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**Cherry Bomb:
Cherry Blossom (CB) Quick Start Guide**

**For CB Version 5.0
[Corresponds to CB Server Software Version 5.0]**

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1 (U) Introduction

(S) The Cherry Blossom (CB) system provides a means of monitoring the internet activity of and performing software exploits on targets of interest. In particular, CB is focused on compromising *wireless* networking devices, such as wireless (802.11) routers and access points (APs), to achieve these goals¹.

(U) This Quick Start Guide gives a brief overview of the CB system, including basic system description and operation. For complete documentation on system description and operation, see the “Cherry Blossom User’s Manual” (CBUM).

2 (U) Related Documents

(U) This document references the following documents:

- Cherry Blossom User’s Manual (CBUM)
- Cherry Blossom Server Installation, Troubleshooting, Failover, and Recovery Guide (commonly referred to as the “Cherry Blossom Installation Guide”)
- WiFi Devices.xls

3 (U) Points of Contact

(U) See the Cherry Blossom Installation Guide for points of contact for the Cherry Blossom system who can assist with system configuration, operation, and troubleshooting.

¹ (S) The CB architecture does not limit itself to wireless devices – in general, wired network devices (e.g., routers, gateways) can be compromised in a similar fashion to achieve the same goals.

4 (U) System Description and Definitions

(U) This section presents the system architecture, gives a high-level description of the CB system, and defines a number of terms used throughout the document.

4.1 (U) Description

(U) The architecture of the CB system is shown in Figure 1. Red boxes are CB components.

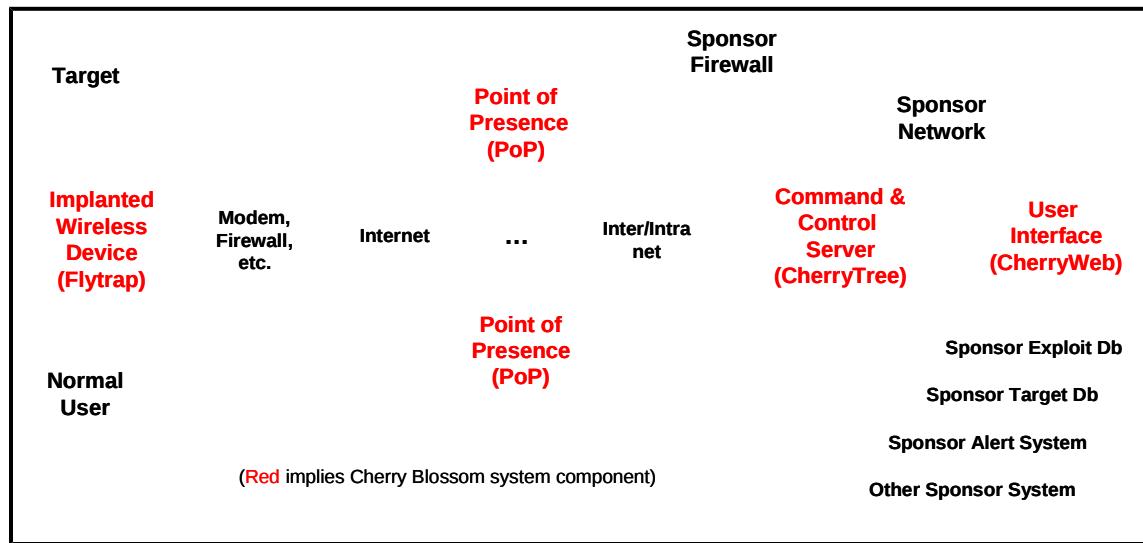


Figure 1: Cherry Blossom Architecture (S)

(S) The key component is the Flytrap, which is typically a wireless (802.11/WiFi) device (router/access point) that has been implanted with CB firmware. Many wireless devices allow a firmware upgrade over the wireless link, meaning a wireless device can often be implanted without physical access. Supported devices (see CBUM Section 6) can be implanted by upgrading the firmware using a variety of tools/techniques:

- **Using the Device's Firmware Upgrade Web Page over a Wireless (WLAN) Link** – this technique does not require physical access but typically does require an administrator password. Some exploitation tools (e.g., Tomato, Surfside) have been created to determine passwords for devices of interest. If the device is using wireless security (e.g., WEP or WPA), then these credentials are required as well.
- **Using a Wireless Upgrade Package** – some devices do not allow a firmware upgrade over the wireless link. To workaround this issue, “Wireless Upgrade Packages” have been created for a few devices of interest. In some cases, the Wireless Upgrade Package also can determine the administrator password. See CBUM Section 9.1 for details.
- **Using the Claymore Tool** – the Claymore tool is a survey, collection, and implant tool for wireless (802.11/WiFi) devices. The survey function attempts to determine device makes/models/versions in a region of interest. The collection

function can capture wireless traffic. The implant function can perform wireless firmware upgrades and incorporates the exploitation tools (for determining administrator passwords) and Wireless Upgrade Packages (for devices that don't allow wireless firmware upgrades). Claymore can run in a mobile environment (i.e., on a laptop) or in a fixed environment with a large antenna for longer ranges. See the "Claymore User's Manual" for more information.

- **Using the Device's Firmware Upgrade Web Page over a Wired (LAN) Link** – this technique would likely be used in a supply chain operation.

(S) Once a wireless device has been implanted (i.e., it is a Flytrap), it will Beacon (over the internet according to parameters that have been built into the implant) to a command & control server referred to as the CherryTree (CT). The Beacon contains device status and security information that the CT logs to a database. In response to the Beacon, the CherryTree sends a Mission with operator-defined tasking. An operator can use CherryWeb (CW), a browser-based user interface, to view Flytrap status and security info, plan Mission tasking, view Mission-related data, and perform system administration tasks.

(S) Missions may include tasking on Targets to monitor, actions/exploits to perform on a Target, and instructions on when and how to send the next Beacon. Target types include:

- Email addresses
- Chat usernames (see CBUM for supported chat services)
- MAC addresses
- VoIP numbers (for devices that support VoIP)

(S) Target actions/exploits include:

- Copying of a Target's network traffic
- Redirection of a Target's browser (e.g., to Windex for browser exploitation)
- Proxying a Target's network connections

(S) Additionally, Mission tasking can include "global actions", i.e. – actions not triggered by Target detection. Global actions include:

- Copying all network traffic
- Proxying all network connections
- Harvesting of email addresses, chat usernames, and VoIP numbers
- VPN Link wherein a VPN tunnel is established between the Flytrap and a CB-owned VPN server and gives an operator access to clients on the Flytrap's WLAN/LAN.
- Application Execution wherein an application can be pushed to and executed on a Flytrap.

(S) Upon receipt of a Mission, a Flytrap will begin Mission execution, typically configuring the necessary implant modules on the Flytrap, running the necessary

applications, etc. When the Flytrap detects a Target, it will send an Alert to the CT and commence any actions/exploits against the Target. The CT logs Alerts to a database, and, potentially distributes Alert information to interested parties (via Catapult).

4.2 (U) Definitions

(U) Listed are definitions of system components and common terminology used throughout this document:

- (U) **Claymore** – (S) a survey, collection, and implant tool used to determine wireless device make, model, and version and to implant supported devices with CB firmware.
- (U) **Flytrap** – (S) a wireless access point (AP), router, or other device that has been implanted with CB firmware. Flytraps execute Missions to detect and exploit Targets.
- (U) **CherryTree (CT)** – (S) command and control server that manages:
 - Handling and storage of Flytrap Missions and Mission-related data
 - Handling and storage of Flytrap status
 - Handling, storage, and further distribution of Flytrap Alerts
- (U) **CherryWeb (CW)** – (S) browser-based user interface that allows operators to view system status, configure the system, view target activity, and plan/assign Missions.
- (U) **Point of Presence (PoP)** – (S) a sponsor-maintained relay that forwards communication between a Flytrap and the CherryTree.
- (U) **User** – (S) an operator of the CB system. Users can, for example, log into CW, plan and assign Missions, view system status, etc.
- (U) **Target** – (S) a computer/person that should be monitored and at which exploits should be targeted. Flytraps use MAC address, email address, chat username, or VoIP number to detect/identify Targets.
- (U) **Target Deck** – (S) a grouping of related Targets.
- (U) **Mission** – (S) tasking given to a Flytrap in response to a Beacon.
- (U) **Operation (formerly Customer)** – (S) an entity around which CB system data is organized and to which this data is reported. CB Users can compartmentalize system data according to Operation.
- (U) **Beacon** – (S) a periodic communication between a Flytrap and the CT, where the Flytrap indicates its status, security info, etc. to the CT. In response to a Beacon, the CT sends the Flytrap a Mission.
- (U) **Alert** – (S) a communication sent from a Flytrap to the CT when the Flytrap has detected Target activity
- (U) **One-way Transfer (OWT)** – (S) a process of packaging and moving CB system data to a secure computer. An OWT report is typically organized around a Operation.
- (U) **Flash** – (noun) non-volatile RAM where the system image and persistent configuration data is typically stored on a wireless networking device
- (U) **Flash/Reflash** – (verb) the process of upgrading a device with a new firmware image.

4.3 (U) Acronyms

(U) This section defines acronyms used throughout the document.

CB	Cherry Blossom
CBUM	Cherry Blossom User's Manual
CB-VPN	CB VPN Server
CT	CherryTree
CW	CherryWeb
FAT	Factory Acceptance Test
FW	Firmware
GF	Generic Filter
HW	Hardware
IV	Initialization Vector
MMV	device Make/Model/HW Version/FW Version
MOFW	Manufacturer's Original Firmware
OWT	One-way Transfer
PoP	Point of Presence
RO	Read-only
RW	Read-write
SW	Software
WUP	Wireless Upgrade Package

5 (U) System Operation

(S) This section discusses operation of the CB system. It is assumed that the following have been successfully completed:

- CherryTree/Web installation and configuration on a server with internet access
- PoP installation and configuration. See “Cherry Blossom Installation Guide” for instructions on how to configure a PoP.
- A CB-supported device has been discovered and identified for implant (using Claymore or other tools/intelligence), or a CB-supported device has been procured (for supply chain scenario)
- A CB Production Release Firmware or Wireless Upgrade Package has been built with suitable parameters for the device of interest (see CBUM for device support). If Claymore will be used to perform the implant, then this firmware has been loaded into the Claymore system.

5.1 (S) Implanting a Wireless Device

(S) There are four general methods for getting a Flytrap implant onto a wireless device, some of which are device-specific (the CBUM contains detailed information on device support and upgrade procedures):

- **Use the Device’s Firmware Upgrade Web Page over a Wireless (WLAN) Link** – this technique does not require physical access but typically does require an administrator password. Some exploitation tools (for example Tomato and Surfside) have been created to determine passwords for devices of interest. If the device is using wireless security (for example WEP or WPA), then these credentials are required as well.
- **Use a Wireless Upgrade Package** – some devices do not allow a firmware upgrade over the wireless link. To workaround this issue, “Wireless Upgrade Packages” have been created for a few devices of interest. In some cases, the Wireless Upgrade Package also can determine the administrator password.
- **Use the Claymore Tool** – the Claymore tool is a survey, collection, and implant tool for wireless (802.11/WiFi) devices. The survey function attempts to determine device makes/models/versions in a region of interest. The collection function can capture wireless traffic. The implant function can perform wireless firmware upgrades and incorporates the exploitation tools (for determining administrator passwords) and Wireless Upgrade Packages (for devices that don’t allow wireless firmware upgrades). Claymore can run in a mobile environment (i.e., on a laptop) or in a fixed environment with a large antenna for longer ranges. See the “Claymore User’s Manual” for more information.
- **Use the Device’s Firmware Upgrade Web Page over a Wired (LAN) Link** – this technique would likely be used in a supply chain operation.

(S) If the firmware upgrade is successful, the device (now a Flytrap) will send its Initial Beacon after meeting the Initial Beacon criteria that have been built into the firmware image (see CBUM for detailed description of Flytrap Beacon logic).

(S) It is important to determine and record the WLAN and LAN MAC addresses of the device you are implanting, as CherryWeb uses these as the Flytrap's unique identifiers. The user can then use these MAC addresses to configure the Flytrap -- assign it a more meaningful name, group, and location, and potentially pre-assign it a particular Mission (see CBUM Sections 5.7 and 5.9). The user can view a list of the WLAN MAC addresses of surveyed devices via the Claymore GUI or in the report log file. Wireless sniffers (for example Airopeek) will typically show the WLAN MAC as the ESSID. Most devices have this information labeled somewhere on the device. In some cases, the MAC address printed on the device is the LAN or WAN MAC, and it is usually similar (only the last octet differs) or identical to the WLAN MAC. The CBUM documents which MAC address(es) are labeled/printed on the supported devices that have passed FAT. When the Flytrap beacons, it sends WLAN, LAN, and WAN MAC addresses, and CherryWeb displays these three MAC addresses on the "Flytrap Details" page (see Figure 6), so that the user can disambiguate if necessary.

5.2 (U) Logging Into CherryWeb

(S) To log into CherryWeb (CW):

1. Login to an Icon terminal
2. Using the Cisco VPN Client software, connect to the "TDN-VPN-ASA01" (Thunderdome) profile.
3. Open a web browser (see CBUM for recommended browsers) to the CW site:

`https://<CherryBlossomServiceIP>/CherryWeb`

See "Cherry Blossom Installation Guide" for the <CherryBlossomServiceIP>.

4. Enter the username and password for your CB User and click "Login". If you do not have a User account, have a User with "cwadmin" privileges (see CBUM) create a User account for you.

5.3 (U) General Layout of CW Pages

(U) Figure 2 shows the CW “Overview” page:

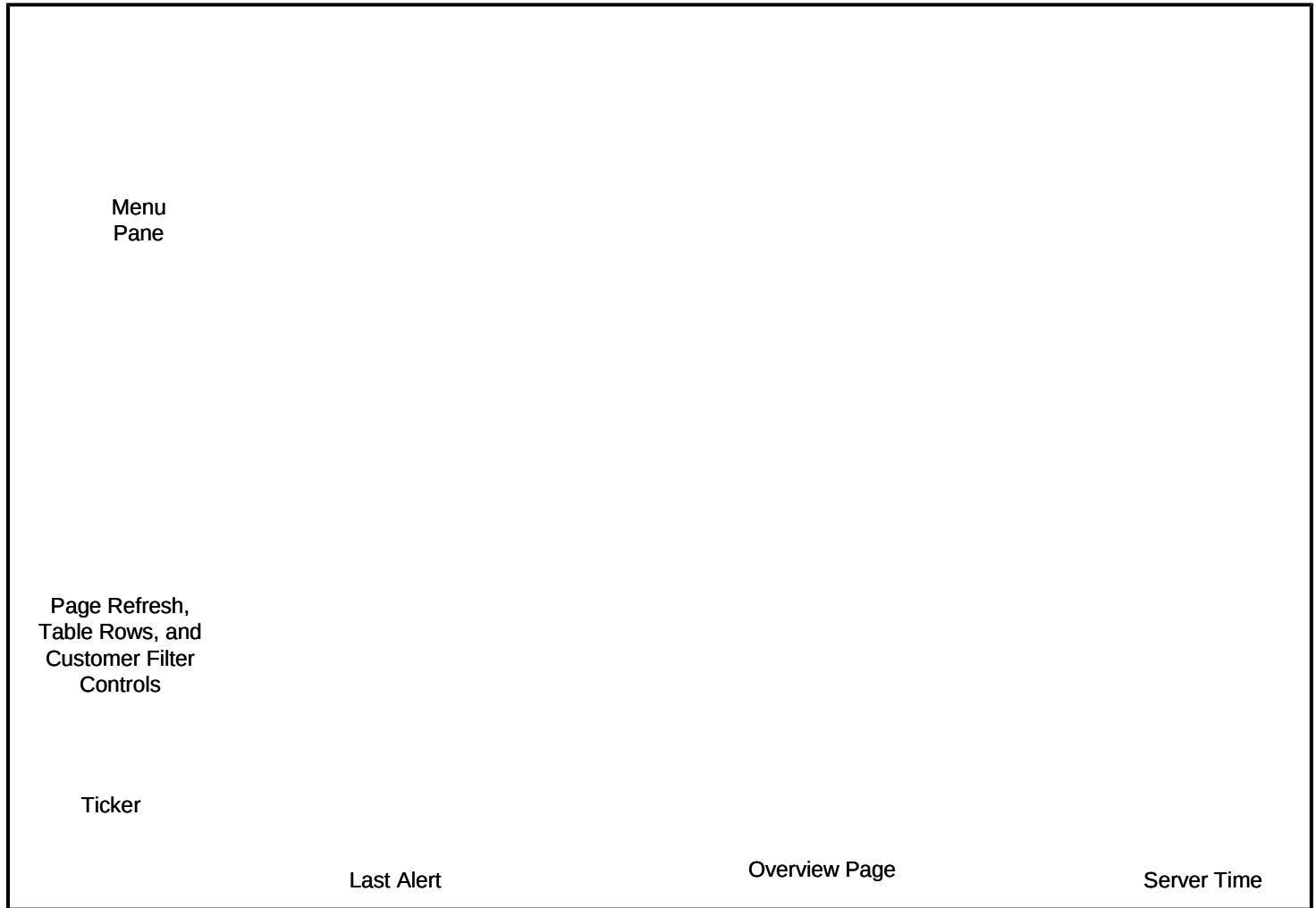


Figure 2: CherryWeb Overview Page

(S) The CW “menu” is located in the left pane. The menu is the starting point for all CW tasks. Links on the menu are grouped under “View”, “Plan”, “Assign”, and “Administer” headings. Links under “View” are analogous to Read-Only or display-only links (e.g., View → Alerts will display a table of recent Alerts). Links under “Plan” are associated with Read-Write links that allow the user to create and/or edit something (e.g., Plan → Missions allows a user to create and/or edit a Mission). Links under “Assign” are associated with links that allow the user to execute a Mission on a Flytrap. Links under “Administer” allow for system administration.

(S) The lower portion of the menu contains a few controls that affect the views of each CW page. The “Page Refresh” combo box allows a User to select how often a page automatically refreshes. A value of “0” (zero) indicates not to refresh automatically. The “Table Rows” combo box allows a User to increase or decrease the number of rows shown for tables that occur on any CW page. The “Operation Filter” combo box allows a User to select a Operation view filter. This control is populated with all Operations that the User has Read or Read-Write access to (see CBUM). If a particular Operation is selected, then any “View” pages will show only entities/assets for that particular Operation. This combo box also includes an “ALL” option, that shows all Operation entities/assets that the User has Read or Read-Write access to.

(S) On the bottom of every CW page is a ticker that will periodically inform the user of any new Alert activity. This ticker also lists the current CherryTree/Web host time in UTC, as CB events are time-tagged according to the CherryTree/Web host time.

(S) CW is a highly cross-referenced user interface, so typically, clicking on any link will yield a page with more detailed information about the link object. For example, clicking on a “Mission Name” link will yield a Mission Details page with detailed information about that Mission. Clicking on a “Flytrap Name” link will yield a Flytrap Details page with detailed information about that Flytrap.

5.4 (U) CW Overview Page

(S) Upon successful login, the user is directed to the “Overview” page (see Figure 2), which shows recent Alert and Flytrap Beacon activity. This screen will periodically refresh according to the countdown timer on the page. The user can return to the “Overview” page by clicking the “Overview” link on the menu. Figure 2 shows the Overview page.

5.5 (U) Changing Your Password

(S) To change your CW password, on the left menu pane, click the “Administer → Password” link. Enter and re-enter a secure password (at least 10 digits, which includes numbers, letters, and special characters, and is not a word or phrase found in a dictionary), and click “Submit”.

