Check Point Security Gateway to utilize an IPv6 Tunnel Broker – Configuration Guide

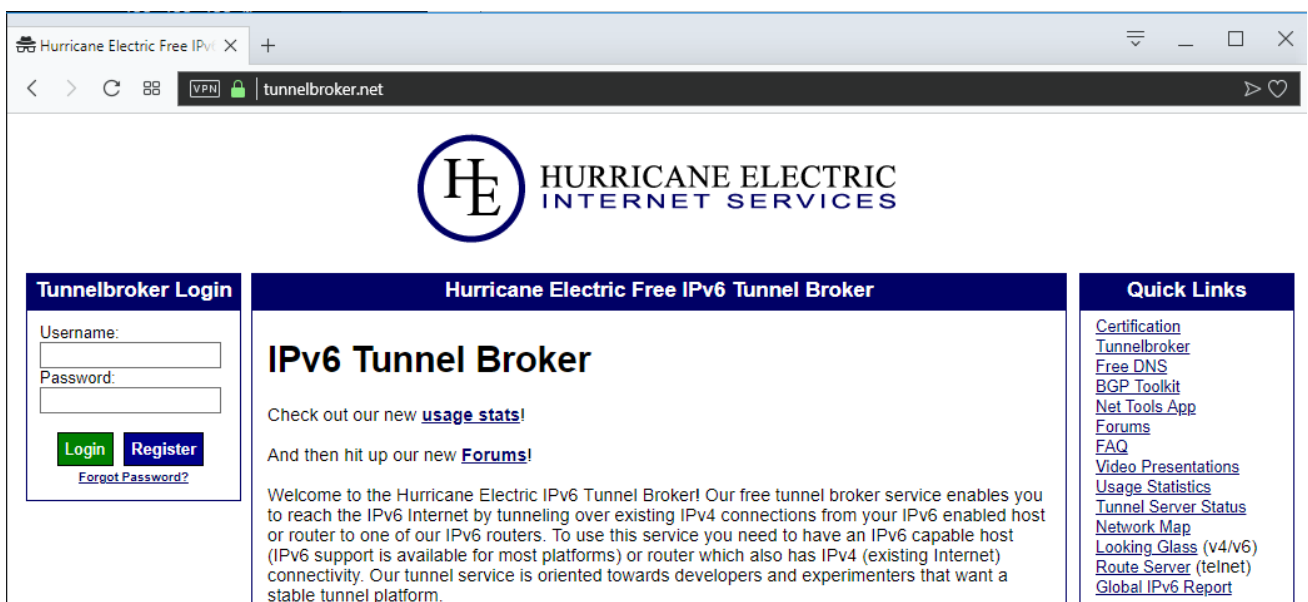**Nate Ressel**
Security Engineer

Not all Internet Service Providers are utilizing IPv6 today. This document provides walk through the process of creating a Hurricane Electric Tunnel Broker account and the configuration on your R80 gateway to utilize an IPv6 address space.

About Hurricane Electric:

Hurricane Electric operates its own global IPv4 and IPv6 network and is considered the largest IPv6 backbone in the world as measured by number of networks connected. Within its global network, Hurricane Electric is connected to over 200 major exchange points and exchanges traffic directly with more than 7,300 different networks. Employing a resilient fiber-optic topology, Hurricane Electric has no less than five redundant 100G paths crossing North America, five separate 100G paths between the U.S. and Europe, and 100G rings in Europe and Asia. Hurricane also has a ring around Africa, and a PoP in Australia. In addition to its vast global network, Hurricane Electric owns and operates two data centers in Fremont, California - including **Hurricane Electric Fremont 2**, its newest 200,000 square-foot facility. Hurricane Electric offers IPv4 and IPv6 transit solutions over the same connection. Connection speeds available include 100GE (100 gigabits/second), 10GE, and gigabit ethernet.

Creating a free IPv6 Tunnel Broker Account:

1) Proceed to tunnelbroker.net and click on the blue register button.

2) Fill out your personal information as requested.

3) Check your email and click on the link to validate your email provided.
4) Log into tunnelbroker.net with your newly activated account.
5) Click on 'Create Regular Tunnel' under 'User Functions' on the left side of the page.

