



**Prepare for a World of Incessant,
Relentless & Omnipresent Cyber Conflict
in Every Aspect of Our Daily & Commercial
Lives**

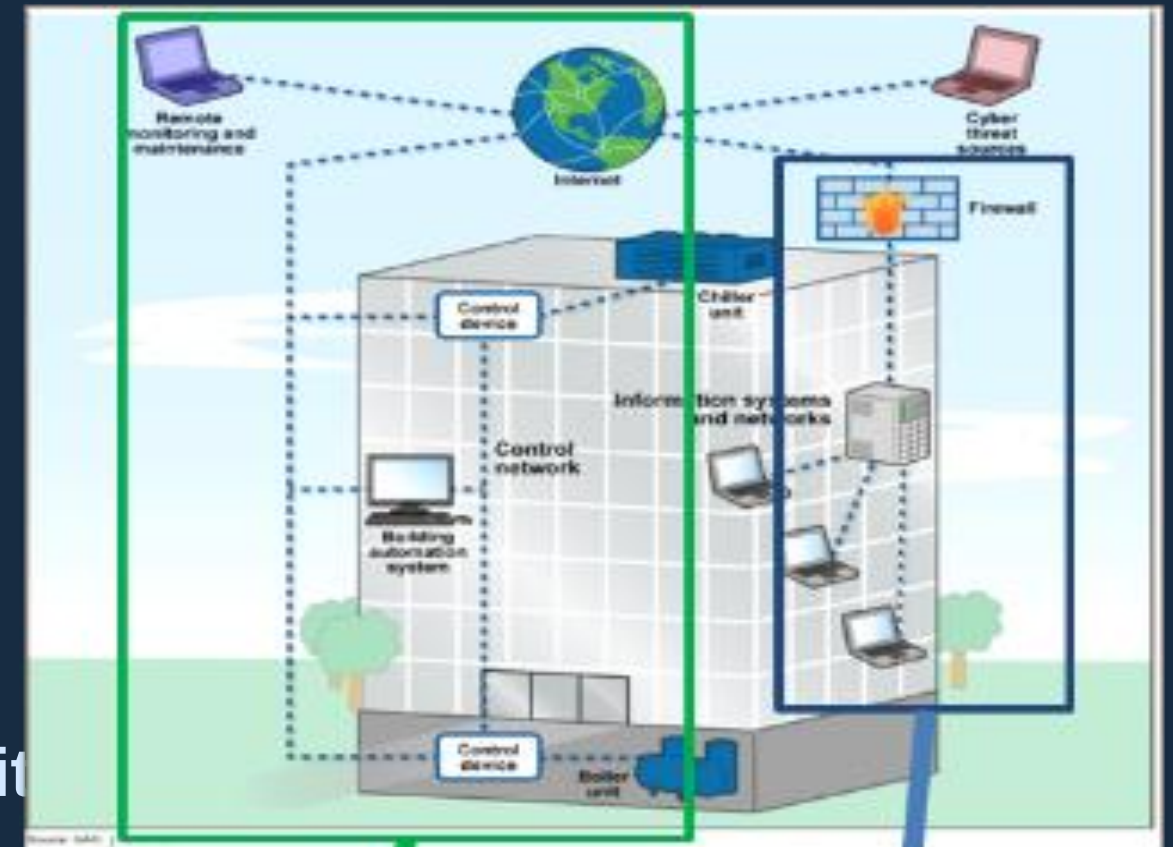


Terminology Decisions Needed

PIT, CS, PIT-CS, ICS, FRCS, OT, SCADA, CPS, IoT, IIoT

- ☒ PIT = Platform Information Technology
- ☒ ICS = Industrial Control Systems
- ☒ FRCS = Facility-Related Control Systems
- ☒ OT = Operational Technology
- ☒ SCADA = Supervisory Control And Data Acquisition
- ☒ CPS = Cyber Physical Systems
- ☒ IoT = Internet of Things
- ☒ IIoT = Industrial IoT
- ☒ CS = Control Systems

~~POT = Platform Operational Technology~~



PIT, CS,
ICS, FRCS,
OT,
SCADA,
CPS, IoT,
IIoT

Information
Systems

Existing Integration Systems

Acuity Brands Roam Advantage Controls ALC Alerton AIE Alerton BACtalk Alerton
 BCM-WEB American Auto-Matrix Auto Pilot American Auto-Matrix Andover Controls
 Continuum Asi controls Auto Matrix Sage Automated Logic WebCTRL Automated
 Logic Barber Coleman Network 8000 Bristol Babcock CAPRON Carrier Carrier
 Comfort Network Carrier Com-Trol Control Microsystems SCADAPack Cylon Unitron
 UC32 Daikin Data Aire Dell Vostro Delta Controls ORCA Distech Echelon i.Lon
 Emerson-Liebert EXHAUSTO Flygt ITT Industries APP 700 General Electric WESDAC
 General Electric Honeywell Excel 5000 Honeywell WEBs-AX HSQ Technology
 Invensys I/A Series Invensys Micronet Invensys Network 8000 Johnson Controls Facility
 Explorer Johnson Controls Metasys Johnson Controls M-Series KMC LANDIS Landis
 & Staefa Integral MS2000 Landis & Staefa Liebert SiteGate LOYTEC Electronics L-VIS
 Lynxspring JENEsys Merlin Gerin PowerLogic Microwave Data Systems Mitsubishi
 Motorola SCADA Systems Odessa Engineering OmniaPRO Orion Controls Paragon
 EC7000 Series Racor Reliable Controls MACH-ProWebSys Richards-Zeta Robert Shaw
 DMS RUGID Schneider Electric I/A Series Schneider Electric PowerLogic Siebe
 Network 8000 Siemens ACCESS Siemens Apogee Siemens Desigo PX Siemens Synco
 700 Staefa Staefa/Siemens STULZ Air Technologies TAC I/A Series TAC Network
 8000 TAC Xenta TAC Vista Telvent Smart Grid Solution Trane Tracer Trane Tracer
 Summit Trane Varitrac TREND Trend Control Systems IQ2 Tridium Vykon

Existing Operating Software

Axon CAT SARL Desigo Insight KNX STANDARD ABB Symphony Plus OptimaxRev 4 ABB Symphony Plus 800xA SV 5.1 ABB Symphony Plus Composer 6.0 ABB Symphony Plus S+ Operations 1.1 Alerton BACTalk Envision 2.0 Alerton BACTalk Envision 2.6 Alerton VisualLogic Allen-Bradley RSLogix 500 Allen-Bradley RSLogix 500, RSView32 Automated Logic ExecB 6.0 Automated Logic SuperVision WebCTRL 5.5 Automated Logic WebCTRL WebCTRL 3 Automated Logic WebCTRL WebCTRL 3.0 Automated Logic WebCTRL WebCTRL 5 Automated Logic WebCTRL WebCTRL 5.2 Automated Logic WebCTRL WebCTRL 4.1 SP1 Automated Logic WebCTRL WebCTRL Automated Logic ExecB 4.1 SP1 Automated Logic ExecB drv_lge_4-02-175 Automated Logic ExecB drv_melgr_vanilla_4-02-175 Automated Logic ExecB Automated Logic Supervision 2.6b Automated Logic WebCTRL 4 SP1B Automated Logic WebCTRL 4.1 SP1 Automated Logic WebCTRL 4.1 SP1b Automated Logic WebCTRL SVR 5.5 Calsense Command Center 4.15.11.20 Carrier Comfort Network Comfort Network 3.0 Control Microsystems ClearSCADA 2009 Ed. R2.2 Data flow Systems HyperTAC 2 Data flow Systems HyperTAC HT3 Delta Controls ORCA ORCAview 3.30 Delta Controls ORCA ORCAview 3.40 Delta Controls Orcaview 3.22 Delta Controls Orcaview 3.30 Delta Controls OrcaView 3.3 Delta Controls Orcaview 3.33 Delta Controls Orcaview Delta Controls, TAC ORCA, I/NET ORCAview, Seven Rel 2.15 EFACAC Prism ERI Siemens Insight 3.6 GE, Intellution Proficy, iFIX, FIX Desktop __, __4.0, __ General Electric Cimplicity Plant Edition 6.1 General Electric Multilin Config Pro 5.03 General Electric Proficy Cimplicity 7.0 General Electric Proficy iFIX 4.0 Honeywell Symmetre Station 3.5 Symmetre 3.5 Honeywell Webstation-AX Niagara Niagara 3.5.40.1 HSQ Miser 6.06 HSQ Miser HSQ, Sun Microsystems Miser, Xview 6.06 Iconics Genesis32 Genesis32 8.3 Iconics Genesis32 Genesis32 9.13 Iconics HMI SCADA Solutions Genesis 32 3.12.005 InduSoft Web Studio Intellution 7 Intellution FIX32 3.5 Intellution FIX32 Intellution iFIX 3.5 Intellution IFIX Intellution iFIX Reporter ITT Flygt AquaView AquaView 1.50 Johnson Controls Metasys 6.0.0.9000 Johnson Controls Metasys GX9100 7.05A Johnson Controls Metasys Metasys 5 Johnson Controls Metasys Metasys 5.1 Johnson Controls Metasys Project Builder 5:1 Johnson Controls Metasys Project Builder 3 Johnson Controls Metasys 5 Johnson Controls Metasys 12.04 Johnson Controls Metasys 2.0.0.70.0 Johnson Controls Metasys 5.2.0.5400 Johnson Controls Metasys Johnson Controls M-Graphics 5.3 Microsoft Explorer N/A N/A N/A N/A Pneu-Logic Pneu-Logic RACO RACO 3.14 Rainbird MAXICOM2 Central Control 4.3 ReLab Software ClearView-SCADA 7.2.8 Reliable Controls MACH ProWebSys RC-Studio 2.0 Robert Shaw Digital Management System Operator Interface 11.0 Rockwell FactoryTalk Service Platform 2.30 Rockwell FactoryTalk View, Rsvision Site Edition, Supervisory 6.0, 6.0 Rockwell FactoryTalk 6.0 Rockwell Automation FactoryTalk View Machine Edition 5.1 Rockwell Automation FactoryTalk View Site Edition 4.0 Rockwell Automation FactoryTalk View Site Edition 5.1 Rockwell Automation FactoryTalk View Site Edition Rockwell Automation RSView Supervisory Edition 4.0 Rockwell Automation RSView Supervisory Edition Rockwell Automation RSView32 7.600.00 ScadaTEC SCADASIS 5.8.14.213 Schneider Electric PowerLogic ION Enterprise 5.6 Schneider Electric PowerLogic ION Enterprise Siebe Network 8000 Signal 4.4.1 Siemens S7 300 STEP 7 Siemens Apogee Insight Siemens Desigo Insight Siemens Insight Desigo Insight 2.31 Siemens Insight Desigo Insight 2.35.021 Siemens WinPM.Net 3.2 SP3 SUBNET Solutions SubSTATION Explorer 1.3.0 SUBNET Solutions SubSTATION Explorer 1.5.7 Sun Microsystems Xview 3.2 Symantec Backup Exec 2011? TAC 1/A Series WorkPlace Tech 5.7 TAC I/A Series Workbench TAC I/A Series WorkPlace Tech 5.7.2 TAC 4.1 TAC Signal, XPSI & ZPSIPC Teletrol eBuilding Telvent OaSys DNA 7.4.* Trane Tracer SC Tracer 3.5 Trane Tracer Summit Tracer 11 Trane Tracer Summit Tracer 16 Trane Tracer Summit Tracer 17 Trane Tracer Summit V14 Tracer 14 Trane Tracer Summit V16 Tracer 16 Trane Tracer Summit V17 Tracer 17 Tridium Vykon Niagara 2.301.428 Tridium Vykon Niagara 2.301.430.v1 Tridium Vykon Niagara 2.301.431.v1 Tridium Vykon Niagara 2.301.514 Tridium Vykon Niagara 2.301.514.v1 Tridium Vykon Niagara 2.301.522 Tridium Vykon Niagara 2.301.522.v1 Tridium Vykon Niagara 2.301.522.v2 Tridium Vykon Niagara 2.301.522V1 Tridium Vykon Niagara 2.301.527.v1 Tridium Vykon Niagara 2.301.529 Tridium Vykon Niagara 2.301.532 Tridium Vykon Niagara 2.301.532.v1 Tridium Vykon Niagara 3.3.31 Tridium Vykon Niagara 3.5.34 Tridium Vykon Niagara Workbench 3.6.31 Tridium Vykon Niagara Tridium Vykon Niagara AX 3.3.22.0 Tridium Vykon Niagara AX 3.5.25.0 "Tridium Vykon Niagara AX 3.5.25.0 3.3.22.0" "Tridium Vykon Niagara AX 3.5.25.0 3.4.51.0" Tridium Vykon Niagara AX 3.5.25.1 Tridium Vykon Niagara AX 3.5.34.0 Tridium Vykon Niagara AX 3.5.34.2 Tridium Vykon Niagara AX 3.5.39.0 Tridium Vykon Niagara AX 3.5.40.7 Tridium Vykon Niagara AX 3.5.7.0 Tridium Vykon Niagara AX 3.6.31.0 Tridium Vykon Niagara AX 3.6.31.4 Tridium Vykon Niagara AX 3.6.47 Tridium Vykon Niagara AX 3.6.47.0 Tridium Vykon Niagara AX Tridium Vykon Niagara R2 2.301.522 Tridium Vykon Niagara R2 2.301.522.v1 Tridium Vykon Niagara R2 2.301.529.v1 Tridium Vykon Niagara R2 2.301.532.v1 Tridium Vykon Niagara R2 R2.301.529 Tridium Vykon Niagara R2 Tridium Vykon Niagra 3.5.34.7 Tridium Vykon Workplace Pro 2.301.428 Tridium Vykon Workplace Pro 2.301.514 Tridium Vykon WorkPlace Pro 2.301.522 v2 Tridium Vykon Workplace Pro 2.301.532 Wonderware Intouch WindowViewer 10.1.200 Yokogawa Exaquantum EXAOPC R3.21 Yokogawa Exaquantum Exaquantum Server R2.60 Yokogawa DAQOPC for DARWIN R3.01 2 6.0 ACS Alerton 3.5.34 Alerton Apogee 2.8 BACnet CSView 11.5.0 build 121 DAQ Works V1.03 Delta-V 7.4 Delta-V DOS 6.2 ERI Excel add -in I/Net 1.02 I/Net 5.1.3-57 I/Net 5.1.4-59 I/Net INET 2000 1.11 build 170 Insight Metasys Power Xpert Software PR970 Prism Protech Siemens 11 SteamEye Symmetre Station 3.5 Tracer Summit 15.0 Versaterm, Crystal Reports VMware WEstation WIN UPM2 Workbench 2.301.522 Workbench 2.310.514