5.6 (U) Operation Permissions

(S) While logged in to CW, you will only have access to those Operation-associated entities to which you have proper permissions. Operation-associated entities include Missions and Target Decks, and any data resulting from Missions and/or Target Decks, including Alerts, Copy Data, Harvest Data, etc. In general, if you have “Read” access to a Operation-associated entity, then you will be able to “View” that data (e.g., if Mission “Red 1” is associated with Operation “Red”, and you have “Read” access to “Red”, then the “Red 1” Mission should display when you click the “View → Missions” link on the menu). In general, if you have “Read-Write” access to a Operation-associated entity, then in addition to “View” functionality, you will also be able to “Plan” and “Assign” entities for that Operation (see CBUM) for a discussion of Mission Assignment as it relates to

Operation permissions). To see Operation-related permissions, click the “Administer → Permissions” link (only available to Users with “cwadmin” privileges, see CBUM).

5.7 (U) Preparing for an Initial Beacon

(S) This is an optional step, but is particularly useful in a supply chain scenario where you want to pre-configure a Flytrap Name/Location/Group/Child Group, and pre-assign a specific Mission to the Flytrap before deployment (i.e., the Flytrap will receive this Mission upon its Initial Beacon). If this step is not completed, the Flytrap will simply receive the Default Mission (see 5.10) upon Initial Beacon, and the Flytrap Name/Location/Group/Child Group can be added/edited at any later time through CW (see 5.9).

(S) To perform this step, you must know the LAN MAC address and WLAN MAC address of the Flytrap – the CBUM documents where to find this information on the devices that have passed FAT.

(S) Once you have determined the LAN and WLAN MAC addresses, log on to CW, and click the “Plan → Flytraps” menu link (see Figure 3). Under “Create a Flytrap”, enter the Flytrap Name in the “Name” text box, select the closest Flytrap Make/Model/HW Version/SW Version from the “Starter Flytrap” combo box, and click the “Create” button.

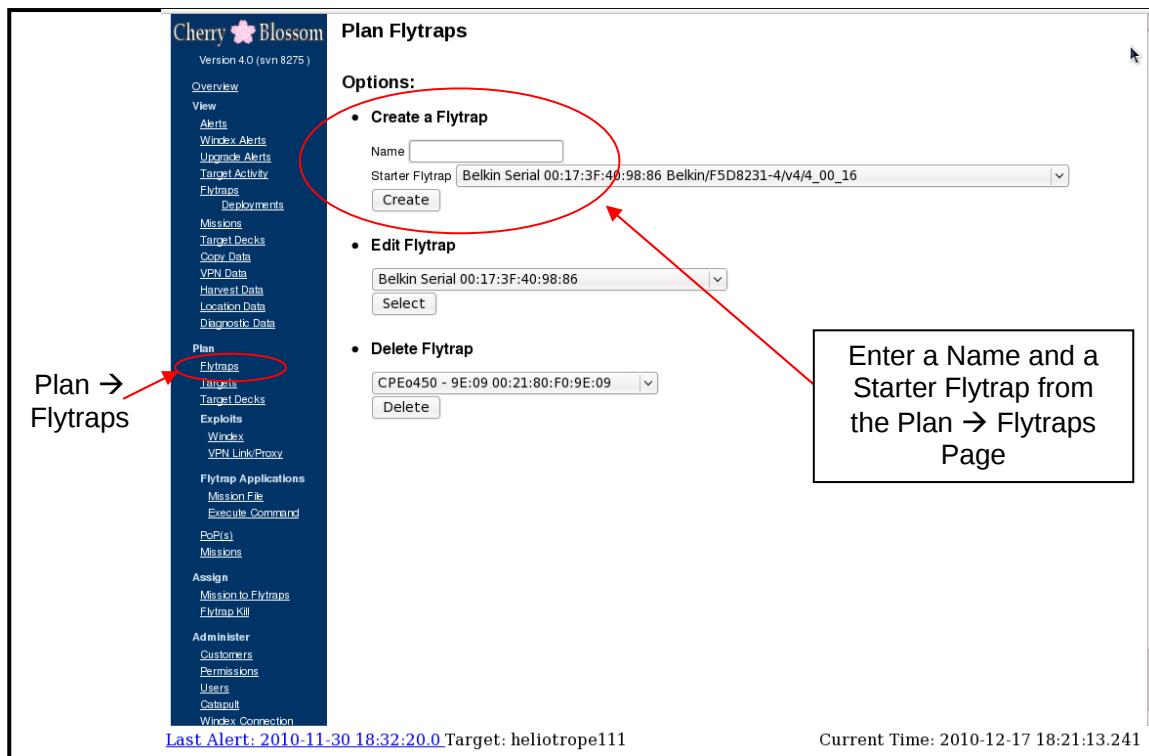


Figure 3: Cherry Web Plan → Flytraps Page (Create)

(S) This will take you to the “Add Flytrap” page (see Figure 4). Here, *carefully* enter the WLAN and LAN MAC addresses, as well as meaningful Location, Group, Child Group, and Description data. At this point, you can also add an estimated Initial Beacon date, if known. Finally, select the Mission you want to pre-assign to the Flytrap. When finished, click the “Update” button.

Add Flytrap

- [NewFlytrap](#)

Base Flytrap
NewFlytrap 00:17:3F:XX:XX:XX Belkin/F5D8231-4/v4/4_00_16 (will lose edits if applied)

Name	Location	Group	Child Group
NewFlytrap	SLO		

WLAN MAC = 00:17:3F:XX:XX:XX
LAN MAC = 00:17:3F:XX:XX:XX

Make/Model/HW/FW = Belkin/F5D8231-4/v4/4_00_16

Estimated Initial Beacon Date = 17 Dec 2010

Next Mission = [M Test 1 \(Active\)](#)

M Test 1 (Active)

[Back to Plan Flytraps](#)

Last Alert: 2010-11-30 18:32:20.0 Target: heliotrope111 Current Time: 2010-12-17 18:22:05.322

Figure 4: Cherry Web Add Flytrap Page

(S) Note that if you make a mistake, you can edit this information at any later time by clicking the “Plan → Flytraps” menu link and selecting the Flytrap from the “Edit Flytrap” combo box. Note that once a Flytrap has sent its Initial Beacon, you can no longer edit the WLAN and LAN MAC addresses (i.e., there is no need at this point).

5.8 (U) Checking Flytrap Status

(S) After the Flytrap has met the Initial Beacon criteria for which it has been configured and has sent its Initial Beacon, you can check the status of the Flytrap on CW by clicking the “View → Flytraps” menu link. You should see a new Flytrap entry with the WLAN MAC address in the “Name” field. Clicking this link will take the user to the “Flytrap Details” page, which displays detailed status information and security settings for this Flytrap. Figure 5 show the View → Flytraps page. Figure 6 shows a Flytrap Details page.

Name	Location	In Com	VPN Link	Harvest Data	Current Mission
Belkin Serial 00:17:3F:40:98:86	SLO	No	N/A	View	M Test 1
cb-vpn PoP 192.12.16.81 LAN=00:1D:7E:DC:2A:69	SLO	No	N/A	N/A	cb-vpn 192.12.16.81
CPE0450 - 8C:A2 LAN=00:24:A1:7D:8C:A2		No	N/A	N/A	at-35
CPEI775 LAN=00:23:EE:1D:58:6F		No	N/A	N/A	at-35
CPE6450 - 9E:09 00:21:80:F0:9E:09		No	N/A	N/A	None
CW 1 LAN=00:24:A1:68:41:3A		No	N/A	View	ORT-5.1
CW 2 LAN=00:24:A1:7C:F5:CA		No	N/A	N/A	ORT-5.15
FT3 00:13:10:44:98:AD	SLO	No	Down	N/A	S test zakura VP
Serial 320N 68:7F:74:29:4B:AA	Scott Office	No	Down	N/A	S test vpnlink glc
Little Bird-750 LAN=00:1E:46:1D:79:02		No	Down	N/A	S test vpnlink glc
M KIT Belkin 00:17:3F:40:01:7C	SLO	Killed	N/A	View	Kill M KIT Belkin
M KIT Linksys WRT300N v2 00:18:39:90:18:C4	SLO	Killed	N/A	View	Kill M KIT Linksy
M KIT WRT54GL 00:25:9C:47:73:F5	SLO	No	N/A	View	M Test 1
SlimBoyFlyTrap 00:25:9C:3B:D3:5B	Firebaugh, CA	No	N/A	View	GlobalShield
SLO flower LAN=00:1E:46:1D:79:14		No	Down	View	S test zakura VP
test planned ft LAN=00:24:A1:00:00:00		No	N/A	N/A	None
00:22:B0:C8:E0:07		No	N/A	N/A	default passive lo
77:77:77:77:77:77		No	N/A	N/A	ORT-5.4
99:99:99:99:99:99	81.3,110.8	No	N/A	N/A	default passive lo
LAN=00:1E:46:1C:DF:42		No	N/A	N/A	default passive lo

Last Alert: 2010-11-30 18:32:20.0 Target: heliotrope111 Current Time: 2010-12-17 17:46:42.221

Figure 5: CherryWeb View → Flytraps Page

(S) The “In Comm” column on the “View → Flytraps” page indicates whether or not the Flytrap is still in communication with the system. A red “No” indicates that the Flytrap has not beaconed within the proper amount of time according to its currently executing Mission. This time is approximately the time of the last beacon, plus the Periodic Beacon Interval plus the Traffic Requirement Timeout (it is shown as the upper range in the “Next Mission Start (est. Range)” column). A yellow “Yes” indicates that the Flytrap has reached its earliest possible beacon time, but has not yet beaconed (e.g., it could be waiting to meet a traffic requirement). This time is the time of the last beacon plus the Periodic Beacon Interval (it is shown as the lower range in the “Next Mission Start (est. Range)” column). A green “Yes” indicates that the Flytrap is still in communication (i.e., the time since the last Beacon has not exceeded the Periodic Beacon Interval). A black “Killed” indicates that the Flytrap has been killed by an operator.

(S) The “View → Flytraps” page has a “VPN Link” column that indicates the status of a VPN Link to that Flytrap. A green “Up” indicates that a VPN Link is open. The Flytrap Details page indicates the IP Address to use to connect to the Flytrap over the VPN Link. This address can be used to run discovery/intrusion/exploitation tools against clients on the Flytrap’s LAN/WLAN. A red “Down” indicates that the VPN Link is down (from a timeout). A yellow “Up?” indicates that the VPN Link should be up based on the Mission settings, but the Flytrap hasn’t beaconed when it was expected to – this could indicate that the Flytrap is no longer in contact and hence the VPN Link may no longer be valid. A black “N/A” indicates that VPN Link (or Proxy) is not configured for the Mission currently executing on the Flytrap. See section 5.27 for a detailed description of the usage of VPN Link and Proxy.

The screenshot shows the "Flytrap Details" page for a device named "J Serial 320N". The page is divided into several sections:

- Flytrap Information:** Includes tabs for Overview, View, Alerts, Upgrade Alerts, Target Activity, Beacon Events, Deployments, Missions, Windex Data, Copy Data, VPN Data, Harvest Data, Diagnostic Data, Plan, Flytraps, Targets, Target Details, Exploits, Windex, VPN Link/Proxy, Flytrap Applications, Mission File, Execute Command, PoPs, Missions, Assign, Return to Flytraps, Flytrap Kill, Administrator, Customers, Permissions, Help, Contact, and Wireless Connection.
- Flytrap Details:** Shows the flytrap's serial number (J Serial 320N), description (General Information), mission information (Current Mission = S-test vpnlink-global, Current Customer(s) = S-test vpnlink-global, Customer(s) Executing Since = 2010-12-13 17:42:55.0, Mission State = Active, Number of Targets = 0, Beacon Interval = 1 Min, Beacon Traffic Timeout = N/A, Beacon Power Cycle = 30 Secs, Session Timeout = 3 Hours, Port Scanning = Scan All Ports, Protocol Scanning = Scan All Protocols, Next Mission Start (est. range) = 2010-12-13 17:43:55.0 -- 2010-12-13 17:44:05.0), status information (Current Status Date = 2010-12-13 17:42:55.0, LAN IP Address = 192.168.1.12, LAN Netmask Bits = 24, WAN IP Address = 0.0.0.0, WAN Netmask Bits = 0, WAN IP Address = 129.91.1, Beacon IP (Internal Network) = 192.12.16.81, Max Actions = 32, Max Targets = 150, Software Uptime = 9 Secs, Hardware Uptime = 1 Hour 3 Mins 23 Secs, SSID = linksys, Password = admin, MissionManager Version = 12, SVN Revision = 8141, PoP IP Address = 24.176.227.182, PoP Port = 8080, Diagnostic = View, Caputl Notified = Connection Error), security information (Security Date = 2010-12-13 17:42:55.0, Security Type = None, WEP Key Index = 1, WEP Key 1 = 00000000000000000000000000000000, WEP Key 2 = 00000000000000000000000000000000, WEP Key 3 = 00000000000000000000000000000000, WEP Key 4 = 00000000000000000000000000000000, WPA Pre-Shared Key =, WPA Radius Server IP = 0.0.0.0, WPA Crypto Type = TKIP), and capabilities (Firmware Inhibit = No, VPN Link = Yes, VPN Proxy = Yes, VPN Encryption = Blowfish, VoIP = No, Location = No, FW Version String = No).
- Data Associated with this Flytrap:** Shows collected data (Windex Data, Firmware Upgrade Alerts, Diagnostic, Harvest Data, Copy Data, VPN Data) and a status history table with columns: Date, LAN IP, Software Uptime, Hardware Uptime, SSID, Password, Tumbleweed Address, RFC822 Fill %, Strict Fill %, and Mission. The table contains four rows of data.
- Status History:** Shows a table with columns: Date, Security Type, WEP Key Index, WEP Keys, WPA Pre-Shared Key, WPA Radius Server IP, and WPA Crypto Type. The table contains one row of data for December 3, 2010, at 01:13:26.0.
- Security History:** Shows a table with columns: Date, Security Type, WEP Key Index, WEP Keys, WPA Pre-Shared Key, WPA Radius Server IP, and WPA Crypto Type. The table contains one row of data for December 3, 2010, at 01:13:26.0.

Figure 6: Cherry Web Flytrap Details Page

(S) The Flytrap Details page (Figure 6) includes a history table of both common status information and security settings from each Beacon. Currently, the most recent 25 status and security entries are displayed, but the CT stores every history entry in its database. Note that the “Status History” table also contains the harvest buffer “Fill %” (both “RFC 822” and “Strict” – see CBUM). A value of “100%” indicates that the harvest buffer was completely filled during the last Beacon interval, and implies that a Mission with a shorter Beacon interval might be desirable for future harvesting.

(S) The Flytrap Details page also contains links to any data associated with the Flytrap, including Windex Alerts, Firmware Upgrade Alerts, Diagnostic Data, Harvest Data, Copy Data, and VPN Data. Clicking on the appropriate link takes the user to a page with the associated data that has been filtered for that Flytrap.

(S) For Roundhouse devices, the Flytrap Details page displays geolocation data. Consult the Roundhouse team for documentation on definitions of geolocation data.

(S) You can also get a more “Initial Beacon”-centric display for all Flytraps by going to the “View → Flytraps → Deployments” page (see Figure 7). The table on this page lists all Flytraps in the system, whether or not they have sent an Initial Beacon, and the date of the Initial Beacon, or the estimated time of Initial Beacon if the device has not yet sent an Initial Beacon.

Deployed Flytraps						
Name	Wireless LAN MAC	Init. Beacon Received	Init. Beacon Date	Last Beacon Date	Catapult Notified	Location
(no name)	00:13:10:44:98:B3	Yes	26 Jan 2012	01 Feb 2012	N/A	
(no name)	LAN=00:25:9C:41:54:2C	Yes	01 Feb 2012	24 Apr 2012	N/A	
NoBeaconFlyTrap	LAN=00:25:9C:00:00:00	No	14 Feb 2012 (est.)		N/A	

Last Alert: 2012-04-19 08:14:42.0 Target: you@suck.eggs

Current Time: 2012-04-24 14:55:22.788

Figure 7: Cherry Web View → Flytraps → Deployments Page

5.9 (U) Setting Flytrap Name, Location, Group, Child Group, Description

(S) If a Flytrap has not been pre-configured for an Initial Beacon (see 5.7), it is wise at this point to set a meaningful Flytrap Name, Location, Group, Child Group, and Description. To do so, click the “Plan → Flytraps” menu link (see Figure 8). In the “Edit

“Flytrap” combo box, select the Flytrap to edit (at this point, the Flytrap is referenced by its WLAN MAC address) and click the “Select” button to navigate to the “Edit Flytrap” page.

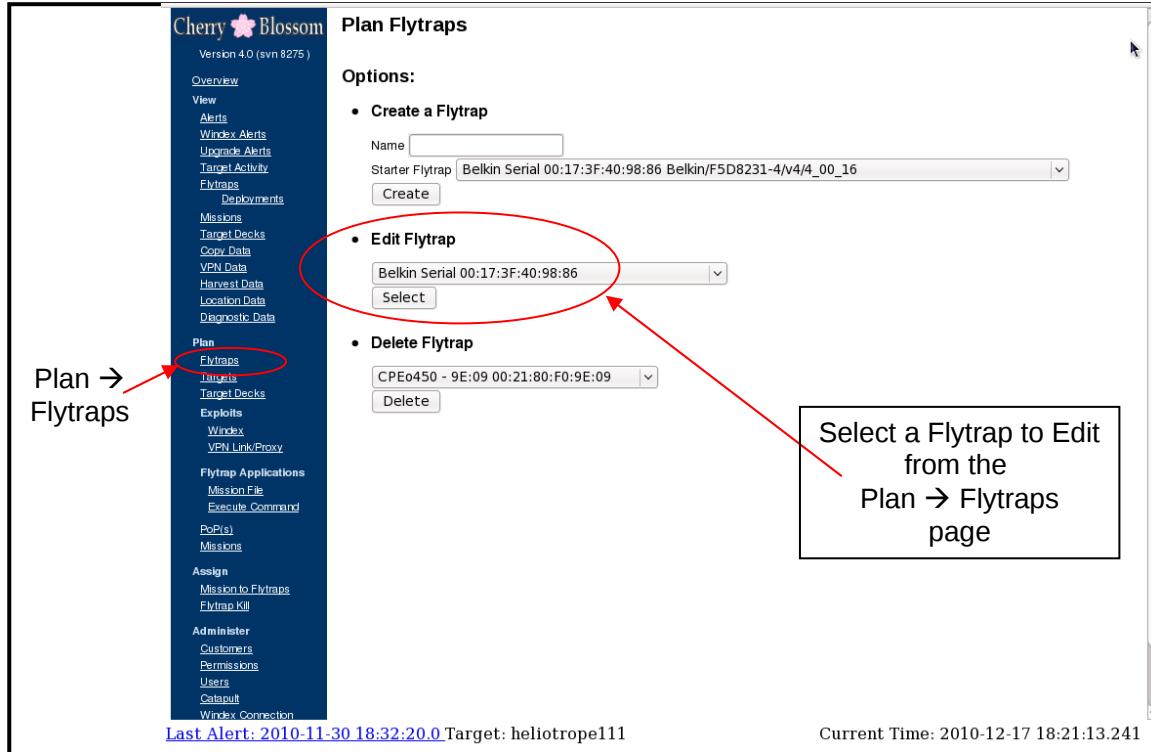


Figure 8: Cherry Web Plan → Flytraps Page (Edit)

(U) On the “Edit Flytrap” page (see Figure 9), edit the Name, Location, Group, Child Group, and Description as appropriate. When you are finished, click the “Update” button.

(U) *NOTE: you can also reach this page from a “Flytrap Details” page by clicking the “plan” link at the top of the page.*

The screenshot shows the 'Edit Flytrap' page in the Cherry Blossom web interface. The left sidebar contains a navigation menu with sections like Alerts, Missions, Plan, Flytrap Applications, PoPs, Assign, and Administer. The main content area has a title 'Edit Flytrap' and a sub-section 'Belkin Serial'. A table displays the following data:

Name	Location	Group	Child Group
Belkin Serial	SLO		

Below the table, there are three colored boxes containing MAC addresses:

- WLAN MAC = 00:17:3F:40:98:86 (blue)
- LAN MAC = 00:17:3F:40:98:86 (green)
- Make/Model/HW/FW = Belkin/F5D8231-4/v4/4_00_16 (blue)

The 'Next Mission' dropdown is set to 'M Test 1 (Active)'. Below it are 'Update' and 'Back to Plan Flytraps' buttons. At the bottom, status messages indicate 'Last Alert: 2010-11-30 18:32:20.0 Target: heliotrope111' and 'Current Time: 2010-12-17 18:22:33.091'.