To create this new tunnel enter in your external IPv4 address.
   a. You can find your external address easily from the following sites.
      i. ipchicken.com
      ii. whatsmyip.com
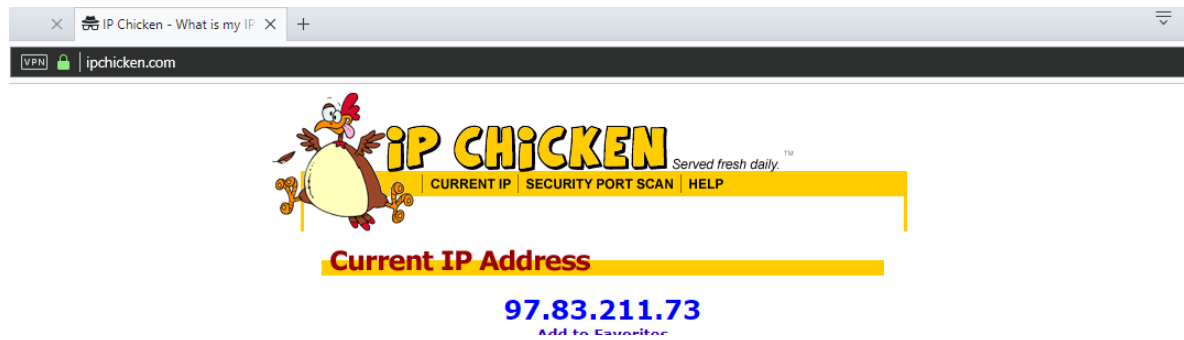
6) Now enter your external address, select the HE.net location closest to you and click 'Create Tunnel'

7) You will then be provided with all of the information for your IPv6 tunnel and assigned address space.

X | **IP Chicken - What is my IP** | **X** | **+**

VPN 🔒 | tunnelbroker.net/tunnel_detail.php

HURRICANE ELECTRIC
INTERNET SERVICES

Account Menu

Main Page
   Account Info
   Logout

User Functions

Create Regular Tunnel
Create BGP Tunnel
IPv6 Portscan

Tunnel Details

| **IPv6 Tunnel** | Example Configurations | Advanced |

Tunnel ID: 515850   [Delete Tunnel]

Creation Date: Dec 31, 2018

Description: [_____]

IPv6 Tunnel Endpoints

Server IPv4 Address: 184.105.253.14

Server IPv6 Address: 2001:470:**1f10**:5b3::1/64

Client IPv4 Address: **97.83.211.72**

Client IPv6 Address: 2001:470:**1f10**:5b3::2/64

Routed IPv6 Prefixes

Routed /64:   2001:470:**1f11**:5b3::/64

Routed /48:   **Assign /48**

DNS Resolvers

Anycast IPv6 Caching Nameserver: 2001:470:20::2

Anycast IPv4 Caching Nameserver: 74.82.42.42

rDNS Delegations   **Edit**

rDNS Delegated NS1:

rDNS Delegated NS2:

rDNS Delegated NS3:

rDNS Delegated NS4:

rDNS Delegated NS5:

Quick Links

Certification
Tunnelbroker
Free DNS
BGP Toolkit
Net Tools App
Forums
FAQ
Video Presentations
Usage Statistics
Tunnel Server Status
Network Map
Looking Glass (v4/v6)
Route Server (telnet)
Global IPv6 Report

Services

Transit
Colocation
Dedicated Servers

v4 Exhaustion

IPv4 & IPv6 Statistics

RIR v4 IPs Left
AfriNIC   6,710,393
APNIC   3,936,963
ARIN   0
LACNIC   1,463,922
RIPE   5,973,145
v6 ASNs

Configuring Check Point Gateway

Configuration Via Gaia GUI:

1) Log into the Gaia portal on the Gateway you want to configure.
2) Click on 'Network Interfaces'.

