



RANSOMWARE IN OT ENVIRONMENT

SANKET BHASIN | TECHNOLOGY STRATEGIST



HISTORY OF RANSOMWARE

OPERATIONAL TECHNOLOGY CYBERSECURITY EXPERT PANEL FORUM 2023

BRIEF HISTORY OF RANSOMWARE



DECEMBER 1989 FLOPPY DISKS MAILED TO VICTIMS



20,000 SENT TO ATTENDEES OF THE WORLD HEALTH ORGANIZATION'S AIDS CONFERENCE IN STOCKHOLM



DEMANDED \$189 BE MAILED TO A PO BOX IN PANAMA



“AIDS TROJAN” AKA “PC CYBORG” RANSOMWARE

OPERATIONAL TECHNOLOGY CYBERSECURITY EXPERT PANEL FORUM 2023

BRIEF HISTORY OF RANSOMWARE



OPERATIONAL TECHNOLOGY CYBERSECURITY EXPERT PANEL FORUM 2023

AGENDA

- COLONIAL PIPELINE ATTACK
- OPERATIONAL TECHNOLOGY THREATS
- WHO IS CARBON SPIDER?
- WHAT NEXT?
- CALL TO ACTION

COLONIAL PIPELINE RANSOMWARE ATTACK

A photograph of a long, straight row of large-diameter industrial pipes, likely made of steel, extending from the foreground into a bright sunset or sunrise. The pipes are dark grey or black, and the background is a warm, orange-yellow gradient of the sky.

DID RANSOMWARE CAUSE A PIPELINE OUTAGE?

OPERATIONAL TECHNOLOGY CYBERSECURITY EXPERT PANEL FORUM 2023

WHAT IS THE COLONIAL PIPELINE?



LARGEST PIPELINE FOR REFINED OIL PRODUCTS IN THE UNITED STATES - 5,500 MILES (8,850 KM)



PROVIDES GASOLINE, HOME HEATING OIL, AVIATION FUEL AND OTHER REFINED PETROLEUM PRODUCTS TO THE SOUTH AND EASTERN UNITED STATES