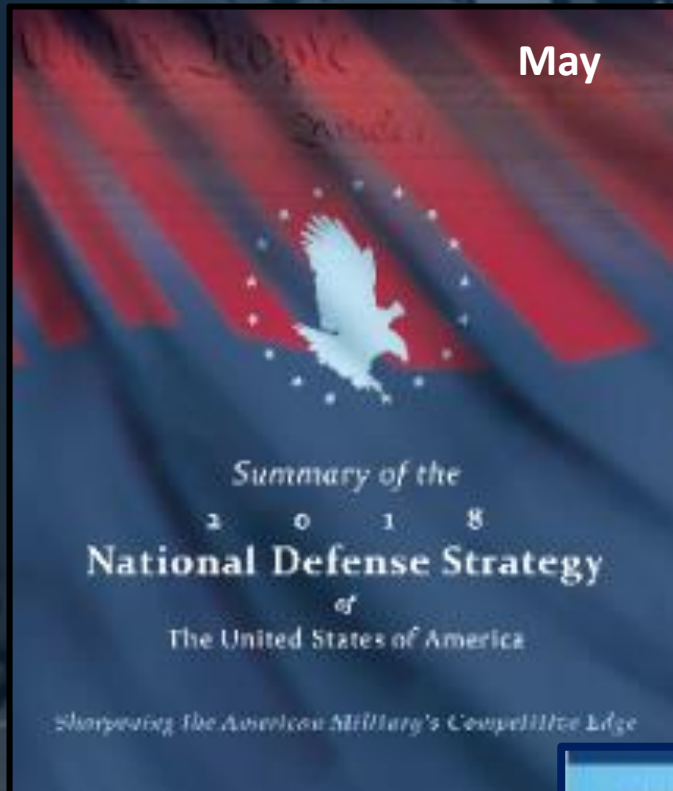
Existing Device Level Controllers

- AAEON Electronics AAON SS1016 ABB ACH550-UH-045A-4 ABB ACH550-UH-04A1-4 ABB ACH550-UH-246A-4 Acuity Brands Roam Gateway ADDER ADDERLink INFINITY ALIF 1000R-US ADDER ADDERLink INFINITY ALIF 1000T-US Advantech Touch Panel Computer TCP-1770H-C2BE Advantech Touch Panel Computer TPC-1780H Advantech Touch Panel Computer TPC-650H AEG BLR-CX 04R AEG Schneider Automation Modicon Micro 612 Alerton VLC-1188 Alerton VLC-444 Alerton VLC-550 Alerton VLC-853 Alerton BACtalk BCM-PWS Alerton BACtalk VAV-SD Alerton BACtalk VLC-1180 Alerton BACtalk VLC-1188 Alerton BACtalk VLC-444 Alerton BACtalk VLC-550 Alerton BACtalk VLC-651R Alerton BACtalk VLC-660R Alerton BACtalk VLC-853 Allen-Bradley Allen-Bradley CompactLogix L23E Allen-Bradley CompactLogix L32E Allen-Bradley ControlLogix 1756-A10 Allen-Bradley ControlLogix 1756-L61 Allen-Bradley ControlLogix OEM Allen-Bradley FlexLogix 1794-L34 Allen-Bradley FlexLogix 5433 Allen-Bradley FlexLogix FLEX I/O Allen-Bradley Integrated Display Computers 6181P Allen-Bradley MicroLogix 1000 1761 Allen-Bradley MicroLogix 1000 1761-L16BWB Allen-Bradley MicroLogix 1100 1763 Allen-Bradley MicroLogix 1100 1763-L16AWA Allen-Bradley MicroLogix 1100 1763-L16BWA Allen-Bradley MicroLogix 1400 Allen-Bradley Micrologix 1400 1766-L32AWAA 8/10.00 Allen-Bradley MicroLogix 1500 1764-24AWA Allen-Bradley MicroLogix 1761-NET-ENI Allen-Bradley PanelView Plus 1000 Allen-Bradley PanelView Plus 2711P-KM420D Allen-Bradley PanelView Plus 600 Allen-Bradley PanelView Plus 700 Allen-Bradley PowerMonitor 3000 Allen-Bradley PowerMonitor 3000 1404-DM A Allen-Bradley PowerMonitor 3000 1404-M405A-ENT B Allen-Bradley SLC 500 DH-485 Allen-Bradley SLC 500 SLC 5/00 Allen-Bradley SLC 500 SLC 5/02 Allen-Bradley SLC 500 SLC 5/03 Allen-Bradley SLC 500 SLC 5/04 Allen-Bradley SLC 500 SLC 5/05 Allen-Bradley VersaView 1500P Andover Controls Continuum Infinet II i2810 Andover Controls Infinity SCX 920 APC AP7960 APC PNET 1 APC Back-UPS BE350R APC Back-UPS BE750G APC Back-UPS BX900R APC Back-UPS ES550 APC Back-UPS Pro 1000 APC Back-UPS RS800 APC Back-UPS XS1500 APC Smart-UPS 1000XL APC Smart-UPS 2200 APC Smart-UPS 2200XL APC Smart-UPS 750 APC Smart-UPS AP5719 APC Smart-UPS SMT3000RM2U APC Smart-UPS SU2200NET APC Smart-UPS SU220RMXL APC Smart-UPS SU3000RMXL APC Smart-UPS SU3000XLM APC Smart-UPS SUA1000RM1U APC Smart-UPS SUA1500 APC Symmetra APC Symmetra AP9617 / Symmetra 40K Arena EX III Arista ARP-2217AP Armstrong SteamEye Gateway 3000M Autoflame DTI MK6DTI Automated Logic LGR1000 Automated Logic LGR25 Automated Logic M line M0100 Automated Logic M line M220nx Automated Logic M line M4106 Automated Logic M line M8102 Automated Logic M line M8102nx Automated Logic M line Mcpu Automated Logic ME812u line ME812u Automated Logic S line S6104 Automated Logic U line UNI/32 AutomationDirect DL06 AutomationDirect DL205 AutomationDirect EA7-T10C AutomationDirect EA-T10C AutomationDirect C-More EA7-T6CL AVG EZ-T10C-F AVG EZ-T15C-FSU Axiomtek DIN-rail Embedded System rBOX201-4COM-FL Axis 214 PTZ Axis 2400PTZ Axis 241Q Axis P5512 B&B Electronics MES1B Badger Meter Disc Series 120 Badger Meter Disc Series 170 Badger Meter Disc Series 35 Badger Meter Disc Series 70 Badger Meter M Series 4000 Badger Meter Turbo Series 2000 Badger Meter Turbo Series 450 Barber Coleman Network 8000 MZ2A Basler Electric BE1-25 Basler Electric BE1-700V Basler Electric BE1-CDS220 Basler Electric BE1-GPS100 E3N2R0U Bay Controls BayNet Belkin F6C1100-AVR Belkin F6C750-AVR Bitronics PowerPlex MTWIN3 Black Box ME838A-R2 Black Box ME838A-R3 BOCA Bristol Babcock DPC 3335 Brother HL-2270DW Brother HL-4040CDN Brother HLYOC Buffalo TS-H0.0TGL\RG Buffalo TeraStation Pro TS-H03TGL-R5 CalAmp VIPER SC Campbell Scientific CR1000 Carel pCO3 Carrier 30RRB06052_00__3 Carrier 30XAB50062-03X93 Carrier Comfort Network Comfort Controller 6400 Cohen OEM Computrol 32X Control Microsystems 5000 Series 5302 Control Microsystems SCADAPack 100 Control Microsystems SCADAPack 334 Cooper Power Systems CL-6A Cooper Power Systems CL-6A WA366B67G6AR Cooper Power Systems CL-6A WE383F44K6XR CyberPower 1500ADR CyberPower CPS1500AVR Cylon Nitron UC32 Daikin McQuay MicroTech II WMC Danfoss OEM Danfoss BACLink VLT DEC LA400-A2 Dell 3000CN Dell 71XPX Dell UPS1000W Dell Color Laser Printer 1320C Dell Laser Printer 1110 Dell Laser Printer 2330dn Dell Laser Printer 3100CN Dell PowerValut MD3000i Dell PowerValut TL2000 Delta Controls ORCA DSC-1212E Delta Controls ORCA DSC-1616E Delta Controls ORCA DSC-633E Deltak OEM Digi AccelePort C/X (1P) 50000598-01 Digital Loggers Web Power Switch III Dolch ORCA-19 Dolch ORCA-19PM DROBO 902-00001-001 Eason Technology 950 Eaton RO LIC-100 HMI Eaton Power Xpert PX4000 Eaton Powerware 3105 Eaton Powerware 5125 Eaton Powerware 9125 Eaton Powerware FE2.1KVA Eaton Powerware PW9130L1500T-XL Electro Industries Nexus 1262 Electro Industries Nexus 1270-S-SWB2-20-60-4IPO-SE Electro Industries Nexus 1272 Electro Industries Shark 100S elo Touch Solutions Touch systems Elo Touch Solutions Touchmonitor ET1739L Elo TouchSystems Elster American Meter 3.5M Elster American Meter AL-425 Elster American Meter AL-800 Elster American Meter GT-3 Elster American Meter RPM Series 1.5M Elster American Meter RPM Series 2M Elster American Meter RPM Series 3.5M EMC CLARiiON CX4-120 Emerson M-Series MD Plus Encorp KWS GDU Encorp KWS2222501 Encorp UPC GDU Endress+Hausser Promass 80 Endress+Hausser Prowirl 72W EPSON FX 2190 Fireye Nexus NX6100 Flygt ITT Industries APP 700 APP700F Fuji HDC 500 Fuji Micrex-F F120S F120S Fuji Micrex-SX SPH3000MM Gamewell 1033502501VD General Electric 16SB1BB339SS52V General Electric 16SB1CB201SDM2Y General Electric 510-0183-01A General Electric 526-2006 General Electric IC695ETM001 General Electric Fanuc 90-30 IC693CPU311 General Electric Fanuc 90-30 IC693CPU311-AD General Electric Fanuc 90-30 IC693CPU311-AE General Electric Fanuc 90-30 IC693CPU311-BE General Electric Fanuc 90-30 IC693CPU311N General Electric Fanuc 90-30 IC693CPU311T General Electric Fanuc 90-30 IC693CPU311W General Electric Fanuc 90-30 IC693CPU311-XX General Electric Fanuc 90-30 IC693CPU311Y General Electric Fanuc 90-30 IC693CPU350 General Electric Fanuc 90-30 IC693CPU352 General Electric Fanuc 90-30 IC693CPU360 General Electric Fanuc 90-30 IC693CPU363 General Electric Multilin 469 General Electric Multilin 750P5G555HIA20R General Electric Multilin SR489-P5-HI-A20 General Electric Multilin SR74555HI485 General Electric PACSystems RX3i General Electric PQMII PQMII General Electric RRTD RRTD General Electric Rx3i PacSystem IC694MDL240 General Electric Rx3i PacSystem IC695ALG112 General Electric Smart Meter kV2c General Electric SR 745 General Electric SR 750 General Electric Versamax IC200CPUE05 Genicom 3850 Hach SC100 Hadax Series 6000 Heliodyne Delta-T Pro Honeywell HC900 Honeywell XL50-MMI Honeywell Excel 5000 Q7055A BNA- Honeywell Excel 5000 Q7750A-2003 Honeywell Excel 5000 XC5010 Honeywell Excel 5000 XCL5010 