



tw telecom inc.
10475 Park Meadows Drive
Littleton CO 80124

September 17, 2013

Mr. David Fujimoto
Contract Administrator
State of Hawaii
1151 Punchbowl Street
Honolulu, Hawaii 96813

Reference: RFP-12-006-SW
Modification Request – Addition of Items

Dear Mr. Fujimoto:

On behalf of **tw telecom holdings inc. (tw telecom)**, I am pleased to submit this written request for modification of our statewide contract with the State of Hawaii (State). The proposed modification addresses the addition of two types of Internet Services, Burstable Internet Service and Distributed Denial of Service (DDoS) Scrubbing. The purpose of this request is to provide the State with more choices in regards to Internet services.

The attached files provide product descriptions and pricing in accordance with Section 5.24 of the original RFP.

If you have any questions or require further information with regard to this modification, please do not hesitate to contact myself or Barry Fong at (808) 441-8565 at any time.

Respectfully,

A handwritten signature in black ink that reads "Cliff Miyake". The signature is fluid and cursive, with the first name "Cliff" and last name "Miyake" clearly legible.

Cliff Miyake
VP and General Manager, Hawaii Market
(808) 441-8537
Cliff.miyake@twtelecom.com

Product Information

Burstable Internet Access Overview

Burstable Internet service enables customers to commit to a minimum bandwidth level (Committed Information Rate - CIR) and receive access to additional bandwidth up to a defined maximum bandwidth level (Peak Information Rate - PIR) for sporadic IP traffic. Burstable Internet service is a good solution for customers who have occasional spikes in their Internet traffic, or those who are very dependent on bandwidth availability AND understand their traffic patterns. A monthly recurring charge is billed for the Committed Information Rate (CIR) and any applicable burstable usage above that CIR for the billing period is billed separately as Burstable Internet Usage.

Usage Calculation

Customers' usage levels are pulled every five minutes on both inbound and outbound traffic streams. At the end of each bill cycle, **tw telecom** calculates customers' usage at the 95th percentile for both inbound and outbound traffic and bills based on the higher of the two.

Samples are taken from the **tw telecom** edge device for all burstable customers on both inbound and outbound traffic. Inbound traffic is defined as traffic from customer's premise to the Internet. Outbound traffic is traffic from the Internet to customer's premise. At the end of the billing period, customers' bandwidth samples are ordered from lowest to highest and the usage level at the 95th percentile is determined.

Distributed Denial of Service (DDoS) Overview

Distributed Denial of Service (DDoS) attacks are becoming more prevalent in today's Internet experience. Customers who rely on their Internet availability cannot afford the risk that an attack imposes upon them. Fortunately, **tw telecom** has created a solution to protect DOE's business. Our reliable, fully customized, proactive DDoS Mitigation Service will monitor and mitigate DDoS attacks and provide your business with an ideal Internet experience.

Using anomaly-based detection methods, **tw telecom** will monitor DOE's Internet traffic patterns for deviations from your normal traffic baseline. This in-line technology learns the normal behavior of your traffic by sampling your traffic as it traverses the **tw telecom** network. This data is sent to our monitoring devices and aggregated into a protocol-based baseline for a given time of day, week, month or year so that alerts are created when traffic spikes above or below the established baseline.

Our anomaly detection methods are centered upon two elements: thresholds and protocol anomalies. Thresholds are set on a per customer basis with variations depending upon a customer's business model, bandwidth and standard traffic patterns. Setting these thresholds will be a part of your initial security consultation. At the same time, **tw telecom** will monitor for protocol anomalies. When protocols are developed, they have defined parameters that indicate the behavior they are supposed to exhibit. Protocol anomaly analysis indicates when this normal behavior deviates from the defined parameters. As these deviations are often malicious in nature, our system will alert us to the anomaly.

The service will begin with a learning phase to understand and establish a baseline of your normal traffic patterns. This baseline will be the foundation from which the thresholds are based. This learning phase

will require a minimum of two weeks to develop the initial baseline. During this two week time period, you will not receive phone calls from our staff. The baseline continues to learn and evolve during the entire time you have the service. Initially you may receive many calls however, later in the relationship as the systems learn which traffic patterns are "normal", phone calls will decrease.

While this service is able to monitor your traffic, it does not actually reside in the path of your traffic. This means no additional latency or jitter will be attributable to this service until you request filters be put into place for mitigation purposes.

tw telecom's security professionals will alert you of any deviations which exceed your thresholds to confirm their validity. Upon DOE's consent, a block will be placed in our network core where it will clear the traffic prior to your link establishment and provide you with optimized Internet Access. Each block is customized based on the attack type and parameters used in the attack.

Key Benefits of tw telecom DDoS Mitigation Services

- Dedicated team of professionals available 24x7x365 to monitor and react to your mitigation needs
- Customized configuration for your individual requirements
- A comprehensive security consultation from the **tw telecom** Security Operations Center
- Installation of service (non-intrusive)
- Proactive monitoring, confirmation and mitigation
- Reporting portal, including:
 - Detailed reports
 - Summarized reports
- Plus the convenience of a single number to call for all your communication needs.