CARRIES 3 MILLION BARRELS OF FUEL EACH DAY FROM TEXAS TO NEW YORK



OPERATED BY COLONIAL PIPELINE COMPANY, HEADQUARTERED IN ALPHARETTA, GEORGIA

OPERATIONAL TECHNOLOGY CYBERSECURITY EXPERT PANEL FORUM 2023

RANSOMWARE ATTACK & OPERATIONAL DISRUPTION



ON MAY 7, DISCOVERED A NETWORK INTRUSION
LEADING TO A RANSOMWARE ATTACK



COLONIAL ACTIVELY SHUT DOWN PARTS OF THE PIPELINE'S
OPERATION IN AN ATTEMPT TO CONTAIN THE THREAT



ATTRIBUTED TO CARBON SPIDER – DARKSIDE
RANSOMWARE RESPONSIBLE FOR THE ATTACK



COLONIAL PAID ADVERSARY APPROXIMATELY
\$5M (75BTC) RANSOM

OPERATIONAL TECHNOLOGY CYBERSECURITY EXPERT PANEL FORUM 2023

CARBON SPIDER ADVERSARY PROFILE



ACTIVE SINCE 2013 BUT EXPANDED THEIR TARGETING PROFILE IN DECEMBER 2015



IN 2016, PART OF THE GROUP SPLIT OFF TO FORM COBALT SPIDER TO FOCUS ON THE FINANCIAL SECTOR



PRIMARILY RELIES ON SPEAR PHISHING TO DELIVER THEIR CUSTOM HARPY BACKDOOR



STARTED OUT BY PRIMARILY TARGETING POINT-OF-SALE TERMINALS USING SUPERSOFT TO HARVEST CARD DATA



MONETIZED STOLEN CARD DATA BY SELLING ON THE CRIMINAL UNDERGROUND, SUCH AS JOKER'S STASH

OPERATIONAL TECHNOLOGY CYBERSECURITY EXPERT PANEL FORUM 2023

BIG GAME HUNTING OPERATIONS



APR 2020, STARTED BIG GAME HUNTING - INITIALLY PARTNERED W/PINCHY SPIDER USING REVIL



AUG 2020, DARKSIDE RANSOMWARE DISCOVERED IN AT LEAST TWO RANSOMWARE ATTACKS TARGETING NA



SEP 2020, RELEASED LINUX VARIANT TARGETING ESXI



NOV 2020, RELEASED RANSOMWARE-AS-A-SERVICE VARIANT AND ANNOUNCED AFFILIATE PROGRAM



MAY 2021, OSTENSIBLY CLOSED DARKSIDE OPERATIONS



**“OT IMPACT OR AN OT OUTAGE,
CAUSED BY AN IT ACTIVITY”**

OPERATIONAL TECHNOLOGY THREATS TO OT, ICS, & SCADA

OPERATIONAL TECHNOLOGY CYBERSECURITY EXPERT PANEL FORUM 2023

BIG GAME HUNTING OPERATIONS



STUXNET

IRAN



BLACKENERGY

UKRAINE



NOTPETYA

MAERSK & MORE



EKANS

MULTIPLE VICTIMS

OPERATIONAL TECHNOLOGY CYBERSECURITY EXPERT PANEL FORUM 2023

COMPROMISING OPERATIONAL TECHNOLOGY ENVIRONMENTS



-  GENERALLY, REQUIRES FIRST COMPROMISING IT ASSETS
-  POTENTIAL COLLUSION W/TRUSTED INSIDER(S)
-  OT/ICS/SCADA ARE RARELY DIRECTLY ATTACKED
-  PRIMARILY UTILIZED FOR DISRUPTION OR DESTRUCTIVE ACTIONS BY SOPHISTICATED NATION STATE ADVERSARIES

OPERATIONAL TECHNOLOGY CYBERSECURITY EXPERT PANEL FORUM 2023

IT/OT CONVERGENCE : OVER-RELIANCE ON AUTOMATION?



IT/OT CONVERGENCE HAS CAUSED ADVANCED NATIONS
TO HEAVILY RELY ON AUTOMATION



COUNTRIES W/LESS DIGITIZATION ARE AT LOWER RISK OF
LONGER OUTAGES DUE TO MANUAL STARTUP EXPERIENCE



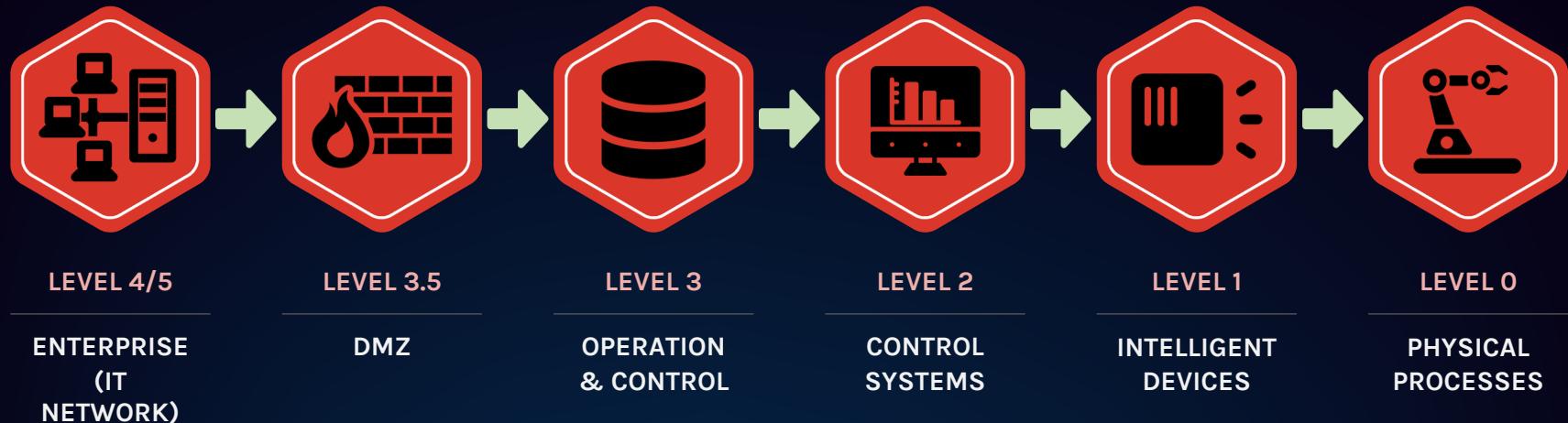
USE OF REMOTE ACCESS TECH IN HUMAN MACHINE
INTERFACES INCREASES RISK OF TRADITIONAL IT THREATS