Honeywell Excel 5000 XL100 Honeywell Excel 5000 XL100C Honeywell Excel 5000 XL20 Honeywell Excel 5000 XL50 Honeywell Excel 5000 XL5010 Honeywell Excel 5000 XL5010C Honeywell Excel 5000 XL50-MMI Honeywell Excel 5000 XL80 Honeywell Excel 5000 XLC50 Honeywell Excel 5000 XLC5010 Honeywell Excel 5000 XLC50-MMI Honeywell Excel 5000 XLC8010 Honeywell Excel 5000 XLC8010A HP HP 700/43 HP 8100 ELITE HP Color LaserJet 4500 HP Color LaserJet CP2025 HP Deskjet 6122 HP InkJet BC354A HP Jetdirect 170x J3258B HP LaserJet HP LaserJet 02461A HP LaserJet 4 HP LaserJet 4600n HP LaserJet 4MV HP LaserJet 5 C3916A HP LaserJet 5200tn HP LaserJet C3980A HP LaserJet CB94A HP LaserJet CP2025 HP LaserJet CP2025DN HP LaserJet CP5225DN HP LaserJet P1102W HP LaserJet P2015 HP LaserJet P4014dn HP OfficeJet 7000 E809a HP Officejet CM755A/8500A HP StorageWorks Tape Array 5300 HSQ Technology HSQ Technology 22501 HSQ Technology 86004862 HSQ Technology 8600-4862 HSQ Technology 8600-6135L HSQ Technology 8602 HSQ Technology 8602-080 HSQ Technology 8602-080A Rev E HSQ Technology 8602-RTU-080-A Rev E HSQ Technology HSQ9588T HSQ Technology V86VR-R030 iEi Technology AFOLUX LX AFL-12A Infinias Intelli-M eIDC Invensys Invensys I/A Series FCM 10E Invensys I/A Series UNC-520-2 ITRON IX100X Johnson Controls Johnson Controls Facility Explorer FX-PCG2611 Johnson Controls M Series MS-N30 Supervisory Controller Kiltrtech Embedded Field Controllers SX-CPU/RS-485 190715 Koyo DL205 Koyo DL206 Koyo DL207 Koyo DL250 CPU Landis & Staefa Integral MS2000 NRK16-NICO Landis & Staefa Integral RSA NRK16/A Lantronix Lantronix Universal Device Server UDS100 Lexmark Optra E312L LG V-NET PQNFB17B0 Liebert StieLink 12 Liebert StieLink 4 LOYTEC Electronics LINX LINX-101 LOYTEC Electronics L-VIS LVIS-3E100 LOYTEC Electronics L-VIS ME215 Maple Systems OIT3175 Maple Systems OIT3250-B00 Maple Systems PC217B Mcquay H62PY McQuay Maverick I OM 1077 MCS MCS-R010 MechoShade Systems SunDialer I-Con Meidensha ADC5000 Meidensha T01E-E01A Meidensha T01E-E01A-A Meidensha Uniseque RC500 MGE UPS SYS UPS 1500 MGE UPS SYS UPS 800 Mitsubishi Mitsubishi AG-150A Mitsubishi MP-22-AF Mitsubishi MP-22-AR Mitsubishi MP-22-CB Mitsubishi CITY MULTI BAC-HD150 Mitsubishi CITY MULTI GB-50ADA Mitsubishi MELSEC Q63P Mitsubishi Q Series FX2N Modicon Micro Modicon Momentum 170ADM39030 Modicon Quantum Automation Series 140CPU113 MODICON TSX Quantum Modicon TSX Series TSX3705028 Modicon TSX TSX3705028 Motion Control Engineering Motion Control Engineering 24-10-0012 Motorola MOSCAD-L Motorola SCADA Systems ACE3600 Moxa MGate IMC-101-M-SC Nalco Switch 2226 3D Trasar NETGEAR ReadyNAS 3200 NETGEAR ReadyNAS Pro NOVAR NL INC B541200039 NovaTech Orion5r Obvius Holdings AcquiSuite A8812 Odessa Engineering DiaLog Plug Okidata MicroLine 321 Turbo Okidata MICROLINE ML420 OMNTEC OEL8000II OEL8000IIP Opto 22 Opto Brian Panasonic BB-HCM531 Panasonic GN 15 Panasonic i-Pro WV-NP244 Panasonic i-Pro WV-NS202A Panasonic i-Pro WV-NW964 Patton Copper Link 2156 Perle IOLAN SCS PML ION7350 PML PowerLogic ION7300 PML PowerLogic ION7330 PML PowerLogic ION7350 PML PowerLogic ION7500 PML PowerLogic ION7550 PML PowerLogic ION7600 PML PowerLogic ION7650 PML PowerLogic ION7700 PML PowerLogic ION8600 Pneu-Logic 10A22646 Pneu-Logic PL4000 DCM Powerlynx OEM Preferred Instruments PCC-III Preferred Instruments PCC-III-0000 Preferred Instruments PCC-III-F000 Preferred Instruments PCC-III-FZ00 Pro-Face GP577R-TC11-OY ProSoft MVI46-MNET Qualitrol ITM 509 ITM RACO VERBATIM DFP RACO VERBATIM SFP Raritan CompuSwitch CS4R Raritan Dominion KX II 216 Raritan Dominion KX II DKX2-216 Raritan Dominion KX II DKX2-432 Red Lion G308 Red Lion G310C Ricoh Aficio MP C2050 RUGID RUG6D RUGID RUG7D RUGID RUG9 RUGID RUG9B RUGID RUG9D Sanyo Denki SANUPS A11H Schneider Electric 170INT11000 Schneider Electric 171CCS76000 Schneider Electric HMIPSCIDE03 Schneider Electric Modicon M340 Schneider Electric I/A Series MNB-1000 Schneider Electric Magelis XBT GT 2330 Schneider Electric Momentum Processor 171CCC96020 Schneider Electric Momentum Processor 171CCS78000 Schneider Electric Powerlogic CM2000 Schneider Electric Powerlogic CM3000 Schneider Electric Powerlogic CM4000 Schneider Electric Powerlogic ECC Schneider Electric Powerlogic EGX 100 Schneider Electric Powerlogic EGX 200 Schneider Electric Powerlogic EGX 400 Schneider Electric Powerlogic enercept Meter Schneider Electric Powerlogic Energy Meter Schneider Electric PowerLogic ION7330 Schneider Electric PowerLogic ION7350 Schneider Electric PowerLogic ION7500 Schneider Electric PowerLogic ION7600 Schneider Electric PowerLogic ION7650 Schneider Electric PowerLogic ION8300 Schneider Electric PowerLogic PM710 Schneider Electric PowerLogic PM850 Schneider Electric Powerlogic Power Meter Schneider Electric TSX Momentum Schneider Electric TSX Momentum 171CCC9803 Schneider Electric TSX Quantum 170-ENT-110-00 Schneider Electric Xenta 280 282 Schneider Electric Xenta 300 301 Schweitzer Engineering Laboratories SEL-2020 Schweitzer Engineering Laboratories SEL-2032 Schweitzer Engineering Laboratories SEL-2447 Schweitzer Engineering Laboratories SEL-2448 Schweitzer Engineering Laboratories SEL-2449 Schweitzer Engineering Laboratories SEL-2516 Schweitzer Engineering Laboratories SEL-3530 Schweitzer Engineering Siemens Apogee 545-7 Siemens Apogee Power mvec Series 200 Siemens Apogee Power mvec System 600 Siemens Apogee PAC100 Siemens Apogee PAC24 Siemens Design PA PAC30 Siemens Design PA PAC32 Siemens Design RCL PAR11 Siemens Design RCL PAR12 Siemens HydroRanger 200 7ML50342AA01 Siemens SIMATIC S7-1200 Silex SX-3000GB Solar OEM STULZ Air Technologies Fieldserver DCC828 Symmetricom bc635PCI Symmetricom TrueTime 820-202 Symmetricom TrueTime XL-DC TAC Xenta 302/N/P Teletrol eBuilding Concentrator Telvent Smart Grid Solution SAGE 2300 Telvent Smart Grid Solution SAGE 2400 Terminator T1H-EBC100 Terminator T1H-EBC101 Toshiba OIS-DS52 Total Control Products QuickPanel Trane EMTF000AAC02100 Trane OEM Trane TNS1 Trane UC800 Trane Tracer CH530 Trane Tracer EX2 Trane Tracer MP503 Trane Tracer MP580/581 Trane Tracer MP581 Trane Tracer SC Trane Tracer Summit BCU Transformative Wave Technologies eIQ nSITE 600 Trend Control Systems IQ250 Trend Control Systems NXNI Trend Control Systems XCITE Trend Control Systems IQ2 IQ204 Trend Control Systems IQ21x IQ210 Trend Control Systems IQ21x IQ233 Trend Control Systems IQ21x IQL-SDK Trend Control Systems IQ22x IQ220 Trend Control Systems IQ24X IQ241 Trend Control Systems IQ25X IQ250 Trend Control Systems IQ25X IQ251 Trend Control Systems IQ3s EINC Tridium JACE-403 Trijay Triplite AVR900U USRobotics Uticor 100G-PL08S2R0 Viconics VT7600 WAGO 750-841 Walchem WMT8130-2LNNN Westinghouse WEstation Woodward 505 9907-163 Woodward LinkNet 9905-966 Woodward LinkNet 9905-970 Woodward LinkNet 9905-971 Yokogawa AIP578 Yokogawa AIP578 Style S1 Yokogawa CP40110-S Yokogawa CP703 Yokogawa DA100-11-1M Yokogawa DA100-22-1M Yokogawa DC100-21-11-1M

Difference Between DoD & Commercial Products = None!

