

HANA BROADBAND COMMITTEE

COMMENTS

REGARDING THE TRANSFER
OF
OCEANIC TIME WARNER CABLE LLC
CABLE TELEVISION FRANCHISE
TO
COMCAST CORPORATION

JULY 15, 2014

HANA BROADBAND COMMITTEE

PO BOX 432
HANA, HI 96713

July 12, 2014

Testimony of the Hana Broadband Committee (HBC)
Subcommittee of the Hana Business Council,
on behalf of its members and others in the communities of East Maui
to the Hawai'i Department of Commerce and Consumer Affairs (DCCA)

Regarding: Franchise transfer from Oceanic Time Warner Cable (OTWC)
to Comcast Corporation (Comcast)

The Hana Broadband Committee in principal opposes the transfer of OTWC's franchise to Comcast on the grounds that competition is the cornerstone of free enterprise capitalism and combining the largest, of the top four cable-companies, is counter to that ideal. However we also recognize that OTWC currently has no cable-company competitors in Hawaii and therefore, regardless of the outcome, it is imperative that the DCCA insist that OTWC, a monopolist, be held to a strongly written agreement that protects the consumer and provides for better and equal service. To that end we submit the following.

GENERAL:

We understand that the management of OTWC seeks to create profit for their investors (owners) and that the Department of Commerce and Consumer Affairs (DCCA) is charged with regulating cable operators in order to best serve the public good, to protect consumers, and to ensure that local needs and interests are met. From this perspective, HBC wishes to support and inform the DCCA in their efforts to ensure that residents and businesses of East Maui are well served.

Hana is a remote community and as such, is arguably more dependent on quality high speed internet than other communities with resources more readily available. It is especially true for our school, emergency services (police, fire, medical), library, government offices, and businesses. East Maui at present receives limited cable service via a microwave link that feeds an old and poorly maintained distribution network limited to Hana Town and some outlying areas. This service has been a disappointment and has not attained the speeds and reliability that are the norm elsewhere. According to the 2010 census, Hana had the second highest increase in population on Maui and with the increasing use of broadband and smart TV we don't feel that the current microwave transmission link will be able to address the future needs. Though Hana was recognized as needing high speed access in the last franchise period, we feel the community was left behind and ignored. We are concerned that the same will happen in the coming years if these issues are not addressed appropriately with the pending transfer of OTWC's franchise to Comcast.

While OTWC has recently made improvements to its service, from past experience, we see this as only for appeasement during negotiations. We believe that if this transfer takes place and the DCCA does not take advantage of this time of transfer to require improved service for consumers, history has shown that OTWC/Comcast will continue to focus on profits at the expense of their customers.

HISTORY:

In 2001 a hybrid fiber-coaxial distribution plant was built delivering an upgraded 750 Mhz signal. The existing last mile coaxial cable was not replaced at that time, and many of those cables date back to the late 1970's. In 2002 internet became available using "Wave" internet service, which allowed for a dialup option. While this was an improvement over telephone dial-up, the system was not well maintained. The older cables were not being upgraded, and the microwave dish facility at the Hana Airport was beginning to suffer corrosion from exposure to the salt air. Relative to central Maui using "Roadrunner" (now "Time Warner Cable Internet"), "Wave" was a substandard service and Hana customers were being charged a higher rate, while receiving a slower and less reliable service.

Before our committee was formed, and during the last months of 2011, Hana's private and business consumers suffered through a series of TV and broadband outages that lasted for several days, caused much frustration and lost revenue to struggling businesses. The microwave dish facility at the Hana airport was by now in total disrepair (See Photo, Exhibit 1-A) and outages were becoming frequent and long.

After much was written, and calls made, the Hana Business Council met on Dec. 2, 2011 with Rick Colletto and Matt Kleinsasser (Manager of technical operations) to discuss our complaints. We were told that rates were higher in Hana due to the high cost of service per customer. We were told that "they were doing the best they can, but current microwave dish technology did not allow for any improvement in service". Outages continued and the Hana Business Council had Rick Colletto back to speak to all of their members at their annual luncheon on June 29, 2012. He again stated that "it's as good as it can be". By this time the "Hana Youth Center" was dropped from OHA's on line Hawaiian culture educational program because they could not meet the connectivity requirements (See Exhibit #2).

OTWC made efforts to find a solution and began to upgrade the system. While outages continued, new equipment and a larger broadband dish was installed at the airport (See Photo, Exhibit 1-B). In February 2013, the old Wave broadband was switched over to "Time Warner Cable Internet" and replacement modems were distributed. Again there were several outages until outside help was brought in to "fix" and "tune" the system. Capacity and dependability, eventually improved, but was still inadequate and inferior compared to the rest of the island.

The broadband needs of Hana School were not being met and in May of 2013 service was so deficient that the fiber INET link for the school and library was switched over to the University of Hawaii microwave dish (See Photo, Exhibit 1-B). Currently the Hana Medical Center (Hana Health) and the County Council office are using a DSL connection through the Hawaiian Telcom dish located at Hamoa. The Police Department, Fire Department and Maui Electric Company use the government dish also located at the airport (See Photos, Exhibit 1-C).

For the majority of the previous franchise period Hana subscribers paid a higher rate than other communities while receiving service which was significantly less reliable. Customer service, while required to be equivalent to central Maui, was limited to one day a week which is intolerable for both customers and businesses. Internet subscribers in Hana still frequently complain that they cannot reliably stream HD movies, nor make quality video calls and that internet and video service is frequently lost altogether. Television subscribers, as well, complain about the quality of their service. Customers often lose HD picture quality and many Smart TV features are not usable with the current TWC cable service. Our committee took a survey in March of this year and found many customers dissatisfied with both past and current TV and Internet customer service (See Exhibit #3).

ISSUES:

I. TECHNICAL/SERVICE AUDIT

From our investigations (See Exhibits #4 and #5) we have found serious technical issues that need to be addressed, and with respect are formally requesting an independent audit be conducted to review both the technical and management practices of OTWC. This would allow for a complete record of the cable system serving East Maui with particular focus on the technical specifications for TV and broadband customer service that is actually provided to the residents of East Maui. We feel that if OTWC's franchise is transferred to Comcast, that all parties should have knowledge as to the condition of the physical and technical assets being transferred.

II. NON-COMPLIANCE:

If Oceanic's franchise is to be transferred to Comcast assurances that issues of non-compliance to the franchise agreement be addressed and rectified.

1. I-Net Connections - The fiber end to end for community anchors including dedicated INET links to County, State and community-based organizations that support public safety, public health, public education, public media, public works, economic development and civic engagement in East Maui are out of compliance. Currently Hana School has to rely on the University of Hawaii microwave link for quality connectivity and reliability.
2. Technical Performance of Cable TV System - outages and signal loss are out of compliance. (See Exhibit #4)
3. Customer Service Requirements (FCC Customer Service Standards) - Terms & Conditions #241, Section 9.4, are not being met. Customer service is available only one day a week on Wednesday, and at times repairs are not completed and are passed to the following week. Per "Decision & Order #241, Section IV", an exception was made for Molokai and Lanai. No such exception was made for Hana, therefore Hana should have the same service as Central Maui which is to comply with the "FCC Customer Service Standards".
4. Service Rates - Terms & Conditions #241, Section 9.4, are not being met. FCC "Customer Service Standards" states that "prices and options of programming services and conditions of subscription to programming and other services" must be provided at installation of service and annually to all subscribers. As bundled with television or purchased separately OTWC billed Hana customers for their "Standard Internet Plan". This plan was advertised at up to 15Mbps download, yet the company, by its own admission, had capped the download speed at 10Mbps. The customers were never informed that they were being charged for a plan that wasn't being provided. The "National Broadband Map" lists Hana, as advertised by OTWC, at between 10-25 Mbps download and 768kbps-1.5Mbps upload. The FCC would conclude from this that Hana is being well served. This false advertising violates consumer protections for east Maui residents and for other communities relegated to second class service.

RECOMMENDED REQUIREMENTS FOR TRANSFER:

With particular reference to the Hana District and broader East Maui, we make the following submission of requirements before the transfer of OTWC's cable franchise to Comcast is accepted by the DCCA.

Because our private and business community is dependent on fast and reliable television and internet access, we feel strongly that if a transfer takes place that the DCCA require, as conditions, that Hana residents, businesses and community anchor institutions be provided with equivalent quality, speed, functionality, and price of service for unrestricted (ie. open & unmetered) internet access as is available in the City of Honolulu. Also that FCC technical and customer service standards, as intended, be implemented and enforced, and where service is available, or to be made available, that these services be extended to all of East Maui.

HBC does not have resources for independent legal review and appreciate the need for clear, direct and enforceable language in the franchise. So, we are incorporating and fully support the franchise requirements proposed by AKAKU as included below:

1. SYSTEM DESIGN

1.1 Network upgrade.

(a) Within two years of the date of this Decision and Order, OTW shall upgrade the Cable System so that it provides the same level of services in Hana, with the same technical quality and reliability, as OTW provides in the City of Honolulu.

(b) It must provide this upgraded service in any area within the franchise area where it is providing cable services as of June 1, 2013.

(c) It must also provide this upgraded service to any area where:

(i) Twelve entities within a one square mile area agree to take any service offered by OTW for a period of at least twelve months; or

(ii) The density is at least twenty-five residential units per square mile;
or

(iii) The entity requesting service is willing to pay a percentage share of the actual incremental cost of extension construction where the percentage equals the number of residential units per square mile divided by 25.

(d) If OTW modifies the Cable System or its operations in a manner that has the effect of requiring modifications to public, educational and governmental ("PEG") use facilities and equipment, or institutional network facilities and equipment, OTW will bear any cost required to ensure that there is no adverse effect on the Designated Entity or to users of the institutional network.

2. CUSTOMER SERVICE

2.1 OTWC shall comply with all federal and state customer service standards, and in addition will comply with the customer service requirements established by the DCCA from time to time. Without limiting its obligation to comply with customer service standards established under federal, state law, OTWC shall comply with the customer service standards set forth in this Decision and Order, which standards shall be treated as minimum, not maximum requirements. In the event of conflicts between standards, the stricter requirement shall control.

2.2 An “outage” is any event that results in a significant deterioration in the quality of any service offered by OTWC. A loss of picture or sound, or a substantial deterioration in picture or sound on one or more channels is an outage.

2.3 At a minimum:

(a) OTW must install equipment, and maintain records so that it may prove that it is in compliance with each obligation hereunder. Failure to maintain records and install equipment shall be a violation of these standards.

(b) OTWC shall provide the means to accept complaint calls twenty-four (24) hours a day, seven (7) days a week via a toll free number. A subscriber must be able to navigate any menu tree and reach a customer service representative within sixty (60) seconds. OTWC must satisfy this standard 90 per cent of the time during normal operating conditions during each calendar quarter. Any outage or other service problem that affects cable services and non-cable services shall be treated as a cable service complaint for purposes of OTWC’s obligations under this provision.

(c) During normal operating conditions, any service complaints from subscribers shall be investigated and acted upon within twenty-four (24) hours. Any service complaint shall be resolved within three (3) business days. Any outages affecting more than one subscriber must be resolved within two (2) business days. If because of the nature of the complaint it cannot be resolved within these time periods (as might occur in the aftermath of a storm that causes significant power outages), OTW will not be deemed to be in violation of this section. But delay is not excused merely because of the location of the affected customers in the County.

