Compliance Mandates Require Technical Vulnerability Assessment

A key requirement of compliance mandates & security standards such as ISO 27000, HIPAA, PCI DSS & others is that organizations *must conduct a comprehensive & thorough assessment of the potentials risks & vulnerabilities to the confidentiality, integrity, & availability (CIA) of all sensitive, confidential information*. These mandates require that organizations must complete a comprehensive & thorough vulnerability assessment on a regular schedule.

*biz*SHIELD^{tm}

*biz*SHIELD^{tm} – An ecfirst Technical Vulnerability Assessment Service

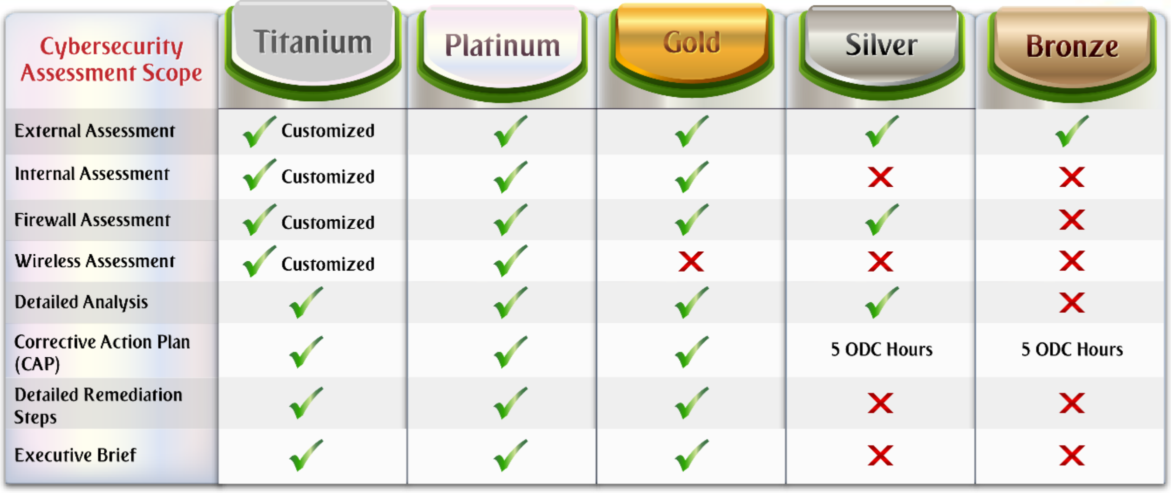
ecfirst developed the *biz*SHIELD^{tm} program to assist organizations in addressing the requirements of compliance mandates & all subsequent guidance documentation & settlement agreements.

As a part of the *biz*SHIELD^{tm} program, ecfirst identifies vulnerabilities from the outside (external) & inside (internal) the organization. Next, ecfirst develops recommended remediation activity, & associated risk priority. All remediation activities will be listed according to recommended implementation time bands in the *biz*SHIELD^{tm} Corrective Action Plan (CAP) table. The *biz*SHIELD^{tm} report is an actionable, documented risk analysis that provides both in depth & executive summary level findings appropriate to all audiences from administrators to the Board of Directors.

Technical Vulnerability Assessment & Penetration Test

Among the items that may be requested as part of a HIPAA compliance audit or an investigation is a copy of the latest vulnerability assessment report. The vulnerability assessment report provides information on risks associated with security gaps that may be exploited to compromise the confidentiality, integrity, &/or availability of Electronic Protected Health Information (EPHI) or other such confidential information such as Personally Identifiable Information (PII).

The ecfirst Platinum Technical Vulnerability Assessment is comprehensive in scope as it addresses both external & internal vulnerabilities. A detailed technical Corrective Action Plan (CAP) is included in the *biz*SHIELD^{tm} report to provide actionable directives for addressing the identified deficiencies.



Cybersecurity Assessment Scope	Titanium	Platinum	Gold	Silver	Bronze
External Assessment	✓ Customized	✓	✓	✓	✓
Internal Assessment	✓ Customized	✓	✓	✗	✗
Firewall Assessment	✓ Customized	✓	✓	✓	✗
Wireless Assessment	✓ Customized	✓	✗	✗	✗
Detailed Analysis	✓	✓	✓	✓	✗
Corrective Action Plan (CAP)	✓	✓	✓	5 ODC Hours	5 ODC Hours
Detailed Remediation Steps	✓	✓	✓	✗	✗
Executive Brief	✓	✓	✓	✗	✗

Technical Vulnerability Assessment vs. Penetration Test

ecfirst’s Technical Vulnerability Assessment (TVA) & Penetration Test (PT) both identify vulnerabilities within your network & provide a report enumerating the issues discovered as well as recommendations for remediation. The main difference between the two is the focus: a TVA’s focus is to identify all vulnerabilities & deviations from best practice that create a risk, while a PT’s focus is to demonstrate that risk.

A PT has a goal, such as ‘Obtain EPHI’, & demonstrates the risk of not remediating identified vulnerabilities by utilizing them to reach this goal. The TVA only looks to identify vulnerabilities, while the PT actually tries to EXPLOIT those vulnerabilities. Unless you already have a robust & mature security program in place, most organizations are best served by performing a Technical Vulnerability Assessment(s) prior to Penetration Testing activities.