UNCLASSIFIED

May



2018

Sept

NATIONAL CYBER STRATEGY

of the United States of America

SEPTEMBER 2018



Sept



U.S. DEPARTMENT OF ENERGY | OFFICE OF ENERGY DELIVERY & ENERGY RELIABILITY



Mar



U.S. DEPARTMENT OF HOMELAND SECURITY

CYBERSECURITY STRATEGY

May 15, 2018

May



DoD Cyber Strategy Lines of Effort

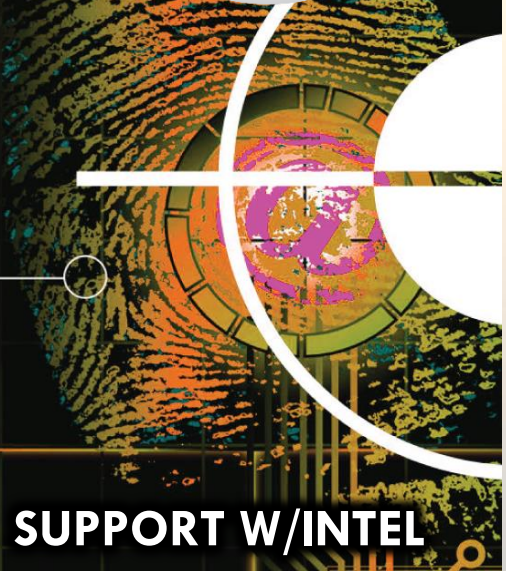


1



**EMPOWER TIMELY
INTEGRATED CYBER OPS**

2

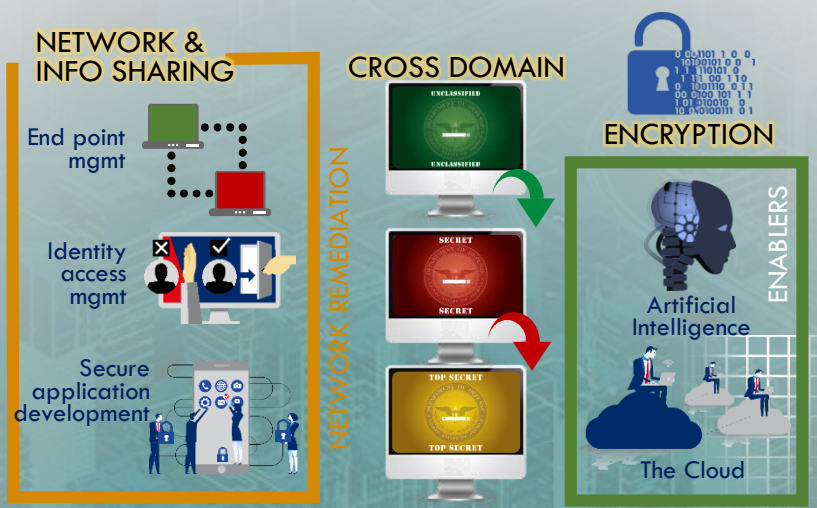


SUPPORT W/INTEL

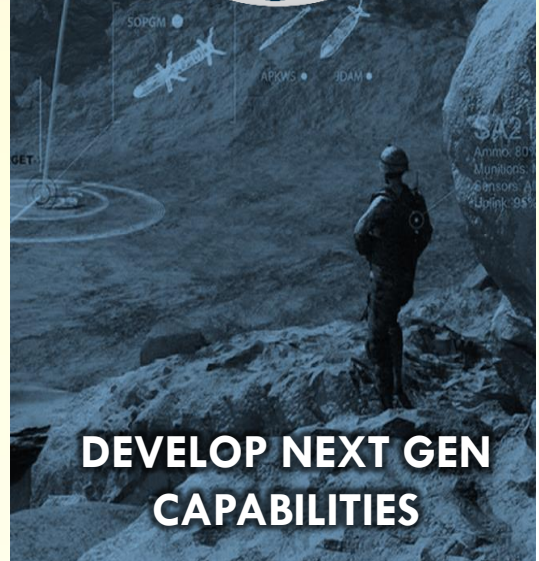
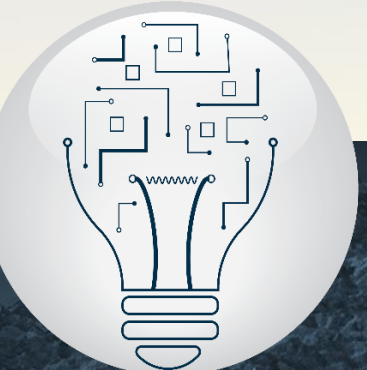
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**TRANSFORM
NETWORK
AND SYSTEM
ARCHITECTURE**

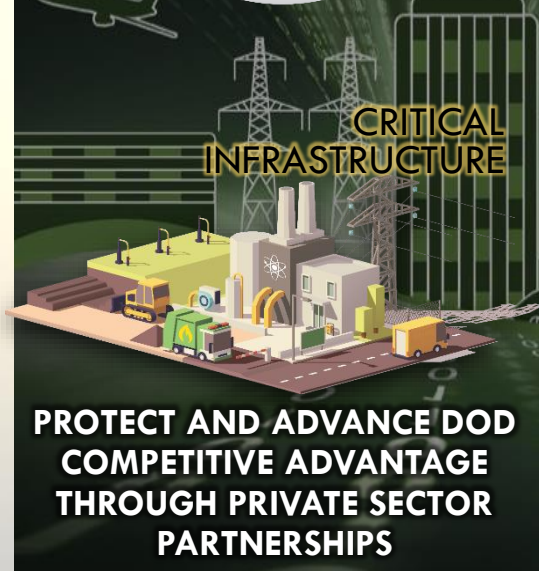


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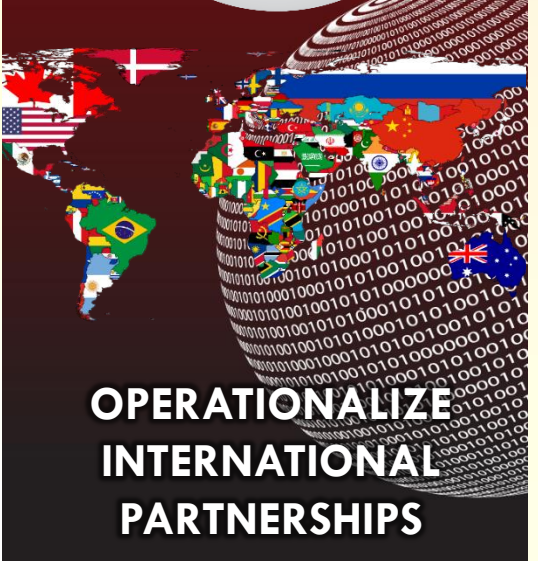


**DEVELOP NEXT GEN
CAPABILITIES**

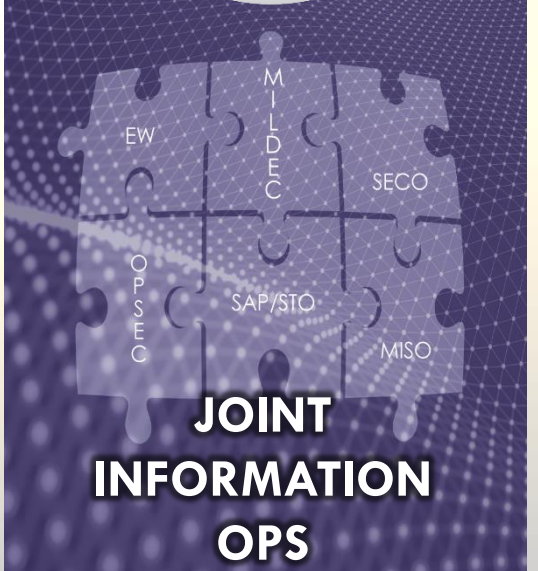
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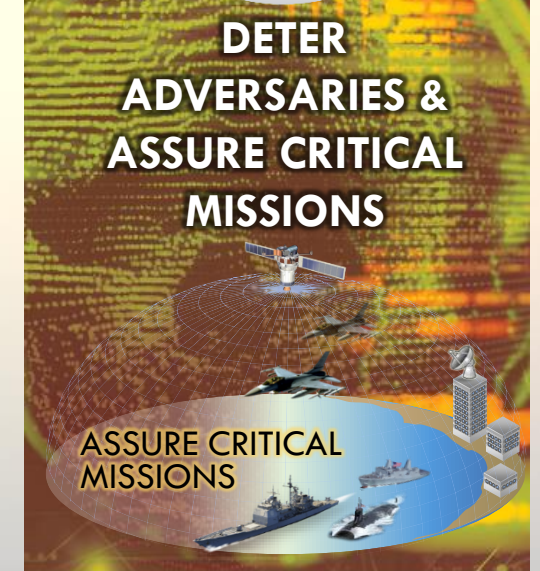
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8

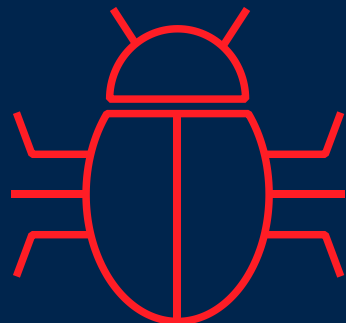


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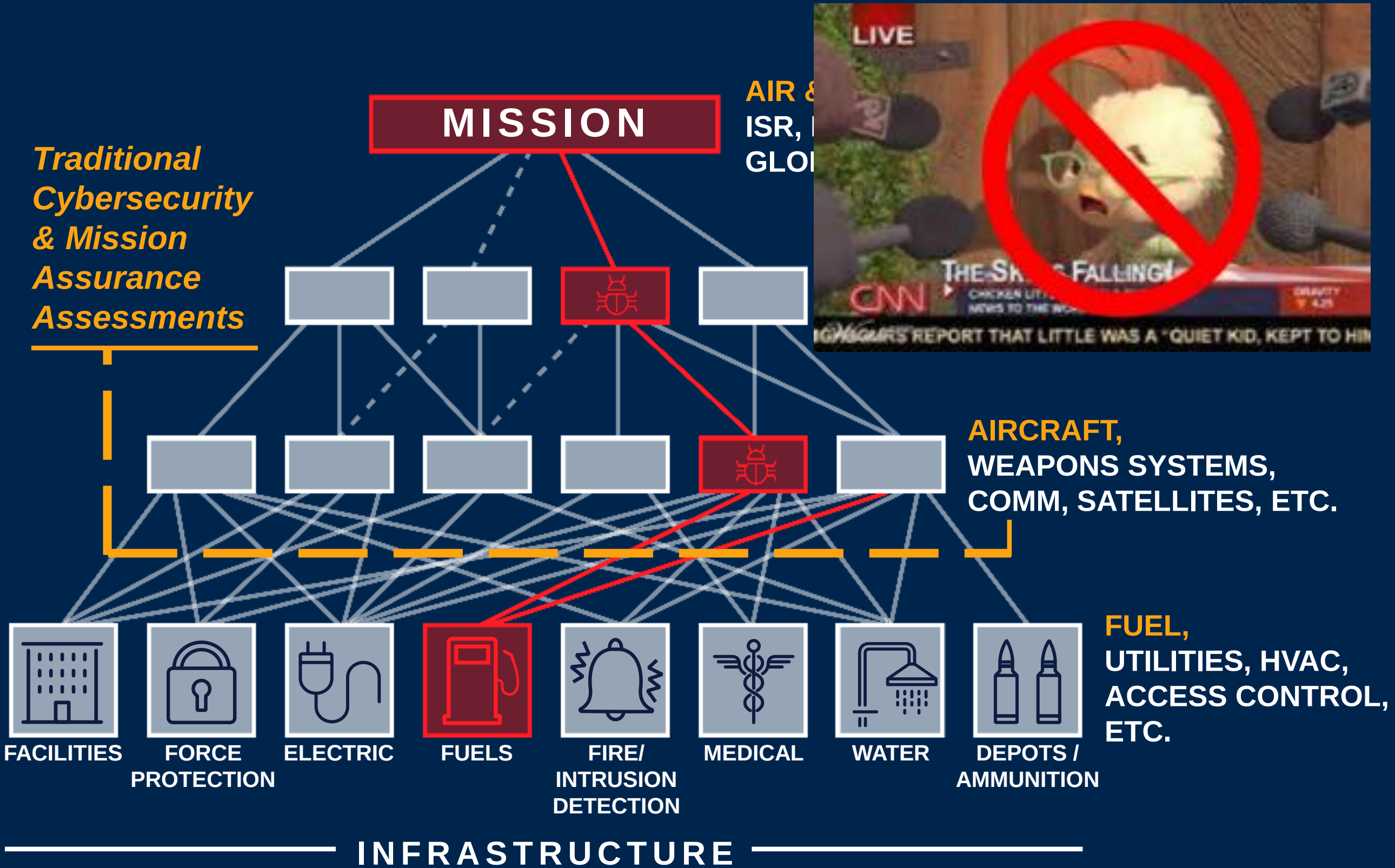


INFRASTRUCTURE VULNERABILITIES DISRUPT MISSIONS

NOTIONAL
MISSION THREAD
CRITICAL PATH



An adversary could disrupt, degrade, or deny a mission by targeting the foundational assets that underpin the system of systems



Who to Best Defend Control Systems: IT or OT SMEs?

