

]HackingTeam[

REMOTE CONTROL SYSTEM
GALILEO

Network Injector Appliance

Whitepaper

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Table Of Contents

1. Overview	5
1.1 Infection scenarios	5
1.2 Capabilities.....	5
2. Essential concepts	6
2.1 Rules Definition	6
2.2 Target identification.....	7
2.3 Resource identification.....	7
2.4 Action	8
3. Deployment and positioning	9
3.1 Monitoring Interface	10
3.2 Injection Interface.....	10
3.3 Agent Deployment.....	11
1. Questionnaire.....	12
4.1 Questions for the Customer	12
4.2 Questions for the ISP	12

1. Overview

HackingTeam *Network Injector Appliance* (NIA) is a hardware appliance for monitoring the Target's Internet traffic and install Agents over their Internet connection, using an innovative patented technology that allows live streaming injection and executable melting without being inline.

With the Network Injector Appliance you can turn the Internet connection of your target into a powerful infection vector.

1.1 Infection scenarios

The NIA is a solution designed to infect targets using their own Internet connection. NIA automatically identifies and infects the desired target's devices, when he/she performs one of the following activities:

- Downloads an executable file (.exe) from the Internet;
- Applications already installed check for updates;
- Views a YouTube video;
- Surfs the web with Internet Explorer (IE).

The injection could also be performed replacing files accessed by the target with different infected files.

1.2 Capabilities

The NIA is engineered to easily integrate in common network implementations, safeguarding the network from service interruption and guaranteeing full network flows visibility.

Key features include:

- Installation at Internet Service Provider's premises;
- Supports Fiber and Copper links;
- Compatible with redundant network paths;
- Supported throughput up to 10Gb;
- Doesn't need to be installed inline, thanks to a patented technology:
 - Non-invasive surgical attacks, excluding the side effects of inline appliances;
 - No impact on the ISP in case of hardware failures;
- Easy management of multiple NIAs.

2. Essential concepts

In the present chapter are described the main concepts that must be comprehend in order to be able to properly perform an infection with the NIA.

2.1 Rules Definition

NIA technology as part of RCS solution must be integrated with the main RCS installation and must be configured from RCS Console. Like as any other Infection Vector also the NIA requires to be properly configured before come into action.

Considering the NIA is designed to be installed in network paths that could provide Internet connectivity to an high amount of ISP users, it became really important to define a specific context where to perform infections.

The basic piece of information used by the NIA is the **rule**, that requires to specify:

- the target name (Target);
- how to identify a target and his HTTP connections (Ident and User pattern);
- a text pattern where to perform the injection (Resource Pattern);
- which attack to be used to inject the Agent (Action);
- the configuration to be used for the agent (Factory).

The screenshot shows the 'Edit Rule' dialog box with the following configuration:

- Enabled:
- Disable on sync:
- Probability:
- Target: Jimmy Page
- Ident: STATIC-IP
- User pattern: 192.168.3.57
- Resource pattern: http://www.mozilla.org/en-US/firefox/
- Action: INJECT-EXE
- Factory: Laptop Configuration
- Scout:

Buttons: Save, Cancel

Figure 1 - Example of rule configuration

NOTE To set-up an effective rule is important to understand how to correctly identify the target and the resource that will be crafted by the NIA.

2.2 Target identification

The **Target identification** could be performed in multiple ways depending on the configuration used by the ISP for the network access management. The supported configurations are: **DHCP**, **Static IP** or **Radius** and the target identification could be done by the following parameters:

- Static IP (Recommended)
- Static Range
- Static MAC
- DHCP
- Radius Login
- Radius Call ID
- Radius Session ID
- Radius Technical Key

NOTE Usage of Range should be done only if ISP guarantees that used range is assigned only to the target, an improper configuration could involve mass injection on devices not related to the Target.

We suggest... Usage of identification based on Static IP, MAC or Radius parameters allows you to better control the behavior of injection process.

2.3 Resource identification

The **Resource Identification** is done providing a text pattern that match an HTTP website URL where to perform the injection. This parameter should be configured to define boundaries that meets the Target behavior and Attack Type you want use.