Figure 9: Cherry Web Edit Flytrap Page

5.10 (U) The Default Mission

(S) When a Flytrap sends its Initial Beacon, the CT will respond with the Default Mission. To view the Default Mission, click the “Plan → Missions” menu link (see Figure 10). The current Default Mission is listed under the “Choose Default Mission” bullet as “Current Default Mission =”. You can also see the Default Mission by clicking “View → Missions”. The Default Mission will have a ‘(default)’ tag after the Mission name.

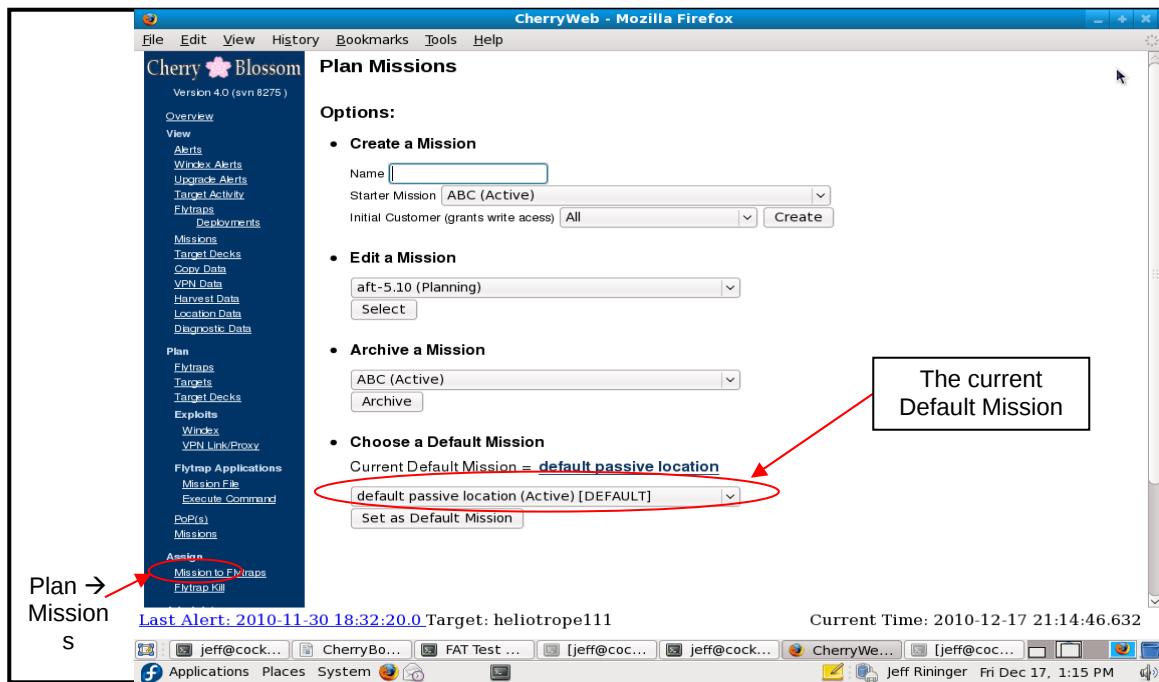


Figure 10: Cherry Web Plan → Missions Page

5.11 (U) Planning a Mission

(S) The most complicated function of CherryWeb is Planning a Mission. This section breaks the process down into 17 steps. Note that steps 1-6 can be thought of as “pre-planning”, because entities defined in these steps can then be used when planning any Mission.

5.11.1 (U) Step 1: Define Targets

(S) This step defines individual Targets, that can then be added to Target Decks, which can then be added to Missions. Note that only Target Decks (and not individual Targets) can be added to Missions (see 5.11.2).

(S) Click the “Plan → Targets” menu link (see Figure 11). Select the Target Type (either email, chat, MAC, or VoIP) in the dropdown box, and then enter the “Name”. Next, click the “Create” button, and CW will validate your entry. CW will prompt the user to re-enter if there are any formatting errors; otherwise, the new Target should appear in the Target list at the bottom of the page. Continue this process until all Targets have been entered properly.

The screenshot shows the Cherry Web interface. The left sidebar has a navigation menu with various links like Overview, View, Alerts, Windex Alerts, Upgrade Alerts, Target Activity, Flytraps, Deployments, Missions, Target Decks, Copy Data, VPN Data, Harvest Data, Location Data, Diagnostic Data, Plan, Flytraps, Targets (which is highlighted with a red circle), Target Decks, Exploits, Windex, VPN Link-Proxy, Flytrap Applications, Mission File, Execute Command, PoPs, Missions, Assign, Mission to Flytraps, Flytrap Kit, Administer, Customers, Permissions, Users, Catalog, and Windex Connection. At the bottom of the sidebar, it says 'Last Alert: 2010-11-30 18:32:20.0 Target: heliotrope111'. The main content area is titled 'Create a Target' with fields for 'Target Type' (set to 'email'), 'Name' (empty), and a 'Create' button. Below this is a note: 'Note: Target names are case insensitive'. A table titled 'Targets' lists entries with columns for Id, Name, Type, and Missions. The table contains 24 rows of target data. At the bottom right of the main area, it says 'Current Time: 2010-12-17 18:23:51.357'.

Figure 11: Cherry Web Plan → Targets Page

5.11.2 (U) Step 2: Create Target Deck(s)

(S) This step defines groups of Targets that can then be added to Missions. It also includes the ability to import a file with a list of Targets. Note that only Target Decks (and not individual Targets) can be added to Missions.

(S) Click the “Plan → Target Decks” menu link (see Figure 12). Under the “Create a Target Deck” bullet, in the Name edit box, enter a unique name. Note that names that are different in case only are *not* considered unique. Next, select a “Starter Target Deck”. This will copy the Starter Target Deck’s data into the new Target Deck you are creating; hence, it is best to select a Starter Target Deck that is most like the Target Deck you are going to create. Select the Initial Operation. Finally, click the “Create” button.

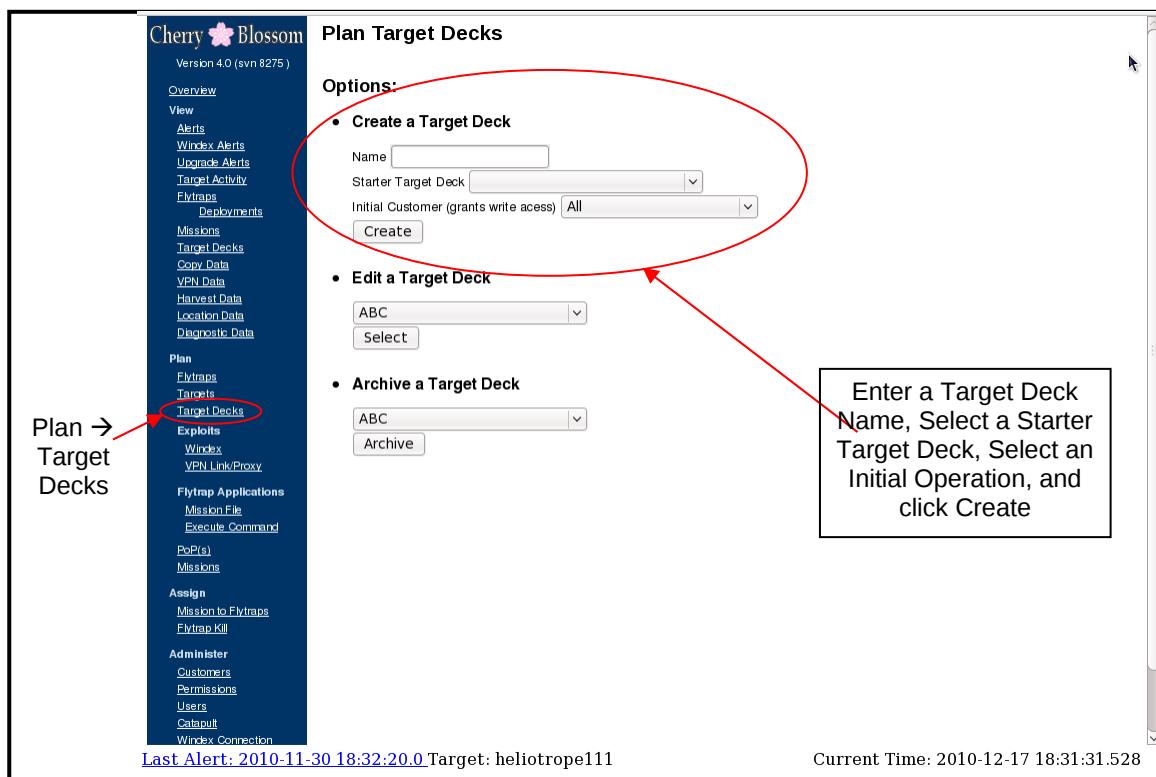


Figure 12: Cherry Web Plan → Target Decks Page

(S) This takes you to the “Target Deck Workflow” page (see Figure 13), which shows a list of the workflow steps to create a Target Deck. Click the “Next” button to continue to the first workflow step.

The screenshot shows the 'Target Deck Workflow' page from the 'Cherry Blossom' application. The left sidebar contains a navigation menu with sections like Overview, Alerts, Missions, Plan, Exploits, Flytrap Applications, PoPs, Assign, Administer, and more. The main content area is titled 'Target Deck' and shows a 'NewTargetDeck' section. It includes a text input field labeled '(edit name)' and a list of three steps: 1. Customer Ownership, 2. Target Deck Upload, and 3. Target Assignment. A 'Next' button is located below the steps. At the bottom of the page, there is a 'Last Alert' message and a timestamp.

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Target Deck Workflow

Target Deck

NewTargetDeck

(edit name)

1. Customer Ownership
2. Target Deck Upload
3. Target Assignment

>> Next >>

Last Alert: 2010-11-30 18:32:20.0 Target: heliotrope111

Current Time: 2010-12-17 18:32:08.068

Figure 13: Cherry Web Target Deck Workflow Page

(S) The “Available Operations” list box lists all Operations that the User has “Read” or “Read-Write” access to. The “Owning Operations” list box lists all Operations that are currently in ownership of the Target Deck. Move “Available” and “Owning” Operations back and forth between the list boxes using the two arrow controls between the list boxes. Once all owning Operations have been set appropriately, click the “Next” button to continue to the next workflow step.

Operation Ownership

NewDeck1

- NewDeck1

Operations

Create a Operation

Available Operations

Owning Operations

→ select ← deselect

DEFAULT TestOp1

Apply Operations

<< Back << >> Next >>

Last Alert: 2012-04-19 08:14:42.0 Target: you@suck.eggs

Current Time: 2012-04-24 14:33:36.798

Figure 14: Cherry Web Target Deck Operation Ownership Page

(S) The “Target Deck Upload” page allows a list of Targets contained in a file (a “Target Deck file”) to be imported (see Figure 15). Note that this step is optional when creating a Target Deck. The “Target Deck file” format is simply a text file with each line representing a different Target. Lines beginning with a ‘#’ sign are interpreted as comments. Empty lines are skipped. A Target with an ‘@’ sign is interpreted as an email Target; a Target with format ‘XX:XX:XX:XX:XX’ (where each X is a hexadecimal digit) is interpreted as a MAC address; all other Target lines are interpreted as chat usernames. Note that leading and trailing whitespace is trimmed from the Target name (i.e., if a Target name has spaces before and after it in the file, they are disregarded). When a Target Deck file is uploaded, each Target is tested for validity and uniqueness. Each valid and unique Target is added to the system’s Target list (viewable via “Plan → Targets”), and added to the Target Deck being created. Each invalid Target is reported as an error.

Figure 15: Cherry Web Target Deck Upload Page

(S) To upload a Target Deck file, click the “Browse...” button and select the Target Deck file. Select “Append” or “Replace” – append will append any valid and unique Targets in the Target Deck file to the Target Deck; replace will replace the Target Deck with the valid and unique Targets in the Target Deck file (i.e., be careful when performing a Replace). Then click “Execute” to upload the Target Deck file. Note that you can repeat this step as many times as necessary to upload all Target Deck files of interest. When finished uploading Target Deck files, click the “Next” button to continue to the next workflow step.

(S) Next, on the “Target Assignment” page of the Target Deck workflow (see Figure 16), move Targets from the “Available” list box to the “Selected” list box and vice versa. Note that you can select multiple Targets from either list box by holding the CTRL key. You can select a contiguous range of Targets from either list box by selecting the first entry of interest, then holding the SHIFT key, then selecting the last entry of interest; or, you can click the first Targets, then hold the left mouse button down, and drag to the last Target. Click the “select” or “deselect” arrow key to move selected Targets back and forth between the “Available” and “Selected” list boxes. When all of the desired Targets are in the “Selected” list box, click the “Next” button at the bottom of the screen to finish the creation of the Target Deck.

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[Overview](#)
[View](#)
[Alerts](#)
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[Upgrade Alerts](#)
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[Caption](#)
[Windex Connection](#)

Target Assignment

NewTargetDeck1
• [NewTargetDeck1](#)

Targets

[Create a Target](#)

Available

- 00118475766037
- 00:01:02:03:04:05
- 00:01:02:03:04:06
- 00:0B:97:29:B7:5D
- 00:0D:60:CD:7E:B0
- 00:0E:08:28:41:6D
- 00:11:22:33:44:55
- 00:12:3F:11:22:33
- 00:18:8B:CB:B3:BB
- 00:18:8B:CB:B3:BC

Selected

- abc@def.com

→ select ← deselect

1 Target(s)
[Apply Targets](#)

<< Back << >> Next >>

Last Alert: 2010-11-30 18:32:20.0 Target: heliotrope111 Current Time: 2010-12-17 18:40:26.671

Figure 16: Cherry Web Target Assignment Page for Target Decks

(S) Next, on the “Target Exploit/Action Assignment” page of the Target Deck workflow (see Figure 17), for each target, select the appropriate Action. To enable a Copy Action (Copy, Copy VoIP, or Copy Call [VoIP targets only]), for a particular target, click the Copy checkbox beside that target. Set a Copy Timeout value (specify all zeros to copy indefinitely). For Windex, select the Windex URL from the drop down box and then choose a Windex type (Double Iframe or Redirect). Recommended Windex type is “Double Iframe”. For VPN Action (VPN Proxy or VPN Link), select “VPN Proxy” to proxy that Target’s TCP and UDP traffic or select “VPN Link” to establish a VPN Link between the CB-VPN and the Flytrap upon Target detection. Set a VPN Action Timeout

value (specify all zeros to perform the VPN action indefinitely). If a VPN Action has been specified, select the VPN Server in the drop down box at the bottom of the Target table.

Target Exploit/Action Assignment (NewMission)					
Target Name	Type	Copy Action	Copy Timeout	Windex URL	
abc@def.com	Email	Disabled	0 Days 0 Hours 0 Mins	asdf website (http://www.asdf.com) 0 Sec to 45 Days 12 Hours 15 Mins	

(For no timeout set Days, Hours, Mins to 0)

Total targets for the Mission: 1
Total unique actions for Mission: 1

[Apply Actions](#)

<< Back << >> Next >>

Last Alert: 2010-11-30 18:32:20.0 Target: heliotrope111 Current Time: 2010-12-17 21:19:19.539

Figure 17: Cherry Web Target Action Assignment Page for Target Decks

(S) Note that VPN Proxy and VPN Link Actions require an operational CB-VPN -- see the “Cherry Blossom Installation Guide” for CB-VPN installation and configuration instructions. See section 5.27 for a detailed description of the usage of VPN Link and Proxy.

(S) Repeat this process until all desired Target Decks have been created.

(S) Note that Target Decks can be edited after creation. See Section 5.17. To view a Target Deck after it has been created, click the “View → Target Decks” menu link and select the Target Deck of interest.

5.11.3 (U) Step 3: Define Windex (Browser Redirect) and VPN Link/Proxy Exploits

(S) This step defines the Windex URL's to which Targets can be directed, and the VPN Servers (CB-VPN) for VPN Proxy and VPN Link actions (see CBUM).

(S) To add a Windex URL, click the “Plan → Exploits → Windex” menu link (see Figure 18). Enter a unique name for the Windex URL and the Windex URL into the “New Windex URL” edit boxes. Next, click the “Create” button, and CW will validate your entry. Note that the name can include letters and numbers and the URL should be fully-qualified, including the protocol (e.g., <http://www.abc.def.com>). Additionally, names that are different in case only are *not* considered unique. CW will prompt the user to re-enter if there are any errors; otherwise, the new Windex URL will appear in the URL list at the bottom of the page. Continue this process until all Windex URLs have been entered properly.

The screenshot shows the Cherry Web interface. On the left, a vertical sidebar lists various menu items under categories like Overview, Alerts, Deployments, Plan, Exploits, Assign, and Administer. A red arrow points from the text "Plan → Exploits → Windex" to the "Windex" menu item in the sidebar. The main content area is titled "Create a Windex URL" and contains fields for "Name" and "URL". Below these is a table titled "Windex URLs" showing a list of entries with columns for "Id", "Name", and "URL". The table includes entries such as "Random Website", "WFW (website for wankers)", "ZZZ Website", "asdf website", "calpoly website", "m end-to-end", and "yyy website". At the bottom of the page, there is a note about the last alert and the current time.

Id	Name	URL
3	Random Website (edit name)	http://www.camelporn.org
4	WFW (website for wankers) (edit name)	http://www.wankers.org
5	ZZZ Website (edit name)	http://www.zipnada.org
1	asdf website (edit name)	http://www.asdf.com
2	calpoly website (edit name)	http://www.calpoly.edu
7	m end-to-end (edit name)	http://10.1.1.77:8181?promo_code=1Z45RDJ
6	yyy website (edit name)	http://www.Yme.net

Figure 18: Cherry Web Plan → Exploits → Windex Page

(S) To rename a Windex entry, click the “Plan → Exploits → Windex” menu link (see Figure 18). Then click the “edit name” link immediately following the desired Windex entry. This will open an edit page with the current Windex name already entered in the “Windex Name” field. Update the Windex name as desired and click “Save” to commit the change or “Back” to cancel. CW will validate the entry and prompt the user if there are any errors. Once the name has been successfully changed, click “Back” to return to the Windex entry page. Note that the URL cannot be changed.

(S) Windex requires that all URL's contain one or more parameters that are used to authenticate the Target. These parameters are appended to the end of the URL. These parameters must be obtained from the Windex system.

(S) When using the Windex "Redirect" technique (i.e., not the Windex "Double Iframe" technique), the Windex URL needs to be created using the following format:

```
http://<windex>/submit?a=user&b=pass&__url=<site>
```

(S) Note that "<windex>" is the address of the Windex web server and "site" is the site to direct the Target to after the browser has been exploited. If "site" is left blank, the Flytrap will fill in the site that the Target was originally requesting before the Redirect. For example,

```
http://<windex>/submit?a=user&b=pass&__url=http://www.cnn.com
```

would direct the Target to cnn.com after the browser has been exploited, and:

```
http://<windex>/submit?a=user&b=pass&__url=
```

would allow the Flytrap to fill in the __url "site" parameter based on where the Target had originally requested. Note that there are two underscores in "__url".

(S) See Windex documentation for Windex setup/installation/operation, and how to create/assign users and passwords that can be used in Flytrap Redirects.

(S) To add a VPN Link/Proxy address, click the “Plan → Exploits → VPN Link/Proxy” menu link (see Figure 19). Enter a unique name and the address/port of a VPN Proxy Server (i.e., a CB-VPN) in the “Name” / “Proxy Address” / “Port” edit boxes. Next, click the “Create” button, and CW will validate the entry. Note that the name can include letters and numbers and the address should be a domain name (e.g., www.zakura.com) or IP address and should *not* have the protocol specified (as was the case with the “Windex URL”). Additionally, names that are different in case only are *not* considered unique. CW will prompt the user to re-enter if there are any errors; otherwise, the new VPN Link/Proxy address will appear in the VPN Server list at the bottom of the page. Continue this process until all VPN Proxy Servers have been entered properly.