Technical Vulnerability Assessment Service

The ecfirst *biz*SHIELD^{tm} risk analysis program includes a technical vulnerability assessment to address compliance mandates with the objective of establishing & prioritizing compliance & security gaps. The ecfirst *biz*SHIELD^{tm} Technical Vulnerability Assessment Service supports several distinct components, including:

- External Assessment
- Internal Assessment
- Firewall Assessment
- Wireless Assessment
- Social Engineering Assessment

The following are the brief stages involved in the assessment:

- Scope & preparation
- Discovery & vulnerability analysis
- Exploitation (penetration tests only), &
- Reporting & documentation

A subset of systems will be identified as **in-scope** for both the external & internal networks as applicable; these are the systems that will be scanned/tested. The objective of the vulnerability assessment is to identify potential security risks & vulnerabilities within these **in-scope systems**.

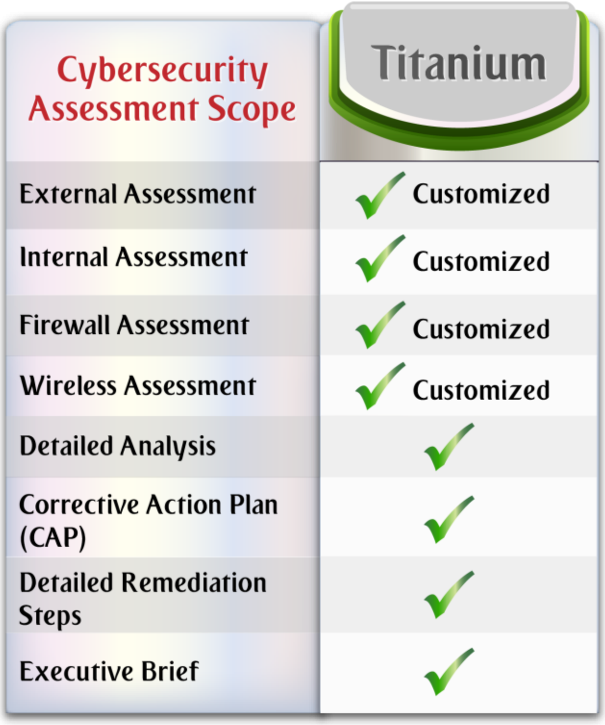
Data gathered is analyzed against policies, HIPAA regulations, standard best practices, & vendor security bulletins in order to determine potential risks & exposures to the computing environment. The results of these vulnerability scans/tests are to be used as the basis for determining the security posture & risk of other systems not directly tested.

When was the last time your organization conducted a risk analysis activity that included a technical vulnerability assessment?

Titanium Vulnerability Assessment

The ecfirst Titanium Vulnerability Assessment is broken up into four (4) distinct areas of analysis performed entirely remotely:

Note: You must be able to deploy a Virtual Machine image (in OVF format) supporting our defined specifications, such as an ESX server or VMWare Workstation installation. If you are unable to deploy our Virtual Machine image, we will have to send you a hardware device at an additional cost



Cybersecurity Assessment Scope	Titanium
External Assessment	✓ Customized
Internal Assessment	✓ Customized
Firewall Assessment	✓ Customized
Wireless Assessment	✓ Customized
Detailed Analysis	✓
Corrective Action Plan (CAP)	✓
Detailed Remediation Steps	✓
Executive Brief	✓

- External Assessment - to be mutually determined & performed remotely
    - Externally accessible IP addresses (up to 256) are scanned for vulnerabilities
        - All identified vulnerabilities are validated to the extent possible
    - Up to four (4) external domains are tested for:
        - Google Hacking Database (GHDB) entries
        - DNS misconfigurations
        - Metadata in publicly accessible documents, &
    - Up to two (2) websites/applications are crawled/scanned for vulnerabilities under one (1) user role
- Internal Assessment - to be mutually determined & performed remotely
    - Internal IP addresses (up to 4096) are scanned for vulnerabilities
        - All identified vulnerabilities are validated to the extent possible
    - Up to 16 Class C network ranges are scanned for
        - Devices responding to “default” SNMP Community Strings
        - Systems running up to three (3) database server types (i.e. MSSQL, MySQL, Oracle, etc.) that allow open access, &
            - Identified systems are also tested for “default” credentials
    - Up to three (3) Active Directory domains are tested for:
        - Identity & Access Management (IAM) best practice adherence
        - Password Policy best practice adherence
        - User account password strength, &
        - USB device enumeration of systems registered in Active Directory (AD)
            - Identification of currently connected devices
- Firewall Assessment - to be mutually determined & performed remotely
    - Firewall configurations to identify OS
        - The firewall rules on one (1) device

- Wireless Assessment (performed remotely)
    - **ecfirst will send you a handheld device (along with instructions) that someone in your organization will utilize to assist ecfirst in this portion of the assessment**
    - Assessment of the Organization to identify:
        - Potentially rogue Access Points/SSIDs
        - Open wireless access segmentation review, &
            - Includes testing of segmentation
        - Insecure authentication/encryption configurations
            - Includes testing of Pre-shared Key (PSK) strength

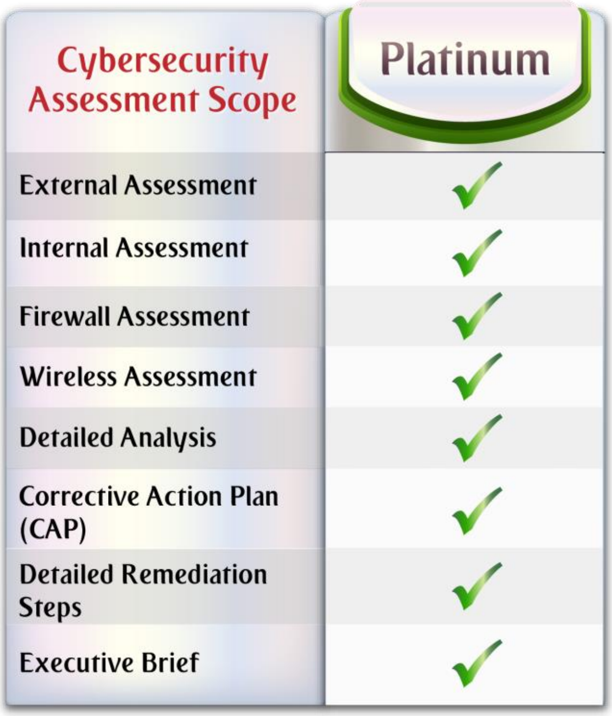
ecfirst documents all security issues found in the *biz*SHIELD™ report. In addition to including the findings & the Corrective Action Plan (CAP), the *biz*SHIELD™ report also contains an Executive Action Plan (EAP) that outlines achievable goals & milestone dates for management or executive attention.