(d) Upon notification by a subscriber of an outage, OTWC shall credit a subscriber's account for loss of service. A subscriber is entitled to one day’s credit for any day where the outage exceeds four (4) hours. The subscriber need not request a credit to receive a credit. The outage will be presumed to be a four hour outage unless OTWC can verify otherwise. If OTWC becomes aware of an outage that affects more than one subscriber, it will credit subscribers affected by the outage, to the extent that they may be identified, without the need for each subscriber to request a credit. OTWC may seek a waiver of this automatic crediting requirement from DCCA if OTWC can demonstrate that it is answering calls regarding outages and credit promptly.

(e) Subsection (d) applies to cable services, but OTWC may opt to apply the same credit in connection with its provision of Internet services, and if so must notify DCCA, and will be liable for its failure to provide the credit. If OTWC does not so opt, then the provision of a credit to a subscriber shall not affect operator liability under applicable consumer protection law, including for failure to deliver services promised, or for charging for services not actually delivered and shall not prevent the subscriber, the state or any entity authorized to bring an action from seeking relief under any provision of state law.

(f) Service windows shall be three hours. Installation and repair services must be provided six days a week, eight hours per day.

(g) During normal operating conditions, company must respond to a request for service and install service within seven (7) days. This standard must be met 95% of the time measured quarterly.

2.4 DCCA is aware that at the present time, certain areas of Maui County are not receiving service with the same speed as other areas. For this reason, these provisions will be read to require OTWC to meet the install standard for each distinct geographic area within Maui County, as defined by DCCA.

EXHIBITS:

1. Photos of old dish and current dish compared.
2. Youth Center
3. Survey
4. Speed Tests
5. Analysis (Chase)

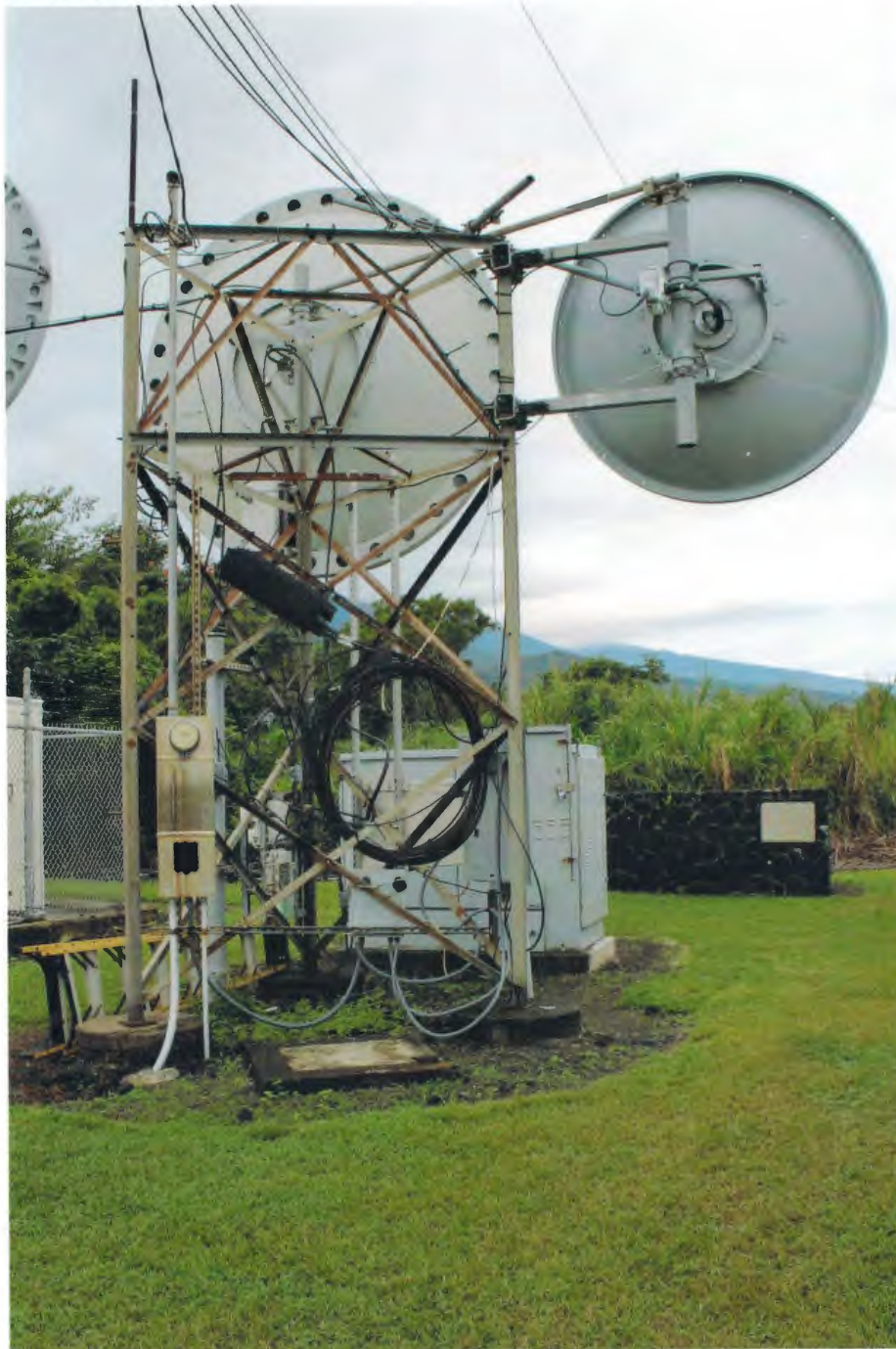
EXHIBITS

EXHIBIT I

EXHIBIT: 1-A



EXHIBIT: 1-B



CURRENT OTWC - TV DISH (LEFT), BROADBAND (RIGHT)



UNIVERSITY OF HAWAII – BROADBAND DISH

EXHIBIT: 1-C



GOVERNMENT - DISH (LEFT SIDE) - UNIVERSITY OF HAWAII DISH (CENTER) - OTWC DISH (RIGHT SIDE)

EXHIBIT II

HĀNA YOUTH CENTER, INC.

E kipaipai i na 'opio i na hana ku i ka pono mai manawa a mau loa aku.
(Inspiring youth to make positive impressions that last a lifetime.)

5091 Uakea Road / P.O. Box 464
Hāna, HI 96713
Phone number: 808.248.8504
Fax number: 808.248.7336
Email: hanayouthcenter@netscape.net
Federal tax I.D. 99-0276738
Check us out on FaceBook

October 1, 2012

Ms. Edwina Minglana
Grants Specialist
Office of Hawaiian Affairs
711 Kapi'olani Blvd. #500
Honolulu, HI 96813-5249

Aloha Ms. Minglana,

Thank you for your letter dated September 25, 2012. Also thank you for having allowed Hana Youth Center to be a part of this OHA-DHHL Native Hawaiian Education and Employment Network.

Our records indicate that over the course of years, several attempts have been made along with PROSIS through communication over the telephone, email, via computer in addition to a couple site visits to get us up and running. All of these efforts have proved unsuccessful. I believe that our situation is that we suffer from not having adequate broadband width in our isolated community.

Our current cable provider is Oceanic Cable. Recently due to community outcry there was a meeting here in Hana where Mr. Rick Coletto, General Manager spoke. In a nutshell he said the our current community system, which is over 40 years old, utilizes outdated microwave technology, transmitting signal from the Big Island. He said that the idea of running fiber optic cable from Central Maui is costly. He mentioned that the idea of piggy backing on MECO cabling is not an option. He did not make any commitment as to when we can look forward to them considering this idea further. I figure that although what we have is inadequate, it is still better than nothing.

PROSIS had wanted to utilize Sandwich Isles Communication, which is the provider for Hawaiian Home Lands on Maui. However, being there are no current

developed Hawaiian Home Lands in Hana, it is not an option for us. I have no idea as to what is happening on that front.

Although being an after school program, Hana Youth Center avails itself during the day as an unofficial site for Hawaii Technology Academy which provides our Hana youth an alternative to attending Hana School. It is an online school utilizing the Internet. We currently have about 12 youth who on and off come to HYC, as they do not have Internet service at home. Originally, Oahu teachers needed confirmation that the problems experienced were actually happening due to the Internet and not of the child's accord.

We also partnered this summer with AKAKU, Maui's public television with something called Project Y-BEAM. This allowed our Hana youth to take classes here at the center and learn video journalism. Our ongoing challenge was it took considerable time to download the youth project clips to the AKAKU system.

Although we continue to experience challenges, we do try to make the best of it. Had we known better we would not have accepted to be part of your of the OHA project. I apologize for the inconvenience this has caused.

In your letter, you mentioned that OHA would designate the equipment we received to another non-profit in our area. Please know that we did what we could and I earnestly believe that the situation will remain unchanged as to any organization on East Maui you choose.

I humbly ask that you not consider having us ship the video conferencing equipment as this would prove impractical, burdensome and costly to our small organization.

I await your equipment decision.

Sincerely,

A handwritten signature in dark ink, appearing to read 'W. Keoki Kalani', written in a cursive style.

W. Keoki Kalani
Director

EXHIBIT III

Hana Broadband Survey Results

10 questions, 60 Respondents, collected 3/5/14-3/16/14

1. Indicate which services you currently subscribe to: (check all that apply)

Answer Choices—

Responses—

Time Warner Cable (Television)	56.67%	34
Time Warner Cable (Internet)	83.33%	50
Dish Network (Television)	3.33%	2
Starband Satellite Internet	5%	3
Excede Satellite Internet	5%	3
None of the above	6.67%	4

Total Respondents: 60

COMMENTS:

Hughes satellite internet

I do not subscribe but use roommates Time Warnet Cable

digital cellular att

DIRECTV

DTV Direct

Directv (television)

the Wave-through Oceanic

DirecTV

Verizon hot spot (internet)

verizon

2. If you are now or previously were a Time Warner subscriber (Internet or Television), please use the check boxes below to tell us more about this.

	I am a subscriber—	It's not available where I live—	It's too expensive—	I switched to another service within the last year—	I switched to another service more than 1 year ago—	I originally decided another company provided better service—	I don't want home/business service—
Television	68.63% 35	11.76% 6	9.80% 5	1.96% 1	3.92% 2	1.96% 1	5.88% 3
Internet	86.54% 45	9.62% 5	3.85% 2	1.92% 1	1.92% 1	3.85% 2	0% 0

COMMENTS:

I use roommate's internet and cable tv. I am not a subscriber but I was required to say so to give feedback. Bad survey. I use your products daily.

Internet service is terrible, and their maintenance/backup/repair has been poor as well

I also use Verizon internet

?

3. Indicate your overall satisfaction with the quality of TELEVISION service you currently receive.

Answer Choices—	Responses—	
Extremely satisfied	11.67%	7
Somewhat satisfied	18.33%	11
neutral	11.67%	7
somewhat dissatisfied	18.33%	11
extremely dissatisfied	10%	6
I do not have any Television service	30%	18

COMMENTS

- WE WERE EXTREMELY DISSATISFIED FOR EVERY YEAR (16) WE HAVE HAD IT UNTIL THE LAST 6 MONTHS, WHEN IT HAS IMPROVED, THOUGH WE STILL HAVE VERY SLOW SERVICE, SOMETIMES NO BANDWIDTH, NIGHTTIME 6 P.M., TO 10 P.M., IS TERRIBLE, EVERYBODY STREAMING MOVIES? COCKROACHING NEIGHBORS?

- The service is extremely unreliable and most times very poor. Not happy at all!!! Have had over a dozen service calls in one year.

- This week in particular there were roving channel blackouts where you may have sound but no picture btw channels 17, 79, 71. An issue with the sevens it would seem. Very frustrating.