Id	Name	Address	Port
4	Fast (edit name)	192.168.1.197	80
2	slo (edit name)	192.12.16.81	80
1	slo dsl (edit name)	70.237.151.14	80
3	zakura vpn (temporary) (edit name)	24.176.227.182	80

Figure 19: Cherry Web Plan → Exploits → VPN Link/Proxy Page

(S) To rename a VPN Link/Proxy entry, click the “Plan → Exploits → VPN Link/Proxy” menu link (see Figure 19). Then click the “edit name” link immediately following the desired entry in the VPN Server list. This will open an edit page with the current VPN Link/Proxy name already entered in the “VPN Link/Proxy Name” field. Update the VPN Link/Proxy name and click “Save” to commit the change or “Back” to cancel. CW will validate the entry and prompt the user if there are any errors. Once the name has been changed, click “Back” to return to the VPN Link/Proxy entry page. Note that neither the proxy address nor the port can be changed.

5.11.4 (U) Step 4: Define Mission Files (for Application Execution)

(S) To have an application execute as part of the Mission, first add the application to the system as a “Mission File”. Click the “Plan → Application Execution → Mission File” menu link (see Figure 20). Upload the application using the “Browse” button. Select a “File Compatibility” for the file.

The screenshot shows the Cherry Web Plan interface. On the left, there is a sidebar with various navigation links. A red arrow points from the text "Plan → Flytrap Applications → Mission File" to the "Mission File" link in the sidebar. The main content area is titled "Import Mission File". It has fields for "Upload a Mission File" (with a "Browse..." button), "File Compatibility" (set to "Universal"), and "Upload Action" (set to "Retain"). Below these is a "Import" button. Underneath is a table titled "Available Mission File(s)" showing a list of files with columns for "File Name", "File Compatibility", "Download", and "Last Modified". The table includes files like "vpn", "test.txt", and several shell scripts. At the bottom of the page, there are "Last Alert" and "Current Time" status messages.

File Name	File Compatibility	Download	Last Modified
vpn	Universal	download	2010-12-02 22:40:03.0
test.txt	Universal	download	2010-07-07 19:27:29.0
max_file_size_is_1010135	Unknown/Unknown/Unknown/Unknown	download	2010-07-23 18:53:09.0
max_file_name_length_32_pass	Unknown/Unknown/Unknown/Unknown	download	2010-07-23 18:53:41.0
shellid_GL	Linksys/WRT54G(L)/v4(1)/4_30_11_ETS	download	2010-09-19 20:55:03.0
shellid_300	Linksys/WRT300N/v2/2_00_08	download	2010-09-19 22:42:11.0
dumbbelld_belkin	Belkin/F5D8231-4/v4/4_00_16	download	2010-11-30 01:45:53.0

Figure 20: Cherry Web Plan → Flytrap Applications → Mission File Page

(S) NOTE: applications must be built using the proper toolchain for the Flytrap of interest, so the “File Compatibility” selector will limit Mission Assignment to this device type. Furthermore, a Mission File can in general be any type of file (for example a data file or a shell script), so “Universal” can be selected to allow a Mission File to be pushed to any device type.

(S) Next, select the “Upload Action” as “Retain” or “Replace” – “Retain” will give an error if the user tries to upload a Mission File that has the same name and Device Compatibility as a Mission File already in the system, whereas “Replace” will overwrite the Mission File already in the system.

(S) Click the “Import” button to import the Mission File into the system. The new file should show in the table. A user can click the “Download” link in the table to pull a copy of the Mission File from the system.

5.11.5 (U) Step 5: Define Execute Commands (for Application Execution)

(S) To have an application execute as part of the Mission, define an Execute Command for the application imported during the previous step. Click the “Plan → Application Execution → Execute Command” link. Enter a Name for the command and an Execution Compatibility (similar to the “File Compatibility” of the previous step). Finally, enter the command exactly as it should be executed on the Flytrap. This command will be executed as a “system” command on the Flytrap. Note that all commands are executed in the background (e.g., run with an appended ‘&’ ampersand character).

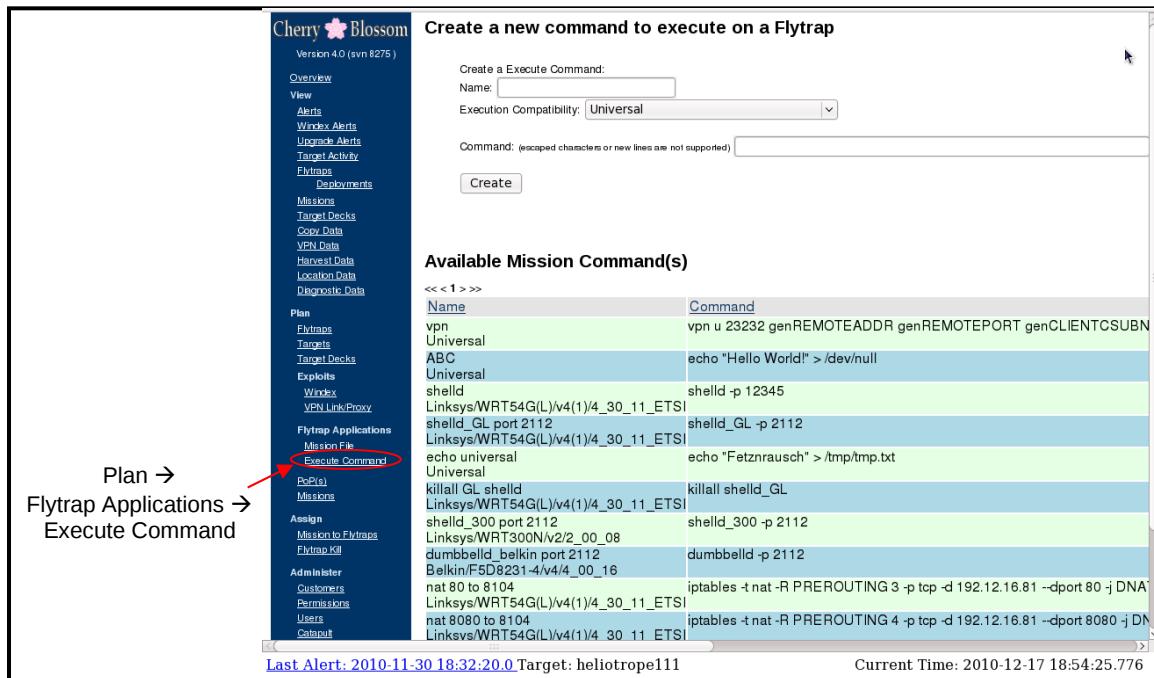


Figure 21: Cherry Web Plan → Flytrap Applications → Execute Command Page

5.11.6 (U) Step 6: Define PoPs

(S) This step defines the PoP domain/IP addresses and port numbers that Flytraps will use to communicate back to the CherryTree. It is *critically important* that PoPs are defined properly.

(S) Click the “Plan → PoP” menu link (see Figure 22). Enter a unique PoP name into the “Name” edit box. Note that the name can include letters and numbers and that names that are different in case only are *not* considered unique. Next enter the URL or IP address in the “URL or IP Address” edit box. The URL should be a domain name (e.g., www.zakura.com) or IP address and should *not* have the protocol specified (as was the case with the “Windex URL”). Next, enter the port, which typically should be 80, although could vary from PoP to PoP depending on the PoP’s configuration. Next, click the “Create” button, and CW will validate your entry. CW will prompt the user to re-enter if there are any errors; otherwise, the new PoP will show up in the PoP list at the bottom of the page. Continue this process until all PoPs have been entered properly.

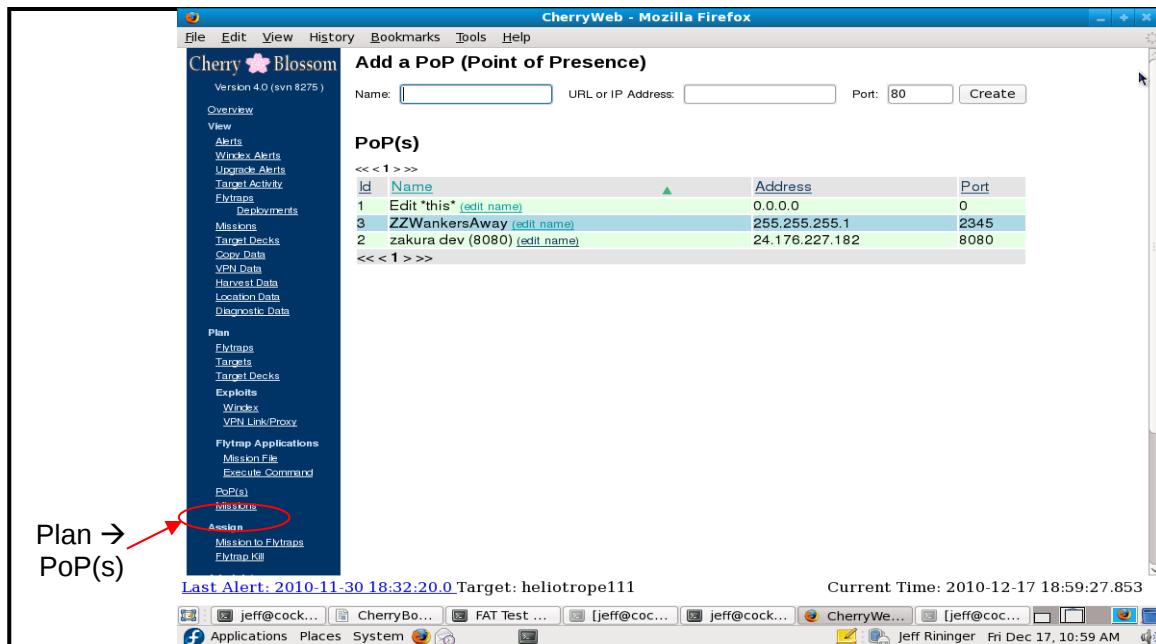


Figure 22: Cherry Web Plan → PoP(s) Page

(S) To rename a PoP, click the “Plan → PoP” menu link (see Figure 22). Then click the “edit name” link immediately following the desired PoP entry in the PoP list. This will open an edit page with the current PoP name already entered in the “PoP Name” field. Update the PoP name and click “Save” to commit the change or “Back” to cancel. CW will validate the entry and prompt the user if there are any errors. Once the name has been successfully changed, click “Back” to return to the PoP entry page. Note that neither the address nor the port fields can be changed.

5.11.7 (U) Step 7: Create a New Mission

(S) To create a new Mission, click the “Plan → Missions” menu link (see Figure 23). Under the “Create Mission” bullet, in the Name edit box, enter a unique name for the Mission. Note that names that are different in case only are *not* considered unique. Next, select a “Starter Mission”. This will copy the Starter Mission’s data into the new Mission you are creating; hence, it is best to select a Starter Mission that is most like the Mission you are going to create. Select the Initial Operation. Finally, click the “Create” button, which will take you to the “Mission Workflow” page.

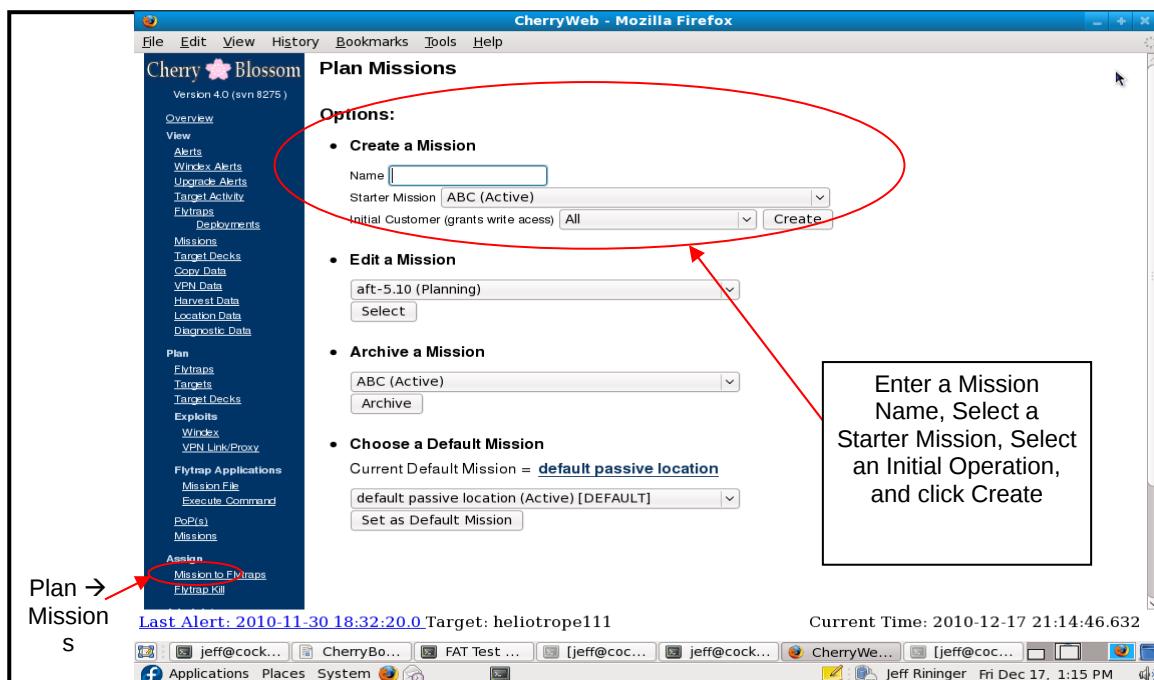


Figure 23: Cherry Web Plan → Missions Page (Create)

5.11.8 (U) Step 8: Edit Operation Ownership of Mission (Mission Workflow 1)

(S) The “Mission Workflow” page shows the workflow steps involved in creating a Mission. Click the “Next” button to continue to the “Operation Ownership” step of the Mission workflow.

The screenshot shows the 'Mission Workflow' page for 'Cherry Blossom Version 4.0 (svn 8275)'. The left sidebar contains navigation links for Alerts, Windex Alerts, Upgrade Alerts, Target Activity, Flytraps, Deployments, Missions, Target Decks, Copy Data, VPN Data, Harvest Data, Location Data, Diagnostic Data, Plan, Flytraps, Targets, Target Decks, Exploits, Windex, Flytrap Applications, and Assign. The main content area is titled 'Mission' and shows the 'NewMission' step. It lists the following workflow steps:

1. [Customer Ownership](#)
2. [Support Parameters](#)
3. [Target Deck\(s\)](#)
4. [Target Exploit/Action\(s\)](#)
5. [Mission File\(s\)](#)
6. [Execute Command\(s\)](#)
7. [Firmware Version String\(s\)](#)
8. [PoP\(s\)](#)

- [Suicide Properties](#)
- [Assign Mission to Flytraps](#)

A 'Next' button is located at the bottom left of the main content area. At the bottom of the page, there is a 'Last Alert' message and a 'Current Time' indicator.

Last Alert: 2010-11-30 18:32:20.0 Target: heliotrope111 Current Time: 2010-12-17 21:16:04.952

Figure 24: Cherry Web Mission Workflow Page

(S) On the “Operation Ownership” Mission workflow page (see Figure 25), the “Available Operations” list box lists all Operations that the User has “Read” or “Read-Write” access to. The “Owning Operations” list box lists all Operations that are currently in ownership of the Mission. Move “Available” and “Owning” Operations back and forth between the list boxes using the two arrow controls between the list boxes.

Figure 25: Cherry Web Mission Workflow Operation Ownership Page

(S) Once all owning Operations have been set appropriately, click the “Next” button to continue to the next Mission Workflow step. Note that the page will validate all entries and show any errors at the bottom of the screen. The User should correct all entries before moving to the next Mission Workflow step.

5.11.9 (U) Step 9: Edit Mission Support Parameters (Mission Workflow 2)

(S) On the “Mission Support Parameters” page of the Mission workflow, edit the Mission Support parameters appropriately (see Figure 26 – note this page is quite large with a lot of fields and does not completely show in the figure).

The screenshot shows the 'Edit Mission Support Parameters' page for a mission named 'NewMission'. The interface includes several tables for configuring mission parameters:

- Periodic Beacon Parameters:** Set to 0 Days, 0 Hours, 1 Mins, 0 Secs. Traffic Requirement is set to 'None'. Traffic Requirement Timeout is 'N/A'. Power Cycle Wait is set to 0 Days, 0 Hours, 0 Mins, 10 Secs. The range for Power Cycle Wait is 0 Sec to 91 Days.
- Target Monitoring Parameters:** Session Timeout is set to 0 Days, 0 Hours, 5 Mins, 0 Secs. The range is 30 Secs to 1 Day. Target Monitoring is set to 'No'.
- Filter Parameters:** Port Scanning is set to 'Scan All Ports'. Protocol Scanning is set to 'Scan All Protocols'. Remove AcceptEncoder is set to 'Yes'.

The sidebar on the left provides navigation links for various system components like Windex, Upgrade, Target Activity, Flytraps, Missions, and Plan. The bottom of the screen displays system status and alerts.

Figure 26: Cherry Web Mission Support Parameters Mission Workflow Page

- **Name** – the name of the Mission
- **Periodic Beacon Parameters (see CBUM for more detailed descriptions):**
 - Interval (sec) – the amount of time in seconds to wait before attempting to send the next Periodic Beacon
 - Traffic Requirement – the traffic requirement that must be achieved for the Flytrap to send a Beacon. High/Medium/Low/None requires that at least 100/50/10/0 packets per second be passing through the Flytrap for a beacon to be sent
 - Traffic Requirement Timeout (sec) – the maximum amount of time in seconds to wait before sending a Beacon if the Beacon Traffic requirement is never met.
 - Power Cycle Wait (sec) – The amount of time in seconds to wait after a Flytrap has been power-cycled before sending the next Beacon. Remember that Mission data (e.g., Targets and Actions) is stored in volatile RAM, and so is lost when the device is power-cycled; hence, if the device is power-cycled, it will need to successfully Beacon before it can continue performing its Mission tasking.

- o Slow Retry Pause (sec) – the amount of time pause for a slow retry in the beacon logic.
 - o Fast Retry Pause (sec) – the amount of time pause for a fast retry in the beacon logic.
- **Target Monitoring Parameters:**
 - o Session Timeout (sec) – the amount of time in seconds to wait before timing out a Target’s session. If a Target is inactive (i.e., has no network activity) for at least Session Timeout, and then becomes active (i.e., generates network activity) again on the same Flytrap, the Flytrap will send another Alert.
 - o Target Monitor Interval (sec) – the interval in seconds at which to send target monitor updates. Set this to “0” to disable target monitoring. Otherwise, the smaller this value is set, the faster the Flytrap will send feedback on target activity.
- **Filter Parameters:**
 - o Port Scanning – “Scan All Ports” will search network traffic for email/chat Targets on all ports, “80 and Chat Ports” will only search traffic on port 80 (i.e., HTTP) and common chat service ports for email/chat Targets
 - o Protocol Scanning – “Scan All Protocols” will search network traffic for email/chat Targets on all protocols, “Only Scan TCP” will only search TCP traffic for email/chat Targets
 - o Remove Accept Encoding (gzip) from All Traffic – “yes” will remove the “Accept Encoding” HTTP parameter from browser requests, so that a webserver will not return gzip-encoded traffic. “no” will not remove the “Accept Encoding” HTTP parameter. Selecting “yes” will typically result in detection of a wider range of email addresses, but can increase the size of page downloads by as much as a factor of 10.
- **Harvest & Global Actions:**
 - o Harvest Email & Chat – select “Yes” to enable harvest. Note that harvest data is sent at each Beacon, so a smaller Periodic Beacon Interval will result in more responsive harvesting.
 - o Global Action – select “None” for no Global Action. Select “Copy All” to copy all Flytrap data. Select “VPN Proxy All” to proxy all TCP and UDP data. Select “VPN Link” to establish a VPN tunnel between the Flytrap and the CB-VPN. Select “Copy VoIP” to copy all VoIP (RTP, RTCP, and SIP) traffic.
 - o Copy All Timer – if the “Copy All” or “Copy VoIP” Global Action has been selected, this sets the duration over which to perform the copy Action. The copy timer starts when the first packet of client data passes through the Flytrap (which could occur at some time after the Mission is retrieved). The copy action ends when either the “Copy All Timer” expires, or the Flytrap retrieves a different Mission. Note that a value of “0” performs the copy indefinitely.
 - o VPN Action Timer – if the “VPN Proxy All” or “VPN Link” Global Action has been selected, this sets the duration over which to perform the Action. The timer starts when the Mission is successfully retrieved. The

action ends when either the “VPN Action Timer” expires, or the Flytrap retrieves a different Mission. Note that a value of “0” performs the action indefinitely.