The EAP & CAP can be made available in a Microsoft Excel spreadsheet format so as to assist in importing the findings into a project management tool of their choice.

Platinum Vulnerability Assessment

The ecfirst Platinum Vulnerability Assessment is broken up into four (4) distinct areas of analysis performed entirely remotely:

Note: You must be able to deploy a Virtual Machine image (in OVF format) supporting our defined specifications, such as an ESX server or VMWare Workstation installation. If you are unable to deploy our Virtual Machine image, we will have to send you a hardware device at an additional cost



Cybersecurity Assessment Scope	Platinum
External Assessment	✓
Internal Assessment	✓
Firewall Assessment	✓
Wireless Assessment	✓
Detailed Analysis	✓
Corrective Action Plan (CAP)	✓
Detailed Remediation Steps	✓
Executive Brief	✓

- External Assessment (performed remotely)
    - Up to Sixteen (16) externally accessible IP addresses are scanned for vulnerabilities
        - All identified vulnerabilities are validated to the extent possible
    - Up to three (3) external domains are tested for:
        - Google Hacking Database (GHDB) entries
        - DNS misconfigurations
        - Metadata in publicly accessible documents, &
    - Up to two (2) websites/applications are crawled/scanned for vulnerabilities under one (1) user role
- Internal Assessment (performed remotely)
    - Up to Sixteen (16) Internal IP addresses are scanned for vulnerabilities
        - All identified vulnerabilities are validated to the extent possible
    - Up to three (3) Class C network ranges are scanned for
        - Devices responding to “default” SNMP Community Strings
        - Systems running up to three (3) database server types (i.e. MSSQL, MySQL, Oracle, etc.) that allow open access, &
            - Identified systems are also tested for “default” credentials
    - Up to two (2) Active Directory domains are tested for:
        - Identity & Access Management (IAM) best practice adherence
        - Password Policy best practice adherence
        - User account password strength, &
        - USB device enumeration of systems registered in Active Directory (AD)
            - Identification of currently connected devices
- Firewall Assessment (performed remotely)
    - Firewall configurations to identify OS

- Wireless Assessment (performed remotely)
    - **ecfirst will send you a handheld device (along with instructions) that someone in your organization will utilize to assist ecfirst in this portion of the assessment**
    - Assessment of one (1) physical building to identify:
        - Potentially rogue Access Points/SSIDs
        - Open wireless access segmentation review, &
            - Includes testing of segmentation
        - Insecure authentication/encryption configurations
            - Includes a Determination of the Pre-shared Key (PSK) strength

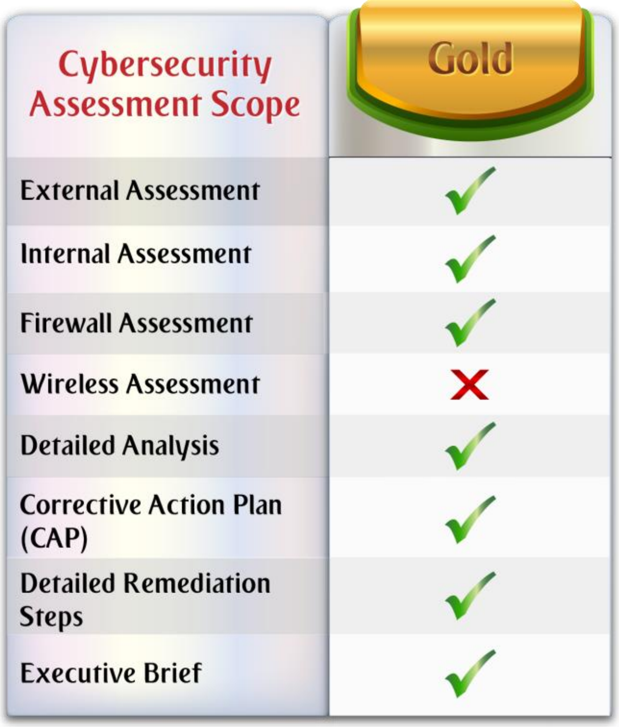
ecfirst documents all security issues found in the *biz*SHIELD™ report. In addition to including the findings & the Corrective Action Plan (CAP), the *biz*SHIELD™ report also contains an Executive Action Plan (EAP) that outlines achievable goals & milestone dates for management or executive attention.

The EAP & CAP can be made available in a Microsoft Excel spreadsheet format so as to assist in importing the findings into a project management tool of their choice.