- FREQUENT lapses in service ESPECIALLY the digital stations

- DirecTV is reliable, price competitive, and technologically advanced. I used to be with Time Warner. They refused to respond to my complaints. Their service was only intermittent, and their technology was inferior in every way to DirecTV, which I didn't discover until I quit Time Warner. After I quit, Time Warner started offering me all sorts of discounts (phone and direct mail) to come back. I refuse. They are awful. Wish DirecTV would start offering internet as well. (BTW, Time Warner told me that DirecTV would not work, would be unreliable. They were so wrong!!!)

- OFTEN MANY OF THE CABLE CHANNELS ARE BROKEN UP OR SIMPLY NOT COMING THROUGH AT ALL. WHY NO HD WHEN I'M PAYING FOR THE SERVICE

- I cannot receive clear HD signals at night, I think that there is not enough bandwidth to handle both television and internet under the current system.

- most of the time it works and they are pretty good about troubleshooting problems

- .Weather interferes with reception

- We experience many power outages in our area throughout the year which directly affect our television and internet services.

- Reception inconsistent, some channels not coming correctly.

- as a disabled veteran, i enjoy watching the Military channels. However, the picture freezes, pixilates, audio chatters and goes to black screen making it impossible to watch and enjoy... i recently just went back to basic cable....sigh

- Service is unreliable.

- Certain channels on my TV does not work and yet I pay for those channels and have called to report

and nothing fixed. Pay per view service is not good sometimes you pay for a movie and then it is disrupted service...

- Slow, down a lot, in bad or fowl weather we lose channels.
- I have dish because Oceanic wanted too much \$\$ to bring service to my location. Years later they brought the internet but we haven't switched to Oceanic TV because we hear a lot of complaints and service goes down often. Dish is very reliable.
- High Band channels are not reliable.
- Every and anytime I have an issue, which is not often, they are extremely helpful and always rectify the problem.

4. Indicate your overall satisfaction with the quality of INTERNET service you currently receive

Answer Choices—	Responses—	
extremely satisfied	8.33%	5
somewhat satisfied	31.67%	19
neutral	11.67%	7
somewhat unsatisfied	26.67%	16
extremely unsatisfied	20%	12
I do not have any Internet service	1.67%	1

COMMENTS:

-SEE ABOVE FOR BOTH TV AND INTERNET

-slow unreliable internet service, pathetic customer service

-However, it is often pretty slow

-When it is available, too much down time this past year.

-At times, too slow.

-not fast enough, doesn't work throughout the house, wifi very inadequate, service poor and only occasional, really horrible, really!

-It is totally unreliable, goes in and out all day, service calls are pointless. Time Warner has told me that the reason is that there are so many people subscribing--they suggest that I only use internet at times when people are not home using it--however, they continue to charge me 24/7!

-Network perforistent. And TWC fmance is inconsront-line technical support is confusing, often times unaware of the situation even though TWC can tell there is a network problem.

MORE DEPENDABLE SERVICE AND SLIGHTLY FASTER SPEEDS SINCE INSTALLATION OF NEW EQUIPMENT BUT STILL NOT UP TO STANDARD -OF SERVICE ELSEWHERE

-Better than it used to be!

-it's better that it use to be but still sometimes slower then we would like especially downloading media stuff. The service is less frequently down, but still down more that it is in other parts of the country.

-it sometimes freezes and I have to turn it off and on.

-Internet services beats dial up, and for that alone I am grateful. When the weather is bad our services get affected and that's a bomber, but overall I have had no other problems.

-I need internet for my work, and it drops out regularly, is slow, and often kicks me off. Getting service is difficult, and streaming for movies often is interrupted.

-altho very very slow in the past, it seems as tho the internet speed is getting better and better.

-Service cuts out. Very slow for what we are paying. Still, would pay even more for faster speed! It's 2014, many small countries have 10X the internet speed we do out here!

-Speed is very slow and service is overall intermittent.
 -It goes off line too often and streaming is always slow.
 -Internet goes down at times off and on but no changes on bill going down! Can't get netflix without disruptions in service...
 -Extremely slow service, at rates that would not be acceptable on the mainland and shouldn't be here. There are times when dial-up is faster.
 Too many slow downs and complete outages for the fees charged.
 -Slow, slow. slow..
 -much better speeds over the past months since the service has been upgraded. Still occasional outage or times when it is running slow.
 -I like my service. I was not on Oceanic TW Cable when it went down for a few weeks a few years ago. I only clicked somewhat satisfied because I understand that in other countries, other places on Maui, and elsewhere, the connection is faster.
 -Most of the time it's pretty fast and reliable, but it does have times when it either goes out for a period or bogs down significantly.
 -Present Verizon service is slow and on occasion is unavailable. Previous Time Warner Cable only worked once in a while. Repeated replacement of modems did nothing to improve service. Finally, we gave up on them
 -Speed of download completely unreliable and slow; frequently just lose connection, usually just briefly but very disruptive. Rarely able to sustain streaming content.

5. Please tell us more about your satisfaction with the specific aspects of Television service listed below

	extremely satisfied	somewhat satisfied	neutral	somewhat unsatisfied	extremely unsatisfied	I do not have Television service	Total Respondents
Picture quality	11.86% 7	30.51% 18	3.39% 2	11.86% 7	10.17% 6	32.20% 19	59
reliability	7.14% 4	21.43% 12	5.36% 3	17.86% 10	17.86% 10	30.36% 17	56
stations available	12.73% 7	18.18% 10	14.55% 8	20% 11	3.64% 2	30.91% 17	55
price	5.45% 3	12.73% 7	16.36% 9	20% 11	14.55% 8	30.91% 17	55
customer service	10.71% 6	19.64% 11	12.50% 7	19.64% 11	7.14% 4	30.36% 17	56

COMMENTS:

-Very expensive and usually unreliable
 -WHEN OCEANIC FOLKS FINALLY COME THEY ARE GREAT. COMING ONLY ON WEDNESDAYS UNLESS THERE IS A REAL EMERGENCY IS NOT ACCEPTABLE. THE WHOLE WORLD OPERATES ON THE WEB NOW, WE CANNOT LOSE SERVICE WEDNESDAY NIGHT AND BE OUT UNTIL THE FOLLOWING WEDNESDAY MORNING. RIDICULOUS.
 -When service goes out, which is frequently, and we call to report it, we get a lot of rigamarole. Examples: "No one else has reported a problem, (they probably had the sense to give up) or, "Our repair crew will be on Wed." (and we're calling on Sat.). Grr....
 -DirecTV is totally responsive. Their equipment is constantly being upgraded--amazing technology!
 -AGAIN WEAK SIGNAL, LACK OF HD AND MISSING STATIONS BIG PROBLEM
 -Again, if the weather is fine than the television service is great. I pay \$146.00 per month for TV and internet services, I feel that is a lot compared to telephone services.
 -Price....altho you charge full price for you service you provide less than "full" quality service to the Hana area
 -The field technicians are good, but the customer service elsewhere in Time Warner is poor.
 -While the technicians on the ground are very helpful and sympathetic, the company does not seem interested in providing the level of service

the advertise - and charge for. The technicians know what the problems are but the company seems unwilling to fix them correctly.
 -Weather plays a factor...

6. Please tell us more about your satisfaction with the specific aspects of Internet service listed below

	extremely satisfied	somewhat satisfied	neutral	somewhat unsatisfied	extremely unsatisfied	I do not have Internet service	Total
Speed	10.17% 6	27.12% 16	10.17% 6	23.73% 14	27.12% 16	1.69% 1	59
Reliability	8.62% 5	29.31% 17	3.45% 2	24.14% 14	32.76% 19	1.72% 1	58
price	5.17% 3	18.97% 11	22.41% 13	27.59% 16	24.14% 14	1.72% 1	58
customer service	8.77% 5	21.05% 12	24.56% 14	17.54% 10	26.32% 15	1.75% 1	57

COMMENTS:

-We pay \$90/month for <15 hours of normal streaming a month.

-OCEANIC PEOPLE WHO COME TO THE HOUSE ARE WONDERFUL AND PROFESSIONAL AND DO THEIR BEST. WITH THE EXCEPTION OF THE WONDERFUL DONNY PINERO IN ENGINEERING AND LIZ IN THE OFFICE, PERSONEL IS NOT SATISFACTORY

-\$\$\$\$ monopoly

-It's a monopoly, so I have to subscribe. Internet service is critical to all that I do, but it's the poorest service and quality that I have found anywhere in the world.

-Don't get me started . . .

-Current pricing should deliver consistent 24x7 20MBps down and 10MBps up

-Internet services is great as long as the weather is great.

-OTW has a very good phone payment system using voice commands that makes it super easy to pay my bill each month in less than a minute. But I also have had bad experiences with customer service not understanding or responding to my issues well.

-At least Verizon service is usually dependable.

-As above, while the technicians on the ground are very helpful and sympathetic, the company does not seem interested in providing the level of service the advertise - and charge for. The technicians know what the problems are but the company seems unwilling to fix them correctly.

7. Regarding Internet Usage, how often do you use the internet for the following activities...

	Constantly	frequently	sometimes	occasionally	hardly ever	never	I do not have Internet service	Total
General Web Browsing/Email	38.33% 23	56.67% 34	3.33% 2	0% 0	0% 0	0% 0	1.67% 1	60
e-commerce/Business usage	20.69% 12	46.55% 27	13.79% 8	3.45% 2	6.90% 4	6.90% 4	1.72% 1	58
Streaming movies/shows (Netflix, Hulu, iTunes, etc.)	6.78% 4	33.90% 20	18.64% 11	11.86% 7	15.25% 9	11.86% 7	1.69% 1	59
Online gaming	1.85% 1	3.70% 2	9.26% 5	3.70% 2	9.26% 5	70.37% 38	1.85% 1	54
Video Communications (Skype, iChat, etc.)	8.93% 5	12.50% 7	17.86% 10	26.79% 15	19.64% 11	12.50% 7	1.79% 1	56
Voice Communications (VoIP service, skype voice, etc.)	5.56% 3	7.41% 4	16.67% 9	20.37% 11	18.52% 10	27.78% 15	3.70% 2	54

8. How often do you notice any sort of interruption in the quality or speed of your Television or Internet service?

	not applicable	Very frequently	Often	Sometimes	Occasionally	Hardly ever	Total
Time Warner Television Service	25% 12	27.08% 13	14.58% 7	20.83% 10	8.33% 4	4.17% 2	48
Time Warner Internet Service	7.14% 4	30.36% 17	33.93% 19	17.86% 10	7.14% 4	3.57% 2	56
Other Television Service	62.50% 15	8.33% 2	4.17% 1	4.17% 1	0% 0	20.83% 5	24
Other Internet Service	52% 13	12% 3	12% 3	4% 1	12% 3	8% 2	25

COMMENTS:

-TIME WARNER TV SERVICE IS REALLY BAD... REALLY REALLY BAD... PIXILATING CONSTANTLY, UPPER TIER NEVER AVAILABLE BUT WE CONTINUE TO PAY FOR IT... AWFUL AWFUL AWFUL... NO RESPONSE FROM REPAIR... THEY JUST SHRUG THEIR SHOULDERS AND SAY "THERE IS NOTHING WE CAN DO ABOUT THIS" AND THEY HAVE BEEN SAYING THAT FOR YEARS!!! RICK COLLETO, MANAGER, SAYS NOTHING TO BE DONE.

-If the electricity is out by Hana airport, which is not on the emergency generator, the cable and internet are out.

-Time Warner service was interrupted constantly, so I finally gave up after 9 months of complaining. DirecTV has never had an outage!

