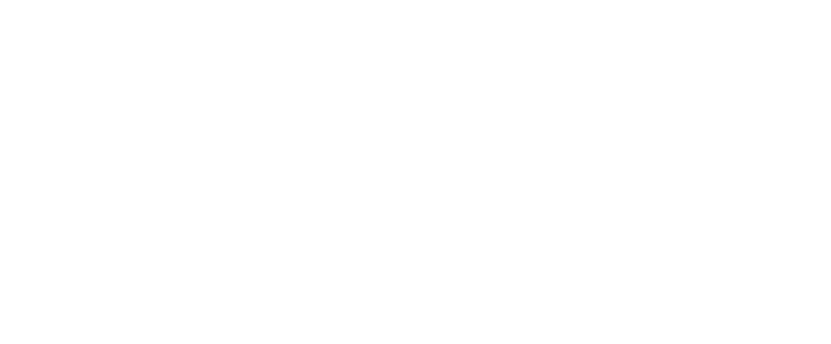
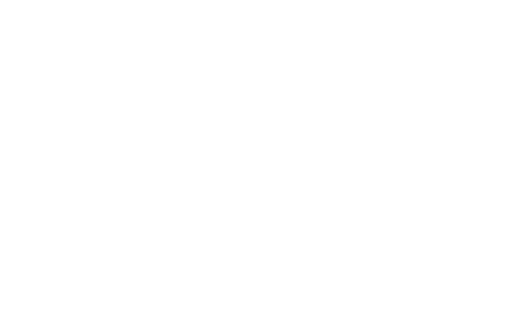


**CTSO Starter Guide**



**Cyber Career & Technical Student Organization Starter Guide 2018-2019**

A handbook to assist teachers and districts in establishing a cyber focused CTSO for the STEM classroom.

Introduction

Dear CTE Educator,

The career and technical student organization (CTSO) is regarded as an integral part of career and technical education (CTE). Extracurricular student organizations play an important part in preparing students to become productive citizens and to assume roles of leadership in their communities.

Educators have found that the CTSO is a powerful instructional tool that works best when it is integrated into the career and technical education curriculum.

Cybersecurity CTE courses and programs have been rapidly developed in middle and high schools in response to the critical demand for a skilled workforce in the state, region, and country. Through a grant from the National Initiative for Cybersecurity Education (NICE), a program within the National Institute of Standards and Technology (NIST), the CyberPrep program was formed by Pikes Peak Community College (PPCC). CyberPrep has create a regional ecosystem composed of representatives from PPCC, regional public school districts, regional businesses, and the National Cybersecurity Center which is based in Colorado Springs. Through the CyberPrep program, these organizations have collaborated to develop and launch programs to stimulate student interest in cyber careers, CTE education programs, and internship programs. As existing national CTSOs lack focused programming in cyber, the **sudo CYBER** student organization has been created to support the adoption of cybersecurity school curriculum. Educators have recognized the need for a CTSO developed to specifically meet the needs of students interested in cybersecurity.

The **sudo CYBER** CTSO and this Starter Guide were created under the CyberPrep program through the collaboration of PPCC Workforce Development, Colorado Springs School District 11 and the National Cybersecurity Center.

The National Cybersecurity Center (NCC) in Colorado Springs, CO, provides cybersecurity leadership, services, and training to a growing ecosystem of citizens that are paying attention to the cyber needs of our nation. The NCC’s commitment to workforce development highlights the importance of education initiatives that serve to build and strengthen those with cyber knowledge, skills, and abilities that will help to meet industry and government demand for talent. The NCC has partnered with Colorado’s CyberPrep group, including educators from Colorado Springs school districts and Pikes Peak Community College as well as regional industry employers that acknowledge the workforce development needs in cybersecurity.

**sudo CYBER** will be an important resource to help students turn their interest in finding and fixing security breaches and protecting our mobile, flexible, and connected ways of life into meaningful career paths. Students that participate in **sudo CYBER** will learn about careers that are in high demand, provide high pay, encourage lifelong skill development, are highly dynamic, are transferrable across all industries and organizations, and serve a higher purpose as the digital line of cyber professionals is increasingly recognized and appreciated as an important and meaningful vocation.

This starter guide is meant to be a handbook that provides teachers with an easy starting point for establishing a cyber-focused Career & Technical Student Organization chapter at your school or institution. Good luck with your **sudo CYBER** CTSO!