The Resource Identification could be done using wildcards to permit identification of multiple Resources as described in the following examples:

- *.ext* - to identify files with a specific file extension (ex: .ext) also on requests composed by multiple values
- *.html - to identify resources with static html code
- *.microsoft.com* - to identify resources coming from a specific website (ex: microsoft.com)
- *.youtube.com/watch* - default value to identify YouTube videos

The Resource Identification should be configured according the Attack type (Action) to be performed as illustrated in the following chapter.

NOTE Usage of wildcards to match multiple URLs must be used with care, as it significantly increases the load on the appliance, especially on 10Gpbs links. To increase the overall effectiveness of NIA we suggest to use multiple rules with specific resource patterns.

2.4 Action

When an HTTP request coming from an **identified target** match the **Resource Pattern** a **rule** is triggered and the NIA performs the selected **Action** and sends specially crafted packets to inject an Agent into that specific HTTP connection.

The actions that could be fired by the NIA are the following:

- Inject executable files
- Inject html files
- Inject YouTube Flash
- Replace Files

A **key factor to perform successful injections** is to place the NIA as much is possible in proximity to the Target: being as near as possible to the Target dramatically raises the chances of performing successful injections.

NOTE Replacement of files should be used with care, replacing a file with another one which contains different content will rise suspects on your target. This action should be supported with Social Engineering.

3. Deployment and positioning

The NIA is designed to operate inside the network of an Internet Service Provider (ISP), monitoring the ISP subscribers. In case the Target Internet connection is in a building with an internally managed network (ex: Offices, Hotels, Airports) the NIA could be also installed inside of the building.

Nowadays ISP infrastructures are really complex but the *digital subscriber line* (DSL) path could be loyally represented with the following diagram:

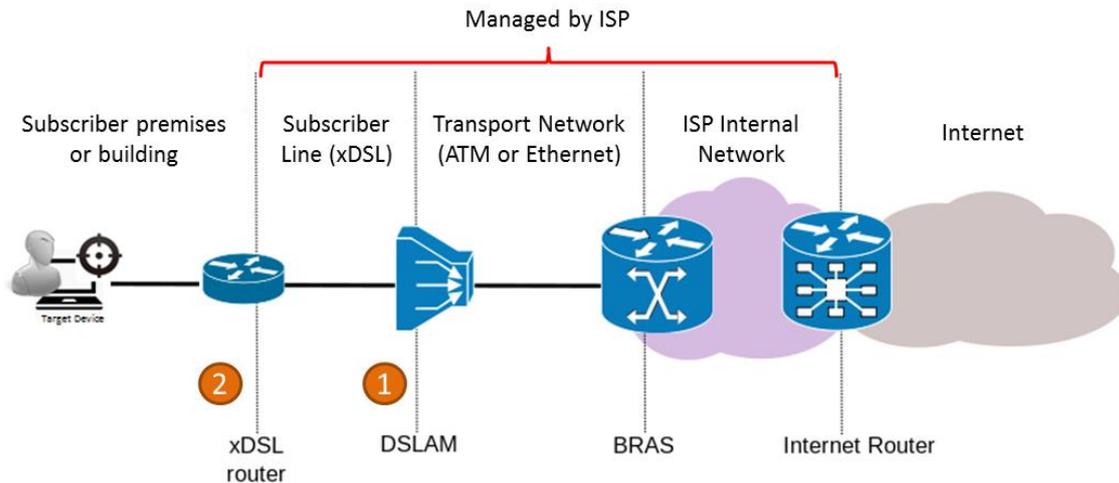


Figure 2 - ISP network diagram

1. For **deployment at ISP premises** the best positioning of the NIA is at the **DSLAM level**, where it can monitor a fraction of the subscribers of the ISP, reducing the amount of aggregated traffic.
2. For **deployment at Target's building premises** with an internally managed network the NIA could be installed at **xDSL router level**.

NOTE Currently, only IP-DSLAMs are supported by the NIA.

3.1 Monitoring Interface

Traffic monitoring is accomplished receiving a copy of the traffic from a SPAN port of the switch or from a network TAP interface to a dedicated network interface on the NIA. This interfaces is engineered to record from high throughput links guaranteeing no loss od packets and uses interchangeable Copper and Fiber GBICs to be much more flexible on installations.