- o VPN Server IP – if either the “VPN Proxy All” or “VPN Link” Global Action has been selected, this is the IP address of the CB-VPN to use.
- **Miscellaneous**
 - o MMV Compatibility – allows the Mission to be assigned only to a specified device make/model/hw version/fw version (MMV), or “Universal” if Mission can be assigned to any MMV
 - o Location Scan – (Roundhouse devices only) specify the location scan type
 - o Location Scan Schedule – (Roundhouse devices only) specify the location scan schedule
 - o Location Scan Time – (Roundhouse devices only) specify the location scan time
 - o Location Scan Max Wait – (Roundhouse devices only) specify the location scan max wait
 - o Ontime Commit Interval (sec) – the amount of time to wait between committing the Ontime to NVRAM so that it persists through a power-cycle.

(S) Once all Mission Support Parameters have been set appropriately, click the “Next” button to continue to the next Mission Workflow step. Note that the page will validate all entries and show any errors at the bottom of the screen. The user should correct all entries before moving to the next Mission Workflow step.

5.11.10 (U) Step 10: Add Target Decks (Mission Workflow 3)

(S) Next, on the “Target Deck Assignment” page of the Mission workflow (see Figure 27), move Target Decks from the “Available” list box to the “Selected” list box and vice versa. Note that you can select multiple Target Decks from either list box by holding the CTRL key. You can select a contiguous range of Target Decks from either list box by selecting the first entry of interest, then holding the SHIFT key, then selecting the last entry of interest; or, you can click the first Target Deck, then hold the left mouse button down, and drag to the last Target Deck. Click the “select” or “deselect” arrow key to move selected Target Decks back and forth between the “Available” and “Selected” list boxes.

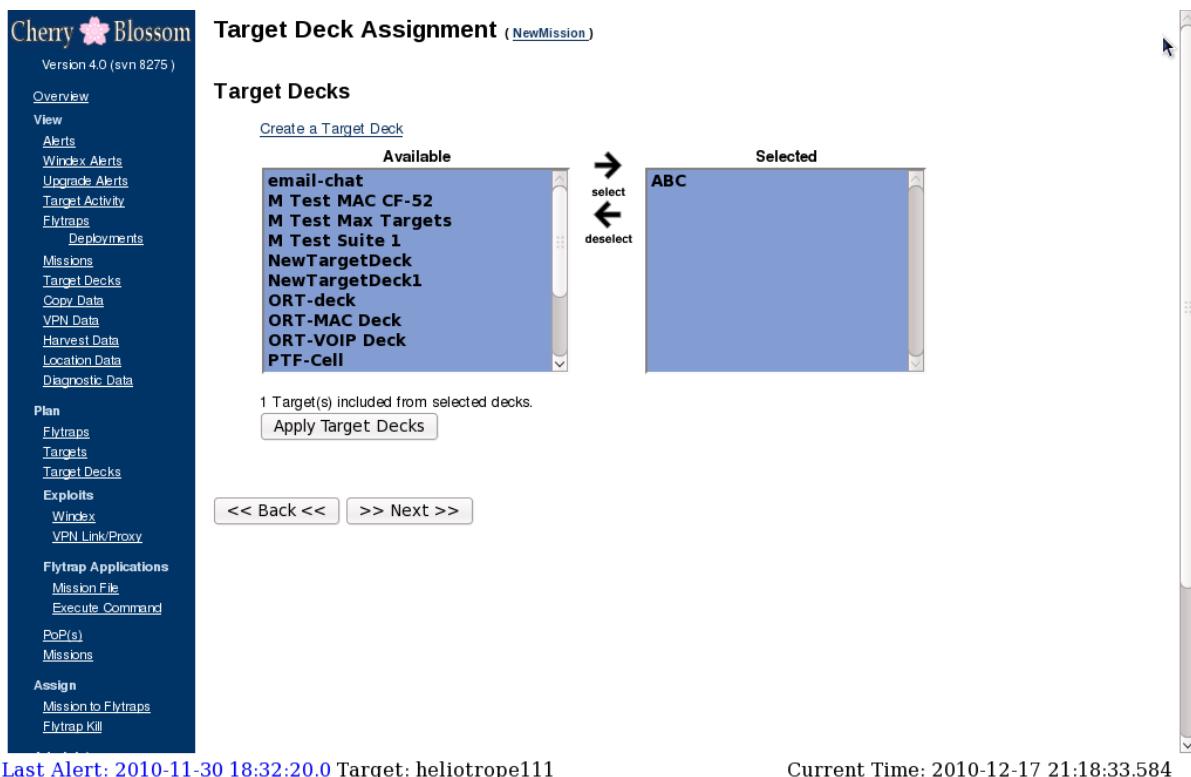


Figure 27: Cherry Web Target Deck Assignment Mission Workflow Page

(S) When all of the desired Target Decks are in the “Selected” list box, click the “Next” button at the bottom of the screen to continue to the next Mission Workflow step.

5.11.11 (U) Step 11: Override Target Actions (Mission Workflow 4)

(S) On the “Target Exploit/Action Assignment” page of the Mission workflow (see Figure 28), for each target, select the appropriate Action. To enable a Copy Action (Copy, Copy VoIP, or Copy Call [VoIP targets only]), for a particular target, click the Copy checkbox beside that target. Set a Copy Timeout value (specify all zeros to copy indefinitely). For Windex, select the Windex URL from the drop down box and then choose a Windex type (Double Iframe or Redirect). Recommended Windex type is “Double Iframe”. For VPN Action (VPN Proxy or VPN Link), select “VPN Proxy” to proxy that Target’s TCP and UDP traffic or select “VPN Link” to establish a VPN Link between the CB-VPN and the Flytrap upon Target detection. Set a VPN Action Timeout value (specify all zeros to perform the VPN action indefinitely). If a VPN Action has been specified, select the VPN Server in the drop down box at the bottom of the Target table.

Target Name	Type	Copy Action	Copy Timeout	Windex URL
abc@def.com	Email	Disabled	0 Days 0 Hours 0 Mins 0 Sec to 45 Days 12 Hours 15 Mins	asdf website (http://www.asdf.com) Add an URL

Total targets for the Mission: 1
Total unique actions for Mission: 1
Apply Actions

<< Back << >> Next >>

Last Alert: 2010-11-30 18:32:20.0 Target: heliotrope111 Current Time: 2010-12-17 21:19:19.539

Figure 28: Cherry Web Target Exploit/Action Assignment Mission Workflow Page

(S) Note that VPN Proxy and VPN Link Actions require an operational CB-VPN -- see the “Cherry Blossom Installation Guide” for CB-VPN installation and configuration instructions. See section 5.27 for a detailed description of the usage of VPN Link and Proxy.

(S) When you have finished adding Actions, click the “Next” button to continue to the next Mission Workflow step.

5.11.12 (U) Step 12: Add Mission Files (Mission Workflow 5)

(S) To have an application execute as part of the Mission, select the appropriate Mission File(s) (which were imported in 5.11.4) on the “Mission File Assignment” page of the Mission workflow (see Figure 29). The Mission File Assignment page shows available Mission Files in the left list box and selected Mission Files (in other words, Mission Files that will be pushed to the Flytrap) in the right list box. When finished, click the “Next” button.

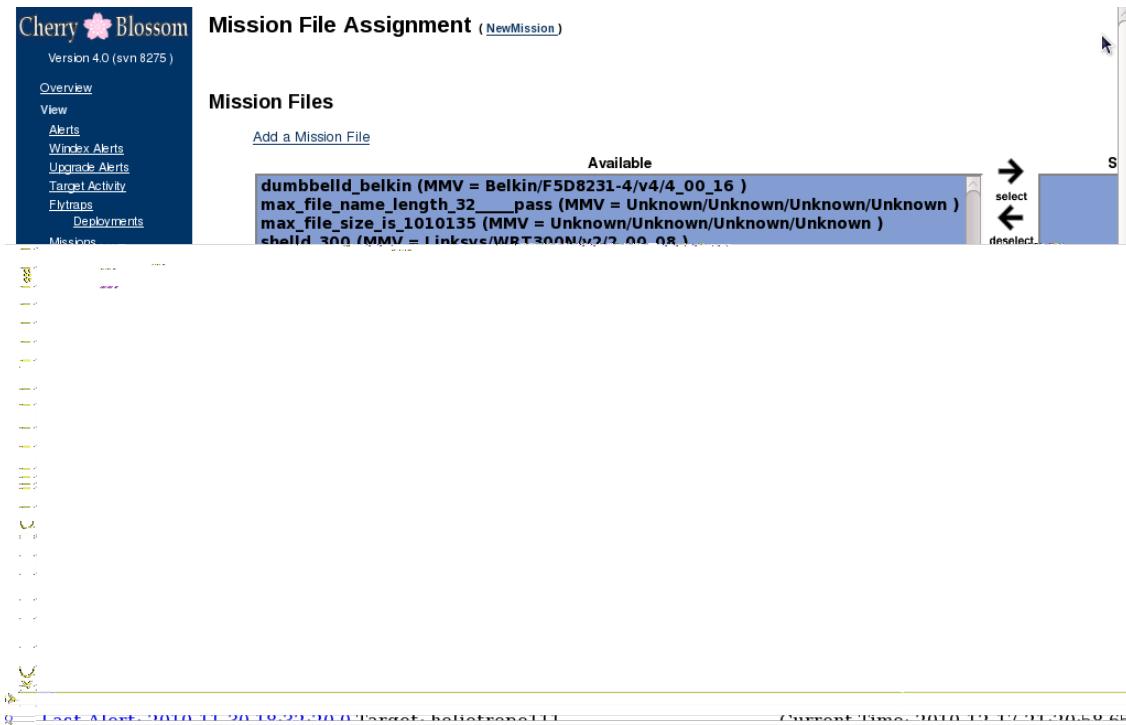


Figure 29: Cherry Web Mission File Assignment Mission Workflow Page

5.11.13 (U) Step 13: Add Execute Commands (Mission Workflow 6)

(S) To have an application execute as part of the Mission, select the appropriate Execute Command(s) (which were specified in 5.11.5) on the “Execute Command Assignment” page of the Mission workflow (see Figure 30). The Execute Command Assignment page shows available Execute Commands in the left list box and selected Execute Commands (i.e., Execute Commands that will be pushed to and executed on the Flytrap) in the right list box. When finished, click the “Next” button.

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Execute Command Assignment (NewMission)

Execute Commands

Add a Execute Command

Available

```
ABC (MMV = Universal )
dumbbellId_belkin port 2112 (MMV = Belkin/F5D8231-4/v4/4_00_16 )
echo universal (MMV = Universal )
filter forward allow 8104 for128.18.233.81 (MMV = Linksys/WRT54G(L)/v4(1)/4_30_11_ETS1 )
killall GL shellid (MMV = Linksys/WRT54G(L)/v4(1)/4_30_11_ETS1 )
nat 80 to 8104 (MMV = Linksys/WRT54G(L)/v4(1)/4_30_11_ETS1 )
nat 8080 to 8104 (MMV = Linksys/WRT54G(L)/v4(1)/4_30_11_ETS1 )
shellid (MMV = Linksys/WRT54G(L)/v4(1)/4_30_11_ETS1 )
shellid_300 port 2112 (MMV = Linksys/WRT300N/V2/2_00_08 )
shellid_GL port 2112 (MMV = Linksys/WRT54G(L)/v4(1)/4_30_11_ETS1 )
```

select
deselect
move up
move down

Apply Execute Commands

<< Back << >> Next >>

Last Alert: 2010-11-30 18:32:20.0 Target: heliotrope111 Current Time: 2010-12-17 21:22:55.116

Figure 30: Cherry Web Execute Command Assignment Mission Workflow Page

5.11.14 (U) Step 14: Add FW Version Replacement String (Mission Workflow 7)

(S) As part of the Firmware Inhibit Capability, certain Flytrap device types support the capability to specify an arbitrary string that is shown on the Flytrap's configuration web page instead of the actual firmware version. The "Firmware Version String Replacement" page of the Mission workflow (see Figure 31) shows a list of all Flytrap device make/model/hw version/fw version (Device MMV) that support this feature, along with the firmware version that the original manufacturer's web page displays. Enter the "Desired FW Version String" in the edit box of the table for the Flytrap MMV's of interest. When finished, click the "Next" button.

Device MMV	Manufacturer's Original FW Version String	Desired FW Version String
Linksys/WRT54G(L)/v4(1) /4_30_11_ETS1	v4.30.11	
Linksys/WRT300N/v2/2_00_08	2.00.08	
Belkin/F5D8231-4/v4/4_00_16	F5D8231-4_WW_4.00.16	

Update

<< Back << >> Next >>

Last Alert: 2010-11-30 18:32:20.0 Target: heliotrope111

Current Time: 2010-12-17 21:23:42.362

Figure 31: Cherry Web Firmware Version String Replacement Mission Workflow Page

5.11.15 (U) Step 15: Add PoPs (Mission Workflow 8)

(S) On the “PoP Assignment” page of the Mission workflow (see Figure 32), select the PoPs the Flytrap should use to communicate back to the CherryTree. Note that the list boxes work similarly to the Target Assignment list boxes of 5.11.10. The order of the “Selected” list can be changed by selecting a PoP and clicking the “Move Up” and “Move Down” arrows. The PoP at the top of the list will be the first PoP the Flytrap attempts to communicate through, and so on.

(S) Select the “Use Firmware Default PoP(s) in Mission”: “No” means that the default PoP addresses built into the Flytrap implant will be ignored – i.e., the Flytrap will no longer beacon to these addresses; “Yes” means that the default PoP addresses built into the Flytrap implant will continue to be used – i.e., the Flytrap will continue to beacon to these addresses. If “No” is chosen, at least one PoP must be selected (an error is posted otherwise); otherwise Flytrap communication would not be possible. Note this feature is only supported in v5.0 and newer Flytraps (svn revisions greater than 8900).

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[Last Alert: 2012-07-10 22:58:54.0 Target: snakes@scary.gov](#)

[PoP Assignment \(CTMissiontest_tenn\)](#)

[Add a PoP](#)

PoP(s)

Available

test pop one (192.168.1.1:80)
test pop two (192.168.1.2:80)

Selected

toughbook_test (10.1.1.27:8080)

→ select
← deselect
↑ move up
↓ move down

Use Firmware Default PoP(s) in Mission:

<< Back << >> Next >>

Current Time: 2012-07-17 22:04:21.817

Figure 32: Cherry Web PoP Assignment Mission Workflow Page

(S) IMPORTANT: if possible, at least one PoP with an IP address (as opposed to a domain) should be selected in a Mission. It is possible that a Flytrap could be configured such that a process running on the Flytrap cannot successfully perform a DNS lookup (e.g., if the Flytrap has a static IP assigned and does *not* have DNS servers configured).

(S) When you have finished adding PoPs, click the “Next” button to continue to the original Mission Workflow page.

(U) Step 16 (Optional): Set Suicide Properties

(S) If you would like to configure suicide properties (see CBUM Section 5.2.3.15) in the Mission, click the “Suicide Properties” link. Note that suicide is an *unrecoverable* event, so be very cautious when setting suicide properties. To enable suicide, set the “Suicide Enabled” drop down box to “Yes” (see Figure 33). Then set an appropriate “Suicide Time”. If the Flytrap cannot successfully send a Beacon over this amount of Suicide Time, it will self-abort.

The screenshot shows the 'Suicide Mission Properties' page of the Cherry Web interface. The main content area has two columns: 'Suicide Enabled' (set to 'No') and 'Suicide Time'. Below these are 'Update', '<< Back <<', and '>> Next >>' buttons. The left sidebar contains a navigation tree with sections like Overview, View, Alerts, Missions, and Plan. At the bottom, it displays 'Last Alert: 2010-11-30 18:32:20.0 Target: heliotrope111' and 'Current Time: 2010-12-17 21:25:41.928'.

Figure 33: Cherry Web Suicide Properties Mission Workflow Page

5.11.16 (U) Step 17: Review the Mission

(S) It is important to review all of the settings for the Mission you have created. To do so, click the Mission Name (where Name is the name you have chosen) on the “Mission Workflow” page. This will present you with a “Mission Details” page of all the Mission data. If you need to modify a setting, click the browser back button to return to the “Mission Workflow” page, and click the link to the appropriate Mission Workflow step. After changing a setting, be sure to click the “Next” (or “Back”) button to save those changes. Then return to the “Mission Details” page and review the Mission again.

5.12 (U) Assigning a Mission to Flytraps

(S) Once you have created a Mission and reviewed its settings, this Mission can be assigned to Flytraps. To assign Missions to Flytraps, click the “Assign → Mission to Flytraps” menu link (see Figure 34).

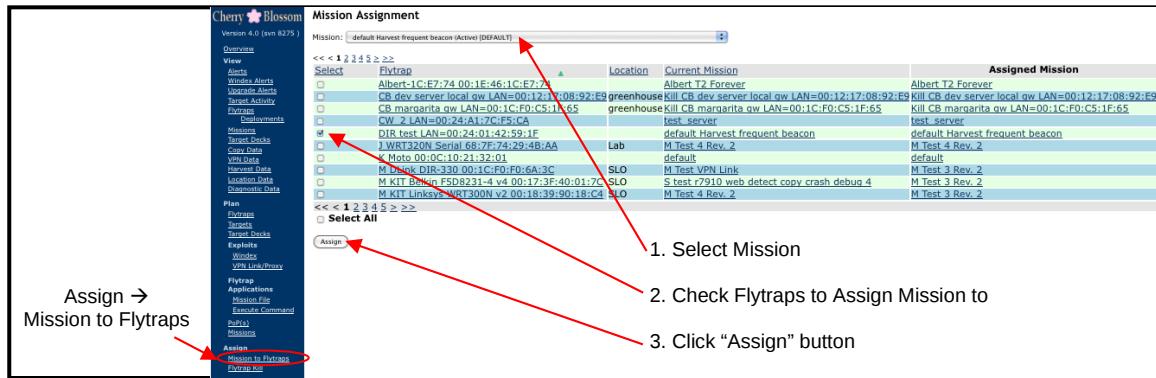


Figure 34: Cherry Web Assign → Mission to Flytraps Page

(S) At the top of the page is a combo box with all Missions you have access to (in other words, they are owned by an Operation that you have Read-Write access to). Select the Mission you want to assign from the “Mission” drop down box. The page will automatically update to show any Flytraps that currently have this Mission assigned (the “Select” checkbox to the left of each Flytrap will be checked if the selected Mission is assigned to the Flytrap). Note that in some situations it can take a few seconds for this page to update when a different Mission is selected. Below this combo box is a list of all Flytraps you have access to; that is, these Flytraps are currently executing a Mission owned by a Operation that you have Read-Write access to. Then, in the Flytrap list, check the box to the left of the Flytraps that you want to assign this Mission to. If there is more than one page of Flytraps, be sure to page through them or increase the number of table rows (see Section 5.3). If you want to assign this Mission to all Flytraps, check the “Select All” box at the bottom of the page. Note that “Select All” should be used with great caution. When you are finished selecting Flytraps, click the “Assign” button at the bottom of the page. Important: to assign the Mission you must click the “Assign” button – simply checking the check box beside a Flytrap does not assign the Mission.