Gold Vulnerability Assessment

The ecfirst Gold Vulnerability Assessment is broken up into three (3) distinct areas of analysis performed entirely remotely:

*Note: You must be able to deploy a Virtual Machine image (in OVF format) supporting our defined specifications, such as an ESX server or VMWare Workstation installation. If you are unable to deploy our Virtual Machine image, we will have to send you a hardware device at an additional cost*



Cybersecurity Assessment Scope	Gold
External Assessment	✓
Internal Assessment	✓
Firewall Assessment	✓
Wireless Assessment	✗
Detailed Analysis	✓
Corrective Action Plan (CAP)	✓
Detailed Remediation Steps	✓
Executive Brief	✓

- External Assessment (performed remotely)
  - Up to eight (8) externally accessible IP addresses are scanned for vulnerabilities
  - One (1) external domain tested for:
    - Google Hacking Database (GHDB) entries
    - DNS misconfigurations
    - Metadata in publicly accessible documents, &
  - One (1) website/application anonymously crawled/scanned for vulnerabilities
- Internal Assessment (performed remotely)
  - Up to eight (8) Internal IP addresses are scanned for vulnerabilities
  - One (1) Class C network range scanned for:
    - Devices responding to “default” SNMP Community Strings, &
    - Systems running one (1) database server type (i.e. MSSQL, MySQL, etc.) that allow open access, &
      - Systems also tested for “default” credentials
  - One (1) Active Directory domain tested for:
    - Identity & Access Management (IAM) best practice adherence
    - Password Policy best practice adherence
    - User account password strength, &
    - USB device enumeration of systems registered in Active Directory (AD)
- Firewall Assessment (performed remotely)
  - Firewall configuration to identify OS

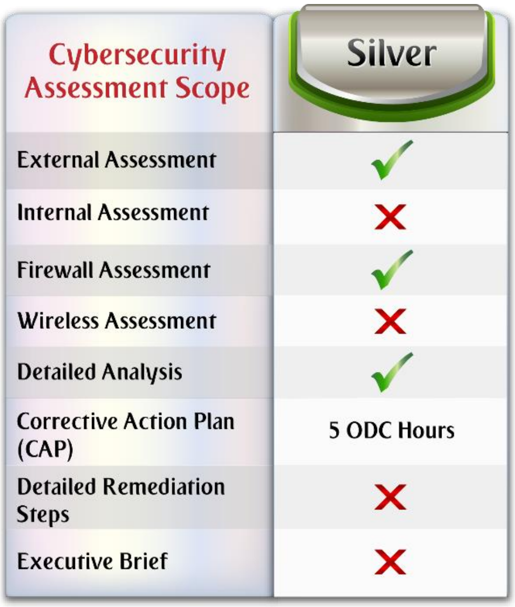
ecfirst documents all security issues found in the *biz*SHIELD™ report. In addition to including the findings & the Corrective Action Plan (CAP), the *biz*SHIELD™ report also contains an Executive Action Plan (EAP) that outlines achievable goals & milestone dates for management or executive attention.

The EAP & CAP can be made available in a Microsoft Excel spreadsheet format so as to assist in importing the findings into a project management tool of their choice.

Silver Vulnerability Assessment

The ecfirst Silver Vulnerability Assessment is broken up into two (2) distinct areas of analysis performed entirely remotely:

It should be noted that the ecfirst Silver Level Vulnerability Assessment would most likely not be considered a comprehensive vulnerability assessment, as critical areas related to the internal network/system management are not included in the testing.



Cybersecurity Assessment Scope	Silver
External Assessment	✓
Internal Assessment	✗
Firewall Assessment	✓
Wireless Assessment	✗
Detailed Analysis	✓
Corrective Action Plan (CAP)	5 ODC Hours
Detailed Remediation Steps	✗
Executive Brief	✗

- External Assessment (performed remotely)
  - Up to eight (8) externally accessible IP addresses are scanned for vulnerabilities
  - One (1) external domain tested for:
    - Google Hacking Database (GHDB) entries
    - DNS misconfigurations
    - Metadata in publicly accessible documents, &
  - One (1) website/application anonymously crawled/scanned for vulnerabilities
- Firewall Assessment (performed remotely)
  - Firewall configuration to identify OS

ecfirst documents all security issues found in the *biz*SHIELD™ report. In addition to including the findings & the Corrective Action Plan (CAP), the *biz*SHIELD™ report also contains an Executive Action Plan (EAP) that outlines achievable goals & milestone dates for management or executive attention.

The EAP & CAP can be made available in a Microsoft Excel spreadsheet format so as to assist in importing the findings into a project management tool of their choice.

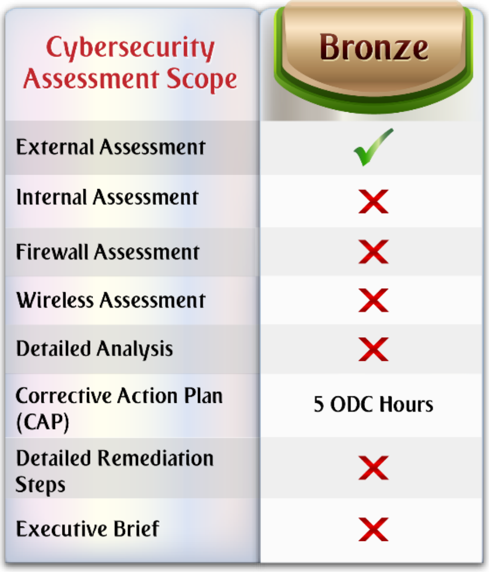
Bronze Vulnerability Assessment

The ecfirst Bronze Vulnerability Assessment consists of one (1) area of testing & is **performed entirely remotely:**

It should be noted that the ecfirst Bronze Level Vulnerability Assessment would most likely not be considered a comprehensive vulnerability assessment, as critical areas related to the internal network/system management are not included in the testing.