3) Click 'Add' and select '6in4 Tunnel
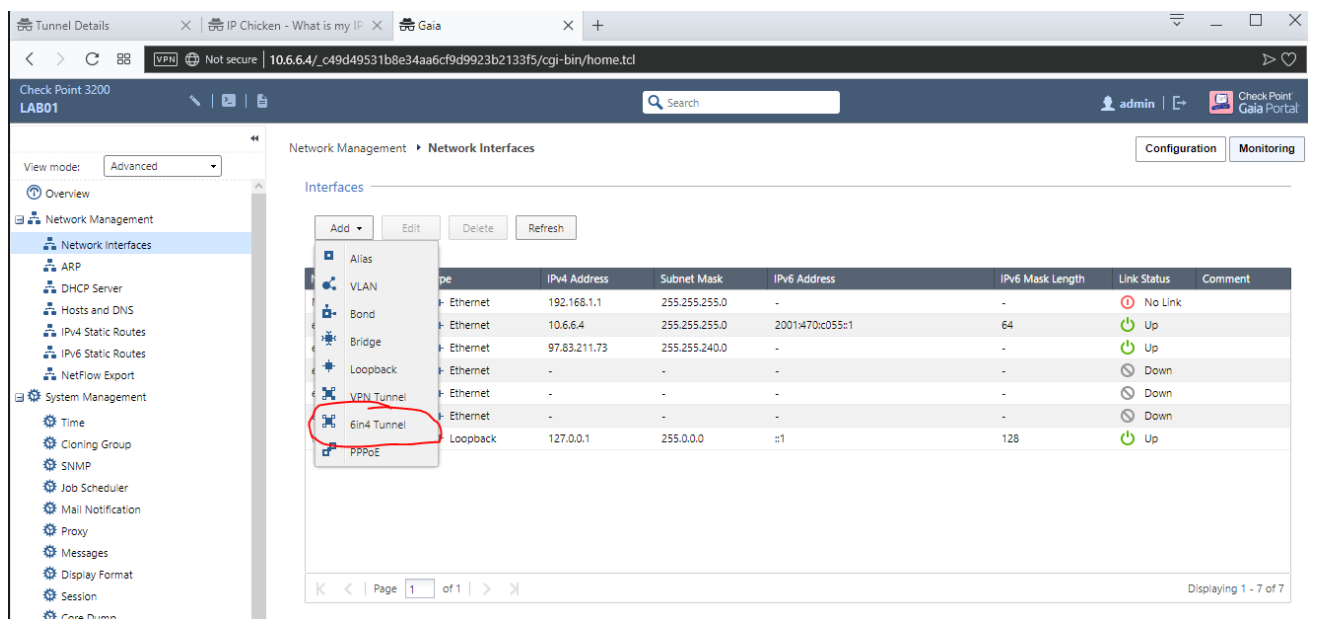
4) Enter the 'Client IPv6 address' as provided from HE

Add 6in4 Tunnel   ✕

Type: 　　　　⬛ 6in4 Tunnel

Enable: 　　　☑

Comment: 　　[   ]

IPv6 | **6in4 Tunnel**

○ Obtain IPv6 address automatically

◉ Use the following IPv6 address:

　IPv6 address: 　[2001:470:1f10:5b3::2]