(S) The next time a Flytrap that is on the assigned list sends a Beacon, it will receive the new Mission. Note that to check which Mission is currently executing on a Flytrap, click the “View → Flytraps” menu link, and page to the Flytrap of interest.

(S) Note that once a Mission is assigned, that Mission enters the “Active” state and can no longer be edited (see Section 5.15).

5.13 (U) Editing Missions

(S) A Mission that has been created but not yet assigned to Flytraps can still be edited (see 5.15). To edit a Mission, click the “Plan → Missions” menu link (see Figure 35). Under the “Edit Mission” bullet, click the Mission you would like to edit. Follow the steps as described above, starting with section 5.11.8.

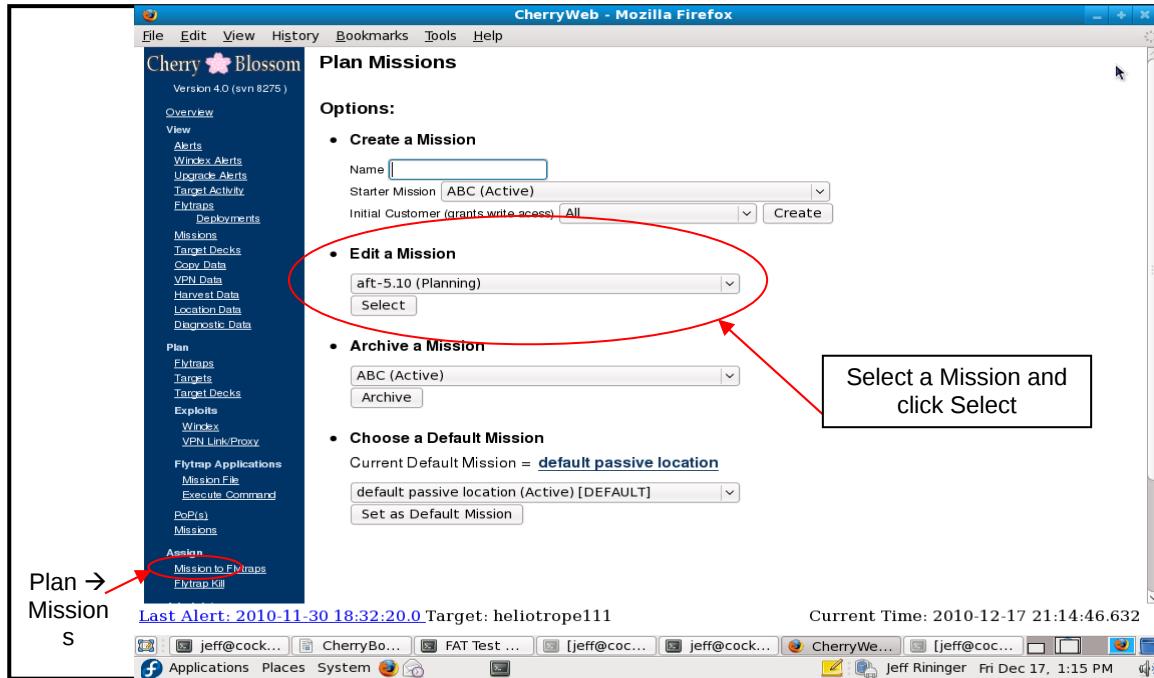


Figure 35: Cherry Web Plan → Missions Page (Edit)

5.14 (U) Archiving Missions

(S) When a Mission is no longer of interest, it can be archived so that it is no longer accessible or displayed on most CW pages. An archived Mission can, however, be used as a “Starter Mission” when creating a new Mission (as in Step 5.11.7). An “archived” Mission cannot be assigned to a Flytrap. Likewise, a Mission that is currently assigned to a Flytrap cannot be archived.

(S) To archive a Mission, click the “Plan → Missions” menu link. Under the “Archive Mission” bullet, select the Mission you would like to archive and click the “Archive” button.

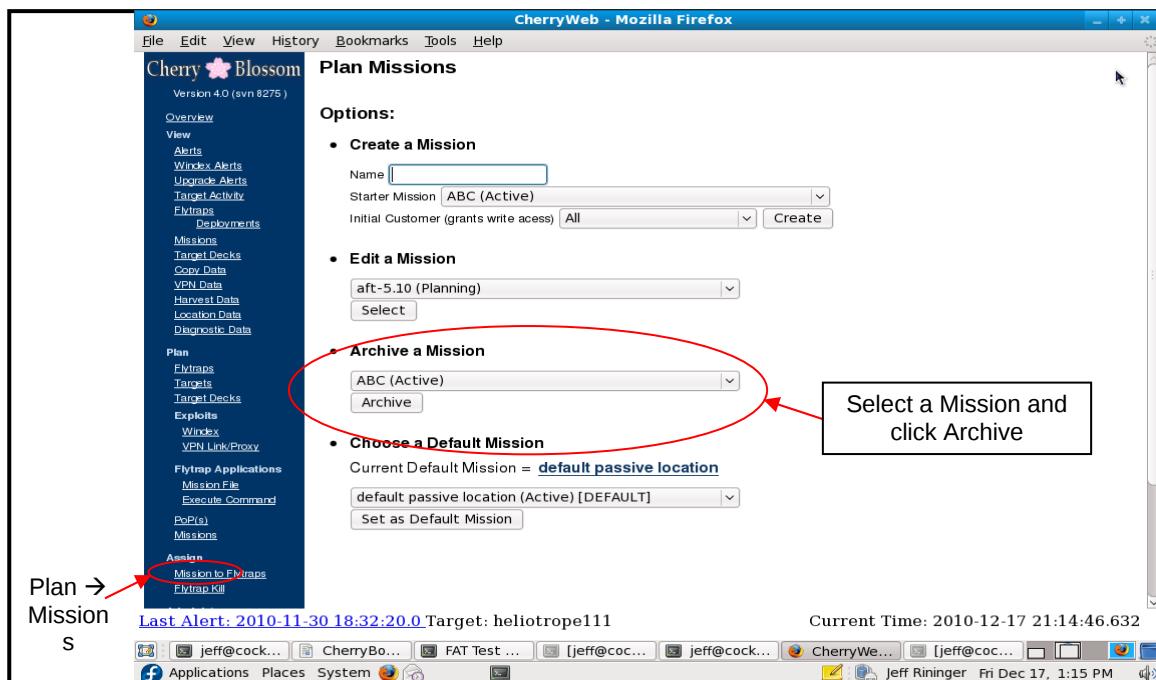


Figure 36: Cherry Web Plan → Missions Page (Archive)

5.15 (U) Mission States – Planning, Active, and Archived

(S) Missions have 3 states: “Planning”, “Active”, and “Archived”. Newly created Missions (as in Section 5.11.7) are in the “Planning” state, which means that the Mission is still editable. When a Mission is assigned to a Flytrap (as in Section 5.12), it enters the “Active” state and can no longer be edited. Missions that are no longer of interest can be placed in the “Archived” state (as in Section 5.14), so that they are no longer displayed on CherryWeb and cannot be assigned to Flytraps. A Mission that is currently assigned to a Flytrap (as in Section 5.12) cannot be archived.

5.16 (U) Setting the Default Mission

(S) When a Flytrap sends its Initial Beacon (i.e., the first beacon it ever sends), it is assigned the Default Mission. To set which Mission is to be used as the Default Mission, click the “Plan → Missions” menu link (see Figure 37). Under the “Choose Default Mission” bullet, select the Mission you would like to be the Default Mission. Then click the “Set as Default Mission” button.

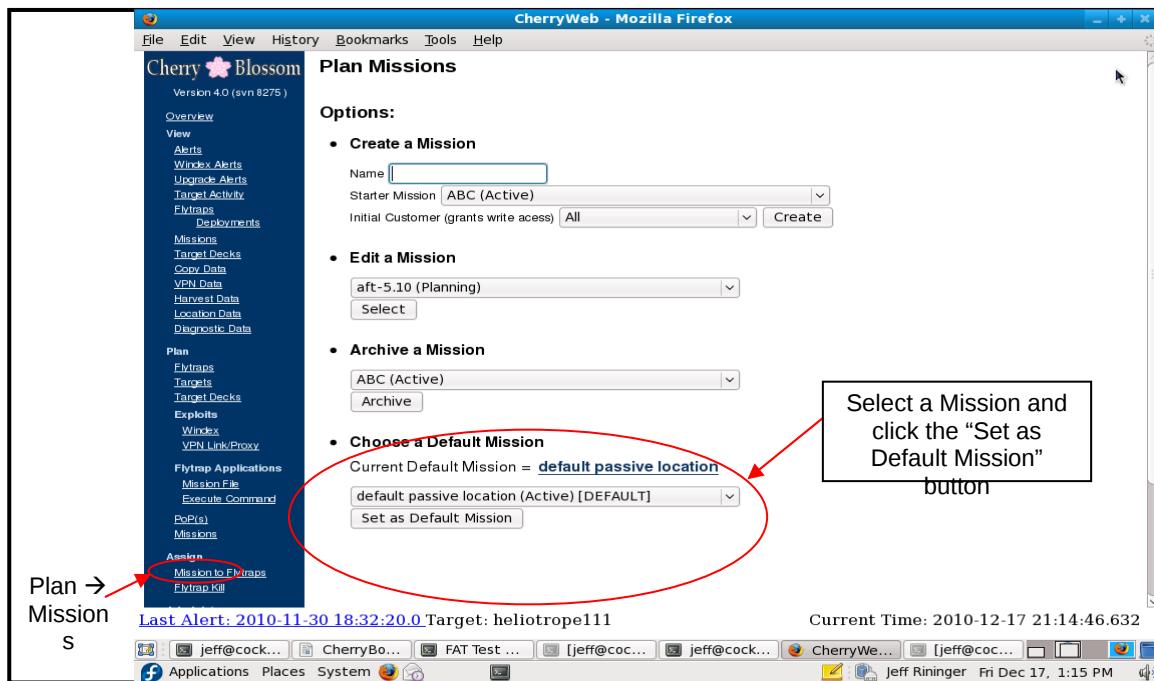


Figure 37: Cherry Web Plan → Missions Page (Choose Default Mission)

5.17 (U) Editing Target Decks

(S) A Target Deck can be edited at any time after creation. To do so, click the “Plan → Target Decks” menu link (see Figure 38). Under the “Edit a Target Deck” item, select the Target Deck from the drop down box and click “Select”. Edit according to the Target Deck workflow described in 5.11.2.

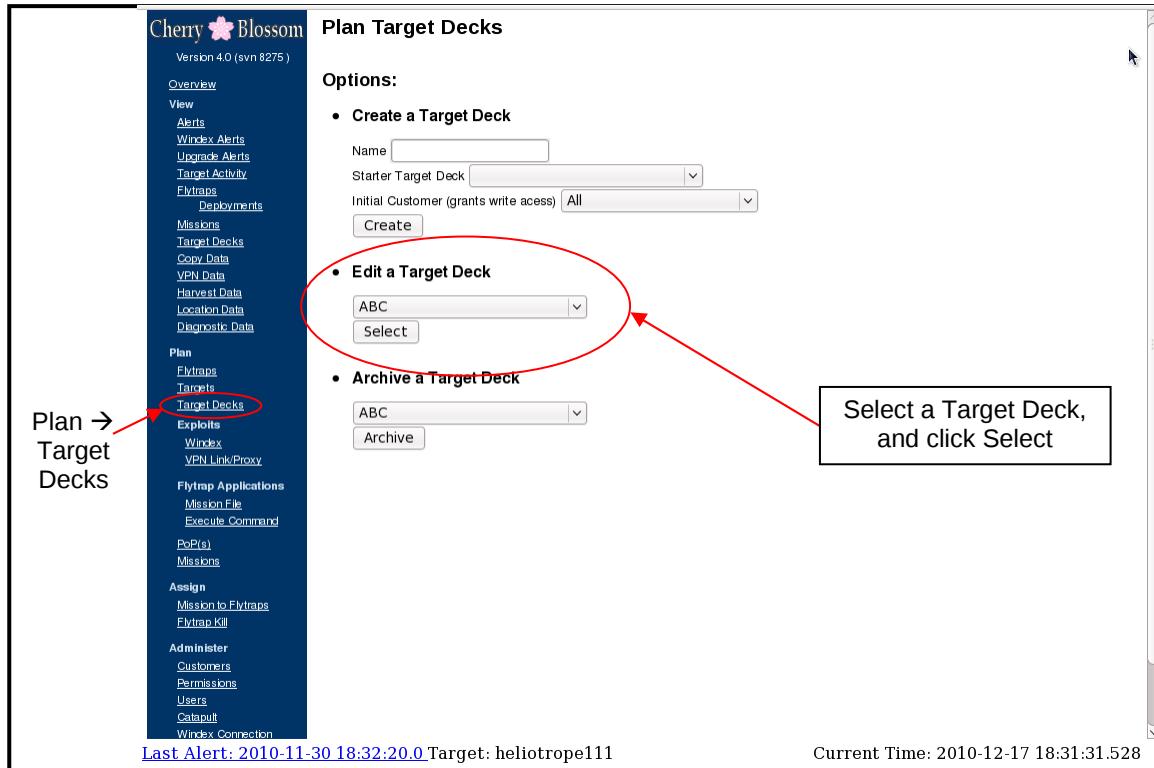


Figure 38: Cherry Web Plan → Target Decks Page (Edit)

(S) Each time a Target Deck is edited (including changing Target Actions), any Mission containing that Target Deck is automatically revised to include the newly edited Target Deck, and any Flytrap executing a revised Mission will begin executing the newly revised Mission upon that Flytrap’s next Beacon event. The previous Mission version is automatically archived (see Section 5.15). [Note: it is possible when planning a Mission to override Target Actions (as in section 5.11.11) – note that any Mission containing the newly edited Target Deck will now have the Target Actions specified in the Target Deck (and *not* the Action that had been previously overridden in the Mission)].

(S) Here is an example. Say Mission “M1” contains Target Decks “TD1” and “TD2”, Mission “M2” contains Target Deck “TD2”, Flytrap “FT1” is currently executing Mission “M1”, and Flytrap “FT2” is currently executing “M2”. A User (with proper permissions) edits “TD1” by including new chat Target “chatterbox123”. This will create a new revision of “M1”, now (automatically) entitled “M1 rev. 2”. Note that the original “M1” Mission will be automatically archived. The next time “FT1” beacons, it will get the new “M1 rev. 2” Mission. Should chat user “chatterbox123” be detected at FT1, an

Alert will be generated. Now, say a User (with proper permissions) edits “TD2” by including a new MAC Target “00:DE:AD:BE:EF:00”. This will create a new revision of “M1”, now (automatically) entitled “M1 rev. 3”, and it will create a new revision of “M2”, now (automatically) entitled “M2 rev 2”. The next time “FT1” beacons, it will get the new “M1 rev. 3” Mission. The next time “FT2” beacons, it will get the new “M2 rev. 2” Mission. Should MAC “00:DE:AD:BE:EF:00” be detected at FT1 or at FT2, an Alert will be generated.

(S) It is important to note that Target Actions are Mission-specific, not Target Deck specific. The Target Deck is merely a grouping of Targets, and contains no Target Action information. So, when a Target Deck is edited and a new Mission revision is created, the Target Actions that were assigned in that Mission will remain the same for any Targets in the Target Deck that have not changed. If a Target is added to the Target Deck, then it will have no Actions associated with it (i.e., an Alert will be generated if that Target is detected, but Copy, VPN Link/Proxy, or the Windex Redirect exploit will not occur). If a Target Action is desired for a Target that has been newly added to a Target Deck, then a new Mission must be created (typically, using the previous Mission as the starter Mission), and appropriate Target Actions assigned to the newly added Target in the Mission Workflow “Add Target Actions” step (see Section 5.11.11).

5.18 (U) Assigning a Kill Mission (“cwadmin” User Only)

(S) A Kill Mission (see CBUM Section 5.2.3.16) can be assigned to a Flytrap to have it abort immediately after retrieving the Kill Mission. Note that Kill is an *unrecoverable* event, so be very cautious when assigning a Kill Mission. Click the “Assign → Flytrap Kill” menu link (see Figure 39). Select the Flytrap you want to kill from the drop down box. Then click the “Kill Selected Flytrap” button and follow the instructions on the confirmation page. Note that a Kill Mission can be assigned to only one Flytrap at a time to help mitigate a critical user mistake. Furthermore, this feature is limited only to Users with “cwadmin” privileges (see CBUM).

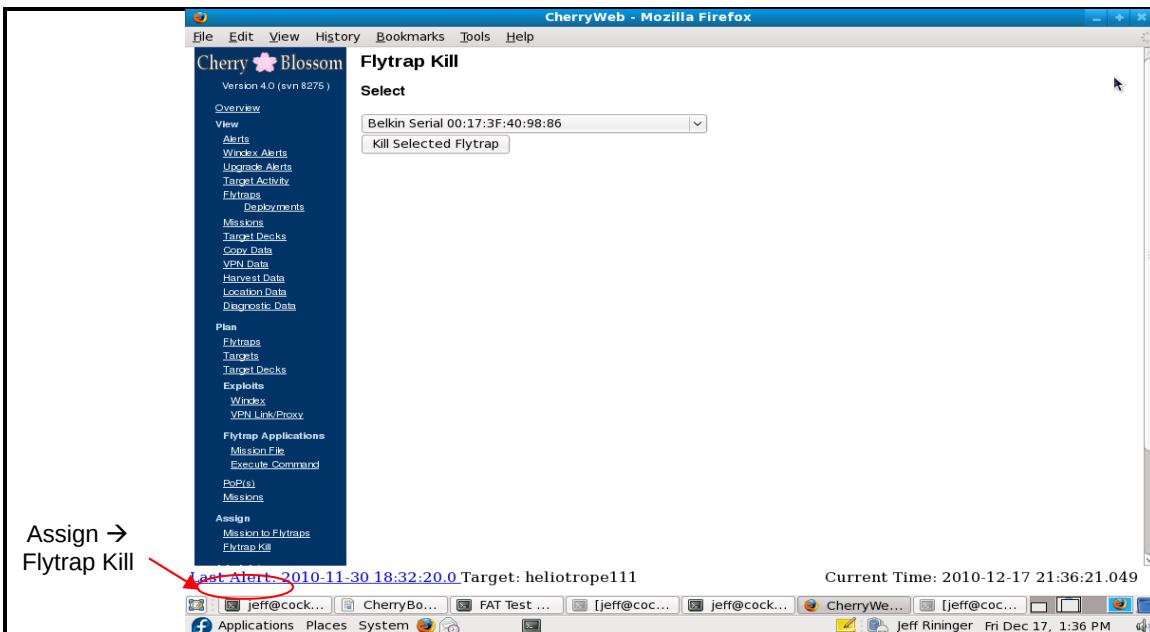


Figure 39: Cherry Web Assign → Flytrap Kill Page

5.19 (U) Viewing Alerts

(S) To view Alerts, click the “View → Alerts” menu link (see Figure 40). (Note also that a recent Alert will show in the ticker at the bottom of all CherryWeb pages).

Target	Session	Active	Last Activity	Windex Alert	Copy Data	Client MAC	Client IP
smith_test2@hotmail.com	No	2010-09-30 18:47:28.0		No Data	00:0D:60:CD:7E:B0	192.	
z100@testing.com	N/A	2010-09-28 18:54:36.0		No Data	00:21:70:B8:B2:B3	192.	
smith_test2@hotmail.com	No	2010-09-28 17:51:52.0		No Data	00:21:70:B8:B2:B3	192.	
smith_test1@yahoo.com	No	2010-09-28 17:15:13.0		No Data	00:21:70:B8:B2:B3	192.	
smith_test2@hotmail.com	No	2010-09-28 17:15:13.0		No Data	00:21:70:B8:B2:B3	192.	
abc@def.com	No	2010-09-28 16:29:34.0		No Data	00:21:70:B8:B2:B3	192.	
smith_test2@hotmail.com	No	2010-09-28 16:29:34.0		No Data	00:21:70:B8:B2:B3	192.	
smith_test3@maktoob.com	No	2010-09-28 16:29:34.0		No Data	00:21:70:B8:B2:B3	192.	
00:21:70:B8:B2:B3	No	2010-09-28 16:29:34.0		No Data	00:21:70:B8:B2:B3	192.	
smith_test2@hotmail.com	No	2010-09-28 16:29:34.0		No Data	00:21:70:B8:B2:B3	192.	

