

Strong  
Workforce  
Program

# Information and Communication Technology Regional Advisory Meetings

Proceedings Report

Regional Advisories support a strong talent pipeline and are a collaborative effort.

**LOS RIOS**  
COMMUNITY COLLEGE DISTRICT

  
valley vision

  
**SIERRA**  
COLLEGE

**YCCD**  
YUBA COMMUNITY  
COLLEGE DISTRICT

The Los Rios Community College District, in partnership with Valley Vision, and in collaboration with Sierra College and Yuba Community College District, invests Strong Workforce funding to organize and convene Regional Advisories.

The objectives of the Regional Advisories are to build strong relationships between employers, educators, and workforce that:

- o Provide timely information on skills gaps and workforce needs, informing partners on major industry trend information;
- o Improve the efficiency of the advisory process for educators and employers;
- o Reflect a regional view of workforce needs and assets;
- o Provide opportunities for more systemic, ongoing engagement that includes workforce partners in key industry sectors.

Regional Advisory meetings help inform decisions on needed investments and enhancements for Career Technical Education (CTE) programs to help fill the growing demand for “middle-skill” positions.

This meeting proceedings report includes key findings, best practices, and minutes from the Fall 2019 Information and Communication Technology (ICT) Regional Advisory meeting.

Valley Vision supports a robust talent pipeline through our multiple 21st Century Workforce initiatives. We prepare our regional workforce for the future by addressing skills gaps, advancing research, aligning efforts and strengthening systems. Valley Vision’s workforce efforts are supported by the Sacramento Employment and Training Agency (SETA), Golden Sierra Workforce Development Board (WDB), North Central Counties Consortium, Yolo WDB and local community college districts.

The Strong Workforce program provides Career Technical Education opportunities to increase social mobility and fuel regional economies with skilled workers.





# Key Findings

- K-12 Tech Directors throughout California have a growing concern for the safety of school networks and information, especially the networks and information of smaller school districts with limited ICT resources.
- Cybersecurity skills are broadly needed throughout the sector, with many programming and database occupations requiring significant cybersecurity skills for the foundations of their programs.
- High-demand cybersecurity skills identified by industry panelists include: security principles, cloud technology, analytical problem solving, communication, and working knowledge of platforms, organizational concepts, and mobile devices.
- Some best practices for cybersecurity training include creating a cybersecurity champion network to promote and educate personnel throughout an organization; utilize national education programs such as CyberPatriot; and partner with local internship programs.
- Several new program courses were approved.





# Meeting Minutes

## Welcome & Introduction

### **Dr. Markus Geissler, Greater Sacramento Regional Director Employer**

**Engagement for of ICT/Digital Media**, started with an overview and a call to action for industry and education partners to proactively align/simplify pathways and implement new methods to be more inclusive (Program Agenda & Participant List). Dr. Geissler also asked the audience to consider directing language for Career Technical Education pathways toward ICT versus computer science, to support pathway clarification.

Dr. Geissler shared information about the rise of cybersecurity jobs throughout all industries. Information security analyst employment will increase 28% through 2026. Executive Director of Technology Services for the Sacramento County Office of Education, Jerry Jones, shared that K-12 Tech Directors throughout California are concerned about ransomware, noting that smaller school districts are at greater risk of security breaches due to limited cybersecurity resources.

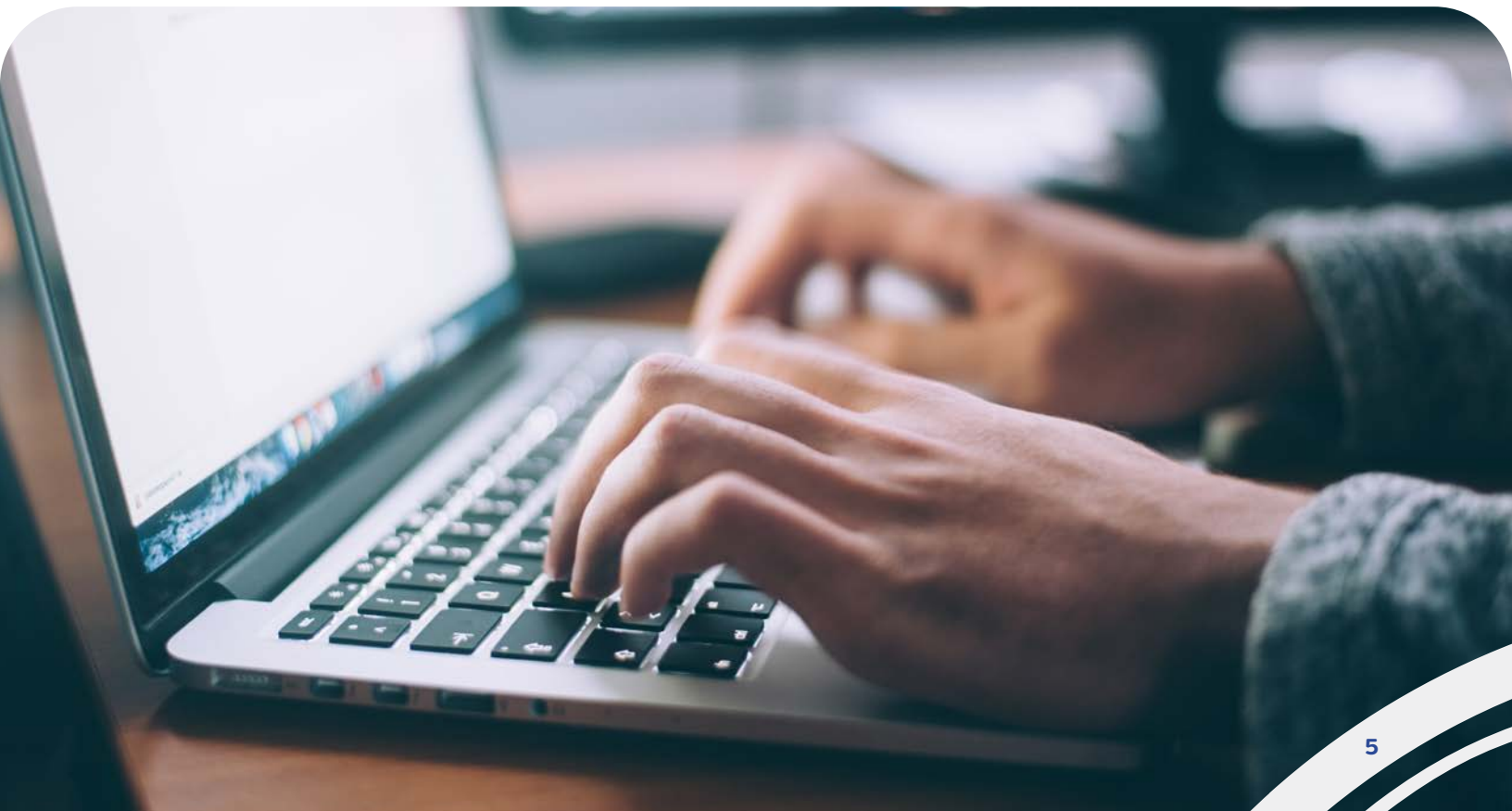
Additionally, Dr. Geissler shared the following faculty resources, opportunities, and considerations:

- Cybersecurity apprenticeship opportunities should be shared through County Offices of Education and school districts.
- Women are underrepresented in the ICT sector. As ICT professionals and educators, please be inclusive in marketing and other materials communicating about ICT.

- Consider sharing occupations in the sector that are more reliant on logic than math skills for students who are discouraged or afraid of the subject to expand interest and understanding of industry opportunities.
- A book recommendation is *Unlocking the Clubhouse: Women in Computing* by Allan Fisher and Jane Margolis.
- K12 Strong Workforce Selection Committee application; this is a funding opportunity for K-12 CTE projects
- WASTC 2019 Winter ICT Educators' Conference on January 6 & 7, 2020
- WASTC Summer Faculty Development Week

## Cybersecurity Needs in the Public Sector: Cal-CSIC Threat Brief

**Marc Glenn, Cyber Intelligence Agent for the California Cybersecurity Integration Center (Cal-CSIC)** presented on the cybersecurity initiatives and needs of the State of California (PowerPoint Presentations). Marc shared that the California Office of Emergency Services (CalOES) currently manages a Cybersecurity Task Force to support workforce development and education pipelines utilizing a model developed by Dr. Keith Clements from Fresno State. Marc welcomed both education and industry partners to participate in the Cybersecurity Task Force as a way to strengthen this sector. The three most common cybersecurity threats the State faces include: email-based attacks, ransomware, and website defacement. Additionally, there are State job opportunities that do not require baccalaureate degrees. These jobs can be fulfilled with permissions and malware installation skills from high school and community college. State jobs also provide student loan repayment benefits. Lastly, CalOES has internship programs that introduce emergency management to individuals 18 years or older, including cybersecurity.



## Cybersecurity Needs Panel Discussion

The advisory panel discussion featured:

- **Marc Glenn, Cyber Intelligence Agent**, California Cybersecurity Integration Center (Cal-CSIC)
- **Robert Leon, Information Security Director**, Raley's Supermarkets &
- **Vitaliy Panych, Chief Information Security Officer**, California Department of Technology (CDT)

The panelists identified challenges and needs in the sector as well as assets and opportunities.

### Needs and Challenges

High-demand cybersecurity skills that were identified by the panelists include: security principles, cloud technology, analytical problem-solving, communication, working knowledge of platforms, organizational concepts, and mobile devices.

**Vitaliy Panych**, CDT, highlighted the hiring challenge that many entry level workers are coming into the workforce with specific platform foundations, however, the State of California is looking for employees who have broad developer and infrastructure knowledge. **Robert Leon**, Raley's, shared that many applicants are book and lab smart, however have difficulty applying their knowledge to the organizational needs and structure of a company. The rest of the panel shared these concerns and discussed the need for organizational change management skills. Panelists expressed that "soft skills", or professional skills like communication and work ethic, are necessary for IT staff to influence organizational perspectives around cybersecurity and safety processes. The panelists emphasized that cybersecurity skills are broadly needed throughout the sector, including database and web design workers.

### Assets and Opportunities

Panelists shared the methods and initiatives they use to recruit and maintain their talent. Raley's has invested in online training, with a certification track available to support their IT staff. The CDT provides information security and cybersecurity training by the SANS Institute, a private for-profit company that specializes in information security, cybersecurity training and certificates, to their employees and partners using existing intern recruitment programs, like Cyber Patriot and Thousand Strong. Cyber Patriot is a National Youth Cyber Education Program created by the Air Force Association to inspire K-12 students toward careers in cybersecurity or other STEM disciplines critical to our nation's future.

On a more local scale, Thousand Strong is a Sacramento city-wide approach to workforce development, providing three different place-based work experiences for youth. The CDT also hosts an annual Information Security Leadership Academy for employees interested in continuing education opportunities. The CDT has a cybersecurity champion in each department to promote and educate other departments on cyber safety, utilizing a career path toolkit that they developed internally. With regards to degree requirements, panelists agreed that baccalaureate degrees are not a requirement for hiring, but do help depending on the role. Panelists affirmed that engagement and networking in cybersecurity competitions like DEFCON Capture the Flag and Cyber Patriot demonstrate communication and cybersecurity skills.

Panelists were asked to look ahead to 2025 and share their thoughts on the future of the sector. They all projecting continued growth in Internet of Things (IoT) and SMART City development. IoT is a system of interrelated computing devices, mechanical and digital machines, and objects that have the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. SMART Cities utilize IoT for municipal services in order to reduce resource consumption and overall costs. However, as services become digitized and more systems are connected, the more vulnerable a network or system becomes to cyberattacks. Developments in both of these areas will require the sector's workforce to have an extensive understanding of robust Wi-Fi environments, infrastructure and cybersecurity to create and maintain these systems for the safety of users.

## Small Group Networking & Curricula Review Breakouts

The participants broke out into small groups to explore the following topics in more depth and review proposed curricula.

1. Strategic Planning for Educational Administration
2. Networking & Cybersecurity
3. Programming & Database

### Strategic Planning for Educational Administration:

The Strategic Planning for Educational Administration breakout session included K-12 administrators, postsecondary administrators and industry partners. **Jared Amalong, ICT Coordinator for the Sacramento County Office of Education**, presented data regarding high school student participation in ICT and Computer Science (CS) pathways in the North/Far North regions. He noted that while access to rigorous and relevant ICT and CS has increased, there are still equity gaps relating to gender, ethnicity, and socioeconomic status.