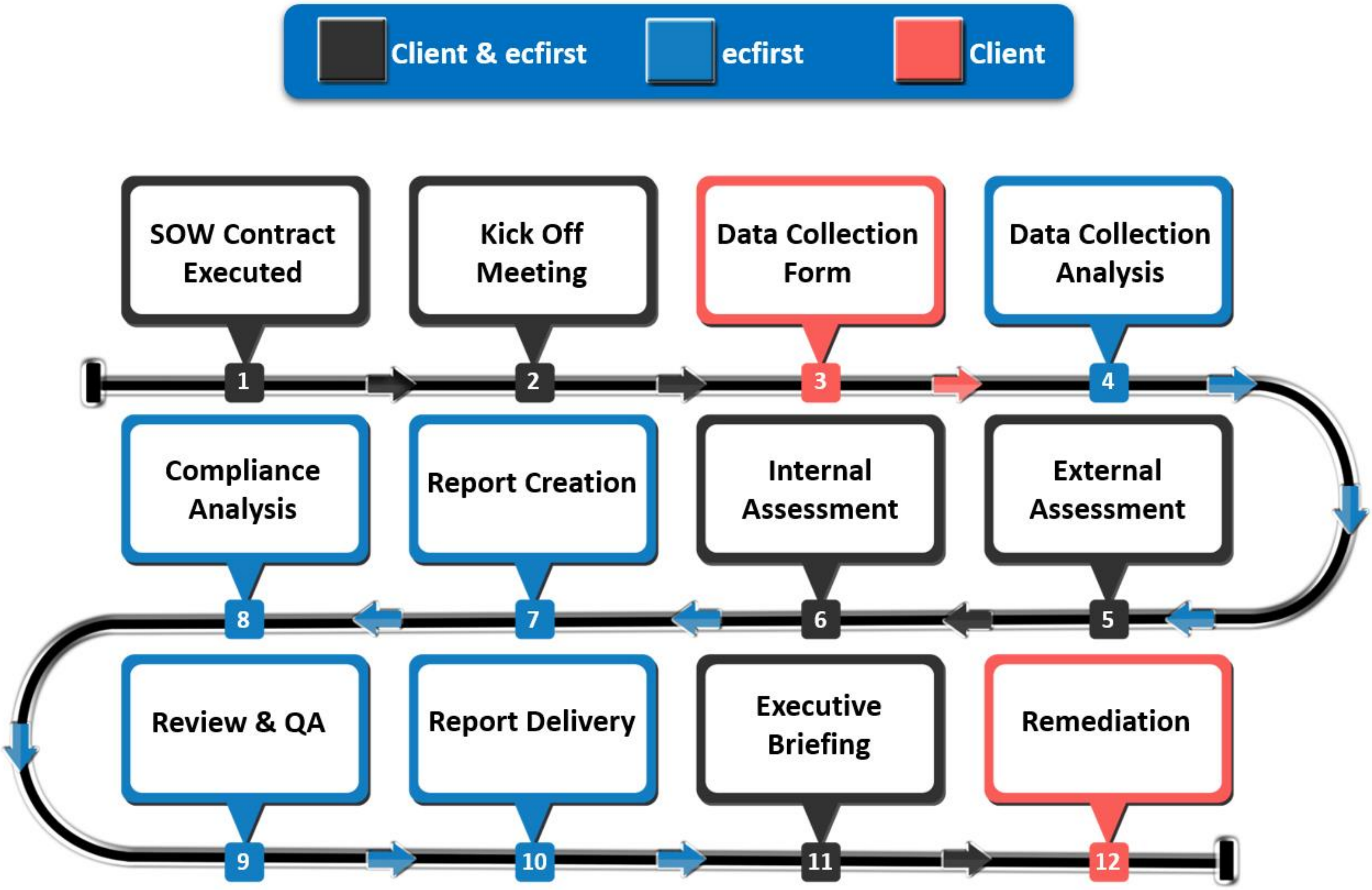
- External Assessment (performed remotely)
  - Up to five (5) externally accessible IP addresses are scanned for vulnerabilities, &
  - One (1) website/application anonymously crawled/scanned for vulnerabilities

Only the “raw” results of the tests performed are provided in the Bronze Vulnerability Assessment report. Unlike the *biz*SHIELD™ report, ecfirst does not perform any additional analysis & as such ecfirst does not provide a Corrective Action Plan (CAP), Executive Action Plan (EAP), Executive Summary, or detailed remediation steps.



Cybersecurity Assessment Scope	Bronze
External Assessment	✓
Internal Assessment	✗
Firewall Assessment	✗
Wireless Assessment	✗
Detailed Analysis	✗
Corrective Action Plan (CAP)	5 ODC Hours
Detailed Remediation Steps	✗
Executive Brief	✗