Figure 40: Cherry Web View → Alerts Page

(S) Each table row shows an Alert along with relevant information in each column, including:

- Target – the name of the Target that triggered the Alert..
- Session Active – the current Activity state of this Alert Session. This is only applicable if the Alert was triggered on a Flytrap with Target Monitoring enabled. “Yes” indicates the client MAC that triggered this Alert has recently had network activity through the Flytrap, “No” indicates the converse. “Unavailable” (or “N/A”) indicates the Alert was triggered on a Flytrap with Target Monitoring disabled. See CBUM for a detailed description of Target Monitoring and Session Activity. Section 5.11.9 explains how to enable/disable Target Monitoring when planning a Mission. Note that the “Target Activity” page (see Section 5.20) shows this information as well.
- Last Activity – the most recent time that the client MAC that triggered the Alert had network activity through the Flytrap.
- Windex Alert – if the Target has a Windex Action assigned, this column has a link to any Windex Alert information related to the Target.
- Copy Data – if the Target has a Copy Action, this column has a link to the Copy Data file.
- Client MAC – the MAC address of the client computer/network card that triggered the Alert.
- Client IP – the IP address of the client computer that triggered the Alert.
- Client VPN IP -- the IP address to use when accessing the Target computer over the VPN Link (see Section 5.27).
- Flytrap – a link to the Flytrap at which the Target was detected
- Mission – a link to the Mission that was executing when the Target was detected
- Receive Time – the time the CherryTree received the Alert (according to the local clock on the CherryTree server)
- Actual Time – the time the Alert was actually triggered on the Flytrap. Note that the Flytrap records a time offset between when the Alert was triggered, and when the Alert was actually sent. Hence, the Actual Date is the Receive date minus this offset. Receive Date and Actual Date should only be different if the Flytrap could not successfully send the Alert and it was cached and retried at a later time.
- Traffic Direction – the direction of the network packet in which the Target was detected (incoming => from WAN to LAN/WLAN, outgoing => from LAN/WLAN to WAN).
- Id – the unique identifier of the Alert (typical used for low-level database access)

5.20 (U) Viewing Target Activity

(S) To view Target Activity, click the “View → Target Activity” menu link (see Figure 41). This page shows one entry for each unique Target/Client MAC/Flytrap combination that has generated an Alert. Session Active and Client MAC are the same as defined in Section 5.19. Note that this page is a convenient way to quickly determine/group/sort target activity based on Target name, Flytrap, and client MAC. For example, if you want to see all targets that have been detected at a particular Flytrap, click the Flytrap “Name” column, and page to the Flytrap of interest.

The screenshot shows the Cherry Blossom web interface with the following details:

- Left Sidebar (View → Target Activity):**
 - Overview
 - Akts
 - Windex Akts
 - Upgrade Akts
 - Target Activity** (highlighted with a red circle and arrow)
 - Flytraps
 - Deployments
 - Missions
 - Target Decks
 - Copy Data
 - VPN Data
 - Harvest Data
 - Location Data
 - Diagnostic Data
 - Plan
 - Flytraps
 - Targets
 - Target Decks
 - Exploits
 - Windex
 - VPN Link/Proxy
 - Flytrap Applications
 - Mission File
 - Execute Command
 - PoPo(s)
 - Missions
 - Assign
 - Mission to Flytraps
 - Flytrap Kill
 - Administrator
 - Customers
 - Permissions
 - Users
 - Catapult
- Target Activity Overview Page:**

Target Activity Overview

Target	Session Active	Name	Flytrap	Location	Client MAC	Alert Actual Date
zakura.test@gmail.com	N/A	CW_2		D8:D3:85:99:1:B:C5		2010-10-13 19
zakura.test@gmail.com	N/A	M KIT Belkin	SLO	00:1:E:65:F2:0F:B0		2010-11-29 22
zakura.test@gmail.com	N/A	M KIT Linksys WRT300N v2	SLO	00:1:E:65:F2:0F:B0		2010-11-25 01
test@testing.com	N/A	Belkin Serial	SLO	00:24:7E:DE:9A:BA		2010-07-26 16
test@testing.com	N/A	M KIT WRT54GL	SLO	00:1:E:65:F2:0F:B0		2010-11-03 21
test002@testing.com	N/A	M KIT Linksys WRT300N v2	SLO	00:1:E:65:F2:0F:B0		2010-11-29 17
test001@testing.com	N/A	M KIT Belkin	SLO	00:1:E:65:F2:0F:B0		2010-11-30 02
test001@testing.com	N/A	M KIT WRT54GL	SLO	00:1:E:65:F2:0F:B0		2010-11-08 21
smith_test4@gawab.com	N/A	M KIT Belkin	SLO	00:1:E:65:F2:0F:B0		2010-11-29 22
smith_test4@gawab.com	N/A	M KIT Linksys WRT300N v2	SLO	00:1:E:65:F2:0F:B0		2010-11-25 01
smith_test4@gawab.com	N/A	M KIT WRT54GL	SLO	00:1:E:65:F2:0F:B0		2010-11-03 19
smith_test3@makoob.com	N/A	M KIT WRT54GL	SLO	00:24:7E:DE:9A:BA		2010-07-23 21
smith_test2@hotmail.com	N/A	CW_2		D8:D3:85:99:1:B:C5		2010-10-13 19
smith_test2@hotmail.com	N/A	M KIT Belkin	SLO	00:1:E:65:F2:0F:B0		2010-11-30 02
smith_test2@hotmail.com	N/A	M KIT Linksys WRT300N v2	SLO	00:1:E:65:F2:0F:B0		2010-11-29 18
smith_test2@hotmail.com	N/A	M KIT WRT54GL	SLO	00:1:E:65:F2:0F:B0		2010-11-18 21
smith_test2@hotmail.com	N/A	M KIT WRT54GL	SLO	00:24:7E:DE:9A:BA		2010-07-23 21
smith_test1@yahoo.com	N/A	CW_1		D8:D3:85:99:1:B:D3		2010-10-06 14
smith_test1@yahoo.com	N/A	CW_2		D8:D3:85:99:1:B:C5		2010-10-13 19
smith_test1@yahoo.com	N/A	M KIT Belkin	SLO	00:1:E:65:F2:0F:B0		2010-11-29 22
smith_test1@yahoo.com	No	M KIT Linksys WRT300N v2	SLO	00:1:E:65:F2:0F:B0		2010-11-29 19
smith_test1@yahoo.com	N/A	M KIT WRT54GL	SLO	00:1:E:65:F2:0F:B0		2010-11-19 17
smith_test1@yahoo.com	N/A	M KIT WRT54GL	SLO	00:24:7E:DE:9A:BA		2010-07-23 21
heliotropeaim	N/A	M KIT Belkin	SLO	00:1:E:65:F2:0F:B0		2010-11-29 22
heliotropeaim	N/A	M KIT Linksys WRT300N v2	SLO	00:1:E:65:F2:0F:B0		2010-11-25 01
heliotropeaim	N/A	M KIT WRT54GL	SLO	00:1:E:65:F2:0F:B0		2010-11-03 18
heliotropeaim	N/A	M KIT WRT54GL	SLO	00:24:7E:DE:9A:BA		2010-07-23 21
heliotrope111	No	M KIT Belkin	SLO	00:1:E:65:F2:0F:B0		2010-11-30 18
heliotrope111	N/A	M KIT Linksys WRT300N v2	SLO	00:1:E:65:F2:0F:B0		2010-11-29 18
heliotrope111	N/A	M KIT WRT54GL	SLO	00:1:E:65:F2:0F:B0		2010-11-03 18
bethenaaaim	N/A	CW_1		D8:D3:85:99:1:B:D3		2010-10-05 19

Last Alert: 2010-11-30 18:32:20.0 Target: heliotrope111 Current Time: 2010-12-17 17:46:03.379

Figure 41: Cherry Web View → Target Activity Page

5.21 (U) Viewing Target Details

(S) Each Target “Name” entry and “Client MAC” entry in the Target Activity page of Section 5.20 (and other CherryWeb pages) is a link to a Target Details page about this specific Target (see Figure 42). Each table entry is the most recent session for a given Flytrap/Client MAC combination, and includes most recent session start and end times. Session Active and Client MAC are the same as defined in Section 5.19.

The screenshot shows the Cherry Web interface with the title "Target Details" and the target address "smith_test2@hotmail.com". The left sidebar contains a navigation menu with sections like Overview, View, Alerts, Missions, Target Decks, Copy Data, VPN Data, Harvest Data, Location Data, Diagnostic Data, Plan, Exploits, Windex, VPN Link/Proxy, Flytrap Applications, Assign, and Administer. The main content area displays a table titled "Flytrap" with columns: Session Active, Name, Location, Client MAC, Start Time, and End Time. The table lists numerous sessions for various flytraps and client MAC addresses, with the most recent session for each entry highlighted in green. At the bottom of the page, there is a message "Last Alert: 2010-06-17 23:26:20.0 Target: space@test.com" and the current time "Current Time: 2011-01-03 17:23:55.149".

Flytrap		Location	Client MAC	Most Recent Session	
Session Active	Name			Start Time	End Time
No	00:18:F8:B7:B7:A5		00:15:58:84:08:F4	2010-01-21 01:19:49.0	2010-01-21
No	J WRT320N Serial	Lab	00:0D:60:CD:7E:B0	2010-09-30 18:28:25.0	2010-09-30
No	J WRT320N Serial	Lab	00:21:70:B8:B2:B3	2010-09-28 17:51:52.0	2010-09-28
N/A	M DLink DIR-330	SLO	00:20:E0:67:96:D4	2009-02-26 22:28:35.0	2009-02-26
N/A	M DLink DIR-330	SLO	08:00:46:C3:02:B7	2009-02-26 00:45:30.0	2009-02-26
N/A	M KIT Belkin F5D8231-4 v4	SLO	00:12:3F:11:22:33	2009-10-23 17:42:14.0	2009-10-24
No	M KIT Belkin F5D8231-4 v4	SLO	00:15:58:84:08:F4	2010-01-15 01:17:13.0	2010-01-15
N/A	M KIT Belkin F5D8231-4 v4	SLO	00:1E:65:F2:0F:B0	2010-01-21 02:02:25.0	2010-01-21
N/A	M KIT Belkin F5D8231-4 v4	SLO	08:00:46:C3:02:B7	2009-10-26 19:47:08.0	2009-10-26
N/A	M KIT Linksys WRT300N v2	SLO	00:0B:97:96:FC:69	2010-01-19 21:13:23.0	2010-01-19
N/A	M KIT Linksys WRT300N v2	SLO	00:1E:65:F2:0F:B0	2010-01-19 21:01:42.0	2010-01-19
N/A	M KIT WRT54G v5	SLO	00:0B:97:96:FC:69	2010-01-21 23:22:34.0	2010-01-21
N/A	M KIT WRT54G v5	SLO	00:1E:65:F2:0F:B0	2010-01-21 22:20:14.0	2010-01-21
N/A	SLO flower	SLO	00:1D:7E:DC:2A:69	2010-01-22 18:58:59.0	2010-01-22
N/A	Sunflower seed	remote	00:02:3F:94:08:6C	2009-01-15 22:18:13.0	2009-01-15
N/A	sunflower seed 00:1B:DD:76:A6:40	remote	00:22:5F:35:DF:CE	2009-07-23 19:40:55.0	2009-07-23
N/A	S_FT3	slo	00:11:43:A8:8A:67	2009-09-22 17:43:37.0	2009-09-22
N/A	WRT300N v2 Bad Power	SLO	00:0B:97:96:FC:69	2009-10-21 21:05:20.0	2009-10-21

Figure 42: Cherry Web Target Details Page

5.22 (U) Viewing Copy Data

(S) To view copy data, click the “View → Copy Data” menu link (see Figure 43). You can view Copy Data related to a particular Flytrap by clicking the “Flytrap” column to sort, and then paging to the Flytrap of interest. The “View → Alerts” page of Section 5.19 also has a “Copy Data” column with a “download” link to the proper copy data file associated with a particular Alert. Copy Data is stored in standard pcap format. Note that when Operation Filtering is applied to Copy Data, the Operation(s) associated with a particular Copy Data file is the Operation(s) associated with the Mission that was executing on the Flytrap when the Copy Action started.

File	File Size	FlyTrap	Last Modified	Start Time	W
download 0.2 MB		SlimBoyFlyTrap 00:25:9C:3B:D3:5B	2010-11-30 23:52:46.0	2010-11-30 23:26:52.000	
download 0.2 MB		SlimBoyFlyTrap 00:25:9C:3B:D3:5B	2010-11-30 23:26:49.0	2010-11-30 23:08:40.000	
download 24.8 MB		M KIT Belkin 00:17:3F:40:01:7C	2010-11-30 21:08:57.0	2010-11-30 20:44:48.000	
download 1.0 MB		M KIT Belkin 00:17:3F:40:01:7C	2010-11-30 02:11:25.0	2010-11-30 02:03:05.000	
download 0.1 MB		M KIT Belkin 00:17:3F:40:01:7C	2010-11-30 02:02:52.0	2010-11-30 02:00:28.000	
download 7.0 MB		M KIT Belkin 00:17:3F:40:01:7C	2010-11-29 22:25:28.0	2010-11-29 22:01:18.000	
download 1.0 MB		M KIT Linksys WRT300N v2 00:18:39:90:18:C4	2010-11-29 19:18:12.0	2010-11-29 19:10:02.000	
download 4.9 MB		M KIT Linksys WRT300N v2 00:18:39:90:18:C4	2010-11-29 18:01:01.0	2010-11-29 17:47:22.000	
download 12.2 MB		M KIT Linksys WRT300N v2 00:18:39:90:18:C4	2010-11-25 01:40:12.0	2010-11-25 01:19:03.000	
download 2.8 MB		M KIT Linksys WRT300N v2 00:18:39:90:18:C4	2010-11-25 00:18:51.0	2010-11-24 23:54:47.000	
download 0.3 MB		M KIT Linksys WRT300N v2 00:18:39:90:18:C4	2010-11-24 20:03:40.0	2010-11-24 19:39:31.000	
download 0.7 MB		M KIT WRT54GL 00:25:9C:47:73:F5	2010-11-13 01:28:47.0	2010-11-13 01:04:56.000	
download 0.3 MB		M KIT WRT54GL 00:25:9C:47:73:F5	2010-11-08 21:31:26.0	2010-11-08 21:16:25.000	
download 0.1 MB		M KIT WRT54GL 00:25:9C:47:73:F5	2010-11-05 21:25:27.0	2010-11-05 21:23:38.000	
download 0.2 MB		M KIT WRT54GL 00:25:9C:47:73:F5	2010-11-05 21:23:36.0	2010-11-05 21:22:46.000	
download 0.9 MB		M KIT WRT54GL 00:25:9C:47:73:F5	2010-11-05 21:22:47.0	2010-11-05 21:21:35.000	
download 0.9 MB		M KIT WRT54GL 00:25:9C:47:73:F5	2010-11-05 21:21:36.0	2010-11-05 21:19:48.000	
download 1.0 MB		M KIT WRT54GL 00:25:9C:47:73:F5	2010-11-05 21:19:49.0	2010-11-05 21:18:37.000	
download 0.1 MB		M KIT WRT54GL 00:25:9C:47:73:F5	2010-11-05 21:17:57.0	2010-11-05 21:08:05.000	
download 0.1 MB		M KIT WRT54GL 00:25:9C:47:73:F5	2010-11-05 21:07:37.0	2010-11-05 21:07:30.000	
download 0.3 MB		M KIT WRT54GL 00:25:9C:47:73:F5	2010-11-05 21:06:45.0	2010-11-05 21:04:54.000	
download 1.7 MB		M KIT WRT54GL 00:25:9C:47:73:F5	2010-11-05 21:04:11.0	2010-11-05 21:00:11.000	
download 1.3 MB		M KIT WRT54GL 00:25:9C:47:73:F5	2010-11-03 22:00:26.0	2010-11-03 21:46:31.000	
download 0.1 MB		M KIT WRT54GL 00:25:9C:47:73:F5	2010-11-03 20:48:49.0	2010-11-03 20:32:47.000	
download 1.0 MB		M KIT WRT54GL 00:25:9C:47:73:F5	2010-11-03 20:32:01.0	2010-11-03 20:28:11.000	
download 0.4 MB		M KIT WRT54GL 00:25:9C:47:73:F5	2010-11-03 20:25:45.0	2010-11-03 20:23:28.000	
download 1.9 MB		M KIT WRT54GL 00:25:9C:47:73:F5	2010-11-03 20:20:52.0	2010-11-03 20:15:08.000	
download 3.3 MB		M KIT WRT54GL 00:25:9C:47:73:F5	2010-11-03 20:01:28.0	2010-11-03 19:43:28.000	
download 9.6 MB		M KIT WRT54GL 00:25:9C:47:73:F5	2010-11-03 18:57:31.0	2010-11-03 18:33:26.000	
download 0.4 MB	CW 1 LAN=00:24:A1:68:41:3A		2010-10-13 22:04:20.0	2010-10-13 22:00:01.0LA	
download 75.2 MB	CW 1 LAN=00:24:A1:68:41:3A		2010-10-13 21:12:55.0	2010-10-13 20:42:31.0LA	

Last Alert: 2010-11-30 18:32:20.0 Target: heliotrope111 Current Time: 2010-12-17 17:48:48.452

Figure 43: Cherry Web View → Copy Data Page

5.23 (U) Viewing VPN Data

(S) To view data captured as a result of a VPN Proxy/VPN Proxy All Action, click the “View → VPN Data” menu link (see Figure 44). You can view VPN Data related to a particular Flytrap by clicking the “Flytrap” column to sort, and then paging to the Flytrap of interest. VPN Data is stored in standard pcap format.

The screenshot shows the Cherry Web interface. On the left is a sidebar with various navigation links. A red arrow points from the text "View → VPN Data" to the "VPN Data" link in the sidebar. The main area is titled "VPN Data" and contains a table header with columns: File, File Size, FlyTrap, Last Modified, Start Time, WLAN MAC, LANMAC. Below the header, there is a message "Back to VPN Data". At the bottom of the sidebar, there is a note: "Last Alert: 2010-11-30 18:32:20.0 Target: heliotrope111" and "Current Time: 2010-12-17 18:17:43.594".

Figure 44: Cherry Web View → VPN Data Page

5.24 (U) Viewing Harvest Data

(S) To view harvest data, click the “View → Harvest Data” menu link (see Figure 45). Note that you can create a Target (which can later be added to Missions) by clicking the “Create Target” link beside a harvested email/chat/client MAC.

Figure 45: Cherry Web View → Harvest Data Page

(S) Note that harvest data is sent in a fixed size buffer at each Flytrap Beacon. This buffer can become full. To view the Harvest Fill Percentage during each Beacon, click the “View → Flytraps” menu link. Then click the Flytrap of interest, which will display the “Flytrap Details” page for that Flytrap. The “Status History” table has a “Harvest Fill (%)” column that shows the percentage of the harvest buffer that was filled during that Beacon (i.e., each row in the table corresponds to a Beacon event). If the harvest buffer is consistently filled, you can assign a new Mission that Beacons more frequently.

(U) The Harvest table may have a “Filter Extra” column. This column is strictly for developer diagnostics and may be safely ignored by the user.

5.25 (U) Viewing Upgrade Alerts

(S) To view alerts related to owner-attempted upgrades, click the “View → Upgrade Alerts” menu link (see Figure 46).