Participants reviewed the CS Equity Guide ([access-ca.org/guide](https://access-ca.org/guide)) and discussed strategies to increase student access to rigorous and relevant ICT and CS. One of those strategies focused on dual coding of ICT courses and leveraging qualified in-service teachers to teach an introductory ICT or CS course. Administrators for Modesto City Schools noted that continued access to free professional development was important for the 2020-2021 school year.

The forthcoming K12 Strong Workforce Program was discussed. Administrators from San Juan Unified School District reviewed the Sacramento County Office of Education ICT Hub Pathway Development Grant Program and noted that regional technical assistance and community of practice support was necessary to support ICT pathway teachers in the district. Administrators from Placer Union High School District discussed the need for an integrated ICT/math course and stated that the District was researching UCLA's Introduction to Data Science course as a possible solution.



## Networking & Cybersecurity:

The Networking & Cybersecurity breakout group reviewed proposals for one new Associate's degree, two new certificates, and several new courses. Additionally, the group approved the deletion of an Associate's degree, a certificate, and several courses at Cosumnes River College.

The breakout group determined that the deletion of the following degree, certificate, and courses, which CRC's CIS Department submitted to double-check that nothing important would go missing, was a good idea:

- CIS - Information Systems Security certificate
- CIS - Information Systems Security A.S. degree
- CISN 374: Messaging Server Administration
- CISN 378: Database Administration for Microsoft SQL Server
- CISS 320: Implementing Network Security and Counter Measures
- CISS 356: Introduction to Information Assurance
- CISS 341: Implementing Windows Operating System Security
- CISS 342: Implementing Linux Operating System Security
- The breakout group also reviewed two new Associate's degrees, two new certificates, and several new courses:
- Two proposed new courses, CISS 315: Ethical Hacking and CISS 321: Scripting for Cyber Security, were approved.
- The proposed new Cybersecurity and Information Assurance A.S. Degree, which is designed to match SCC's offerings for the purpose of future collaboration, was approved.





- The proposed new Information Technology Associate degree (formerly CIS - Server Administrator) was NOT approved due to concerns that students who are already working and looking to switch to the Cybersecurity field would not be able to complete CISC 498 - Work Experience in Computer Information Science - Core (1- 4). Since the group found work experience to be important, however, it is recommended that CISC 498 be converted to an elective instead, similar to the proposed new Information Technology Technician certificate (formerly Network Helpdesk Technician). The high number of units for this proposed A.S. degree (38) was also mentioned as a concern, but since the required CISC 310 course, the elective BUS 310 course, and the required MATH course could be double counted toward General Education requirements; this was deemed acceptable.
- The proposed new Information Technology Technician certificate (formerly Network Helpdesk Technician) was approved, but the group suggested that the MATH requirement be removed to reduce the number of units.
- The proposed new Information Technology Associate certificate (formerly CIS - Server Administrator) was also approved, but the group also suggested that the MATH requirement be removed to reduce the number of units.
- The group discussed a proposal submitted by Pioneer H.S. (WJUSD) regarding a year-long CyberSecurity and ICT Essentials (Cisco) course. The group approved the proposal with the suggestions that the course name be changed to IT Essentials to match the name used in the Cisco Networking Academy and that the Cybersecurity portion be used to help prepare students not only for the Skills USA competition, but also for the CompTIA Security+ certification exam.

### **Programming & Database:**

The Programming & Database breakout group reviewed and approved proposals for 7 courses from 6 different school sites. The courses approved include:

- Database Design and SQL Programming (Sheldon High School, EGUSD)
- Mobile Apps Development (Laguna High School, EGUSD)
- C++ Programming (Monterey Trail High School, EGUSD)
- Make Your Mark: Connecting and Making with Technology (Pioneer High School, WJUSD)
- Computer Programming for Solving Applied Problems (Pioneer High School, WJUSD)
- iOS App Developer (Sacramento City College)
- Project Invent (Da Vinci Charter, DJUSD): Project Invent is a course that is modeled after a Bay Area social change and empathy physical tech demo competition created by Connie Lu; goal for the course is to draw diverse students into computer science utilizing an inclusive framework

The next advisory meeting will be held on Friday, April 3, 2020.

# APPENDIX

## ICT Regional Industry Advisory Meeting Which Cybersecurity Skills do Employers Need Most Urgently?

November 1, 2019 | 9:00-12:00 PM

Sacramento County Office of Education, 10474 Mather Blvd, Mather, CA 95655



### MEETING OBJECTIVE

Industry partners inform community college faculty, high school instructors, and educational administrators about how to best prepare Cybersecurity students for the workforce.

### AGENDA

8:30-9:00 AM

#### **Registration & Networking**

9:00-9:15 AM

#### **Welcome & Overview**

**Markus Geissler**, Professor & Regional Director, Employer Engagement, ICT/Digital Media, Greater Sacramento Region, California Community Colleges

9:15-10:00 AM

#### **Presentation: Cybersecurity Needs in the Public Sector**

**Marc Glenn**, Cyber Intelligence Analyst  
California Governor's Office of Emergency Services

10:00-10:10 AM

#### **Networking Break**

10:10-11:00 AM

#### **Panel Discussion: Cybersecurity Needs Within Industry Sectors**

- **Marc Glenn**, Cyber Intelligence Analyst  
California Governor's Office of Emergency Services
- **Robert Leon**, Information Security Director, Raley's
- **Vitaliy Panych**, Chief Information Security Officer, California Department of Technology

11:00-12:00 PM

#### **Small Group Breakouts**

- ICT Strategic Planning for Educational Administrators with Jared Amalong in Room A
- Programming & Database with Lilibeth Mora in Room B
  - iOS App Developer Certificate, Sacramento City College
  - Advanced System Programming, Elk Grove Unified School District: Laguna Creek High School
  - Advanced System Programming, Elk Grove Unified School District: Sheldon High School



Golden Sierra



- Computer Programming for Solving Applied Problems, Woodland Joint Unified School District
- Make your Mark: Connecting & Making with Technology, Woodland Joint Unified School District
- Project Invest, Davis Joint Unified School District, Da Vinci Charter Academy
- Office Applications & Web Development with Evan Schmidt in Mather Room West (window side)
- Computer Networking & Cybersecurity with Markus Geissler in Mather Room East (wall side)
  - Information Technology Associate Certificate, Cosumnes River College
  - Information Technology Associate Degree, Cosumnes River College
  - Information Technology Technician Certificate, Cosumnes River College
  - Program & Course Deletions/Additions, Cosumnes River College
  - Cybersecurity: ICT Essential, Woodland Joint Unified School District

Community of Practice meeting for high school instructors to follow.