-TWC current Internet provisioning feels as though it is specifically designed to prevent competitive services (Netflix.com, Hulu.com, Vimeo.com, youtube.com, etc) as an alternative to TWC CableTV

-We experience interruptions only during bad weather, trees fall on cable lines, etc. Otherwise, we are very happy and content with the Oceanic services.

-RE: internet usage #7. I would use some features more if the service was fast and reliable enough.

9. If given the choice, would you choose to pay for a faster level of Internet service from Time Warner like subscribers in other parts of the state can do?

Answer Choices—	Responses—	
Yes	55.00%	33
No	18.33%	11
Not sure	26.67%	16
Total	60	

COMMENTS:

-Price is already more than the quality provided

-WHY SHOULD WE HAVE TO PAY EXTRA FOR GOOD SERVICE????? WE PAY A WHOLE LOT OF MONEY FOR REALLY BAD SERVICE! AND HOW FAST IS "FASTER"?? WOULD THAT BE THE "NORMAL" ELSEWHERE ? I JUST WANT REGULAR, UNINTERRUPTED INTERNET AND TV SERVICE. THIS SEEMS REASONABLE FOR ALL THE MONEY WE PAY AT THIS TIME. AND T-W NEEDS TO BE HELD ACCOUNTABLE, AND NEEDS TO RESPOND TO THE NEEDS OF ITS CUSTOMERS. THAT IS NOT NOW THE CASE BECAUSE THEY HOLD PRACTICALLY A MONOPOLY ON INTERNET AND CABLE TV SERVICE, AND NOW WITH THE PURCHASE UNDERWAY, I PREDICT IT WILL ONLY GET WORSE AND WORSE. OUR PUBLIC OFFICIALS DO NOT, REPEAT NOT, RESPOND TO THIS. OUR ELECTED OFFICIALS DEPEND ON CAMPAIGN FUNDS TO GET RE-ELECTED AND ARE NOT ABOUT TO STICK THEIR NECKS OUT FOR CONSUMERS (I.E, THE PUBLIC, THE VOTERS)... THAT IS REALLY SAD, DISAPPOINTING, AND DISILLUSIONING. ALL OF WHICH WE NEED TO REGISTER AT THE BALLOT BOX IN THE NEXT ELECTION.!

-I'm not interested in trusting Time Warner with more \$\$

-You can't maintain what you have, why pay more for unreliable service.

-if reasonable

-I'd prefer another provider!! Done with Time Warner!

-SUBJECT TO A MINIMUM SLA (Service Level Agreement) that ensures less than 0.5% packet loss at all times!

-Not a choice.

-i reliable....

-please, please, please!

-Depends on price and service.

-Seems like for the rates charged the provider should provide a reliable highspeed so that additional fees for increased speed would not be necessary.

-depends on price

-But not if it means the movement to undo net neutrality. see www.freepress.net

-speed has not been an issue.

10. Please use this space to share any thoughts or concerns regarding television or internet service in the Hana district.

When we first received new modems in summer 2013, service was great. Since this past fall, the speed and reliability have seem to have gotten worse.

3/16/2014 1:49 PM

Hana residents are getting ripped off by the high cost and low quality of internet service. Why should we pay more for less? If you can't solve the problems that continue to occur, then don't charge us so much for such poor service. I'd rather you fix it. Btw, when I did have cable internet at another residence in Hana, the guys who came to provide service were great!

3/14/2014 8:42 PM

we should have a reduction in price due to inconsistent and bad reception...without having to constantly phone and have repairmen come out.

3/14/2014 9:40 AM

Need TV/Internet service in Upper Nihiku

3/13/2014 9:04 PM

WE HAVE BEEN FIGHTING THIS FIGHT FOR YEARS AND YEARS WITH OCEANIC,

3/13/2014 6:04 PM

The absolute worst service I've ever experienced. All calls go straight to Honolulu and they have no clue where Hana is and seems to be just as clueless on the continued problems here. It's a joke!! And, when I've asked to have someone from Maui call me back, I've never had a returned call from anyone on this island in a year. I have wondered several times if I should contact the better business bureau as I feel that Oceanic Time Warner has been ripping off the people of Hawaii for years. I even had poor service issues in Honolulu.

3/13/2014 2:07 PM

Reliability is a big issue.

3/13/2014 1:12 PM

We need fiber optic cable connection over the entire route from "the other side"

3/10/2014 10:32 AM

How about servicing outer Hana, Nahiku area for example.

3/9/2014 3:16 PM

Is it true we are the only area in Hawaii where we can't get internet via phone company? I think I heard this somewhere.

3/8/2014 7:48 PM

We need great service and quality of internet. How can we get it? Cause we certainly aren't getting either right now.

3/8/2014 2:15 PM

Hana Coast needs competitive internet service--I hope DirecTV will come in and provide internet.

3/7/2014 5:38 PM

If it isn't the case that TWC is purposefully making the internet unreliable or useful to competitive alternatives, then it must be the case TWC lacks sufficient technical skills to deliver reliable service -- either directly or through their subcontractors.

3/7/2014 9:50 AM

WE HAVE BEEN A STEP CHILD TOO LONG. PLEASE DO WHAT NEEDS TO BE DONE TO PROVIDE THE QUALITY OF SERVICE THAT WE ARE PAYING FOR.

3/7/2014 9:10 AM

How important is it to put in microwave to pollute our clean environment?? This is not why folks live in & visit Hana, slow town doesn't need fast business. Keep Hana CLEAN & Keep microwave OUT !!!

3/7/2014 8:54 AM

Use the power company's easement to service Hana with fiber-optic cable. This will speed up service and reliability of that service.

3/7/2014 6:08 AM

Because Time Warner only sends their customer service reps to Hana once a week, getting service can often mean a three week wait which seems far too long.

3/6/2014 8:57 PM

Internet is down about 1/3 of the time, and I depend on it for my business.

3/6/2014 8:34 PM

We need fiber optic cable from anyone who will provide it. Current service is horrible!!!!

3/6/2014 3:06 PM

I am off the grid so I have to have satellite service.

3/6/2014 1:50 PM

I would not mind if time Warner upgrade the services to a faster level for Hana as long as the cost does not go up. I feel I am paying too much already!!!!

3/6/2014 11:36 AM

We have had Oceanic owned internet of the "Wave" originally. Now is just part of Oceanic Time Warner. It works well sometimes, but you never know.

3/6/2014 10:56 AM

I would be extremely excited & grateful for the availability of OTWC television & high speed internet service (equal to that of other parts of Maui) for my Hana residence as well as business. Mahalo!

3/6/2014 10:55 AM

you charge full price for less than full service....

3/6/2014 10:54 AM

please extend wired internet service further west of Hana!!

3/6/2014 10:42 AM

This is a very underserved area that is predominantly Hawaiian. The deficit level of service in this area is discriminatory.

3/6/2014 10:18 AM

It's better than it used to be but not as good as other areas of Maui for the same price.

3/6/2014 10:15 AM

Living in an isolated area makes connectivity even more important to all of us in Hana. The inferior speeds and reliability of the Time Warner service in Hana should not be accepted. Service provided to other areas of Hawaii is far superior and that should be the standard set for Hana as well. The fees paid in Hana are the same as paid everywhere else, including the mainland, but in those areas they expect and get much higher speeds and reliability. Why should we accept less for the same fees? If Time Warner wants to offer a faster service for a higher price, why should we be expected to pay more for what is considered "normal" elsewhere? An area that also needs improvement is customer service and their awareness of the Hana customers and situation. Experience has shown that any call only leads to frustration because the customer service rep tells each caller that he is the only one having trouble when we have already talked to friends having the same trouble and who have called and gotten that same reply. There is apparently very poor communication within Time Warner customer service and placing a call usually guarantees frustration and poor results.

3/6/2014 10:07 AM

Increase bandwidth for better and faster quality

3/6/2014 9:40 AM

Oceanic must continue to explore methods to upgrade the infrastructure in order to provide comparable service to the Hana area as is provided to the rest of the State.

3/6/2014 9:35 AM

Amazing it exists. We ARE remote. Thanks for your efforts.

3/6/2014 9:03 AM

Previously with Time Warner internet it was so unsatisfactory that I had to use the public library for access. With Verizon my service is slow, occasionally undependable, but I am able to carry out my correspondence and affairs with patience.

3/6/2014 7:08 AM

TWC does not seem interested in providing service to Hana anywhere near comparable to that offered elsewhere in Hawaii, yet we are "trapped" by TWC as there is no realistic alternative. Their franchise is sanctioned by the state and should require a guaranteed standard of service across their ENTIRE system - not just high density more urban areas. I would argue that a higher level of service should be required BECAUSE we are remote.

3/6/2014 5:22 AM

The digital and hd cable is a rip off. you shouldn't even offer it, if you can't ensure a high quality picture and reliable service.

3/6/2014 12:32 AM

The internet service I have (near Hana airport) is comparable to the high speed I paid double for on mainland. I have past experience with business use on high speed internet and am very satisfied with Time Warner.

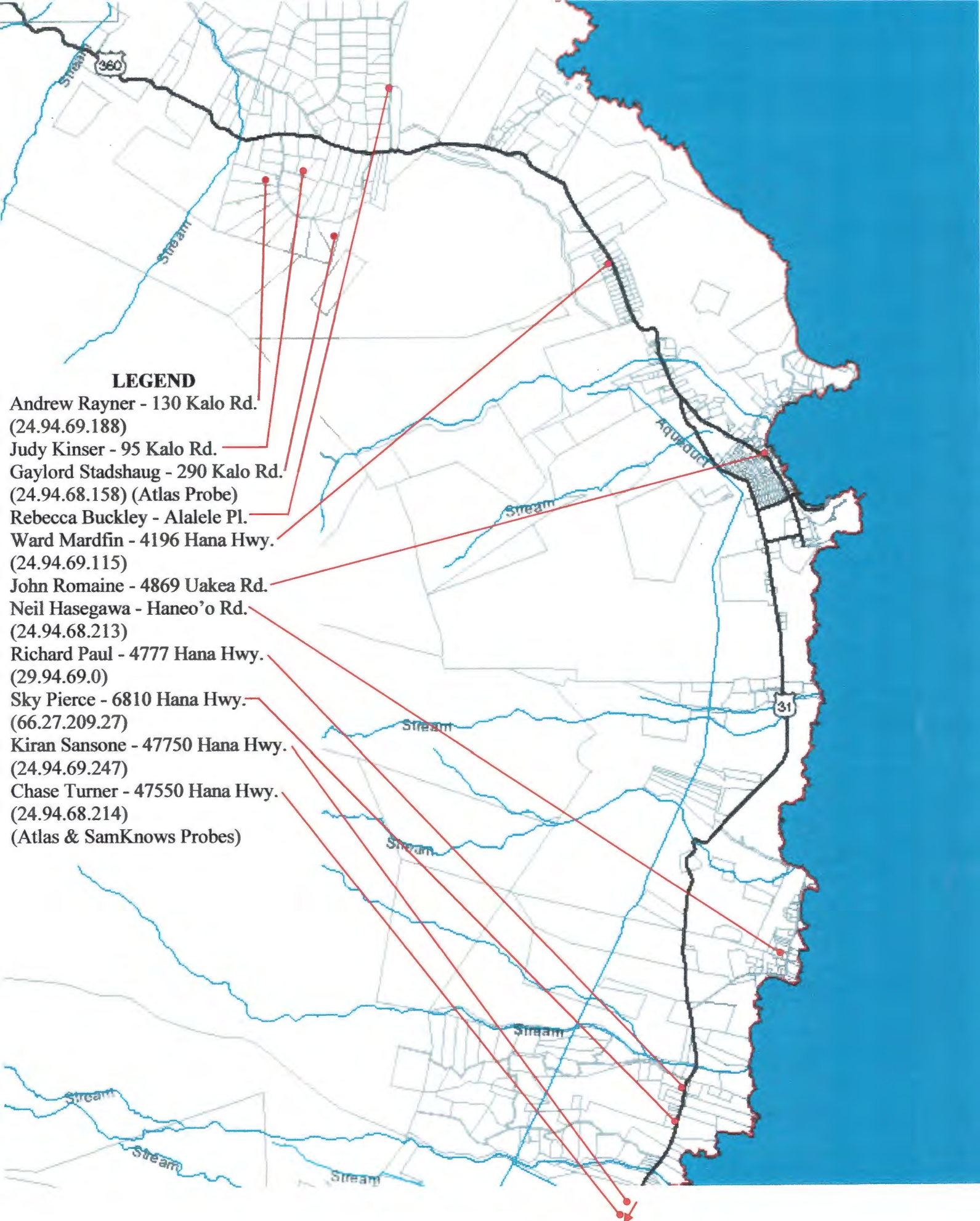
3/5/2014 10:18 PM

reliability is my primary issue

3/5/2014 9:34 PM

it is more about the frequent interruptions in service and we still have to pay a full bill every month. it goes off ALOT!