# Why is a Cybersecurity CTSO necessary?

Because the skills gap in cybersecurity talent represents a critical regional and national imperative, there is a strong need for opportunities for students to learn about cyber pathways while developing their knowledge, skills, and abilities in a fun, extracurricular environment. Effective Career and Technical Education Student Organizations present students with the chance to learn about diverse career opportunities within the associated field, and a cyber CTSO will keep up with the latest developments in the field of technology.

Cybersecurity is more than the prevue of information technology departments and technologist, it is a *Domain* encompassing every organization, private or public sector, existing at every level and function within an organization. Single individuals, large organizational departments, and huge national divisions are all part of the ecosystem that requires cyber attention. As technology becomes increasingly integrated into our systems, infrastructure, and lifestyle, we have become more dependent on it. This dependency creates a need for a population with the knowledge, skills, and abilities to meet the regional and national imperative for cyber talent. A significant workforce gap exists while education strives to catch up with industry demand for workers with the interest and foundational skillsets to consider a diverse set of career opportunities. Rapid innovations in technology demand that cybersecurity solutions are constantly expanding and evolving, requiring vigilance on the part of consumers of technology as well as those that understand and work with technology on a daily basis.

Existing CTSOs do not holistically address the field of cybersecurity. A CTSO focused on cyber will offer students a depth and breadth of opportunities to observe, learn, interact, explore, collaborate, network, and build skills in this vast and critical field. The national CyberPatriot competition is integrated into the CTSO and will expand the scope of cyber events.

# What’s in a name?

How do you name a new CTSO? *You ask the students!* The NCC and our partners worked with high school and middle school students in a naming and branding exercise. The result? “**sudo**,” the one command to rule them all. Pronounced like “sue dough,” it stands for “super user do!” For those that know the open-source operating system Linux, a system administrator (or power user) has **sudo** as one of the most important commands in their arsenal. Utilizing the **sudo** command is much better than logging in as root or using the su “switch user” command. **“sudo ”** allows users to run programs with the security privileges of another user, by default as the superuser. System administrators can give certain users or groups access to some or all commands without those users having to know

the root password. It also logs all commands and arguments so there is a record of who used it for what, and when the action happened. The **sudo** command also makes it easier to practice the [principle of](https://kb.iu.edu/d/amsv) [least privilege](https://kb.iu.edu/d/amsv) (PoLP), which is a computer security concept that helps control system access and potential system exploits and compromises.

Students understand that cyber relates to the culture of computers, information technology, and virtual reality. In our nomenclature, CYBER is always listed in caps, and **sudo CYBER** is bold.

# How will a cyber CTSO benefit a school?

**sudo CYBER** offers students the chance to gain exposure to and explore the range of careers available to them in cybersecurity while building skills that complement their classroom learning. They will discover the important roles played by non-IT elements within organizations and begin to understand how workers at all levels of businesses and organizations contribute to the maintenance of safe security postures.

The **sudo CYBER** CTSO supports information technology, cybersecurity, and computer science CTE programs and provides an additional platform for the development of problem-solving and critical thinking skills. This CTSO also benefits a school as it will be part of a network of regional cybersecurity academic and business organizations that are committed to cyber education and opportunities for students. Participating students will be able to take advantage of rigorous and challenging learning opportunities outside the classroom, which will in turn strengthen their learning in other high school academic programs. Simple to implement, **sudo CYBER** meets the requirements for CTE program approvals.

# What does a cyber CTSO look like?

Founded in the 2018-19 school year, **sudo CYBER** is a local, school-based student organization with a structure and operation aligned with traditional CTSOs. Cyber CTSOs utilize the **sudo CYBER** name, logo, and colors (red, white, and blue). The organization utilizes the school’s (or district’s) CTE program Advisory Council. Student officers participate in a regional Fall Leadership Conference and all **sudo CYBER** members attend the Careers and Skills Conference in the Spring. Students benefit from networking opportunities with other regional teams as well as local industry partners. While there are no national or regional CTSO membership fees currently, student member dues are at the discretion of the local school **sudo CYBER** CTSO.