　Mask length: 　[64] ▲▼

[OK] [Cancel]
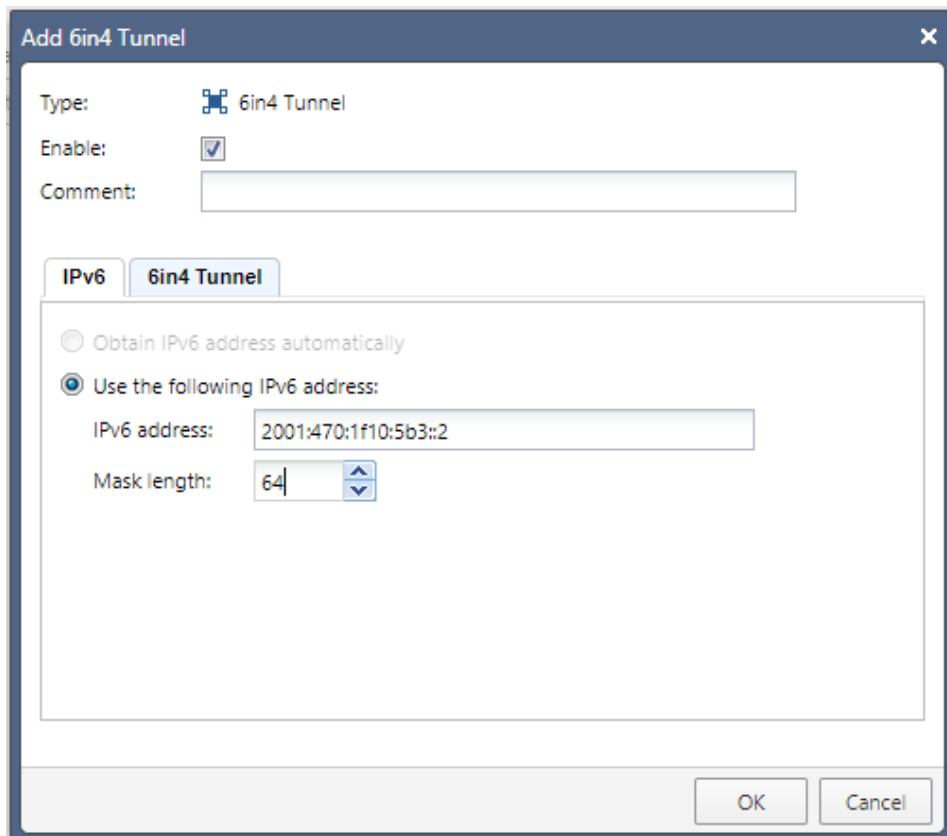
5) Select the '6in4 Tunnel' Tab and configure the following:
   a. Interface – This is your external interface on the Gateway.
   b. Tunnel ID – Use any ID that is not in use.
   c. TTL – Set this higher as a low number can cause issues depending on the number of hops you are away from your local HE Datacenter.
   d. Remote Address – Set this as provided by HE labeled 'Server IPv4 Address' under 'IPV6 Tunnel Endpoints'
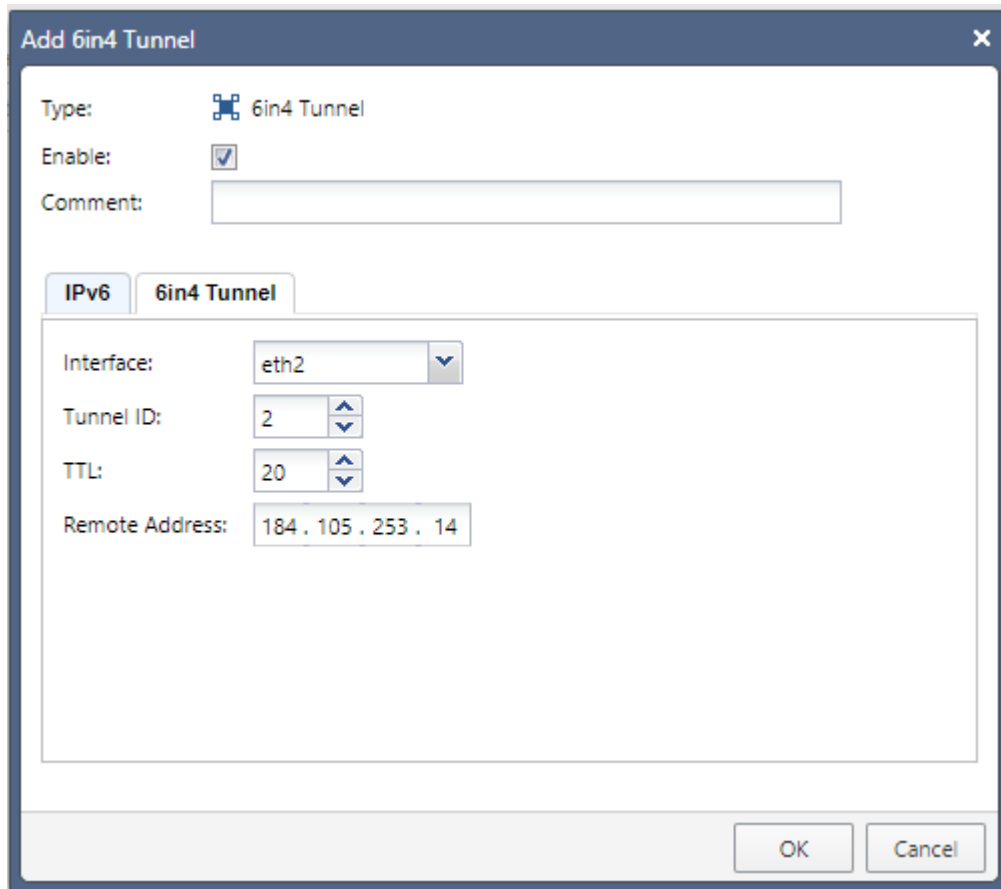
6) In Gaia click on 'IPv6 Static Routes'.
7) Set the Default Route to the Gateway provided by HE listed as 'Server IPv6 Address' under 'IPV6 Tunnel Endpoints'.