Wetware Error

What It is: Report cites 52% of all industrial cyber incidents last year were caused by employee error

History: Kaspersky Labs' 'State of Industrial Cybersecurity 2019 Report' collected data from 282 firms with cyber-physical (OT) systems

Impacted Sectors:

- Power Infrastructure
- Oil and Gas
- Chemical
- Transportation & Logistics
- Aerospace

Key Issues:

**Lack of trained OT
Cyber specialists**

Safety Impacts:

**All infrastructure
Public Safety**



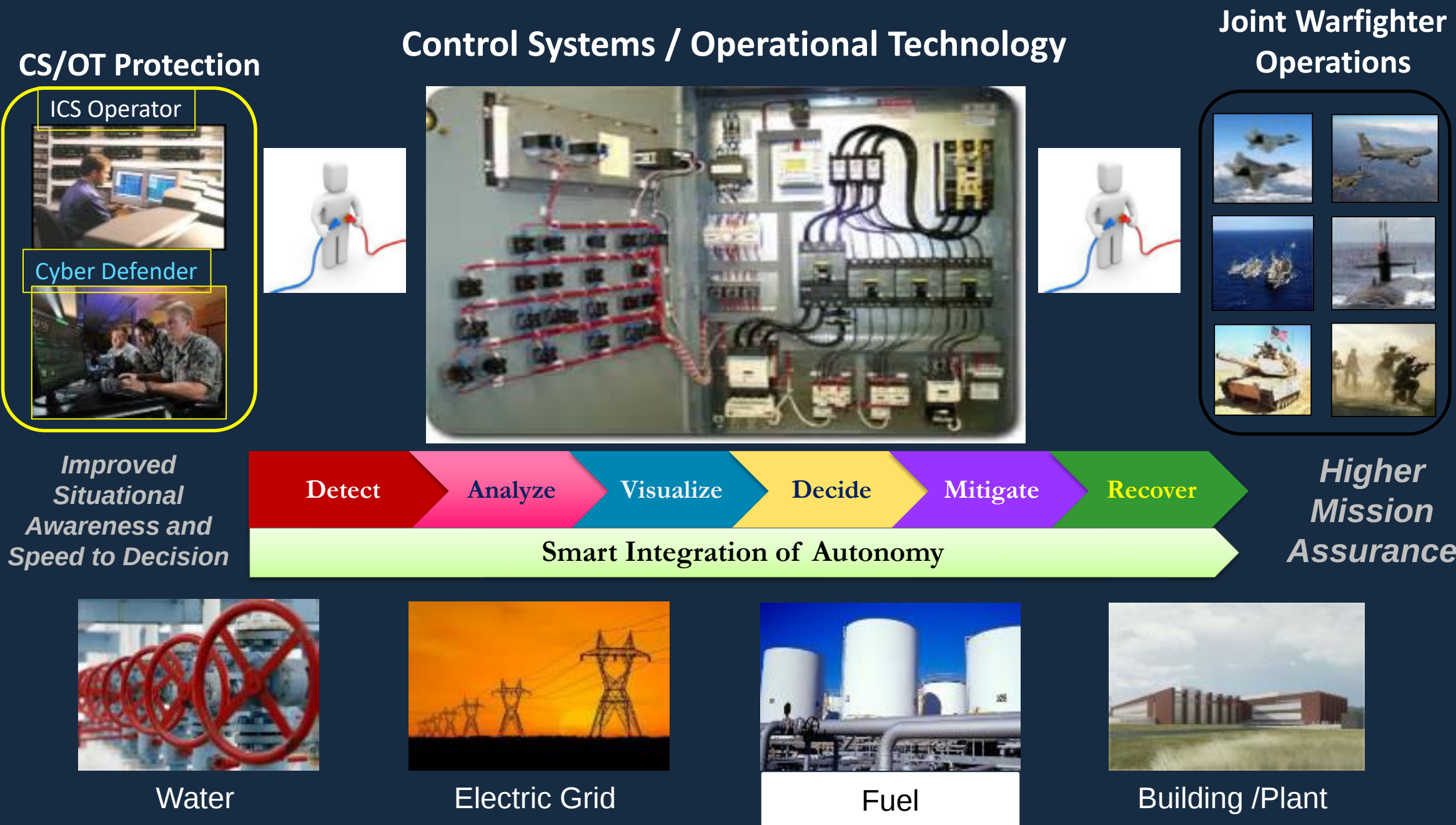
Exec Order on America’s Cybersecurity Workforce (May’19):
“Cyber-Physical Systems (CPS) for which safety & reliability depend on
secure control systems...”

- Survey to identify & evaluate skill & training gaps in Federal and non-Federal cybersecurity personnel
 - Critical Infrastructure Sectors
 - Defense Critical Infrastructure
 - DoD Platform Information Technologies (PIT)
 - Collaboratively develop cyber career pathways & competency models

Specific questions to identify:
-Existing skill gaps in CPS workforce
-Underlying cause of skill gaps
-Recommendations to address gaps

Cyber-physical Workforce Survey				Federal, Non-Federal, or Both?:		
24-Jun-19				Sector:		
				Organization/Service/Agency:		
INSTRUCTIONS:				POC Name:		
1. Complete your organizational information starting in cell E1.				POC Phone Number:		
2. Complete survey questions 1-7 in columns E-K for each of the Competency Areas.				POC Email:		
3. Provide additional comments in column L.						
4. If the gap applies, but you are unsure of the answer to the survey questions, please indicate with "?"						
The goal is to derive as much information as possible with this survey - Thank you for your thoughtful support!						
Competency and Gap References (based on FBPTA 2018 Update and JHU APL Report for CS Skills)				Survey Question 1	Survey Question 2	Survey Question 3
Competency Area	Control System Competency	Competency Gap	Training Opportunities	Does this competency gap exist for CPS in your footprint? (1=Not at All; 2=Somewhat; 3=Moderately; 4=Very Much; 5=Completely)	List additional competency gaps related to this competency associated with CPS in your footprint.	Is the competency gap due to an issue other than a training gap? If so, describe issue (e.g., personnel shortfall due to hiring difficulties, not enough allowed positions).
	Demonstrate familiarity with cyber-physical systems, subsystems, sensors and other components.	Maintain configuration management of CS	ICS-CERT: Intro to Control Systems Cybersecurity			
		Maintain awareness of vulnerabilities to older systems (due to age)	NPS: CS Lab, CISR Lab, CS4558 Network Traffic Analysis			
		Ensure workforce training and procedures for operation of critical equipment	USMA: Network Lab			
	Demonstrate familiarity with cybersecurity assessment of CPS.	Maintain network awareness	ICS - CERT: Intermediate Cybersecurity for Industrial Controls Systems, NPS: CS4678 Advanced Cyber Vulnerability Assessment, CS4679			
		Provide institutional knowledge of system purpose and architecture	Advances in Cyber Security Operations, Network Penetration Testing and Computer Networks			
		Provide for identification of new vulnerabilities	CS 420 Data Communications			
			ICS-CERT: ICS Cybersecurity Scada hacker: General ICS and Cybersecurity Training			
			NPS: CS Lab, CISR Lab, CS4558 Network Traffic			

More Situational Awareness of ICS MOSAICS



Protect Critical Infrastructure CS / OT from Non-Kinetic Attacks

Control System Tested Product List (CS TPL)

 TECHNOLOGY	Risk Reduction
	Validated CS Security
	Reliable, Interoperable Systems
 PROCESSES	Streamlined Approval Processes
	Cost Savings/Avoidance
	Ease of Specification/Acquisition Burden
	Centralized Support of Cybersecurity Initiatives
 PEOPLE	Mission Assurance Support
	Dedicated, Trained CS Testing Workforce
	Increased Industry Collaboration
Eased Burden of CS Owners	

Validated DoD Control System
Cybersecurity

Secure DoD
Control
Systems

CS
Acquisition
Confidence

Cost Savings
/ Avoidance

Support of
Federal, DoD
Initiatives

Expected Operational Value

- Provides list of vetted/tested/approved CS products
- Testing documentation may be reused (Reciprocity and Reuse)
- Reduces Assessor burdens with standard, repeated process
- Fulfills 3rd-Party assessment rqmt
- Facilitates CS acquisition
- Streamlines Cyber testing and RMF authorization processes
- Removes redundancy of multi-site evaluation of same system

How Much Time & Resources Could be Saved with an CS TPL?

Study: Understanding Potential Effects & Consequence of Cyber Vulnerabilities on Installation FRCS

Description

- Events have not yet had a significant impact
- Demo may drive cultural & behavioral changes
- Develop *a plan for a pilot demonstration*
- Provide underpinnings for the design, planning, execution, and assessment of a major, likely multi-year, demonstration leveraging multiple agencies, laboratories, FFRDCs, etc.
- Leverage previous exercise and wargame execution deliverables
- Effort begins Sept'19; complete plan NLT Mar'20

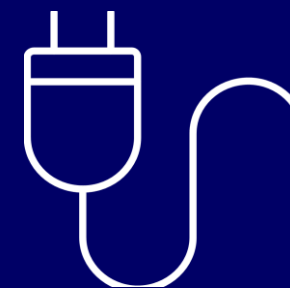


***Cyber Risk to the Department's Installation Infrastructure is Unknown;
Focused Cyber Assessments and Mitigations Needed***

Artificial Intelligence, Machine Learning, Quantum Computing, etc.



All Need:



WHAT IS YOUR CYBER 'RISK' SCORE?

This FICO-score-like rating measures an organization's **chance of experiencing a data breach**, based on measurements tied to the company's public-facing assets. Your score gives alerts for cyber or physical threats to supply chains, allowing intelligence to evaluate critical vendors. The lower your score, the higher your risk.