THIS IS NOT CONCEPTUAL – IT HAS HAPPENED

OPERATIONAL TECHNOLOGY CYBERSECURITY EXPERT PANEL FORUM 2023

PURDUE MODEL FOR ICS SECURITY



OPERATIONAL TECHNOLOGY CYBERSECURITY EXPERT PANEL FORUM 2023

UNDERSTANDING THE OPERATIONAL TECHNOLOGY ATTACK SEQUENCE



RECONNAISSANCE

ADVERSARY CONDUCTS RECONNAISSANCE TO IDENTIFY MULTIPLE METHODS OF GAINING ACCESS TO VICTIM NETWORK

EXPLOITATION

ADVERSARY PURCHASES ACCESS PACKAGE OR IDENTIFIES EXPLOITABLE VULNERABILITY FOR NETWORK ACCESS

COMPROMISE

VICTIM NETWORK IS COMPROMISED, AND ATTACKER IMPLANTS BACKDOORS, STAGES TOOLS, MAINTAINS PERSISTENCE, AND MORE ...

PIVOTING

ADVERSARY MOVES LATERALLY AROUND COMPROMISED NETWORK TO IDENTIFY ACCESS AND GATEWAY(S) TO OT SEGMENT(S)

OBJECTIVES

ADVERSARY LOCATES MISSION CRITICAL ASSETS, PERFORMING SOME FORM OF DISRUPTIVE OR DESTRUCTIVE OPERATIONS

WHAT NEXT?

Stop The Bleed: 7 Steps To Be Prepared

- 1 Gain visibility into your security gaps
- 2 Implement separation of IT/OT network: Segment IT/OT
- 3 Protect Operational/Process Network
- 4 Reduce attack surface of Legacy devices
- 5 Prioritize identity protection
- 6 Know your adversary
- 7 Practice makes perfect

Find them. Know them. Stop them.

Discover the adversaries targeting your industry.

- Adversaries
- Threat Report
- eCrime Index

Your Industry

Business Size

Your Country

Clear

Update Search

Global Threat Landscape

Global

[Veto Spider](#)
[Wandering Spider](#)
[Recess Spider](#)
[Lily Spider](#)
[Shining Spider](#)
[Holiday Spider](#)
[Scattered Spider](#)
[Blind Spider](#)
[Alpha Spider](#)
[Mirage Tiger](#)
[Hive Spider](#)
[Partisan Jackal](#)
[Vice Spider](#)
[Bitwise Spider](#)
[Thunderbolt Jackal](#)
[Nemesis Kitten](#)
[Terror Kitten](#)
[Viking Spider](#)

Turkey

[Cosmic Wolf](#)
[Percussion Spider](#)

Iran

[Banished Kitten](#)
[Haywire Kitten](#)

China

[Vapor Panda](#)
[Sunrise Panda](#)
[Phantom Panda](#)

Russian Federation

[Royal Spider](#)
[Brain Spider](#)
[Hermit Spider](#)
[Ember Bear](#)
[Mallard Spider](#)
[Yellow Spider](#)
[Graceful Spider](#)
[Smoky Spider](#)
[Lunar Spider](#)
[Clockwork Spider](#)
[Sally Spider](#)
[Gossamer Bear](#)
[Indrik Spider](#)
[Cozy Bear](#)
[Voodoo Bear](#)
[Berserk Bear](#)

Explore the Adversary Universe
Get your personal threat landscape

<https://www.crowdstrike.com/adversaries/>

Nigeria

[Aviator Spider](#)

Venezuela

[Curious Jackal](#)

North Korea

[Velvet Chollima](#)
[Labyrinth Chollima](#)
[Stardust Chollima](#)
[Silent Chollima](#)

South Korea

[Solar Spider](#)

India

[Razor Tiger](#)

Philippines

[Solar Spider](#)

Vietnam

YOUR ABILITY TO **DEFEAT ADVANCED CYBER THREATS** RESTS ALMOST ENTIRELY ON YOUR **UNDERSTANDING OF THE PROBLEM**