Vulnerability Assessment Process



⬛ Client & ecfirst 🟦 ecfirst 🟥 Client

1 SOW Contract Executed

2 Kick Off Meeting

3 Data Collection Form

4 Data Collection Analysis

5 External Assessment

6 Internal Assessment

7 Report Creation

8 Compliance Analysis

9 Review & QA

10 Report Delivery

11 Executive Briefing

12 Remediation

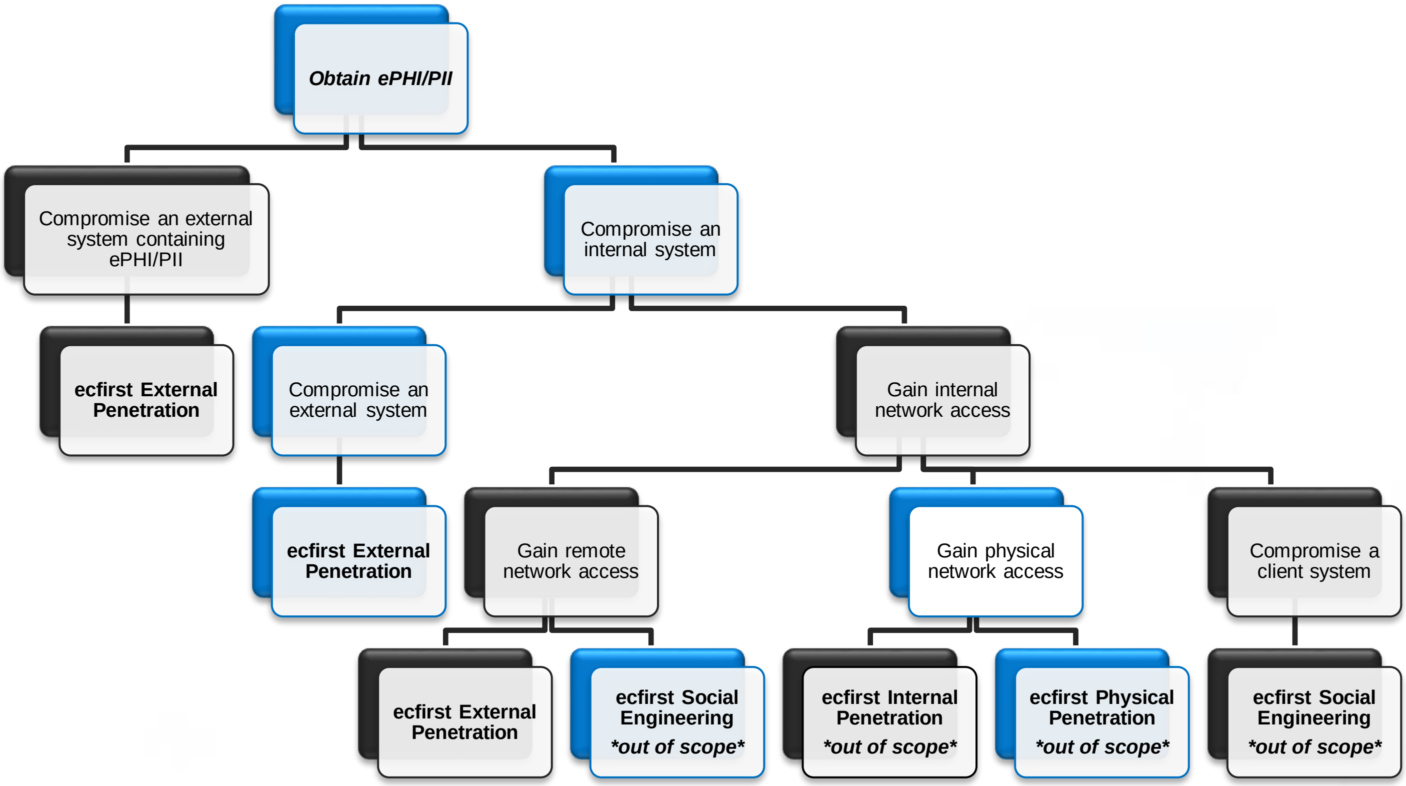
External Penetration Test

The ecfirst External Penetration Test (performed remotely) includes the following specific items:

- The External Penetration Test is “pre-scoped” to the following general criteria
  - A “grey box” test is based on the following information provided
    - IP address ranges owned/operated &
    - All domains owned/associated with up to sixteen (16) external systems included in the scope
- The primary goal is to gain unauthorized elevated access to an externally accessible system
  - A secondary goal is to gain unauthorized access to other systems utilizing the primary goal system
- Out-of-Scope
  - End-user attacks (i.e. phishing, man-in-the-middle, client-side exploitation, etc.)
  - Denial of Service (DoS) attacks

The External Penetration Test methodology is described below:

- **Reconnaissance**
  - Client personnel & cultural information
  - Client business terminology
  - Technical infrastructure information
- **Scanning**
  - Network Discovery
  - Network Port & Service Identification
  - Vulnerability Identification
  - Wireless LAN Discovery/Scanning
  - Enumeration
- **Exploitation**
  - Password cracking
  - Discovered credential usage
  - Manual & Automated vulnerability validation
  - Privilege escalation
  - Additional tool installation
  - Data discovery


Obtain ePHI/PII
Compromise an external system containing ePHI/PII
Compromise an internal system
ecfirst External Penetration
Compromise an external system
Gain internal network access
ecfirst External Penetration
Gain remote network access
Gain physical network access
Compromise a client system
ecfirst External Penetration
ecfirst Social Engineering ***out of scope***
ecfirst Internal Penetration ***out of scope***
ecfirst Physical Penetration ***out of scope***
ecfirst Social Engineering ***out of scope***