EXHIBIT IV



HANA SPEED TEST MAP

SPEED TEST DATA

NAME: Judy Kinser

ADDRESS: 95 Kalo Rd., Hana, HI 96713

DCCA SITE - <http://www.hibroadbandmap.org/speed-test/>

OCEANIC SITE - <http://speedtest.oceanic.com/>

		MBPS - DOWNLOAD			MBPS - UPLOAD			MBPS - DOWNLOAD			MBPS - UPLOAD		
DATE	TIME	TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3
3/13	7:34PM	1.48			1.05			10.24			1.06		
	7:38PM	1.19			1.04			10.68			1.07		
	7:41PM	1.11			1.05			8.92			1.05		

Signal Stats (Codewords)	Bonding Channel Value		
Channel ID	2	3	4
Total Unerrored Codewords	23358210567	23242011702	23241977960
Total Correctable Codewords	5958	10018	7089
Total Uncorrectable Codewords	12816	13863	13838
Unerrored/Uncorrectable	1822581.973	1676549.932	1679576.381

SPEED TEST DATA

NAME: Gaylord & Robin IP 24.94.68.158

ADDRESS: 290 Kalo Rd. Hana

DCCA SITE - <http://www.hibroadbandmap.org/speed-test/>

MBPS - DOWNLOAD

MBPS - UPLOAD

OCEANIC SITE - <http://speedtest.oceanic.com/>

MBPS - DOWNLOAD

MBPS - UPLOAD

DATE	TIME	TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3
3/11	8:05P	.56	.51		1.05	.96		6.2	1.6		1.06	1.05	
3/11	8:10P	.44			.94			3.63			.66		
3/11	8:15P	.51	.85		1.08	1.05		5.17	3.85		1.05	1.08	
3/11	8:20P	.62	.89		1.08	1.06		3.89			.78		
3/11	8:25P	.61			1.08			2.09			1.06		
3/11	8:30P	.65			1.05			3.91			1.07		

Signal Stats (Codewords)	Bonding Channel Value		
Channel ID	2	3	4
Total Unerrored Codewords	6061073238	6061056454	6061064662
Total Correctable Codewords	259	334	224
Total Uncorrectable Codewords	687	547	533
Unerrored/Uncorrectable	8822522.908	11080541.96	11371603.49

SPEED TEST DATA

NAME: Rebecca Buckley

ADDRESS: Alalele Pl., Hana, HI

DCCA SITE - <http://www.hibroadbandmap.org/speed-test/>

MBPS - DOWNLOAD

MBPS - UPLOAD

OCEANIC SITE - <http://speedtest.oceanic.com/>

MBPS - DOWNLOAD

MBPS - UPLOAD

DATE	TIME	TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3
1/21/14	10:35 am	3.26			1.04			1071			1.06		
	3:00 pm	2.18			1.05			10.83			1.09		
	9:30 pm	1.16			1.05			9.93			1.09		
1/22/14	7:40 am	4.49			1.05			11.00			1.10		
	2:35 pm	2.38			1.05			NOT AVAILABLE			NOT AVAILABLE		
	9:15 pm	1.16			1.05								
1/23/14	7:00 am	6.22			984 kb								
	2:05 pm	1.78			1.04								
1/24/14	6:30 am	7.54			1.05			10.70			1.08		
1/25/14	6:50 am	4.01			1.04			10.93			1.07		
	4:10 pm	2.36			1.05			10.88			1.09		
	10:15 pm	2.30			1.05			7.21			1.09		
1/26/14	12:45 pm	3.71			927 kb			N/A			N/A		
	9:50 am	1.72			1.05			8.20			1.09		
1/27/14	7:30 am	6.25			1.05			10.89			1.09		
	7:55 pm	242 kb			866 kb			N/A			N/A		
1/28/14	8:50 am	1.58			1.03			10.92			1.08		
	5:20 pm	327 kb			1.05			2.52			1.10		
	9:35 pm	811 kb			1.00			8.99			1.09		
1/29/14	6:55 am	6.68			1.05			10.76			1.10		
	11:30 am	5.24			1.04			10.64			1.10		
	7:55 pm	915 kb			1.06			9.85			1.09		
1/30/14	7:12 am	6.15			1.05			9.87			1.08		
	10:30 pm	1.83			1.06			10.92			1.10		

SPEED TEST DATA

NAME: Ward Mardfin IP: 24.94.69.115 (all three)

ADDRESS: 4196 Hana Highway (Wakiu area), Hana, HI, 96713

No particular disruptions

W Desktop 3/11 Youtube: Dishonorable Disclosures

W Laptop 3/11 Youtube: McLaughlin 7/26/2013

J Desktop 3/11 Youtube : Over Hawaii

DCCA SITE - <http://www.hibroadbandmap.org/speed-test/>

MBPS - DOWNLOAD

MBPS - UPLOAD

DATE TIME

TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3
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		Ward	Desktop				
3/11	8:05	0.221			0.881		
3/11	8:10	0.440			1.03		
		Ward	Laptop				
3/11	8:05	0.386			1.03		
3/11	8:10	0.525			0.437		
		Jean	Desktop				
3/11	8:05	0.345			1.03		
3/11	8:10	0.227			1.03		
		Ward	Desktop				
3/12	8:05	.395	.597	.426	1.04	.952	1.04
3/12	8:08	.775	.686	.818	1.05	1.05	1.05
3/12	8:08	.329	.519	.735	1.01	.951	1.03
3/12	8:28	.813	.810	.797	1.05	1.05	1.05
		Ward	Laptop				
3/12	8:05	1.08	.605	.527	1.04	1.04	1.02
3/12	8:08	.834	.390	.597	1.03	.940	.936
3/12	8:11	.744	.856		1.03	1.02	
		Jean	Desktop				
3/12	8:05	.264	.808	.851	1.02	.906	1.03
3/12	8:10	.718	1.07	.332	1.04	1.04	.888

OCEANIC SITE - <http://speedtest.oceanic.com/>

MBPS - DOWNLOAD

MBPS - UPLOAD

TEST 1 TEST 2 TEST 3 TEST 1 TEST 2 TEST 3

[illegible]

Signal Stats (Codewords)	Bonding Channel Value		
Channel ID	2	3	4
Total Unerrored Codewords	70989177937	70209229650	70060416041
Total Correctable Codewords	10889905	4326659	5964796
Total Uncorrectable Codewords	4774031	1448147	1695000
Unerrored/Uncorrectable	14869.86112	48482.11518	41333.57879

SPEED TEST DATA

NAME: John Romaine

ADDRESS: 4869 Uakea Rd., Hana, HI 96713

DCCA SITE - <http://www.hibroadbandmap.org/speed-test/>

OCEANIC SITE - <http://speedtest.oceanic.com/>

DATE	TIME	MBPS - DOWNLOAD			MBPS - UPLOAD			MBPS - DOWNLOAD			MBPS - UPLOAD		
		TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3
1/20	4:20 pm	4.58			1.05			10.84			1.09		
1/21	10:00 am	2.43			1.04			10.81			1.09		
1/22	9:30 am	3.10			1.04			10.63			1.08		
	2:00 pm	7.24			1.04			10.82			1.09		
1/23	6:10 pm	3.23			1.01			10.77			1.09		
1/24	4:30 pm	1.65			1.04			10.70			*		
1/25	8:00 am	6.03			1.05			10.82			1.09		
	2:05 pm	7.65			1.05			10.55			1.05		
1/26	10:25 am	4.64			1.05			10.80			1.09		
1/27	9:00am	5.26			1.02			10.80			.99		
1/28	9:15 am	3.46			1.04			10.82			1.09		
1/29	5:00 pm	1.25			1021 kb			10.78			1.07		
1/30	7:00 pm	6.43			1.05			10.73			1.09		
2/1	9:45 am	4.88			1.05			10.78			1.08		

* Cable connection went down - no test

Signal Stats (Codewords)	Bonding Channel Value		
Channel ID	2	3	4
Total Unerrored Codewords	4749078223	4749086035	4749096208
Total Correctable Codewords	7702	9767	8104
Total Uncorrectable Codewords	4224	2924	3051
Unerrored/Uncorrectable	1124308.291	1624174.431	1556570.373

SPEED TEST DATA

NAME: Neil Hasegawa

ADDRESS: Haneo'o Rd., Hamoa, Hana HI 96713

IP ADDRESS: 24.94.68.213

DCCA SITE - <http://www.hibroadbandmap.org/speed-test/>

OCEANIC SITE - <http://speedtest.oceanic.com/>

MBPS - DOWNLOAD

MBPS - UPLOAD

MBPS - DOWNLOAD

MBPS - UPLOAD

DATE _____

TIME

TEST 1

TEST 2

TEST 3

TEST 1

TEST 2

TEST 3

TEST 1

TEST 2

TEST 3

TEST 1

TEST 2

TEST 3

[illegible]

SPEED TEST DATA

NAME: Richard W. Paul

ADDRESS: 4777 Hana Hwy. Hana, HI

IP ADDRESS: 29.94.69.0

DCCA SITE - <http://www.hibroadbandmap.org/speed-test/>

MBPS - DOWNLOAD

MBPS - UPLOAD

OCEANIC SITE - <http://speedtest.oceanic.com/>

MBPS - DOWNLOAD

MBPS - UPLOAD

DATE	TIME	TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3
3/11/14	8:05 pm	558 kb			1.05								
	8:10 pm	235 kb			934 kb								
3/12/14	8:05 pm	784 kb			1.05								
	8:10 pm	784 kb			1.05								
3/13/14	8:08 pm	775 kb			1.05								