**Next Advisory Meeting: Friday, March 27<sup>th</sup>, 2020**





# ICT Regional Industry Advisory Meeting

## Which Cybersecurity Skills do Employers Need Most Urgently?

### PARTICIPANT LIST

Jared Amalong, Sacramento County Office of Education

Kevin Anderson, Sacramento City College

Raquel Arata, American River College

Sadaf Ashtari, California State University, Sacramento

Rachelle Barkus, Modesto City Schools

Cameron Bennett, Ponderosa High School

Shanell Brumfield, Foundation for California Community Colleges

Fernando Cantillo, Sacramento City College

Joe Collinwood, Cysure

Brad Crockett, Roseville High School

Clay Dagler, Elk Grove Unified School District

Henry Davis, SIATech Charter School

Yzabelle Dela Cruz, Valley Vision

Linda Dewberry, Sheldo High School, EGUSD

Walter Di Mantova, Generative Futures Lab

Randall Fairchild, Florin High School

Chuck Ferguson, Sutter Networks

Gary Garot, Laguna Creek High School

Markus Geissler, Los Rios Community College District

Wendy Ghyselink, Rocklin Unified School District

Sean Glantz, Davis Joint Unified School District

Marc Glenn, California Governor's Office of Emergency Services

Terri Griffin, Roseville Joint Union High School District

Melissa Hale, Cosumnes Oaks High School

Katy Hensley, Sacramento Unified School District

Todd Higley, Antelope High School / Sierra College

Kim Hitchcock, Monterey Trail High School, EGUSD

Jerry Huang, Sacramento New Technology High School

Don Isabell, Placer High School

Erica Johnson, Yolo County Health and Human Services

Darla Jones, Sierra College

Jerry Jones, Sacramento County Office of Education

Abdelaziz Kaina, Sacramento City College

Edwin Kang, Mendocino County Office of Education

Emma Koefoed, Valley Vision

Larry Lagerstrom, Barobo, Inc.

Mitchell Leach II, Interns 2 Pros

Robert Leon, Raley's

Doug Lewin, Folsom Cordova Unified School District

Branka Marceta, Sacramento County Office of Education/Adult Education

Rob McBee, SMUD

Gabriel Meehan, Sacramento City College

Mysti Miller, Sacramento County Office of Education

Nile Mittow, Hacker Lab

Dariu Mois, San Juan Unified School District

Sean McNally

Amanda Moore, Enochs High School

Lilibeth Mora, Elk Grove Unified School District

Coleen Morehead, CLEAR Strategies

Sam Myung, SIATech Charter School

Nancy Ortner, Visions In Education

Vitaliy Panych, California Department of Technology

Lance Parks, Cosumnes River College

Gregg Ramseth, Placer Union High School District

Evan Schmidt, Valley Vision

Blaine Smith, North/Far North Regional Consortium

Buddy Spisak, Cosumnes, River College

Elizabeth Swithenbank, Folsom Lake College

Joeleen Takano, Twin Rivers Unified School District

Joseph Taylor, California State University, Sacramento

James Town, Sacramento City College

Maria Trappe, Del Campo High School

Harsh Verma, ACM Sacramento Chapter

Asha Warrior, River City High School

Cameron Whitfield, Folsom Lake College

Brett Wolfe, San Juan Unified School District

Meili Xu, Sacramento City College

Miela Zitelli, Sacramento City College

## Industry Speaker Bio

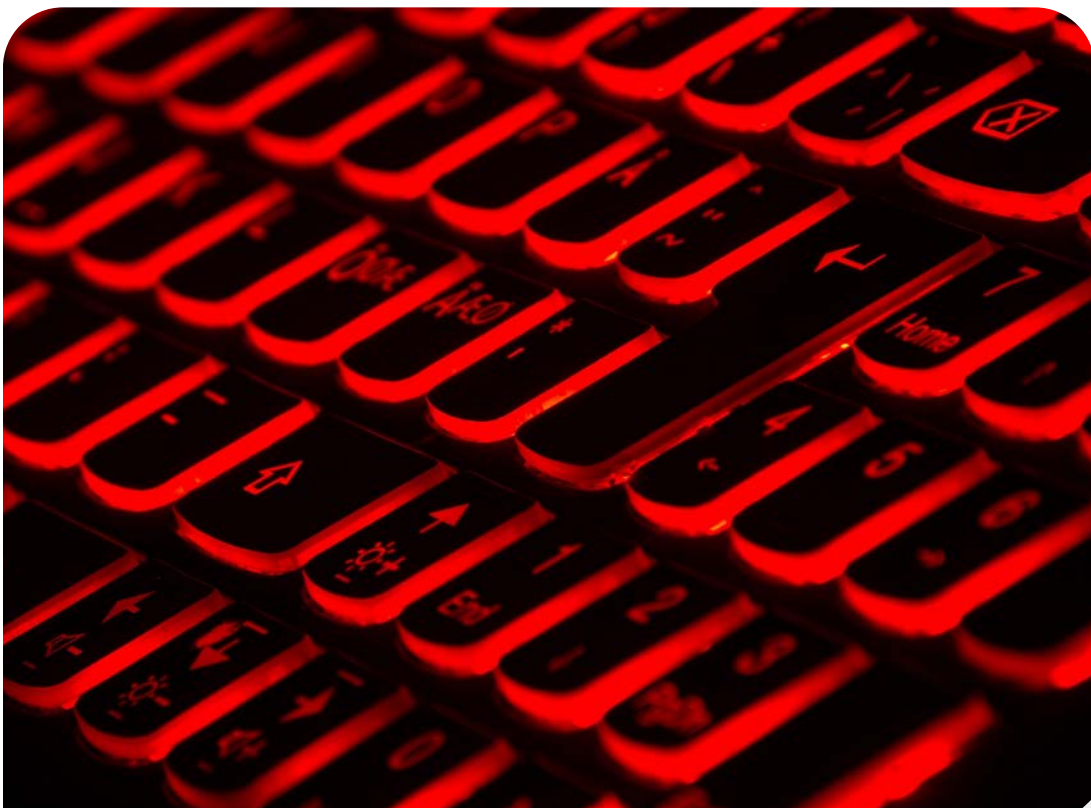
Marc Glenn has been cybersecurity professional for over twenty-three years. He is a retired Army veteran and his career began in 1989 where he worked as a Bradley Fighting Vehicle Systems Engineer, telecommunications specialist and trainer. In 1998



he became a computer specialist and network engineer with the California National Guard. From 2000 to 2014, Marc worked with the Department of Defense in various roles culminating in his assignment as the California National Guard's Chief Information Security Officer (CISO).