Configuration Via CLI:

1) Log into the CLI via SSH or console and enter the following commands.

   set ipv6-state on
   # MAY REQUIRE REBOOT
   add interface {local IPv4 interface name} 6in4 {ID (2-999999)} remote 184.105.253.14 ttl 20
   set interface sit_6in4_ID state on
   set interface sit_6in4_ID mtu 1480
   set interface sit_6in4_ID ipv6-address 2001:470:1f10:5b3::2 mask-length 64
   set interface sit_6in4_ID comments "HE.NET IPv6 Tunnel"
   set ipv6 static-route default nexthop gateway 2001:470:1f10:5b3::1 priority 1 on

Complete

You now have successfully created a tunnel to Hurricane Electric to use your own IPv6 address space. To utilize IPv6 fully you should implement a DHCP scope for the address space provided or assign static addressed to all of your devices.

Troubleshooting

Tunnel not passing traffic. Interface shows as up in Gaia, but link not available via CLI 'show interface sit_6in4_2'

LAB01> show interface sit_6in4_2
state on
mac-addr Not configured
type 6in4
link-state not available
mtu 1480
auto-negotiation Not configured
speed N/A
ipv6-autoconfig Not configured
duplex N/A
monitor-mode Not configured
link-speed Not configured
comments
ipv4-address Not Configured
ipv6-address 2001:470:1f10:117::2/64
ipv6-local-link-address fe80::6153:d346/128

Statistics:
TX bytes:0 packets:0 errors:0 dropped:0 overruns:0 carrier:0
RX bytes:0 packets:0 errors:0 dropped:0 overruns:0 frame:0

In /var/log/messages –
Dec 31 19:06:25 2018 LAB01 xpand[4833]: netis_get_driver_info:Cannot get driver information for sit_6in4_2, Invalid argument

Dec 31 19:05:44 2018 LAB01 xpand[4833]: admin localhost p +interface:eth2:6in4:2 t
Dec 31 19:05:44 2018 LAB01 xpand[4833]: admin localhost p +interface:sit_6in4_2 t
Dec 31 19:05:44 2018 LAB01 xpand[4833]: admin localhost p +interface:sit_6in4_2:dev eth2
Dec 31 19:05:44 2018 LAB01 xpand[4833]: admin localhost p +interface:sit_6in4_2:ip6 t
Dec 31 19:05:44 2018 LAB01 xpand[4833]: admin localhost p
+interface:sit_6in4_2:ip6addr:200104701f100117000000000000002 t
Dec 31 19:05:44 2018 LAB01 xpand[4833]: admin localhost p
+interface:sit_6in4_2:ip6addr:200104701f100117000000000000002:mask 64
*Dec 31 19:05:44 2018 LAB01 xpand[4833]: admin localhost p +interface:sit_6in4_2:local **97.83.211.70***
Dec 31 19:05:44 2018 LAB01 xpand[4833]: admin localhost p +interface:sit_6in4_2:mtu 1480
Dec 31 19:05:44 2018 LAB01 xpand[4833]: admin localhost p +interface:sit_6in4_2:remote 184.105.253.14
Dec 31 19:05:44 2018 LAB01 xpand[4833]: admin localhost p +interface:sit_6in4_2:state on
Dec 31 19:05:44 2018 LAB01 xpand[4833]: admin localhost p +interface:sit_6in4_2:ttl 20
Dec 31 19:05:44 2018 LAB01 xpand[4833]: admin localhost p +interface:sit_6in4_2:type 6in4

Solution:

You will notice that the local address configured during the creation process of the sit interface is not the current external address assigned to your external DHCP connection.

In Gaia, if you have ever assigned an external address and reverted back to DHCP you will see the old address still in the static address area even though it is greyed out. You must remove this old entry or change it to your new external address for the tunnel configuration to be complete.