SPEED TEST DATA

NAME: Sky Pierce IP: 66.27.209.27

ADDRESS: 6810 Hāna Hwy. Hana, HI 96713

DCCA SITE - <http://www.hibroadbandmap.org/speed-test/>

OCEANIC SITE - <http://speedtest.oceanic.com/>

DATE	TIME	MBPS - DOWNLOAD			MBPS - UPLOAD				MBPS - DOWNLOAD			MBPS - UPLOAD		
		TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3		TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3
1/16	6:30pm	905k	2.28		622k	1.04			8.71	10.65		1.09	1.09	
1/24	9:25pm	175k	744k	1.00	1.04	816k	691		1.87	.21	3.44	.39	.35	.75
1/28	8:10pm	391k	315k	1.04	1.03	1.04	1.05		3.83	3.36	2.87	.65	.90	.91
1/29	12:30pm	340k	5.99	4.09	690k	1.05	1.04		10.63	10.29	10.45	1.03	1.08	1.05
1/31	10:25am	453k	275k	511k	375k	178k	197k		.79	1.26	.51	.22	.18	.15
2/27	10:15am	2.9	1.97	2.54	1.04	1.05	1.01		5.84	9.63	10.77	1.09	Error	1.07
2/27	8:48pm	329k	882k	378k	132k	1.04	1.04		4.9	4.41	3.51	1.03	1.08	1.09
3/11	8:05pm	495k	745k	663k	906k	728k	1.01		4.54	1.44	.89	1.01	.72	.31
3/11	8:10pm	195k	215k	541k	436k	862k	430k		4.3	6.48	4.88	1.08	1.07	.89

Signal Stats (Codewords)	Bonding Channel Value		
Channel ID	2	3	4
Total Unerrored Codewords	4328045401	4306133569	4306131509
Total Correctable Codewords	5414	5532	5024
Total Uncorrectable Codewords	11942	10840	11475
Unerrored/Uncorrectable	362422.2572	397244.7942	375262.0051

SPEED TEST DATA

NAME: Kiran Sansone IP: 24 94 69 247

ADDRESS: 47750 Hāna Hwy., Hana, HI 96713

DCCA SITE - <http://www.hibroadbandmap.org/speed-test/>

OCEANIC SITE - <http://speedtest.oceanic.com/>

		MBPS - DOWNLOAD			MBPS - UPLOAD			MBPS - DOWNLOAD			MBPS - UPLOAD		
DATE	TIME	TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3	TEST 1	TEST 2	TEST 3
3/12	8:00PM	744 kb		1.04									
	8:05PM	674 kb		962 kb				6.62			1.05		
	8:10PM	1.09		1.04				5.87			1.02		
	8:15PM				Upload Test Error			4,58			1.04		

Signal Stats (Codewords)	Bonding Channel Value		
Channel ID	2	3	4
Total Unerrored Codewords	19555539391	19439206874	19439186483
Total Correctable Codewords	3573	5430	4168
Total Uncorrectable Codewords	14397	15773	16576
Unerrored/Uncorrectable	1358306.549	1232435.61	1172730.845

SPEED TEST DATA

NAME: Chase Turner

ADDRESS: 47550 Hana Hwy. 7G, Hana, HI 96713

IP ADDRESS: 24.94.68.214

[illegible]

EXHIBIT V

Measurements of Oceanic TWC Broadband Service to Hana, HI

by A. Chase Turner & Nick Buraglio
for Hana Business Council

2014-07-14 1700 - Work in Progress - For Discussion Purposes Only.
Please contact authors for permission to cite or use this report.

Subject to revision upon availability of more information from TWC concerning details of their
network operations

Outline

- Executive Summary
- Terminology
- Measurements
- Observations
- Recommendations

Executive Summary

TWC High Speed Internet service for Hana is under-provisioned, resulting in an unreliable and unpredictable broadband experience for Hana residential and business subscribers.

TWC plans to double microwave backhaul capacity will not solve current or future network congestion problems.

Hana residential and business subscribers continue to be excluded from TWC broadband service offerings available elsewhere in Hawaii.

Terminology

“RTT and ms”

*Light or microwave travel 140 miles in **0.8ms** in a vacuum*

*If there is zero-latency overhead for network routing and switching gear, it should take **1ms RTT** to deliver round-trip network packets between Oahu and Hana, Maui in optical fiber*

- **RTT** is Round Trip Time
- **1ms** is 1 milliseconds. Is same as 0.001 seconds

source: <http://www.wolframalpha.com/input/?i=How+far+does+light+travel+in+2+milliseconds%3F>

Terminology

“Network Congestion”

*“TWC’s internal policy is to upgrade networking gear when **network congestion** levels are in excess of 70%”*

- **Network Congestion** is evident when there are significantly varying RTT between overload segments, and packet drops in excess of 1% during peak utilization

Measurements

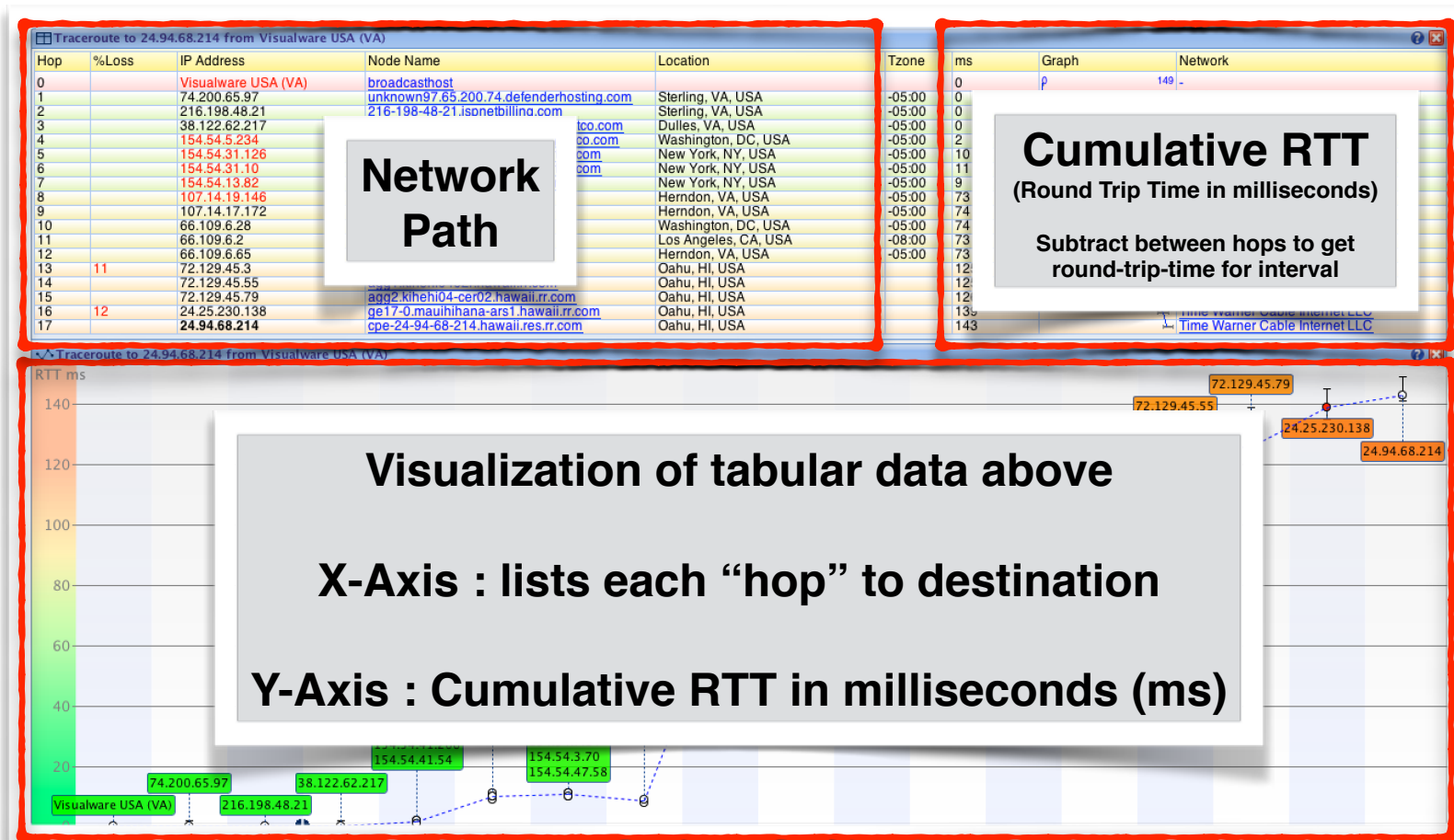
- Point to Point Ingress
 - VisualRoute measurement
 - SmokePing measurement
- Point to Point egress
 - SamKnows measurement
- Multi-point Ingress and Egress
 - atlas.ripe.net measurement

VisualRoute measurements

What is “VisualRoute”

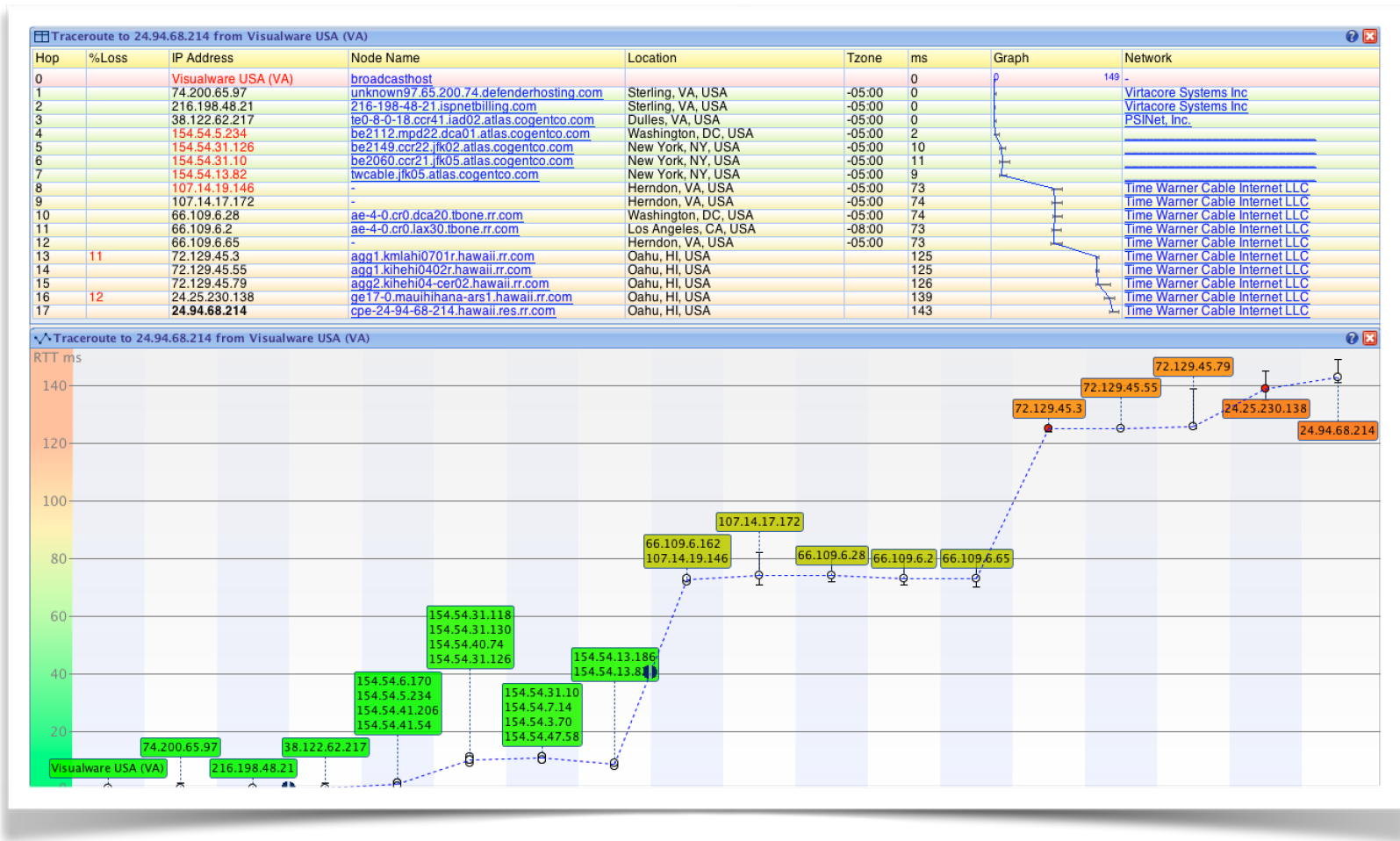
- “traceroute” is the network routing points connecting a client computer with a remote server
- The “logical” view of those connection points is visualized with tools such as www.visualroute.com
- The following analysis is focused on the TWC managed network segments only