KEY RISK INDICATORS

- Health & hygiene of IT systems
- Network infrastructure
- Software & services

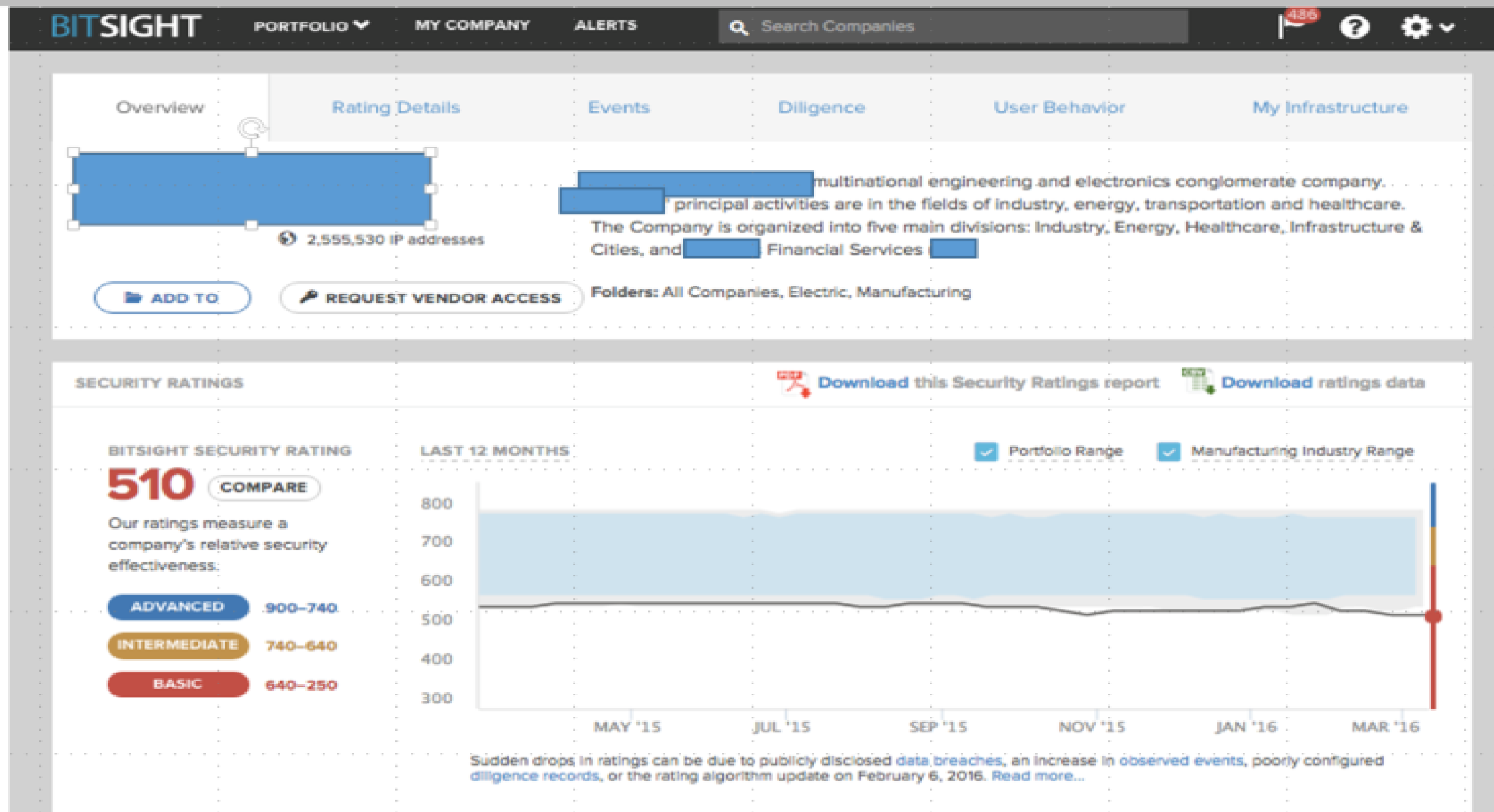


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*Why Should Govt
Contract Decisions /
Tax Dollars Fund
Poor Cyber
Performance?*

BitSight Rating Interface



File Sharing category distribution

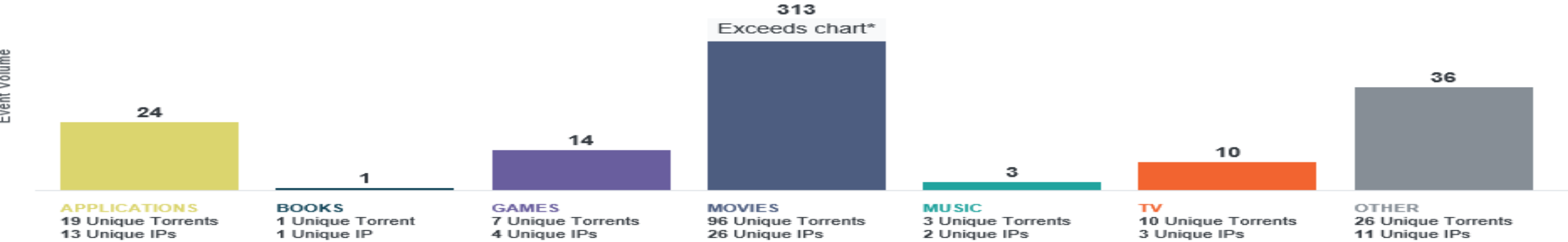
File Sharing events indicate the number of times in the past 60 days that file sharing activity occurred, sorted by torrent category. Each event represents one IP address sharing one torrent per day.



in the **bottom 10%** of all companies

File Sharing – 401 events over the past 60 days
40 unique IPs observed

*Data which exceeds the chart is on a scale too large to display accurately with other categories in the space provided and has been shortened to fit.



From to

Filter Results:

☐ Only Impacts Grade

Filter By Tags

	File Sharing Category	Start	End	Impacts Grade	Days	Whitelisted
☐	Applications	03-29-2018	03-29-2018		1	No
☐	Music	03-28-2018	03-28-2018		1	No
☐	Movies	03-27-2018	03-27-2018		1	No



Cybersecurity Maturity Model Certification (CMMC)



- DoD is working with John Hopkins University Applied Physics Laboratory (APL) and Carnegie Mellon University Software Engineering Institute (SEI) to review and combine various cybersecurity standards into **one unified standard for cybersecurity**.
- New standard and maturity model will be named **Cybersecurity Maturity Model Certification (CMMC)**
- Levels will range from basic hygiene to “State-of-the-Art” and will also capture both security control and the institutionalization of processes that enhance cybersecurity for DIB companies.
- Required CMMC level (notionally between 1 – 5) for a specific contract will be contained in the RFP sections L & M, and will be a “go/no-go decision”.
- Must be semi-automated and, more importantly, cost effective enough so that Small Businesses can achieve the minimum CMMC level of 1.
- Model will be agile enough to adapt to emerging and evolving cyber threats to the DIB sector. A neutral 3rd party will maintain the standard for the Department.
- Will include a center for cybersecurity education and training.
- Will include the development and deployment of a tool that 3rd party cybersecurity certifiers will use to conduct audits, collect metrics, and inform risk mitigation for the entire supply chain.

DIB Cybersecurity Posture

Hypothesis:
< 1% of DIB
companies

•State-of-the-Art

- Maneuver, Automation, SecDevOps

•Nation-state

- Resourcing: Infosec dedicated full-time staff ≥ 4 , Infosec $\geq 10\%$ IT budget
- Sophisticated TTPs: Hunt, white listing, limited Internet access, air-gapped segments
- Culture: Operations-impacting InfoSec authority, staff training and test

•Good cyber hygiene

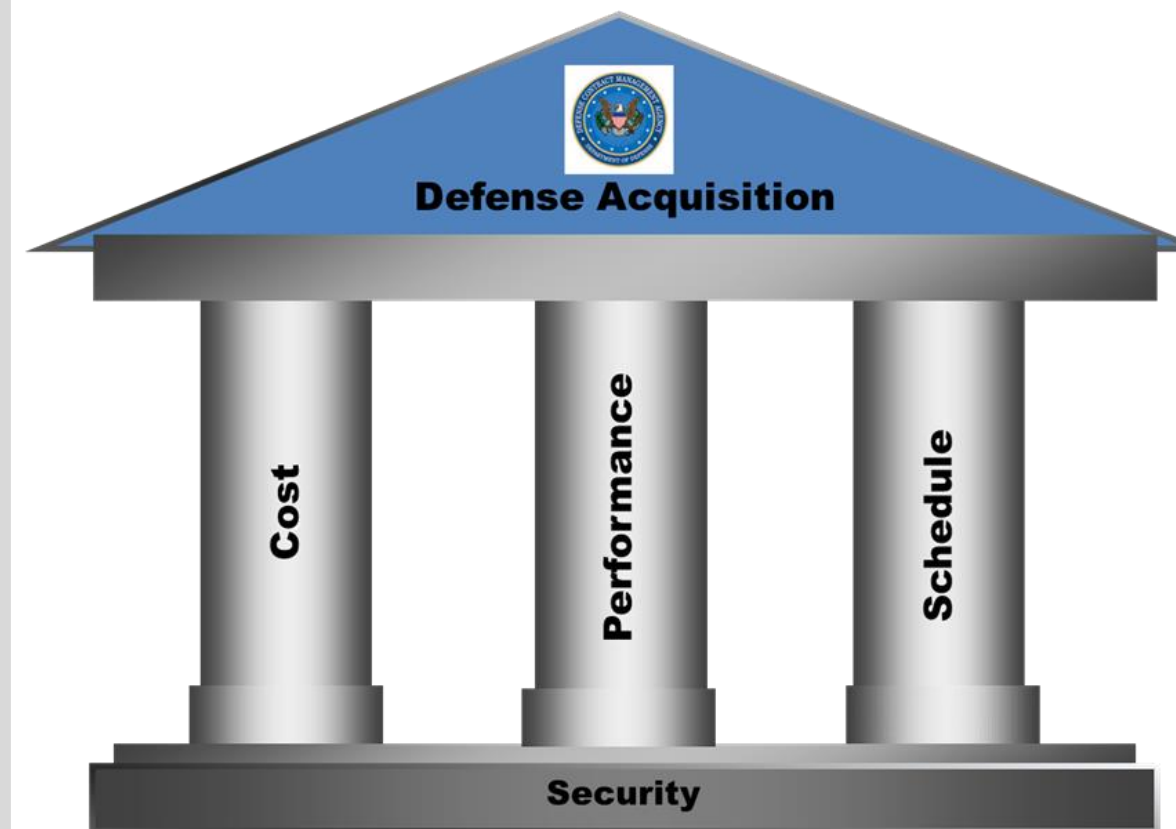
- NIST SP 800-171 compliant, etc.
- Consistently defends against Tier I-II attacks