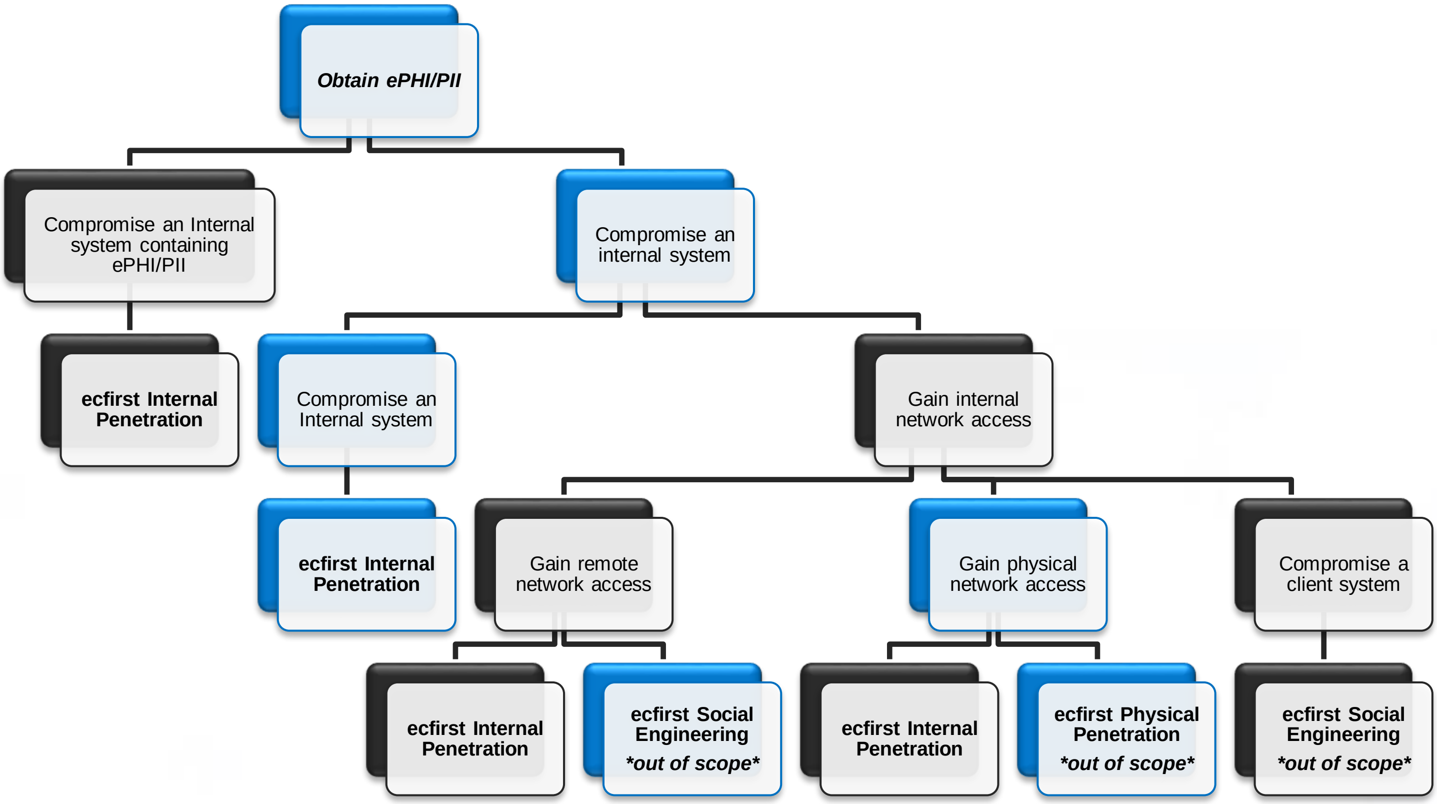
Internal Penetration Test

The ecfirst Internal Penetration Test (performed remotely) includes the following specific items:

- The Internal Penetration Test is “pre-scoped” to the following general criteria:
    - A “grey box” test is based on the following information provided
        - Domain User account configured as a “regular” employee
        - Remote access to the internal network via a Virtual Machine or physical device ecfirst provides
    - Not all vulnerabilities identified will be validated &/or exploited
        - Only those deemed most likely to assist in reaching the defined Goal will be further validated & exploited
- The primary goal is to gain Domain Administrator level access on the internal network
    - A secondary goal is to gain unauthorized access to sensitive data
- Out-of-Scope
    - End-user attacks (i.e. phishing, man-in-the-middle, client-side exploitation, etc.)
    - Denial of Service (DoS) attacks

The Internal Penetration Test methodology is described below:

- Scanning
    - Network Discovery
    - Network Port & Service Identification
    - Vulnerability Identification
    - Wireless LAN Discovery/Scanning
    - Enumeration
- Exploitation
    - Password cracking
    - Discovered credential usage
    - Manual & Automated vulnerability validation
    - Privilege escalation
    - Additional tool installation
    - Data discovery


Obtain ePHI/PII
Compromise an Internal system containing ePHI/PII
Compromise an internal system
ecfirst Internal Penetration
Compromise an Internal system
Gain internal network access
ecfirst Internal Penetration
Gain remote network access
Gain physical network access
Compromise a client system
ecfirst Internal Penetration
ecfirst Social Engineering *out of scope*
ecfirst Internal Penetration
ecfirst Physical Penetration *out of scope*
ecfirst Social Engineering *out of scope*

Web Application Penetration Test

The scope of a Web application penetration test includes the following specific items:

- One (1) Web Application to be assessed
- One (1) user role type to be utilized for testing
  - "Client" user account type
  - Anonymous access will also be tested
- General Goal(s)
  - Gain anonymous access to authenticated sections of the application
  - Gain access to other client data within the application
- Out-of-scope
  - Underlying System vulnerability exploitation
  - System Account Creation
  - Web Application Firewall (WAF) &/or IDS/IPS evasion

The Web Application Penetration Test methodology is described below:

Reconnaissance

- Client personnel & cultural information
- Client business terminology
- Technical infrastructure information

Mapping

- Network Discovery
- Network Port & Service Identification
- Analyzing HTTPS Support
- Identify Virtual Hosting & Load Balancers
- Analyze Software Configuration
- Spider the site/application
- Application flow charting
- Relationship analysis
- Session analysis

Discovery

- Automated Vulnerability Scanning
- Information Leakage & Directory Browsing Discovery
- Username Harvesting & Password Guessing
- Command Injection Discovery
- Directory Traversal & File Inclusion Discovery
- SQL Injection Discovery
- Cross-site Scripting (CSS) Discovery
- Cross-site Request Forgery (CSRF) Discovery
- Session Flaw Discovery
- Insecure Redirects & Forwards Discovery

Exploitation

- Exploit identified Enumeration flaws
- Exploit identified Bypass flaws
- Exploit identified Injection flaws
- Exploit identified Session flaws
- Chain exploits together, pivot to other systems, data exfiltration, raid the fridge, etc

Social Engineering Assessment

Organizations with excellent security programs often spend large amounts of money on capital purchases to implement technical security controls. However, employees or contractors of the entity often prove to be the weak link in the security chain. Employee & contractor education is a key component to any information security program. Authorized members of the workforce have both authenticated access to information systems as well as physical access to facilities & secured areas.

