network on VPX prototype form factor	6	1st QTR FY26
Enhanced prototype fielded demonstration, mounted in-vehicle demonstration with device operator	Medium	Ease of operator use in a relevant environment	7	1st QTR FY27

HOW

Projected Business Model: ObjectSecurity will seek a manufacturer partner and sell the rugged, portable device through Defense and Commercial Channel Partners. We have secured collaborative support and assistance from Lockheed Martin, KPMG, and Federated Wireless (Letters of Support). We will also collaborate with these partners around transition and acquisition planning, testing, demonstration, and validation. Mass production will require capital; therefore, we seek funding vehicles through commercial customers, rapid innovation funds, SAFE investments, or early-stage venture capital.

Company Objectives: ObjectSecurity LLC is a leader in solving complex, evolving defense and industrial cybersecurity and supply chain risk challenges that threaten national security and production downtime. Our novel research and development are applied to commercial solutions, proactively addressing the core source of cyber vulnerabilities and risk. Char5G strategically and technically supports the corporate portfolio of technologies and underscores the strength of our novel approach to advancing the security of our warfighters. Char5G also enables us to accelerate a dual-use commercial 5G cybersecurity solution for the DoD and industries currently leveraging 5G networks for manufacturing, industrial automation, transportation, agriculture, and education.

Potential Commercial Applications:
- Commercial 5G Network Diagnostics Analysis
- Private 5G Network Vulnerability Analysis for Smart Warehouses and Manufacturing Facilities
- 5G Pentesting Tool for Network Security Experts
- Regional Telecom Network Characterization Surveys via Drone or Unmanned Vehicle

Contact: Susan Farrell, Head of R&D Commercialization
susan@objectsecurity.com   (832) 567-3747