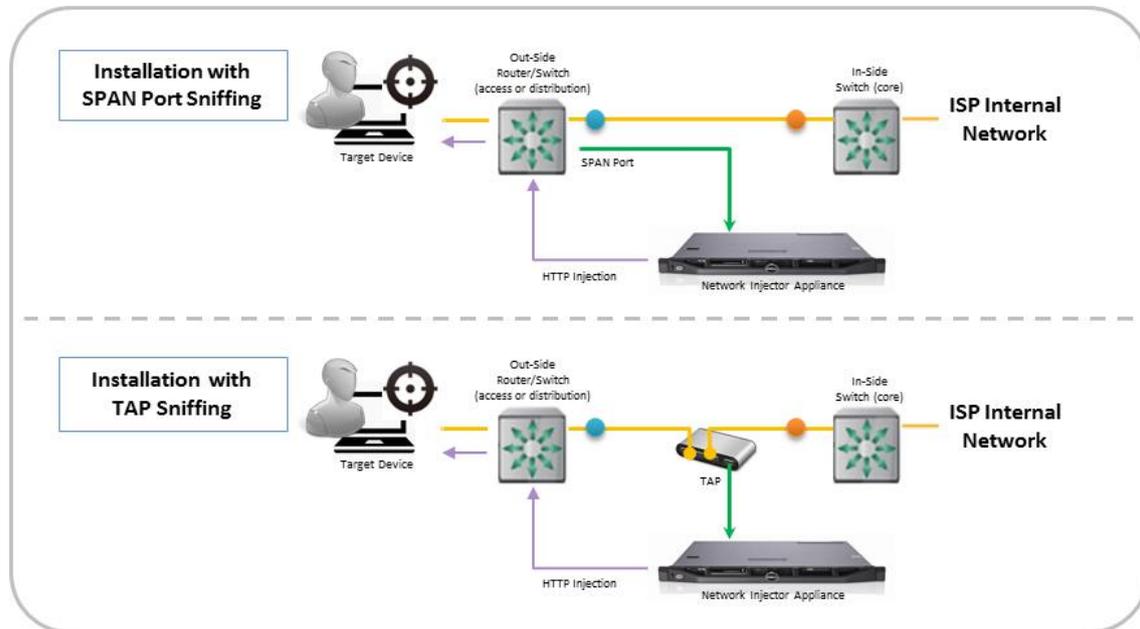


Figure 3 - Common NIA deployment scenarios

The NIA is compatible with many physical network links, and is capable of monitoring at wire-speed up to 10Gb. For supported interconnections refer to “RCS - Network Injector Appliance - Deployment Manual” document.

Connector Types: RJ45, LC 850nm, LC 1310nm

3.2 Injection Interface

The Injection is performed crafting packets through a second NIA interface. Since the packets are injected with the same IP address of the Target as identified on the monitor link, the injection link must have a valid IP address and must be connected on the monitored network subnet.

Connector Types: RJ45

NOTE No disruptive packets are sent from the NIA. Only connections related to the target are affected.

3.3 Agent Deployment

During injection, the NIA can embed RCS Agents into different types of HTTP resources.

Resource	Description
Executable file	When an executable application is downloaded (e.g., setup packages, automatic software updates), it appends the Agent to the file. Once the application is executed the Agent is installed.
Web page	When the target visit a website, the NIA injects additional code into the webpage triggering the installation of the Agent.
YouTube	Forces the target to upgrade of a browser component by blocking the video. The upgrade package installs the Agent.
Any resource	You can replace any file on the web with your own version. I.e. it is possible to replace any .doc file downloaded by the target with a .doc previously built and containing an exploit.

1. Questionnaire

Following is a quick questionnaire, in two parts, to kickstart the technical review needed to prepare a plan of installation.

Please try to answer with as much detail as possible.

4.1 Questions for the Customer

- Are you interested in making a permanent installation of the NIA within the ISP network?
- If yes, is the installation aimed at deploying RCS Agents on a selected few targets or on entire networks?
- How many ISPs are you willing to instrument with NIAs?

4.2 Questions for the ISP

- How many DSLAMs do you have in your network?
- What's the average aggregated bandwidth of the DSLAM?
- What link type the DSLAM uses (copper, fiber)?
- Please provide the protocol stack, up to the IP protocol, for traffic going from the DSLAM to the BRAS.
- Is it possible to mirror the traffic going from the DSLAM to the BRAS? Are there SPAN ports available or copper/optical TAPs in place?
- Have you any statistic about the average amount (percentage) of DNS and HTTP traffic found in DSLAMs?
- How are Subscribers identified within your network (eg. Static IP, Radius)?