During the social engineering assessment, ecfirst will attempt to gain unauthorized or inappropriate access to facilities, secured areas, documents, credentials, or confidential data. ecfirst security personnel will attempt to bypass security controls that are in-place in order to gain access to various assets. ecfirst will attempt to bypass electronic, personnel, & procedural controls during this assessment. ecfirst will document & present a very detailed record of successes, failures, controls bypassed, access achieved & information obtained during the assessment.

Client Testimonial

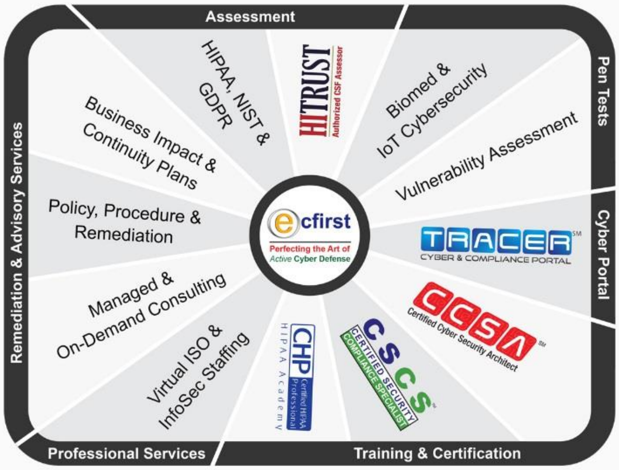
“ecfirst provides excellent value across a comprehensive portfolio of first rate solutions for regulations such as HIPAA | HITECH compliance, risk analysis, social engineering, vulnerability assessment, disaster recovery and business continuity. They are not just experts in these respective fields but are able to communicate & motivate corporate audiences to effect change.”

“ecfirst is an excellent business partner that focuses on long term, successful relationships through consistently successful project delivery.”

Joe Granneman, CTO & CSO, Rockford Health System

ecfirst

Perfecting the Art of *Active* Cyber Defense


Assessment
HIPAA, NIST & GDPR
HITRUST Authorized CSF Assessor
Biomed & IoT Cybersecurity
Vulnerability Assessment
Pen Tests
Cyber Portal
TRACER℠ CYBER & COMPLIANCE PORTAL
CCSA℠ Certified Cyber Security Architect
CSCS℠ CERTIFIED SECURITY COMPLIANCE SPECIALIST
CHP Certified HIPAA Professional
HIPAA Academy
Training & Certification
Professional Services
Virtual ISO & InfoSec Staffing
Managed & On-Demand Consulting
Policy, Procedure & Remediation
Business Impact & Continuity Plans
Remediation & Advisory Services
ecfirst
Perfecting the Art of Active Cyber Defense

VISION (Mantra)

Enabling establishment of an active cyber defense program and capability.

MISSION (Karma)

Implement an evidence-based compliance program integrated within an enterprise-wide active cyber defense system.

OUR PROMISE

- Unconditional Guarantee. No Questions!
- ecfirst will not consider an engagement complete unless client is 100% satisfied.

Client Reference

“I just wanted to take a moment and say thank you. Thank you and the ***excellent team*** at ecfirst for ***hard work***, late hours and ***diligence*** during the first round of our HITRUST certification, and now working on our annual risk management and HIPAA compliance assessment.”

“From HIPAA compliance, cybersecurity pen tests, to the HITRUST certification engagement, we have found ecfirst to be an ***exceptional partner*** that labored incredibly hard for us, with us. The ecfirst insight and diligence to ensuring HITRUST certification mandates are met led to us completing our engagement on budget and time. We look forward to deeper collaboration with ecfirst in the cybersecurity space in the future. I continue to recommend ecfirst highly and often!”

BRG Berkeley Research Group

Chip Goodman | Vice President of Information Technology

“The ecfirst team literally helped us build our HIPAA practices from ground up since 2012, allowing us to offer secure HIPAA-compliant eHealth and health IT solutions to our customers across the U.S. We are actively taking the logical next step in working with ecfirst to pursue the HITRUST certification in order to further expand our market. We see the partnership with ecfirst as an ***integral part*** of our business strategy and have been ***extremely satisfied*** with the ***quality and value*** of the services that ecfirst has rendered.”

BrightOutcome COLLABORATIVE SYMPTOM MANAGEMENT

DerShung Yang | Founder & President

“Provant Health partnered with ecfirst to build a plan and assist in executing it with the goal of achieving HITRUST certification. Ali Pabrai and his team were ***flexible, collaborative*** and most importantly patient as we worked to educate our management team and key employees on the meaning and value of HITRUST. I’d recommend ecfirst to any company who wants to understand HITRUST or work on assessing and remediating their processes and systems in preparation for certification.”

provant health *life. changing.*

Tom Basiliere | Chief Information Officer

John Schelewitz | John.Schelewitz@ecfirst.com | +1.480.663.3225

Delivering Everything Compliance. Everything Security.

1000s of Clients | Clients in all 50 States | Clients on 5 Continents

HITRUST Authorized CSF Assessor

ecfirst | Perfecting the Art of *Active* Cyber Defense

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HIPAA™ Academy

CSCS™
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HITRUST
Authorized CSF Assessor