

Cherry Blossom Mobile VPN Server

April 26, 2012

Objective of this meeting

- Validate design meets COG/NOD functional requirements
- Validate design accommodates COG/OSD technical requirements

Background

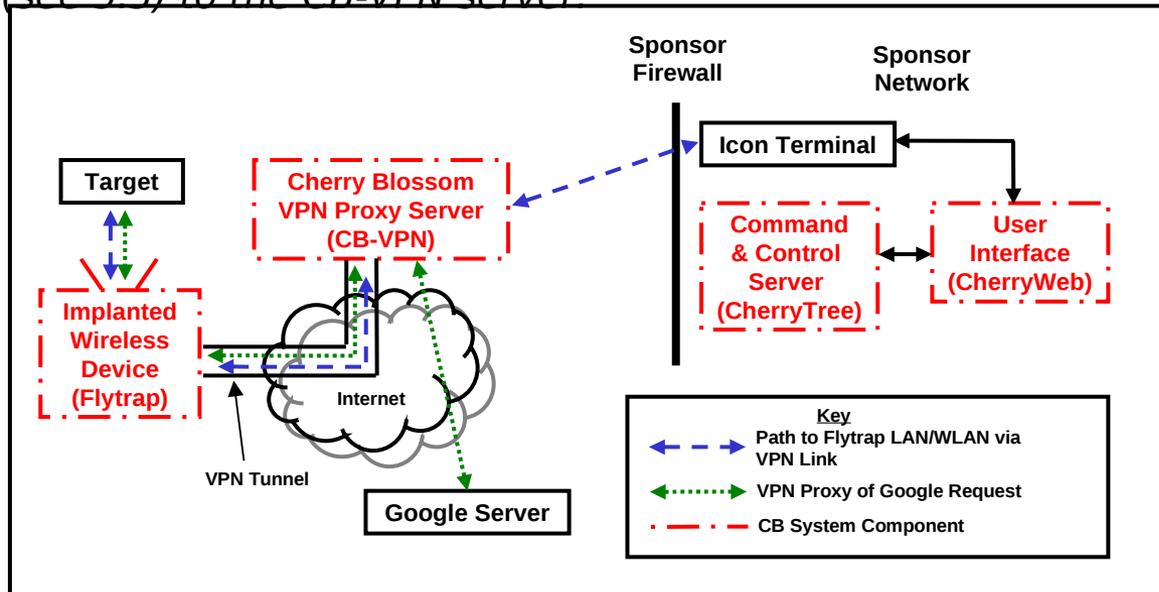
- The desire for a mobile version of the CherryTree VPN server was first raised by COG/NOD Cherry Blossom users in 2010
- WG tasked the Cherry Blossom contractor to perform a study of the concept. SRI delivered a study report “Deployable Cherry Blossom VPN Server” in January 2011
- Cherry Blossom v5.0 System Requirements Specification (SRS) was created in October 2011 and updated in February and March 2012 to include a formal requirement for a mobile VPN server capability
 - Fedora Core 10 was specified as the VPN server OS
- IMIS requirement 2012-0336 was drafted in December 2011 and finalized in April 2012
- A formal Cherry Blossom Requirements Review (RR) was held on 2 Feb 2012
 - COG/NOD and COG/OED/GB attended
- A formal Critical Design Review (CDR) was held on 22 March 2012 at the contractor facility
 - Only WGB attended
 - The Cherry Blossom User’s Manual was updated to illustrate how a VPN Server could be located anywhere in the world
- WGB held two meetings with COG/OSD/CNB, one involving a secure telephone conversation with the CB contractor, in April 2012 to discuss infrastructure implications of hosting the mobile VPN server on ICON
 - CNB requested that SRI switch to Fedora Core 14
 - CNB provided DVD images of FC10 and FC14 to WGB and SRI on 18 April

CDR Description of Mobile VPN Server

- (U) Operator boots ICON terminal to Fedora 10 OS
- (U) Operator installs Mobile VPN Server Package
- (S) Operator can now plan and execute missions (with the public IP address of the ICON terminal) that exploit targets from the ICON-hosted Mobile VPN Server
 - (S) Reach a target's computer directly over the internet from the Mobile VPN Server (VPN Link action)
 - (S) Proxy a target's network stream through the Mobile VPN Server (VPN Proxy action)

User Manual Description of VPN Server

- **Using VPN Link and VPN Proxy**
- (S) Figure 50 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 50). 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 (see 5.3) to the CB-VPN server.*



User Manual Description of VPN Server

- (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 50 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 (i.e., 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 9.8 for status codes).

User Manual Description of VPN Server

- (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 (at time of writing [30 December 2010] the CB CC slave server IP address was 172.24.5.18). 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).