•Ad hoc

- Inconsistent cyber hygiene practices
- Low-level attacks succeed consistently

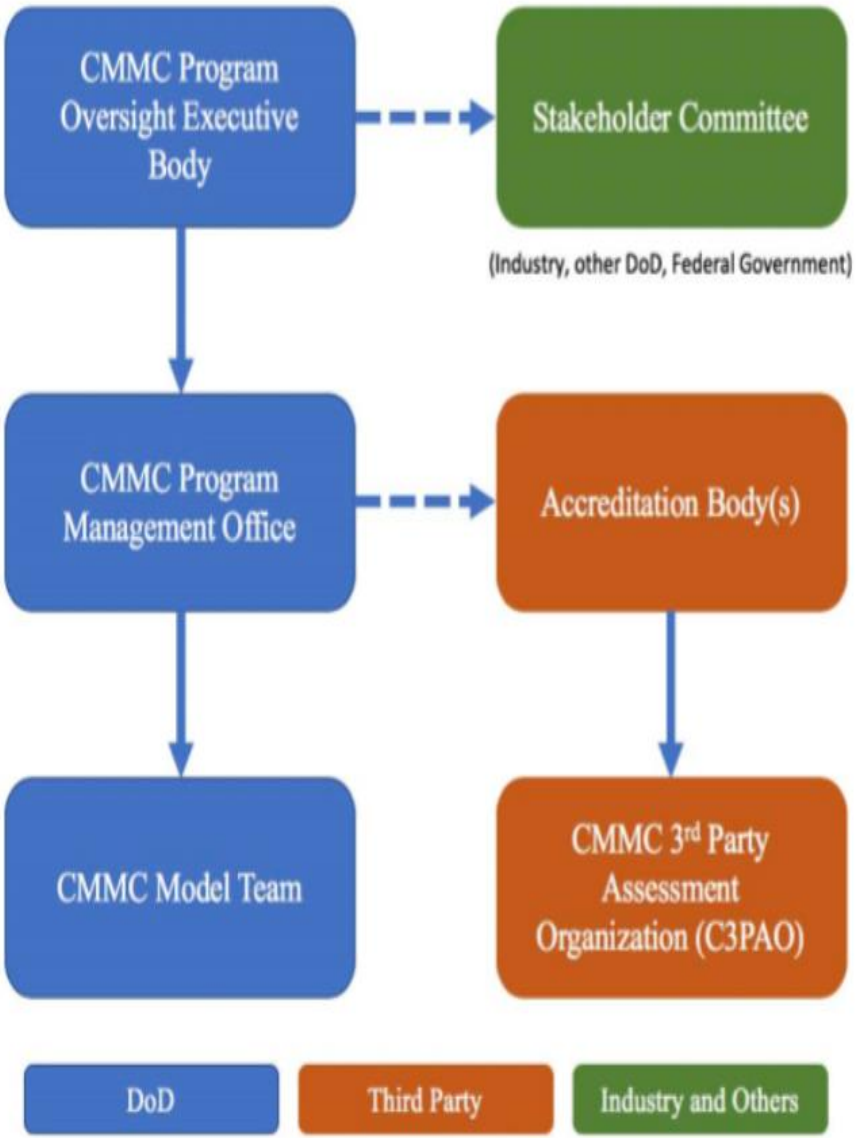
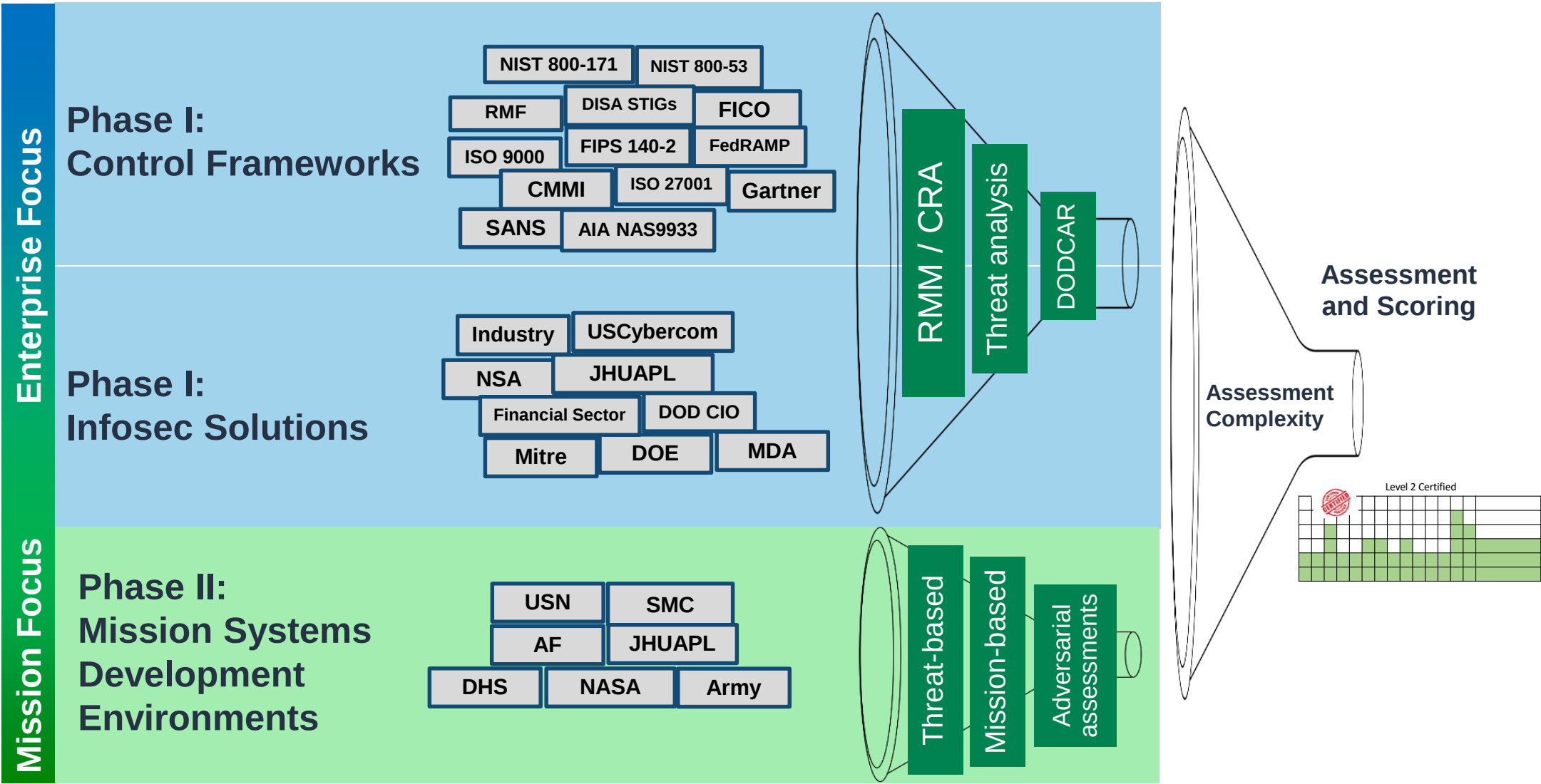
Vast majority
of
DIB
companies

Cost, Schedule, Performance
**ARE ONLY EFFECTIVE IN A
SECURE ENVIROMENT**





Notional CMMC Model Development

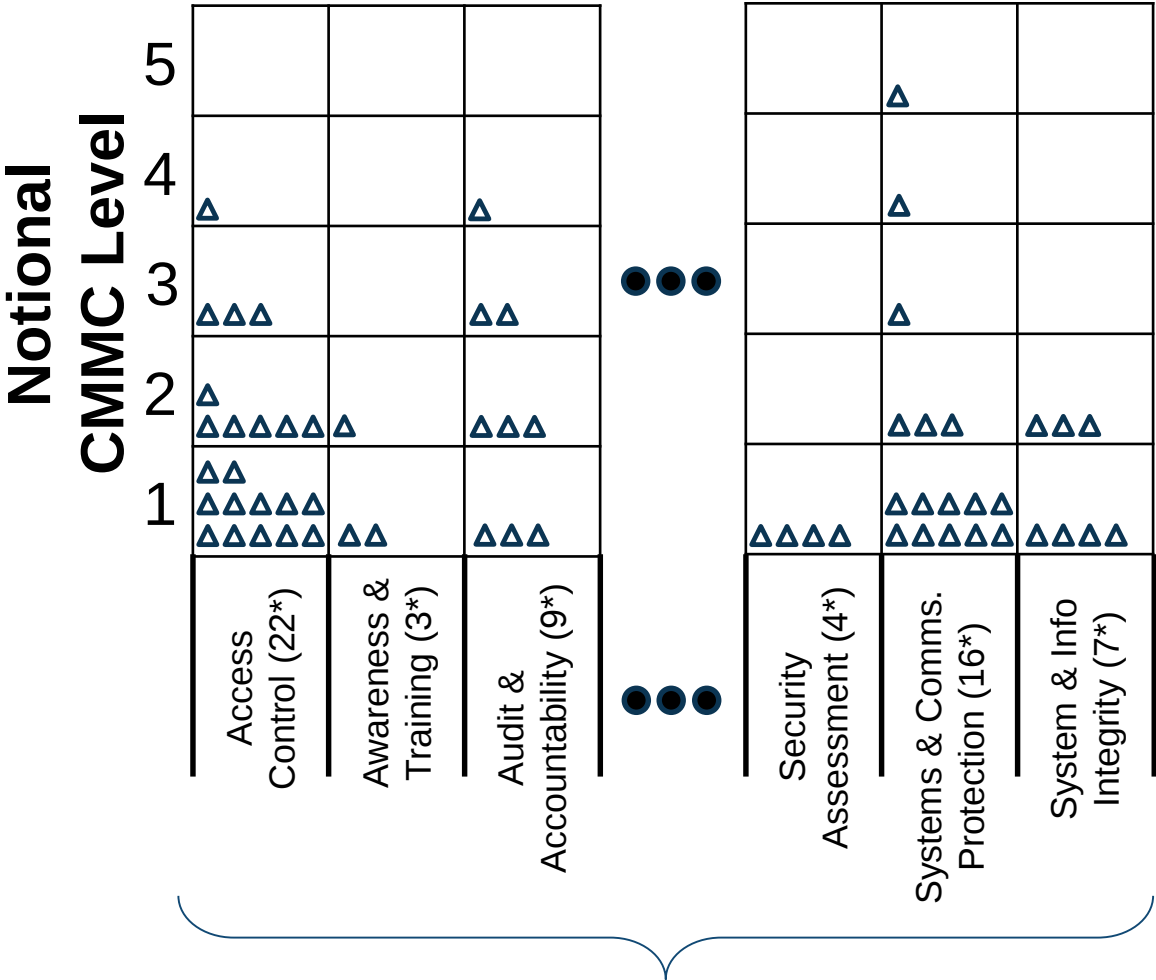


Maturity model must be dynamic and threat informed;
Assessments for Certification will be Conducted On-Site



Notional CMMC Model Components

Sophistication of Practices -- AND -- Institutionalization of Processes



All 14 Control Families

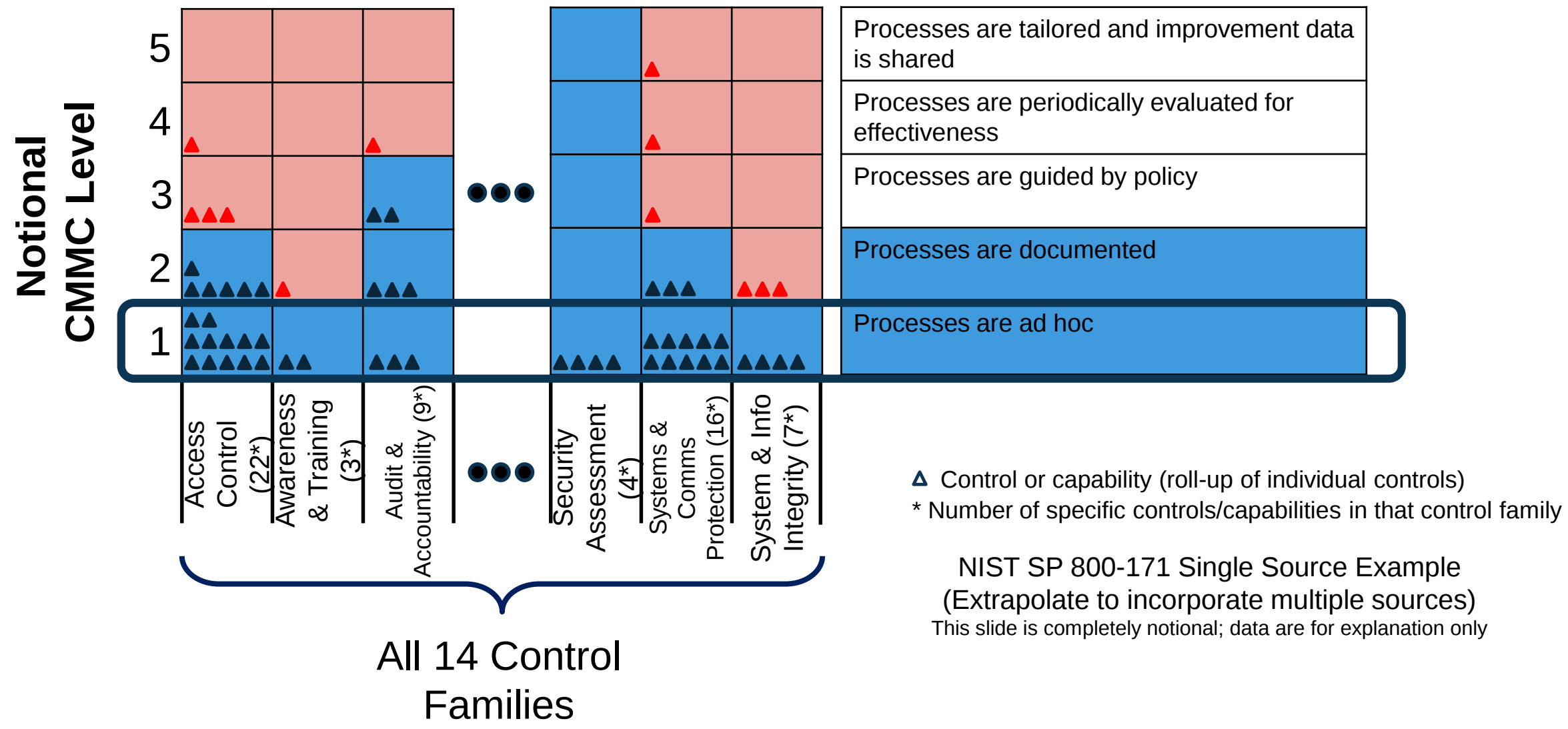
Processes are tailored and improvement data is shared	5
Practices are periodically evaluated for effectiveness	4
Processes are guided by policy	3
Processes are documented	2
Processes are ad hoc	1

▲ Control or capability (roll-up of individual controls)
* Number of specific controls/capabilities in that control family