In July of 2014 Marc began working for the Employment Development Department creating the department's first Network Operations and Security Center (NOSC). In 2015, Marc retired from the military as the first official, J6 / G6 Sergeant Major for the California National Guard and State of California Military Department.

Marc has worked closely with various companies and governmental agencies around the world including teaching Cybersecurity courses at Heald College and ITT Technical Institute for over 10 years. Marc has numerous certifications and has helped create and mature cyber programs for the Department of Defense, NSA, US CERT, ACERT, SANS Institute, Comp TIA, NATO, Joint Task Force Domestic Support Counterdrug, The Ministry of Defense for Macedonia and Ukraine, the California Highway Patrol, the State of California ISO, the California Employment Development Department and most recently, the California Cybersecurity Integration Center in Rancho Cordova California.



## Curriculum Reviews

Course/Certificate/Degree	Site	Description & Strong Workforce Considerations	Status
Database Design & SQL Programming Capstone Course	EGUSD: Sheldon High School	CA Department of Justice software developer feedback expressed strong excitement and support of the theory & practice of the course; "college & professional level"	Approved
Mobile Apps Development Capstone Course	EGUSD: Laguna Creek High School	Supports entrepreneurship and start-up skill needs; Alignment with new SCC course (below)	Approved
C++ Programming Capstone Course	EGUSD: Monterey Trail High School	Utilizes Arduino circuit board; Students build full-color applications at the end of the class	Approved
Make Your Mark: Connecting & Making with Technology Course	WJUSD: Pioneer High School	Introductory course to sequence; Programming & logistics intro that translates into CISCO training	Approved
Computer Programming for Solving Applied Problems Course	WJUSD: Pioneer High School	New concentrator course that leads to security essentials	Approved
Project Invent Course	DJUSD: Da Vinci Charter Academy	Modeled from the social change and empathy physical tech competition from Connie Lu (Bay Area); goal to draw students into computer science using inclusive framework; Alignment with course at Cosumnes Oaks HS	Approved
iOS App Developer Course	Sacramento City College	Multi-platform MAR; Intended for self-starter businesses and iOS development	Approved
CIS - Information Systems Security certificate	Cosumnes River College		Deleted
CIS - Information Systems Security A.S. degree	Cosumnes River College		Deleted
CISN 374: Messaging Server Administration	Cosumnes River College		Deleted
CISN 378: Database Administration for Microsoft SQL Server	Cosumnes River College		Deleted
CISS 320: Implementing Network Security and Counter Measures	Cosumnes River College		Deleted
CISS 356: Introduction to Information Assurance	Cosumnes River College		Deleted
CISS 341: Implementing Windows Operating System Security	Cosumnes River College		Deleted
CISS 342: Implementing Linux Operating System Security	Cosumnes River College		Deleted
CISS 315: Ethical Hacking	Cosumnes River College		Approved
CISS 321: Scripting for Cyber Security	Cosumnes River College		Approved
Cybersecurity and Information Assurance A.S. Degree	Cosumnes River College	Designed to match SCC's offerings for the purpose of future collaboration	Approved
Information Technology Technician Certificate	Cosumnes River College	Formerly Network Helpdesk Technician; group suggested that the MATH requirement be removed to reduce the number of units	Approved
CyberSecurity and ICT Essentials	WJUSD: Pioneer High School	Group suggests that the course name be changed to IT Essentials to match the name used in the Cisco Networking Academy and that the Cybersecurity portion be used to help prepare students not only for the Skills USA competition, but also for the CompTIA Security+ certification exam.	Approved
CISC 498 - Work Experience in Computer Information Science	Cosumnes River College	Not approved due to concerns about students ability to complete; group finds work experience valuable, however, recommended that CISC 498 be converted to an elective instead	Not Approved



Markus Geissler, PhD

Regional Director, Employer Engagement,  
Information & Communication Technologies/Digital Media

## Which Cybersecurity Skills do Employers Need Most Urgently?

Regional ICT Industry Advisory  
November 01, 2019



California  
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Information and Communication Technologies  
and Digital Media  
Sector Navigation Team



# Agenda

- Introduction
- Keynote
- Short break
- Industry panel
- Small Group Breakouts
  - Curriculum Approval
  - Facilitated Networking

# STOP! What is wrong with this slide deck?



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and Digital Media  
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Markus Geissler, PhD

Regional Director, Employer Engagement,  
Information & Communication Technologies/Digital Media

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## Wise Words from your Regional Director

More than  
CS!

Cybersecurity

K12 Strong  
Workforce

Professional  
Development

Women in Computing

Pathway



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## Students Need Clear and Consistent Pathways

- Shared responsibility between faculty and administration
  - Curriculum structure
  - Course scheduling
- Offer the necessary classes when and how students wish to take them!
  - Students want to be able to plan, just like faculty.
- Academic freedom is important, but...
  - **Providing consistent pathways to students is more important!**
  - Especially for CTE students

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## Computer Science is only One of the Computing Disciplines!

- Information Technology
- Information Systems (Management Information Systems)
- Computer Engineering
- Software Engineering
- Mixed disciplinary majors
  - Bioinformatics, Gaming and Animation, Medical (or health) Informatics, etc.
- Not yet officially included
  - Cybersecurity
  - Data Science

Computing Curricula 2005, Association for Computing Machinery (ACM; [www.acm.org](http://www.acm.org))

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## To many students MATH is a 4-letter word!

- Computer Science, Software Engineering and Computer Engineering transfer programs typically require multiple semesters of Calculus.
  - CS Departments use Calculus to teach Logic.
    - Logic is important, but most CS and SE graduates will never need to use Calculus on the job!
- Many H.S. graduates are NOT Calculus-ready.
  - Their conclusion: Computing careers are not for me! 😞

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## More than Computer Science!