Date	Flytrap	Type	Client MAC	IP
2010-11-29 22:30:17.0	M KIT Belkin 00:17:3F:40:01:7C	Upgrade attempted	00:24:7E:DE:9A:BA	192
2010-11-29 22:28:57.0	M KIT Belkin 00:17:3F:40:01:7C	Upgrade page visited	00:24:7E:DE:9A:BA	192
2010-11-29 22:27:10.0	M KIT Belkin 00:17:3F:40:01:7C	Upgrade page visited	00:24:7E:DE:9A:BA	192
2010-11-29 22:25:32.0	M KIT Belkin 00:17:3F:40:01:7C	Upgrade page visited	00:24:7E:DE:9A:BA	192
2010-11-25 01:42:28.0	M KIT Linksys WRT300N v2 00:18:39:90:18:C4	Upgrade page visited	00:1E:65:F2:0F:B0	192
2010-11-25 01:42:23.0	M KIT Linksys WRT300N v2 00:18:39:90:18:C4	Upgrade page visited	00:1E:65:F2:0F:B0	192
2010-11-25 01:40:50.0	M KIT Linksys WRT300N v2 00:18:39:90:18:C4	Upgrade page visited	00:1E:65:F2:0F:B0	192
2010-11-25 01:40:47.0	M KIT Linksys WRT300N v2 00:18:39:90:18:C4	Upgrade page visited	00:1E:65:F2:0F:B0	192
2010-11-25 01:35:30.0	M KIT Linksys WRT300N v2 00:18:39:90:18:C4	Upgrade page visited	00:1E:65:F2:0F:B0	192
2010-11-03 22:06:14.0	M KIT WRT54GL 00:25:9C:47:73:F5	Upgrade page visited	00:1E:65:F2:0F:B0	192
2010-11-03 18:02:05.0	M KIT WRT54GL 00:25:9C:47:73:F5	Upgrade attempted	00:24:7E:DE:9A:BA	192
2010-10-27 17:18:23.0	M KIT Belkin 00:17:3F:40:01:7C	Upgrade attempted	00:24:7E:DE:9A:BA	192
2010-10-27 17:15:06.0	M KIT Belkin 00:17:3F:40:01:7C	Upgrade page visited	00:24:7E:DE:9A:BA	192
2010-10-15 23:27:19.0	FT3 00:13:10:44:98:AD	Upgrade page visited	00:21:86:61:4B:AA	192
2010-10-15 23:27:05.0	FT3 00:13:10:44:98:AD	Upgrade attempted	00:21:86:61:4B:AA	192

Last Alert: 2010-11-30 18:32:20.0 Target: heliotrope111 Current Time: 2010-12-17 17:45:30.277

Figure 46: Cherry Web View → Upgrade Alerts Page

(S) The table lists upgrade alert info, including the Flytrap on which the upgrade event occurred, time of the event, client MAC and IP address of client that triggered the event, and event type:

- **Upgrade page visited** indicates that the owner navigated to the device’s firmware upgrade page
- **Upgrade attempted** indicates that the owner attempted to upgrade the firmware. In the case of a Flytrap configured with the Firmware Upgrade Inhibit option, the Flytrap will only send an “upgrade attempt” Upgrade Alert in the case where the owner has somehow subverted the Upgrade Inhibit. In other words, when operating as designed, the Upgrade Inhibit option prohibits the owner from performing a detectable upgrade attempt action. In the case of a Flytrap without the Firmware Upgrade Inhibit option, an “upgrade attempt” Upgrade Alert would likely signal the loss of the implant.

5.26 (U) Viewing Windex Alerts

(S) To view alerts related to Windex (browser redirect) actions, click the “View → Windex Alert” link (see Figure 47).



The screenshot shows the Cherry Web interface with the title "Cherry Blossom Version 4.0 (svn 8275)". The left sidebar contains a navigation menu with various links such as Overview, View, Alerts, Windex Alerts (which is highlighted with a red circle), Upgrade Alerts, Target Activity, Flytraps, Deployments, Missions, Target Decks, Copy Data, VPN Data, Harvest Data, Location Data, Diagnostic Data, Plan, Flytraps, Targets, Target Decks, Exploits, Windex, VPN Link/Proxy, Flytrap Applications, Mission File, Execute Command, PoPo(e), Missions, Assign, Mission to Flytraps, Flytrap Kill, Administrator, Customers, Permissions, Users, and Catapult. The main content area is titled "Windex Alerts" and displays a table of alert information. The table has columns: Target, Receive Time, Windex Status, Updated, Client MAC, and Client IP. The data in the table includes various entries with timestamps ranging from 2010-11-30 to 2010-12-17, and status types like Pending, Unknown, Success, Failure, and Redirected. At the bottom of the table, it says "Last Alert: 2010-11-30 18:32:20.0 Target: heliotrope111" and "Current Time: 2010-12-17 17:44:49.558".

Target	Receive Time	Windex Status	Updated	Client MAC	Client IP
abc@def.com	2010-11-30 17:20:41.0	Pending	2010-11-30 17:20:01.0	0:0:24.7:E-DE:9A-BA	192.168
abc@def.com	2010-11-30 02:12:19.0	Pending	2010-11-30 02:12:19.0	0:0:1E:65:F2:0F:B0	192.168
00:1E:65:F2:0F:B0	2010-11-30 02:02:56.0	Unknown	2010-11-30 02:03:47.0	0:0:0:1E:65:F2:0F:B0	192.168
smith test2@hotmail.com	2010-11-30 01:59:42.0	Unknown	2010-11-30 01:59:59.0	0:0:0:1E:65:F2:0F:B0	192.168
00:1E:65:F2:0F:B0	2010-11-30 01:39:31.0	Unknown	2010-11-30 01:39:37.0	0:0:0:1E:65:F2:0F:B0	192.168
00:1E:65:F2:0F:B0	2010-11-30 01:21:00.0	Success	2010-11-30 01:21:24.0	0:0:0:1E:65:F2:0F:B0	192.168
00:1E:65:F2:0F:B0	2010-11-30 01:14:00.0	Success	2010-11-30 01:14:44.0	0:0:0:1E:65:F2:0F:B0	192.168
00:1E:65:F2:0F:B0	2010-11-30 00:58:54.0	Pending	2010-11-30 00:58:54.0	0:0:0:1E:65:F2:0F:B0	192.168
00:1E:65:F2:0F:B0	2010-11-30 00:05:16.0	Failure	2010-11-30 00:05:52.0	0:0:0:1E:65:F2:0F:B0	192.168
00:1E:65:F2:0F:B0	2010-11-29 23:45:31.0	Pending	2010-11-29 23:45:31.0	0:0:0:1E:65:F2:0F:B0	192.168
00:1E:65:F2:0F:B0	2010-11-29 23:38:17.0	Failure	2010-11-29 23:38:58.0	0:0:0:1E:65:F2:0F:B0	192.168
00:1E:65:F2:0F:B0	2010-11-29 23:33:15.0	Failure	2010-11-29 23:34:12.0	0:0:0:1E:65:F2:0F:B0	192.168
00:1E:65:F2:0F:B0	2010-11-29 23:29:09.0	Unknown	2010-11-29 23:29:46.0	0:0:0:1E:65:F2:0F:B0	192.168
abc@def.com	2010-11-29 22:01:19.0	Unknown	2010-11-29 22:01:37.0	0:0:0:1E:65:F2:0F:B0	192.168
00:1E:65:F2:0F:B0	2010-11-29 19:09:53.0	Unknown	2010-11-29 19:10:10.0	0:0:0:1E:65:F2:0F:B0	192.168
smith test2@hotmail.com	2010-11-29 17:46:18.0	Unknown	2010-11-29 17:46:39.0	0:0:0:1E:65:F2:0F:B0	192.168
abc@def.com	2010-11-24 23:54:47.0	Pending	2010-11-24 23:54:47.0	0:0:0:1E:65:F2:0F:B0	192.168
00:1E:65:F2:0F:B0	2010-11-24 22:13:45.0	Success	2010-11-24 22:14:07.0	0:0:0:1E:65:F2:0F:B0	192.168
00:1E:65:F2:0F:B0	2010-11-24 21:57:07.0	Failure	2010-11-24 21:58:42.0	0:0:0:1E:65:F2:0F:B0	192.168
00:1E:65:F2:0F:B0	2010-11-24 21:21:05.0	Failure	2010-11-24 21:44:58.0	0:0:0:1E:65:F2:0F:B0	192.168
abc@def.com	2010-11-24 19:39:31.0	Unknown	2010-11-24 19:39:37.0	0:0:0:1E:65:F2:0F:B0	192.168
abc@def.com	2010-11-13 01:04:56.0	Pending	2010-11-13 01:04:56.0	0:0:0:OB:97:29:87:5D	192.168
abc@def.com	2010-11-08 21:17:17.0	Redirected	2010-11-08 21:17:31.0	0:0:0:1E:65:F2:0F:B0	192.168
test@testing.com	2010-11-03 21:46:33.0	Pending	2010-11-03 21:46:33.0	0:0:0:1E:65:F2:0F:B0	192.168
abc@def.com	2010-11-03 21:45:23.0	Redirected	2010-11-03 21:45:31.0	0:0:0:1E:65:F2:0F:B0	192.168
test@testing.com	2010-11-03 20:32:51.0	Redirected	2010-11-03 20:33:02.0	0:0:0:1E:65:F2:0F:B0	192.168
00:1E:65:F2:0F:B0	2010-11-03 20:26:06.0	Redirected	2010-11-03 20:26:34.0	0:0:0:1E:65:F2:0F:B0	192.168
00:1E:65:F2:0F:B0	2010-11-03 20:23:24.0	Redirected	2010-11-03 20:24:33.0	0:0:0:1E:65:F2:0F:B0	192.168
00:1E:65:F2:0F:B0	2010-11-03 20:15:03.0	Redirected	2010-11-03 20:15:44.0	0:0:0:1E:65:F2:0F:B0	192.168
00:1E:65:F2:0F:B0	2010-11-03 19:43:24.0	Redirected	2010-11-03 19:44:11.0	0:0:0:1E:65:F2:0F:B0	192.168
abc@def.com	2010-11-03 18:33:28.0	Redirected	2010-11-03 18:34:02.0	0:0:0:1E:65:F2:0F:B0	192.168

Figure 47: Cherry Web View → Windex Alerts Page

(S) The table lists Windex alert info, including Target identifier, time of the event, status, Windex Session ID, Flytrap, client MAC and IP, and the URL the client originally requested. Windex Status has the following types:

- **Pending** indicates that the Target has been detected, but has not yet gone to a root web page to initiate the browser redirect
- **Redirected** indicates that the Target’s browser has been redirected
- **Active** indicates that Windex has an Active session with the redirected client
- **Success** indicates that Windex has successfully exploited the client
- **Failure** indicates that Windex was not able to exploit the client
- **Unknown** indicates that the current status is unknown (e.g., the CT could not contact the Windex server for a status update)

(S) Windex Session ID can be used on a Windex Server to fetch more detailed information about the Windex exploitation event (in particular if a failure occurs).

5.27 (U) Using VPN Link and VPN Proxy

(S) This section details usage of the VPN Link and VPN Proxy capabilities of the CB system. VPN-related actions are available only on a limited number of devices. Section 5.11.3 discusses device support for VPN Link and Proxy actions.

(S) Figure 48 shows the CB architecture related to VPN actions. When a Flytrap begins either a VPN Proxy Action or a VPN Link Action (i.e., through Mission tasking), it first establishes an encrypted VPN tunnel to the CB VPN Server (CB-VPN). The CB-VPN requires authentication to establish the VPN tunnel.

(S) *NOTE: in general, a CB-VPN server could be located anywhere (as illustrated in Figure 48). The CB team maintains a production CB-VPN server that is located behind the sponsor firewall on the sponsor network (see the “CB Server/Sponsor Network Diagram” in the “CB Installation Guide”). For this server, connections from the Flytrap are proxied through a PoP to the CB-VPN server.*

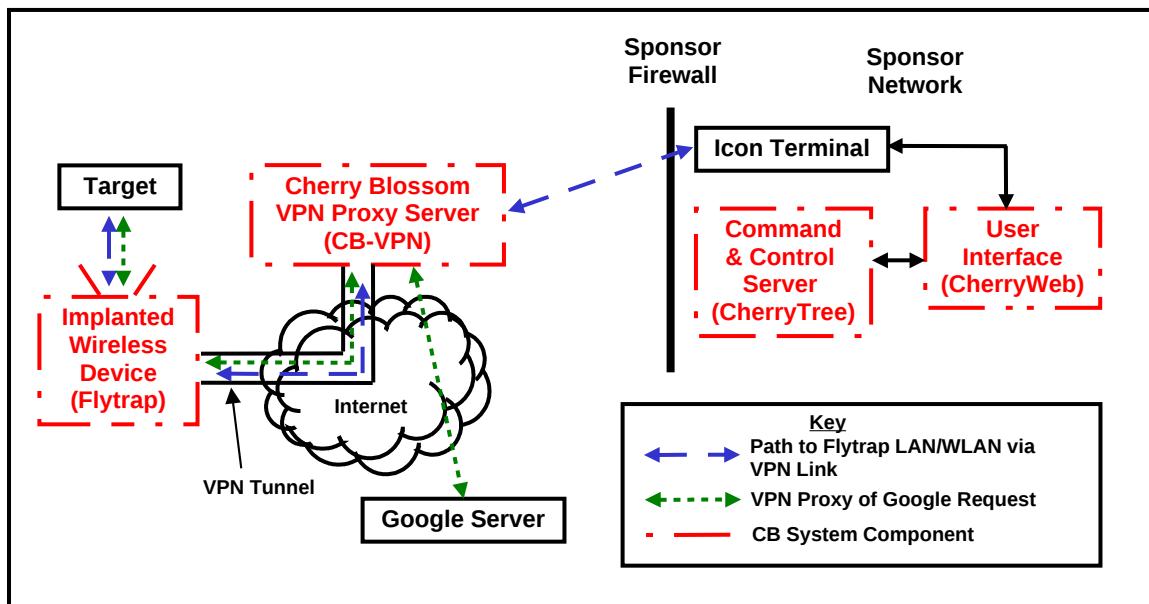


Figure 48: VPN Link/Proxy Architecture

(S) For the case of VPN Proxy, any proxied network traffic is first sent through the VPN tunnel to the CB-VPN. For the case of a Proxy All Global Action, all TCP and UDP traffic from any LAN/WLAN client of the Flytrap is sent through the tunnel. For the case of a Target with a proxy action, as soon as the Target is detected, all of that Target's TCP and UDP traffic is sent through the tunnel. The CB-VPN then handles the proxied traffic, forwarding requests to the proper server. The green arrow path in Figure 48 shows a typical case of a Target with a VPN Proxy Action making a request to google.com. Instead of going directly from the Flytrap to the Google Server, the request instead is sent through the tunnel to the CB-VPN, which then routes the traffic properly to the Google Server. Note that the CB-VPN could run MITM software to exploit the Target's network traffic.

(S) For the case of VPN Link, the VPN tunnel is used to provide a path from the Sponsor Network to the Target behind the Flytrap (in other words, on the Flytrap's LAN/WLAN side). Typically this would not be possible because the Flytrap's WAN would likely have a non-routable IP address. A VPN Link can be established in a number of ways:

- The Flytrap executes a Mission with a VPN Link Global Action
- The Flytrap executes a Mission with a VPN Proxy All Global Action
- The Flytrap detects a Target with a VPN Link Action
- The Flytrap detects a Target with a VPN Proxy Action

On the CherryWeb “View → Flytraps” page, the “VPN Link” column shows the status of the VPN Link for each Flytrap (see Section 5.8 for status codes).

(S) If a Flytrap has a VPN Link with status “Up”, then an Icon Terminal (connected to the proper Cisco VPN “profile”) can be used to gain access to the Flytrap and any clients on the Flytrap’s LAN/WLAN. The blue arrows in Figure 3 show the path from the Icon Terminal to the CB-VPN, which can then reach the Flytrap and LAN/WLAN clients through the VPN tunnel. To gain access to the VPN Link tunnel, establish a “VPN Link Terminal” as follows:

(S) Note: the “CB VPN ASA” Cisco VPN profile has been removed due to sponsor concerns related to linking two sponsor networks via a VPN tunnel. As such, in order to establish a “VPN Link Terminal”, a server on the CB VPN Server’s subnet must be used to route to the CB VPN Server and access the tunnel. The following technique uses the CB CC slave server as the server that routes to the CB VPN Server and from which the VPN Link tunnel can be established:

- **Establish a CB Server “root” Console/Terminal to the master CB CC slave server (i.e., the slave Cherry Tree server)** – see the CB Installation Guide for instructions and server IP addresses. This step requires an Icon terminal.
- **Add a route to the CB VPN Server** – from the “root” console, execute:

```
route add -net 10.128.0.0/9 gateway <CB_VPN_SERVER_IP>
```

where <CB_VPN_SERVER_IP> is the IP address of the CB VPN Server (see the CB Installation Guide – at time of writing [30 December 2010] the CB VPN server IP address was 172.24.5.21).

(S) To reach the Flytrap over the VPN Link tunnel (from the “VPN Link Terminal”), the Flytrap’s “VPN IP Address” must be used. CherryWeb displays the VPN IP Address on the “Flytrap Details” page (i.e., clicking any CherryWeb link with the name of the Flytrap will take the user to the “Flytrap Details” page). For example, say the Flytrap’s VPN IP Address is 10.129.12.34. Issuing “ping 10.129.12.34” from the “VPN Link Terminal” will ping the Flytrap over the VPN Link tunnel.

(S) To reach a Target on the Flytrap's LAN/WLAN from the "VPN Link Terminal", the Target's "Client VPN IP Address" must be known. If the Target has been detected, then the Alert will show the Client VPN IP Address. For example, say the Target's VPN Client IP Address is 10.129.99.99. From the "VPN Link Terminal", running "<ssh root@10.129.99.99>" will attempt a secure shell login on the Target's computer. Note that nmap or other similar tools can be used against the Client VPN IP Address from the "VPN Link Terminal".

(S) For generic network discovery/intrusion, (for example in the case where there may be no specific Target behind the Flytrap, but more information on that network is desired), nmap's discovery/intrusion features could be used from the "VPN Link Terminal" given the Flytrap's VPN IP Address. For example, to scan the 255 class "C" level address on the Flytrap LAN and attempt to determine what OS is running using the stealth SYN technique, issue:

```
nmap -sS -O <Flytrap_VPN_IP_Address>/24
```

5.28 (U) Viewing Flytrap Diagnostic Data

(U) To view Flytrap Diagnostic Data, click the “View → Diagnostic Data” menu link (see Figure 49). This page gives some rudimentary error messages about errors/warnings that have occurred on a Flytrap over time.



Figure 49: Cherry Web View → Diagnostic Data Page

5.29 (U) One-way Transfer (OWT) of Cherry Blossom Data

(U) The CB system supports a One-way Transfer (OWT) Report mechanism to facilitate packaging of and transmittal of CB data to a secure Sponsor host. Each OWT Report generates a series of data files that contain CB data collected for a specified Operation since the last OWT report was generated. See the CBUM for detailed description of the output format and directory structure.

(U) To generate an OWT report, click on “Administer → OWT” which is located at the bottom of the main CW menu on the left side if the screen. The OWT screen will then appear as shown in Figure 49. Select the desired Operation and start/end times and click “Generate”. The desired OWT data will be placed in the directory shown in the completion message.

Cherry Blossom

Version 5.0 (svn 8748M)

OWT Report Configuration

Operation: DEFAULT

Start Time: 25 Apr 2012 08:31:43

End Time: 25 Apr 2012 08:33:13

Output Directory: /home/jeff/src/CherryBlossom/CherryWeb/context/Reports

Generate

Report completed successfully!!!

Results can be found in /home/jeff/src/CherryBlossom/CherryWeb/context/Reports/DEFAULT

User: cbuser Logout

Last Alert: 2012-04-19 08:14:42.0 Target: you@suck.eggs

Current Time: 2012-04-25 08:34:36.113

Figure 49: Cherry Web Administer → OWT Data Page