NIST SP 800-171 Single Source Example
(Extrapolate to incorporate multiple sources)
This slide is completely notional; data are for explanation only



Notional CMMC Level 1





CMMC Levels

CMMC Level 1 – Basic Cyber Hygiene has 17 security controls

CMMC Level 2 – Intermediate Cyber Hygiene has 46 additional controls

CMMC Level 3 – Good Cyber Hygiene has 47 controls in addition to completing the first 2 levels

<equivalent to the 110 controls currently found in NIST SP 800-171>

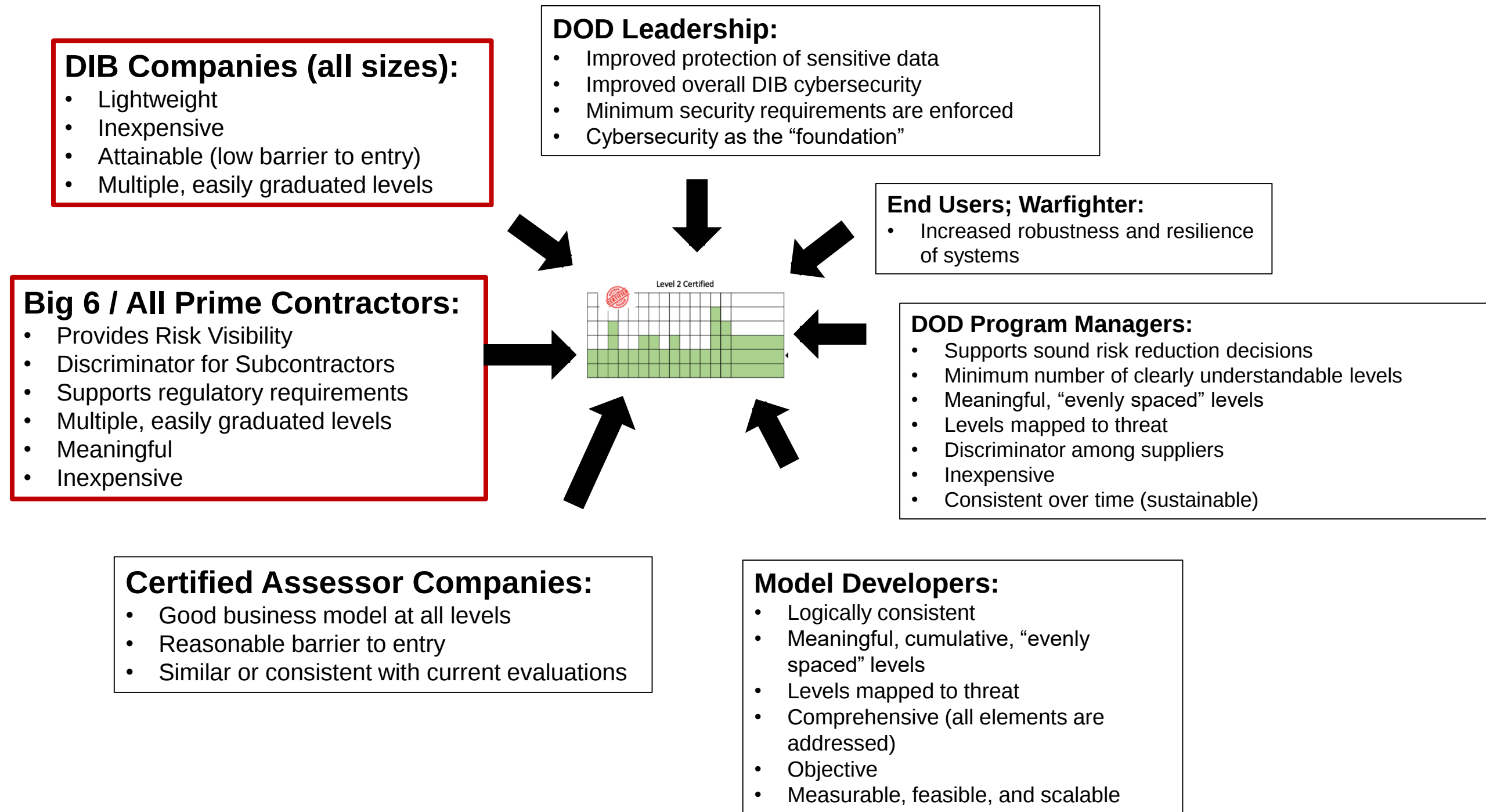
CMMC Level 4 – Proactive will have +26 security controls in addition to 110 found in NIST 800-171

CMMC Level 5 – Advanced/Progressive/ State-of-the-Art has +30 in addition to 110 in NIST 800-171

CMMC will be semi-automated and, more importantly, cost-effective enough so that Small Businesses can achieve the minimum CMMC level of 1, while larger primes will need to certify at a level 3

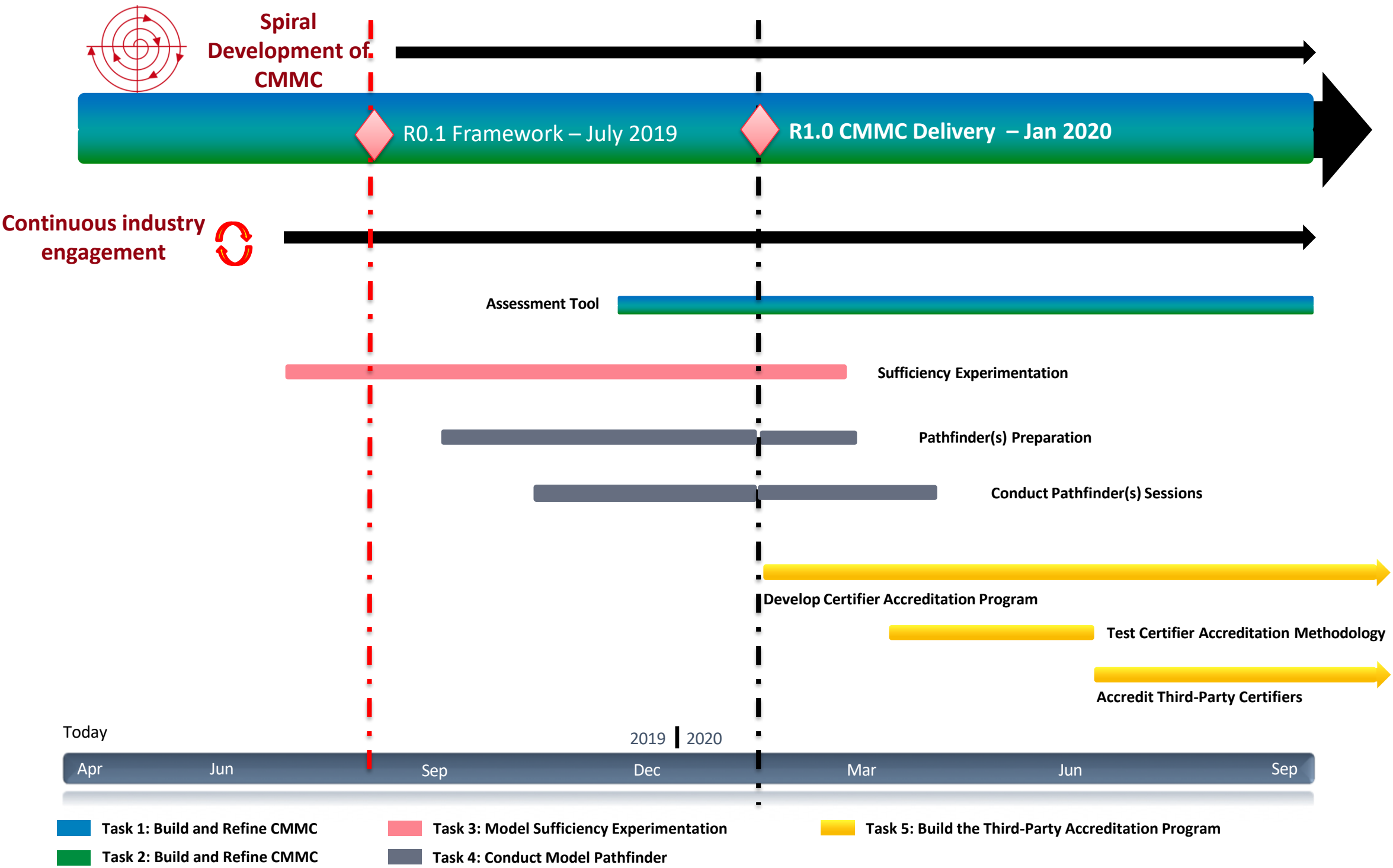


Preliminary Stakeholder Perspectives on CMMC





Notional CMMC Timeline





Industry Days / Listening Sessions

Questions can be sent to: osd.cmmc@mail.mil <https://youtu.be/FZbKauPJalo>

<https://www.acq.osd.mil/cmmc/docs/cmmc-draft-model-30aug19.pdf>

Hosting 12 collaborative sessions:

Washington D.C. (NDIA)	July 9
Online Webinar (PSC)	July 17
San Diego, CA	July 25-26
Washington D.C. (ITI)	July 29
Washington, D.C. (NIST)	August 8
Novi, Michigan (NDIA)	August 15
Tampa, FL	August 21
Augusta, GA	August 23
Huntsville, AL	August 27
Washington D.C.	September 5
Colorado Springs, CO	September 19
Burlington, MA	October 10
Arlington, VA	October 16
Scottsdale, AZ	October 21-23
Tampa, FL	November 13

DoD plans to release the draft for CMMC by January. Expect to see the new standard in RFI's in June 2020 and in RFP's by Fall of 2020. Contractors are expected to start achieving their certification between the January draft and the June release

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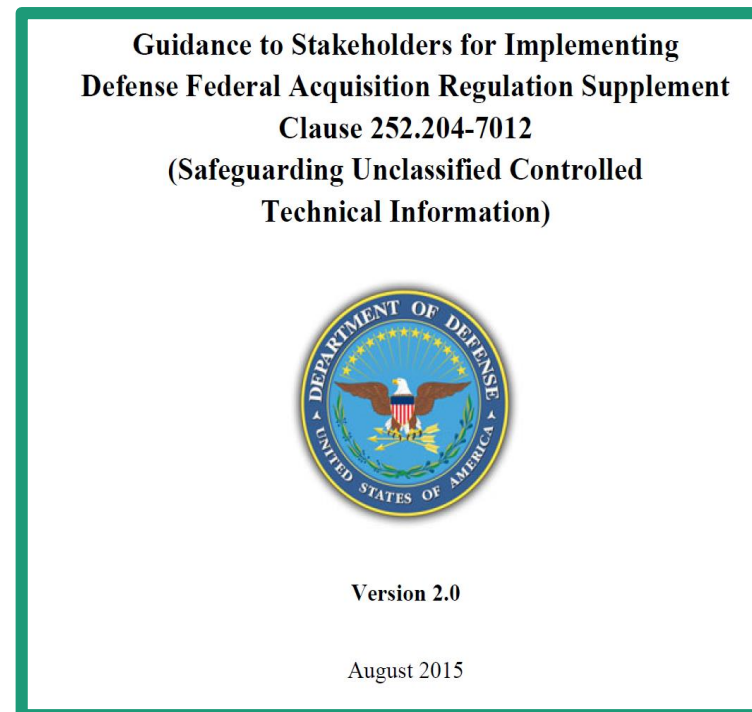


- Adversaries are coming and may already be on your network / devices
- Know your / vendor systems & devices connectedness
- Verify vulnerabilities & risk w/ Implement basic cyber hygiene, best practices
- Report Suspicious System / Device Behavior & Incidents

DoD Resource Site

- **WEBSITE = Strategic Environmental Research and Development Program (SERDP) and Environmental Security Technology Certification Program (ESTCP)**
- <https://serdp-estcp.org/Tools-and-Training/Installation-Energy-and-Water/Cybersecurity>

- **Policies / Tools**
- **Contract language**
- **Design & Commissioning**
- **Energy Project / 3rd party**
- **Protecting CUI**



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Great Place to START! Welcome Suggestions to Improve!