- Counselors need to be informed about all ICT disciplines.
  - They play a huge role in guiding students!
  - Instructors: Help inform the counselors at your institution!
- Counselor Conference on February 13, 2020
  - DoubleTree near Arden Fair
  - Currently sold out, but waiting list is available

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## Is a Cybersecurity Degree Worth It?

- Cybersecurity jobs are on the rise!
  - Information security analyst employment to increase 28% through 2026 (U.S. Bureau of Labor Statistics)
- Cybersecurity professionals are needed in all industries
  - Specifically, financial institutions and the healthcare industry

Is a Cyber Security Degree Worth It? The Facts You Can't Ignore, by Kirsten Slyter, 05/20/2019 for Rasmussen College

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## Is a Cybersecurity Degree Worth It?

- Companies are struggling to find qualified Cybersecurity professionals
  - Shortage of approximately 2.93 million qualified Cybersecurity professionals globally, according to (ISC)<sup>2</sup>®
- Employers are seeking candidates with a Cybersecurity degree
  - 93% of job postings called for a Bachelor's degree.

Is a Cyber Security Degree Worth It? The Facts You Can't Ignore, by Kirsten Slyter, 05/20/2019 for Rasmussen College

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## Is a Cybersecurity Degree Worth It?

- Cybersecurity job opportunities typically increase with education level
  - High school diploma: 7,987 job postings
  - Associate's degree: 3,033 job postings
  - Bachelor's degree: 82,773 job postings
  - Master's degree: 2,442 job postings
  - Doctoral degree: 716 job postings



Is a Cyber Security Degree Worth It? The Facts You Can't Ignore, by Kirsten Slyter, 05/20/2019 for Rasmussen College

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## Is a Cybersecurity Degree Worth It?

- Cybersecurity professionals have solid earning potential
  - Employers are willing to make significant investments in qualified candidates.
  - Median annual salary for Cybersecurity analysts in 2018 was \$98,350. (BLS)



Is a Cyber Security Degree Worth It? The Facts You Can't Ignore, by Kirsten Slyter, 05/20/2019 for Rasmussen College

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# Is a Cybersecurity Degree Worth It?

- The Cybersecurity field offers room for career advancement
  - 0 to 2 years: 16,615 jobs available
  - 3 to 5 years: 47,573 jobs available
  - 6 to 8 years: 22,088 jobs available
  - 9+ years: 16,083 jobs available



Is a Cyber Security Degree Worth It? The Facts You Can't Ignore, by Kirsten Slyter, 05/20/2019 for Rasmussen College



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# Women in Computing (We need more of you!)

- Instructors should proactively address gender issues in the classroom.
  - The women know what's going on.
  - Men are often be less aware of their behavior.
- All students need to be taught, or reminded, that being inclusive is good for everyone.
  - Team assignments, collaboration on projects, etc.
- Industry has the same problems
  - Many companies have started initiatives to recruit and retain women.



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# K12 Strong Workforce Program

- Funds to support CTE projects in high schools and middle schools
  - New! No school or district LEA can be listed on more than 3 applications.
  - Match required! Plan wisely.
  - Applications must be received by 5:00 pm on Wednesday, December 18, 2019 in NOVA
- K12 SWP *Selection Committee* Applications due TODAY, November 01st!

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## Professional Development - Weekly

- ICT Educator Webinar Series
  - Sponsored by ICT-Digital Media Sector Team
  - Fridays from 10:00 AM to 11:00 AM during the academic semester
    - Webinars are recorded for later viewing
  - Some previous topics
    - Cloudification of the IT Model Curriculum, Choosing the Right Cyber Activities for Your Campus, Cisco Update: A New Streamlined Certification Program, and Talent Fuels the Fifth Revolution
  - Register at [www.ictdmsector.org](http://www.ictdmsector.org).

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## Professional Development – Intensive

- ICT Educators Winter Conference – Variety of presentations
  - Cisco Headquarters in San José, CA (January 06 & 07, 2020)
  - \$1,000 stipend for regional CC faculty to attend
    - K12 instructors: Check with your administrator about Perkins or similar funding
- Summer Faculty Development Weeks – Focus on one Topic
  - Cabrillo College (June 08-12, 2020) and Coastline College (June 15-19, 2020)
  - \$2,000 stipend for regional CC faculty to attend
- Register at [www.wastc.org](http://www.wastc.org) !



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## Mark your Calendars!

- Spring 2020 Regional ICT Industry Regional Advisory
  - Friday, March 27, 2020
  - Location TBA
  - Focus: Cloud Computing
    - Cloud curriculum standards
    - Integration into existing curriculum



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## Keynote Speaker – Marc Glenn

- Senior Cybersecurity Intelligence Analyst, California Cybersecurity Integration Center, Office of Emergency Services, State of California
- Cybersecurity professional for over 23 years
- Army veteran
- Various other roles with the Department of Defense
  - California National Guard's Chief Information Security Officer (CISO)
- Taught Cybersecurity courses at Heald College and ITT Technical Institute
- Holds numerous certifications
- Helped create and mature cyber programs for many government organizations

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## Keynote Speaker – Marc Glenn



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# Cal-CSIC Threat Brief / Overview

Marc A. Glenn  
Senior Cybersecurity Intelligence Analyst, Cal-CSIC  
Regional ICT Industry Advisory meeting  
01 November, 2019



## Agenda

1. Threat Brief
2. Cal-CSIC
3. Legislative Information Tracker
4. The Work Ahead
5. Emergency Support Function 18 (ESF18)
6. Questions



# Email Based Attacks

(U//FOUO) Malspam and Phishing attacks continue to be among the top attack vectors, according to national reporting.