Steps to Implementation of the **sudo CYBER** CTSO

A school, district, or sponsoring teacher (or a pair of teachers, or a group of teachers) identifies and understands the need for a Career and Technical Education Student Organization that focuses on cyber and cybersecurity. Each CTSO has a constitution and/or set of bylaws which outlines rules for the organization, including how membership in the CTSO is determined. To be a viable CTSO, the organization must be available to ALL students participating in the program area. The following steps should be taken:

1. Become familiar with the **sudo CYBER** Starter Guide
2. Recruit student members
3. Hold first meeting and elect student officers
4. Adopt the bylaws outlined in the starter guide (or create chapter bylaws); the bylaws should be reviewed every year for relevancy and updated as needed; print the set of bylaws being used by your CTSO and keep them in a file folder or binder tabbed and marked “Bylaws” so that they are available to refer to as needed.
5. Schedule regular meetings
6. Establish a Program of Work for the chapter
7. Join the network of other **sudo CYBER** chapters
8. Participate in conferences, competitive events, and collaboration with other chapters
9. Join CyberPatriot
10. Join IT-Adventures
11. Track progress of events / activities for the school year; document organizational activities for review in future years

**Chapter Sponsors, Teachers, Administrators:**

***Please notify us that you have started a sudo CYBER chapter at your school.***

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* Doug Jacobson – Iowa State University, [dougj@iastate.edu](mailto:dougj@iastate.edu)

# Resources

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| Iowa / CTE RESOURCES | |
| Iowa CTE Website | <https://educateiowa.gov/adult-career-and-community-college/career-and-technical-education> |
| Iowa CTSO Websites | https://educateiowa.gov/adult-career-and-community-college/career-and-technical-education/career-technical-student-organizations |
| IT-Adventures | http://www.it-adventures.org/ |
| CYBER PATRIOT RESOURCES | |
| CyberPatriot (AFA) | <https://www.uscyberpatriot.org/> |
| CyberCamp (AFA) | [https://www.uscyberpatriot.org/special-initiatives/afa-](https://www.uscyberpatriot.org/special-initiatives/afa-cybercamp-program/program-overview)  [cybercamp-program/program-overview](https://www.uscyberpatriot.org/special-initiatives/afa-cybercamp-program/program-overview) |
| GENERAL / NATIONAL RESOURCES | |
| NICE Framework | [https://www.nist.gov/itl/applied-](https://www.nist.gov/itl/applied-cybersecurity/nice/resources/nice-cybersecurity-workforce-framework)  [cybersecurity/nice/resources/nice-cybersecurity-workforce-](https://www.nist.gov/itl/applied-cybersecurity/nice/resources/nice-cybersecurity-workforce-framework)  [framework](https://www.nist.gov/itl/applied-cybersecurity/nice/resources/nice-cybersecurity-workforce-framework) |
| National Cybersecurity Center | <https://cyber-center.org/> |
| National Center for Systems Security and Information Assurance | <http://www.cssia.org/> |
| National Cybersecurity Framework | <https://csrc.nist.gov/publications/detail/nistir/8193/draft> |
| STUDENT / TEACHER RESOURCES | |
| Stay Safe Online | <https://staysafeonline.org/> |
| Security-Literacy | http://www.security-literacy.org/ |
| Hacker High School | <http://www.hackerhighschool.org/home.html> |
| Cyber Degrees Resources | <https://www.cyberdegrees.org/resources/the-big-list/> |
| Cyber Degrees General Info | <https://www.cyberdegrees.org/> |
| ICT Essentials Suite | [http://www.ictcertified.com/ict-for-schools/schools-](http://www.ictcertified.com/ict-for-schools/schools-overview.php)  [overview.php](http://www.ictcertified.com/ict-for-schools/schools-overview.php) |
| National Cyberwatch Center Curriculum | [https://www.nationalcyberwatch.org/programs-](https://www.nationalcyberwatch.org/programs-resources/curriculum/)  [resources/curriculum/](https://www.nationalcyberwatch.org/programs-resources/curriculum/) |
| CAREER RESOURCES / PROFESSIONAL ORGANIZATIONS | |
| AFCEA | <https://www.afcea.org/site/> |
| CompTIA | <https://www.comptia.org/> |
| ISSA | <https://issa.site-ym.com/default.aspx> |
| IEEE | <https://cybersecurity.ieee.org/> |
| ISC2 | <https://www.isc2.org/> |
| US Dept of Labor Apprenticeships | <https://www.dol.gov/apprenticeship/> |
| CareerWise | <https://www.careerwisecolorado.org/> |
| Jobs in Cybersecurity | <https://www.cyberdegrees.org/jobs/> |
| Jobs in Cybersecurity | https://www.cyberseek.org/ |
| **sudo CYBER**  CONTACT INFORMATION | [Info@**sudo** cyber.org](mailto:Info@sudocyber.org) |