## 2019 Global Email Trends and Estimates



**422.49 billion** daily **spam** Emails  
**85.04%** of Total Email volume

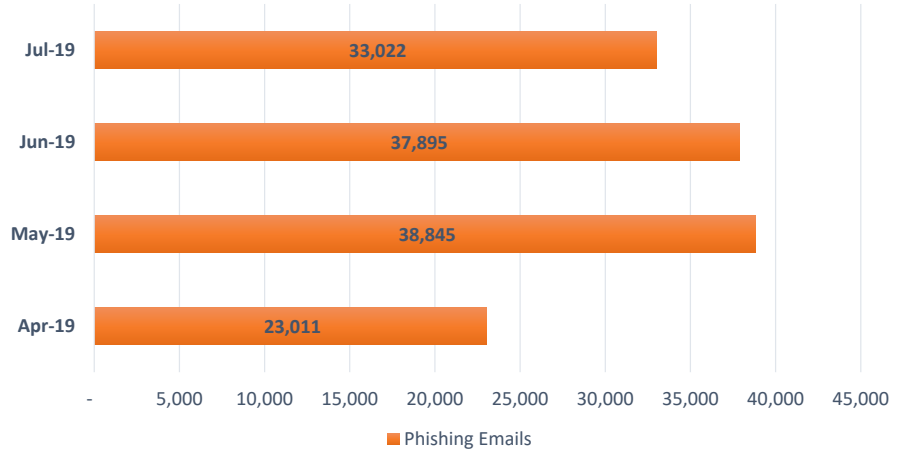


**3.4 billion** daily **suspicious** Emails  
**1.2%** of total Email volume



**172,374** **phishing** websites  
created in **2019** YTD

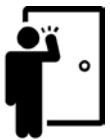
## Q3 2019 Global Open Source Phishing Data



# Ransomware



Top Infection vectors for Ransomware **Q2 2019**



**Remote Services**  
**59.1%**



**Malicious Emails**  
**34.1%**



**Software Vulnerability**  
**6.8%**



**Q1 2018** → **Q1 2019**

**521% Increase** for ransomware detection in **businesses**

**33% Decrease** in ransomware detections for **consumers**



**187% Increase** in Average Ransomware Payment Demand

**Q1 2019**  
**\$12,762**      **Q2 2019**  
**\$36,295**

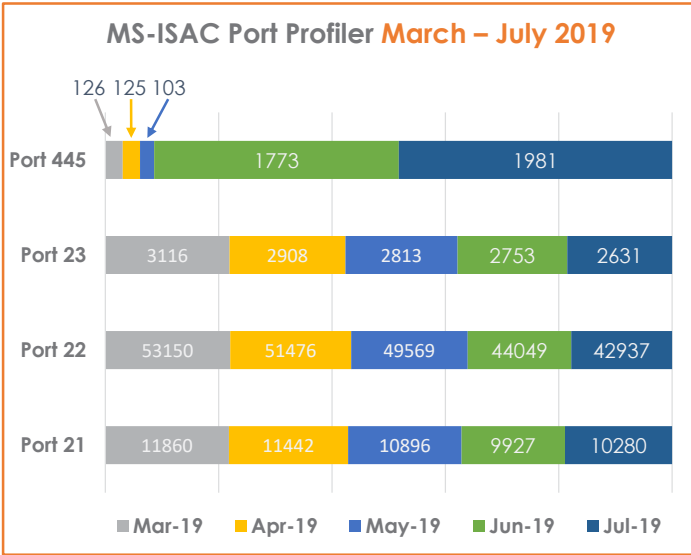


**5 ransomware** attacks in **2019** against local **California** governments

**50+ ransomware** attacks in **2019** against **state & local** governments across the **US**



# Configuration Management



## Trends: March – July 2019

**Port 445:** Server Message Block (SMB) exposure increased **1472%**

**Port 23:** Telnet exposure decreased **15.5%**

**Port 22:** Secure Shell exposure decreased **19%**

**Port 21:** File Transfer Protocol exposure decreased **13%**

## Cloud Trends

**50%** of US government organizations are using the cloud

### 2017-2019

Average of **2,200** misconfiguration incidents in the cloud (IaaS)

**Misconfigured cloud** services involved in **42%** of successful attacks



# Website Defacements



**75 .gov** websites defaced in **2019** YTD



**Negatively** impacts reputation



Provides opportunity for **disinformation** campaign



**31 California** government websites defaced in **2019** YTD



**Degrades public confidence** in government run information systems



**Creates** opportunity to **infiltrate** internal computer networks



**45 Publicly** disclosed web **vulnerabilities** for California government websites





# California Website Defacements Examples



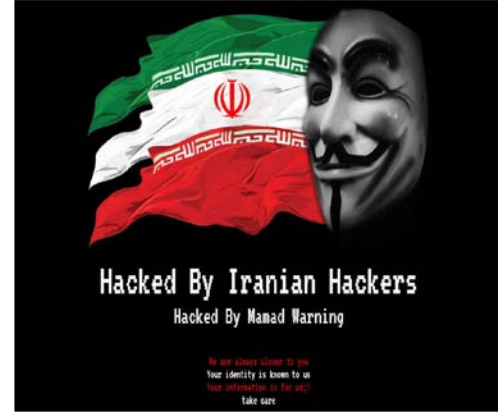
Extremist



Hacktivist



Nation-State



# Cal-CSIC



## Cal-CSIC

Marc Glenn  
Senior Cybersecurity Intelligence Analyst, Cal-CSIC



## Established by Governor's Executive Order B-34-15 Codified, 26 Sep 2018 GC 8586.5

**Primary mission: Reduce the likelihood and severity of cyber incidents that could damage California's economy, its critical infrastructure, or public and private sector computer networks**

**Serve as central organizing hub of state government's cybersecurity activities**

**Coordinate information sharing with local, state and federal agencies, tribal governments, utilities and other services providers, academic institutions, and non-governmental organizations**

**Review threat intelligences from partner agencies; assess risks, prioritize threats and provide warnings of cyber attacks**

**Develop a statewide cybersecurity strategy in partnership with the Governor's Cybersecurity Task Force**



## "Whole of State Government" Approach

**Focus the state's resources to protect *all* of California**

**Sharing cyber threat intelligence and information with partners**

**State, local and tribal governments**

**Higher education, including University of California, California State Universities and California Community Colleges**

**Private industry, including utilities, health, financial and technology**

**Coordinating cyber incident response with partner agencies**

**Federal: FBI, DHS, ATF, Coast Guard, D.O.D, 4 by law**

**State: State Agencies, GoBIZ, Non Constitutionals, 10 agencies by law**

**Local: Cities, Counties, Financial, Education, Critical Infrastructure**





## Cal-CSIC Leg Update



### Developing and promoting pragmatic and agile cyber legislation, policies, and standards

- State Administrative Manual (SAM) 5300 – Information Security
- California Joint Cyber Incident Communications and Escalation Framework
- California Joint Incident Response Guide
- Emergency Support Function 18 (Cybersecurity) – In Draft
- Approved Cybersecurity Legislation:
  - SB 532 - Emergency Services: State of Emergency: Cyberterrorism
  - SB 327 - Information Privacy: Connected Devices
  - AB 670 - Information Technology Security
  - AB 1022 - Information technology: Technology Recovery Plans: Inventory
  - AB 1841 - Cybersecurity Strategy Incident Response Standards
  - AB 2813 - California Cybersecurity Integration Center
  - AB 3075 - Office of Elections Cybersecurity



## The Work Ahead ....



- We need to restructure the Cybersecurity Task Force to focus on evolving threats such as those that threaten our elections and our water and agriculture
- Update California’s Cybersecurity Strategy and Homeland Security Strategy
- Redouble our efforts on engagement with Private Sector partners and academia
- Further our reach to protect small and medium sized businesses and our citizens
- We need to address issues identified in State Auditor’s Report 2018-611, July 2019 “Gaps in Oversight Contribute to Weaknesses in the State’s Information Security”
- We need to identify the resources necessary to advance to the next level of our state’s cybersecurity posture
- We need to continue to enhance our ability to stop cyberattacks before they occur and to quickly recover once they do
- We need to develop new strategies to protect California’s vast amount of Intellectual Property





# ESF18



## What is the ESF 18 ?

The Annex is a guide and tool for local jurisdictions and partners to operate in a unified and collaborative manner to response to a cyber-attack

The Annex looks beyond the more commonplace attack to the response for a large-scale, targeted attack

The Annex is a collaborative effort led by Cal-OES but created with direction and direct input from the stakeholders and industry leaders throughout the state



# ESF18



## Annex as part of the Statewide Emergency Management Plan (SEP)

How response to natural or human-caused emergencies occurs in California

Comprised of 17 Annexes which support emergency functions

Is a requirement of the California Emergency Services Act (ESA)

## Describes the activities to be conducted in the event of a major actual or perceived cyberattack that includes:

Any cyber threat that could severely impact California’s economy

Any attack to critical infrastructure, or public and private sector computer networks in our state.

## Staff charged with duties involving Cybersecurity disaster recovery or incident response tasks.

Information Security and Privacy Officers

Risk Managers / Cybersecurity Analysts

Disaster / Technology Recovery coordinators



**Federal**

DOJ, DHS, National Cybersecurity and Communications Integration Center, (NCCIC) FBI

**State**

Cal-OES, CDT, CHP, CMD, Governors Cybersecurity Task Force, AG, Dept of Education

**Regional**

Chambers of Commerce, County and Municipality ISO's, Fusion Centers

**Private**

Backbone Providers, Large IT Companies, Utilities, Healthcare providers, Financial Institutions



# Questions ?

Marc A Glenn  
Senior Cybersecurity Intelligence Analyst, Cal-CSIC  
[marc.glenn@caloes.ca.gov](mailto:marc.glenn@caloes.ca.gov)  
(916) 284-0357  
Incident Reporting: (916) 636-2997

## Short Networking Break

- Restrooms are located out the door and to the left.
- Please help yourself to the refreshments.



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## Industry Panel – Cybersecurity Needs Within Industry Sectors

- Marc Glenn
  - Senior Cybersecurity Intelligence Analyst, California Cybersecurity Integration Center, Office of Emergency Services, State of California
- Robert Leon
  - Information Security Director, Raley's
- Vitaliy Panych
  - Chief Information Security Officer, California Department of Technology



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## Industry Panel Question 1

- Would you please introduce yourself to the audience? Please include...
  - your current job title,
  - the primary tasks that you perform in your job,
  - any academic degrees or industry certifications that you may hold, and
  - your career path to where you are today.



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## Industry Panel Question 2

- What skills do you expect individuals to have before you hire them for a position within your organization's Cybersecurity unit?
- What additional skills would those individuals need to be able to advance to a mid-level Cybersecurity position?



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## Industry Panel Question 3

- What initiatives, if any, has your organization implemented to recruit and keep Cybersecurity talent?
- To which extent are those initiatives working?



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## Industry Panel Question 4

- Which academic degrees, certificates, or industry certifications will provide an advantage to those seeking employment or advancement within your Cybersecurity organization?



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## Industry Panel Question 5

- More and more students are participating in Cybersecurity competitions, such as CyberPatriot or the National Cyber League. From your perspective, how valuable are these competitions in the preparation of future Cybersecurity professionals?

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## Industry Panel Question 6

- Finally, what trends do you foresee in the Cybersecurity discipline between now and 2025 to which our sector will need to respond?

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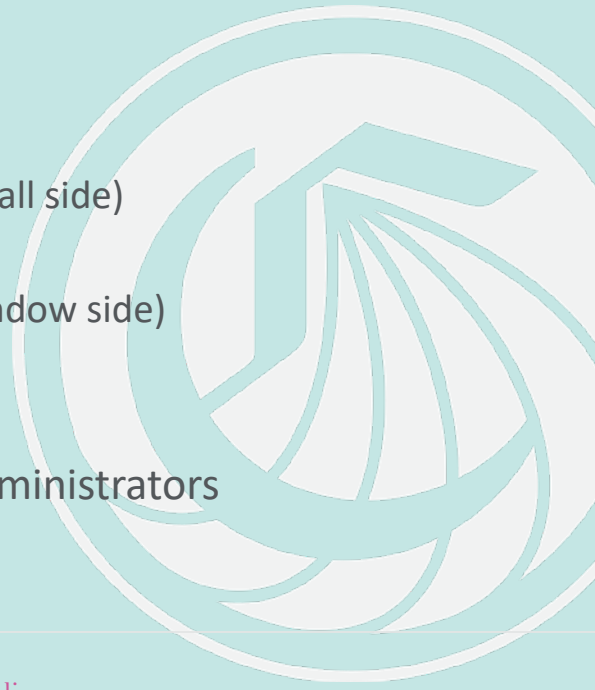


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## Small Breakout Sessions

- Computer Networking & Cybersecurity
  - Moderator: Markus Geissler, Mather Room East (wall side)
- Office Applications & Web Development
  - Moderator: Evan Schmidt, Mather Room West (window side)
- Software Development & Database
  - Moderator: Lilibeth Mora, Room B
- Strategic ICT Needs Planning for Educational Administrators
  - Moderator: Jared Amalong, Room A



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valley vision

Community Inspired Solutions

[valleyvision.org](http://valleyvision.org)

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