VisualRoute Key Indicators

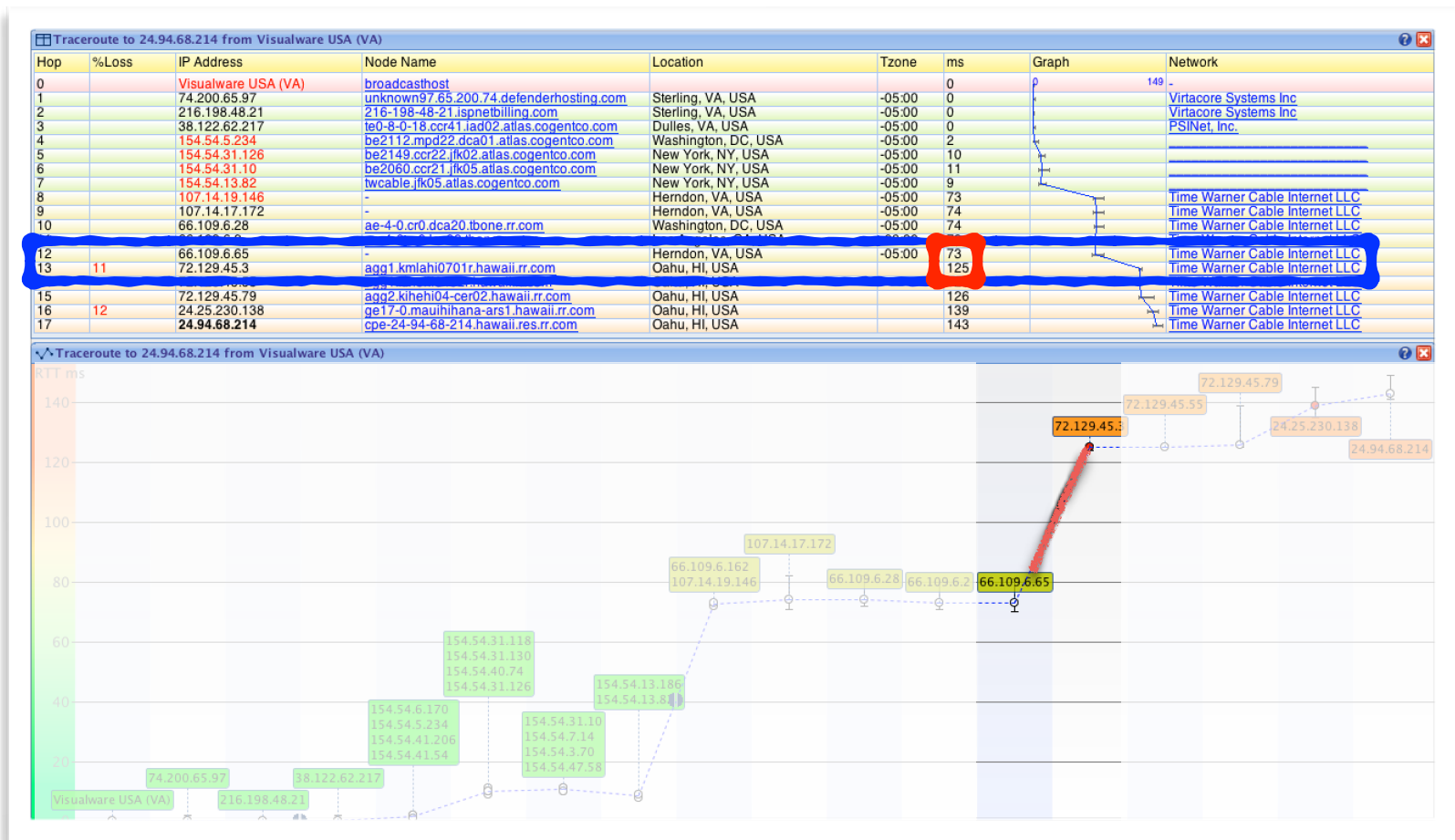


Sterling, VA to Hana, HI

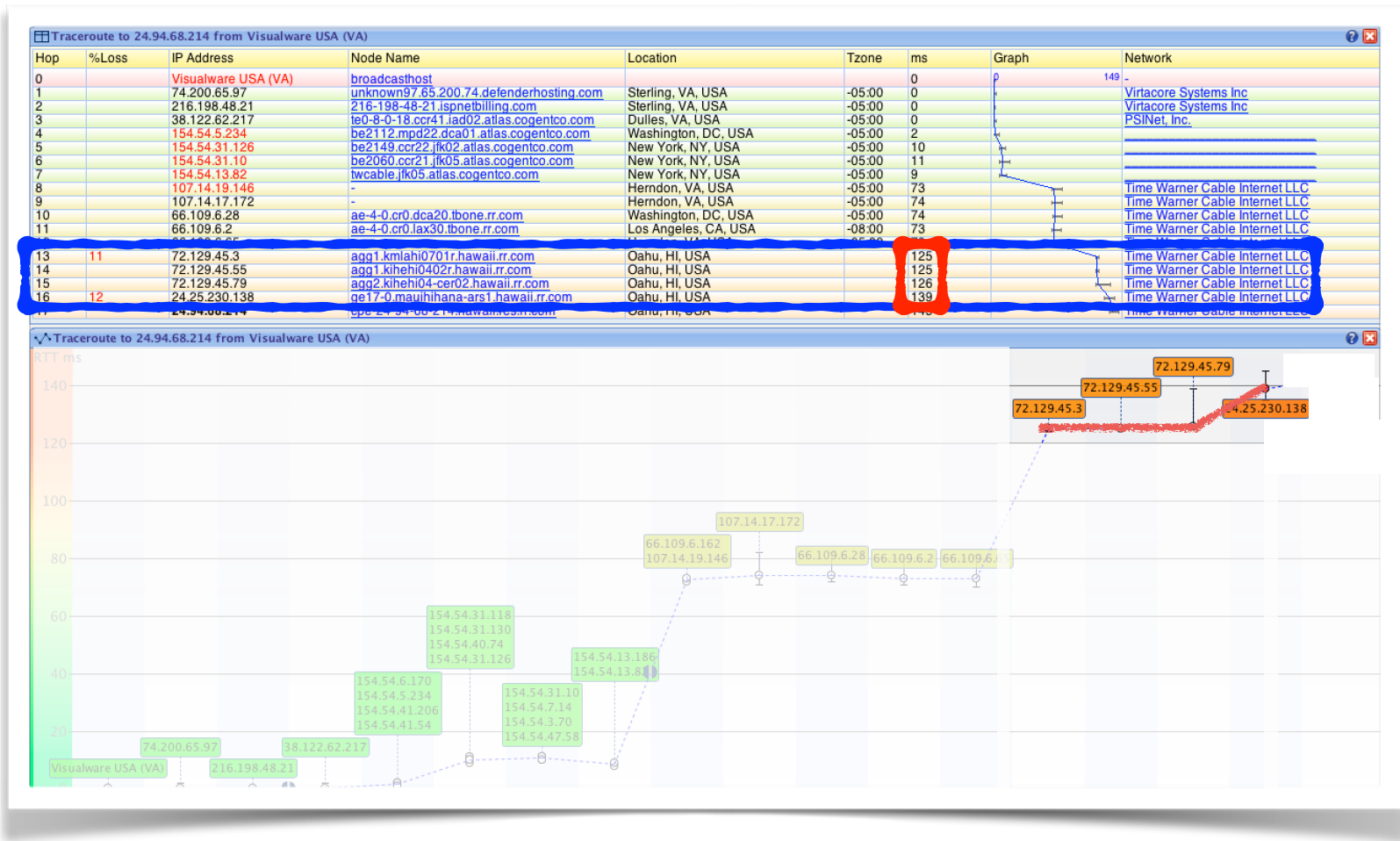
TCP Port 80



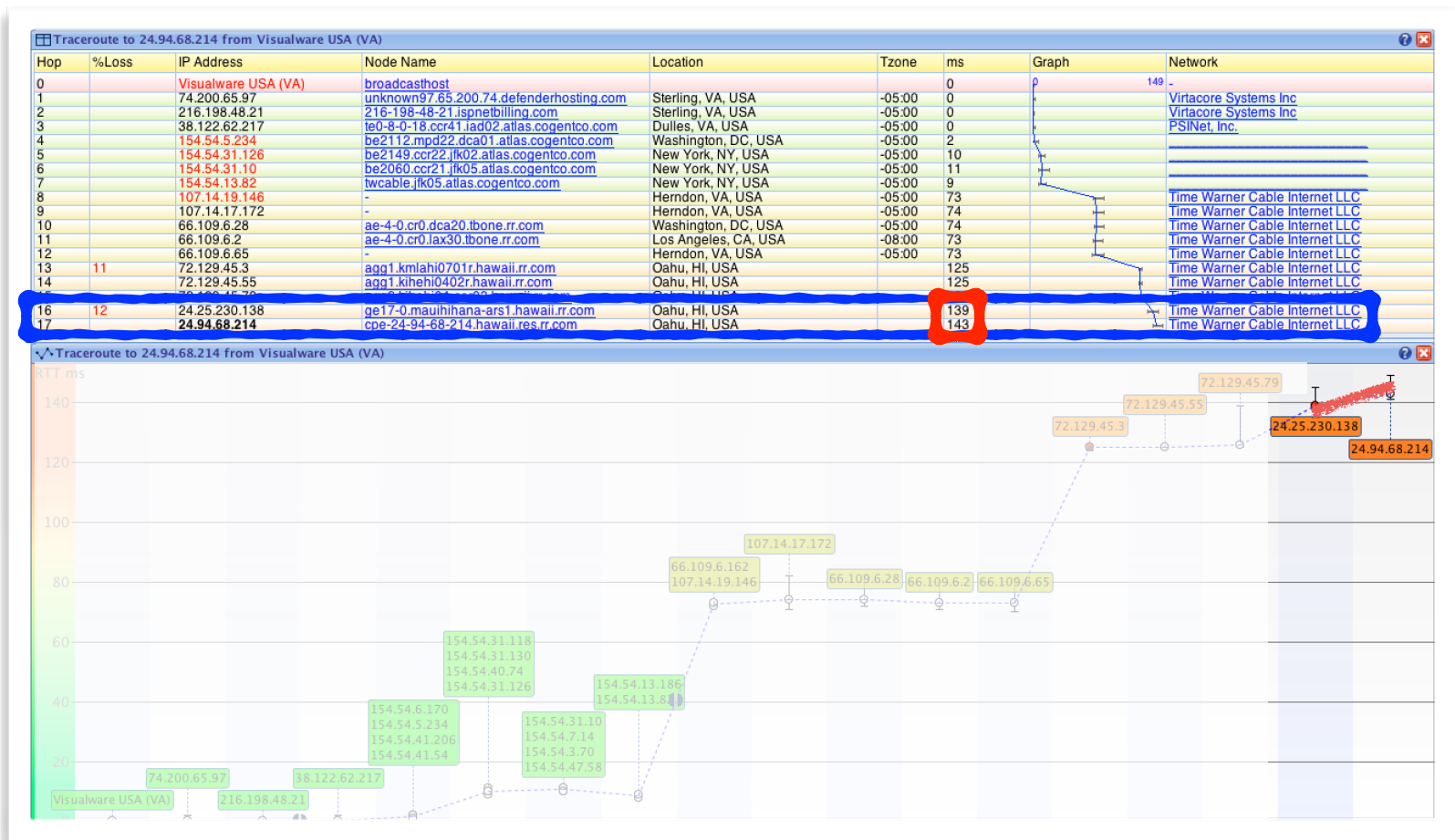
52ms Pacific transit in fiber



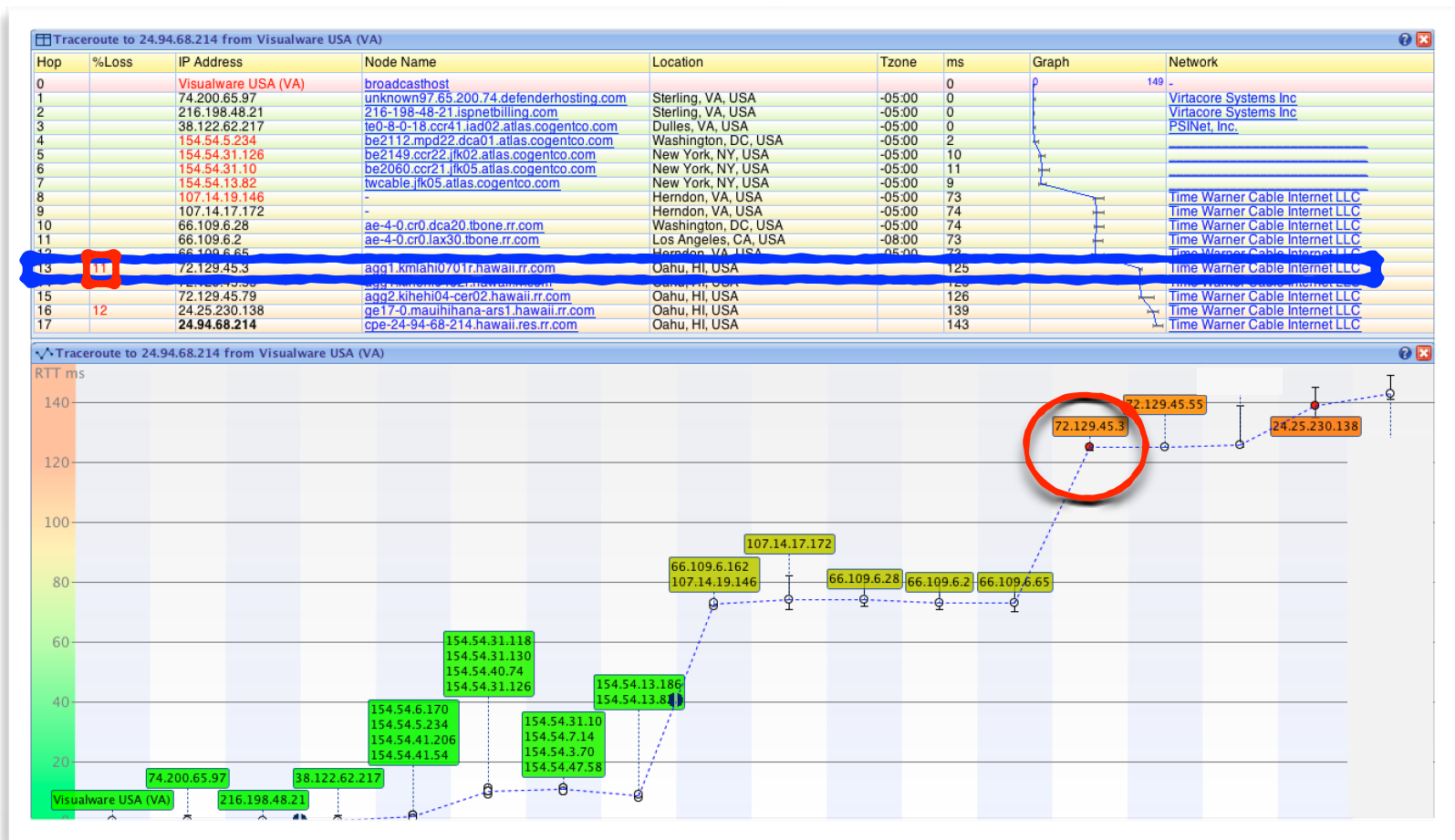
14ms to transit 10 miles on Oahu?!



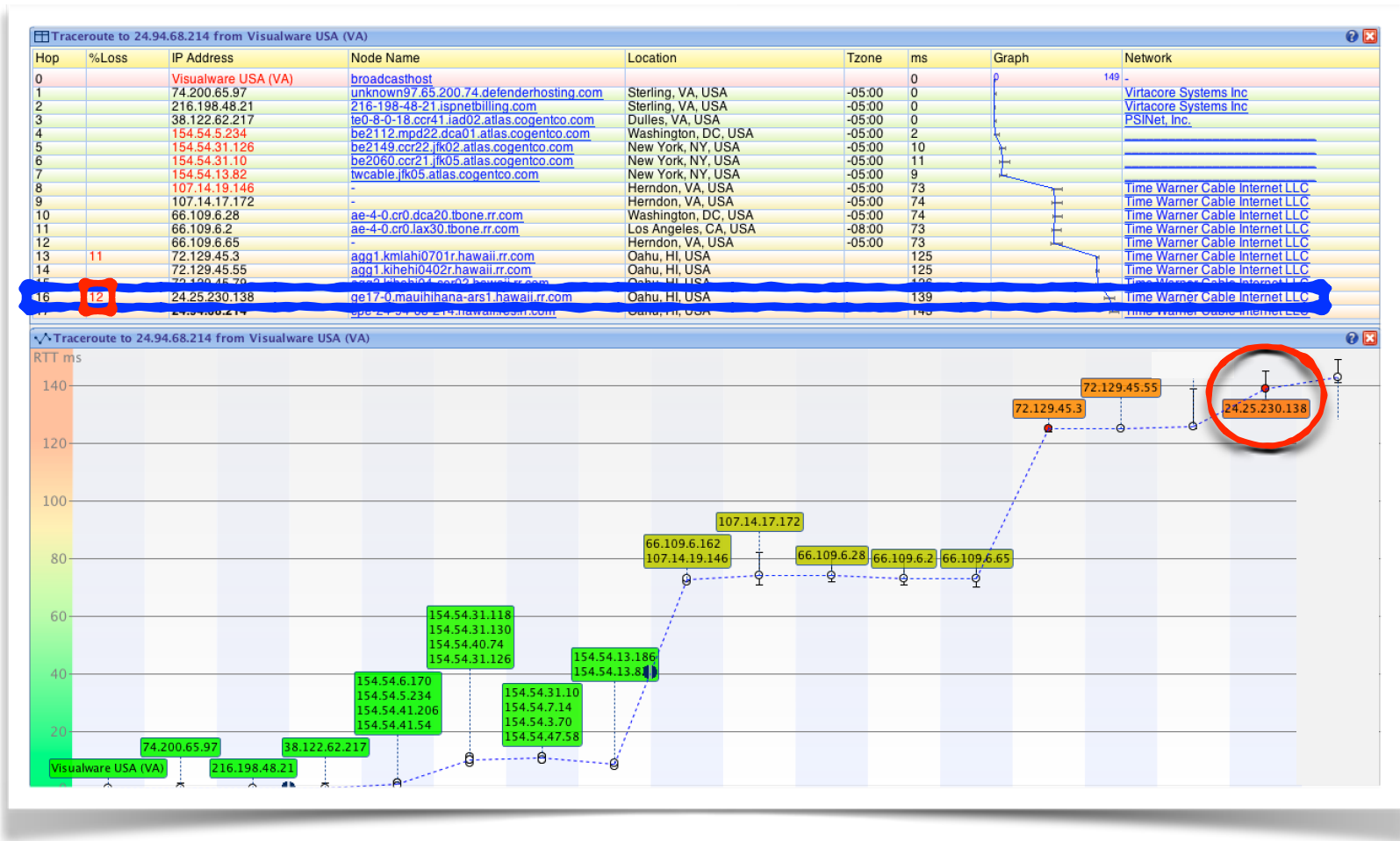
4ms from Oahu to Hana is nominal



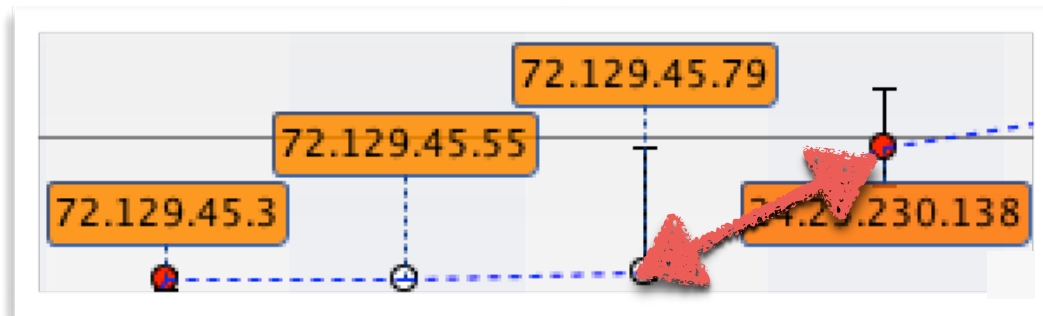
11% packet loss in Oahu



12% packet loss in Oahu before transit to Hana

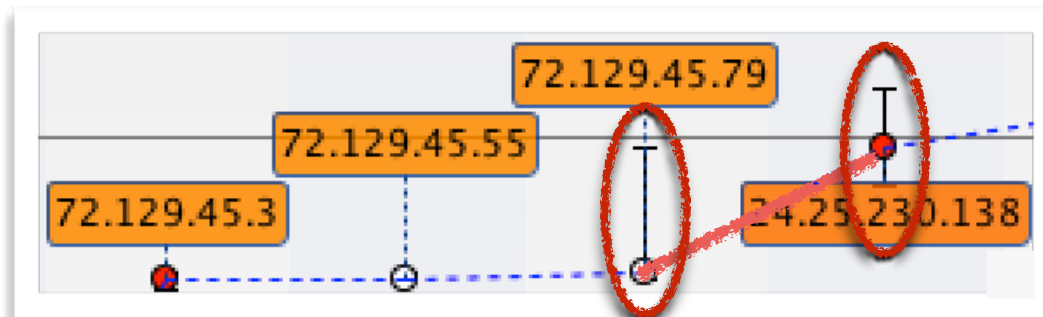


TWC transit in Oahu



- 52ms is round-trip transit in 4,000 miles of Pacific fiber
- 14ms is 1,000 miles travelled by light or microwave
- 14ms is required by TWC to move broadband packets less than 100 miles

TWC Congestion on Oahu



Red circles also highlight error bars in traceroute path, indicating network congestion

VisualRoute Summary

- TWC managed broadband network transit of 10 miles in Oahu is one order of magnitude slower than trans-Pacific route covering thousands of miles
- TWC's network device (ge17-0.mauiHiHana-ars1.hawaii.rr.com 24.25.230.138) drops or delays packets, directly contributing to network congestion for an unreliable and unpredictable broadband experience

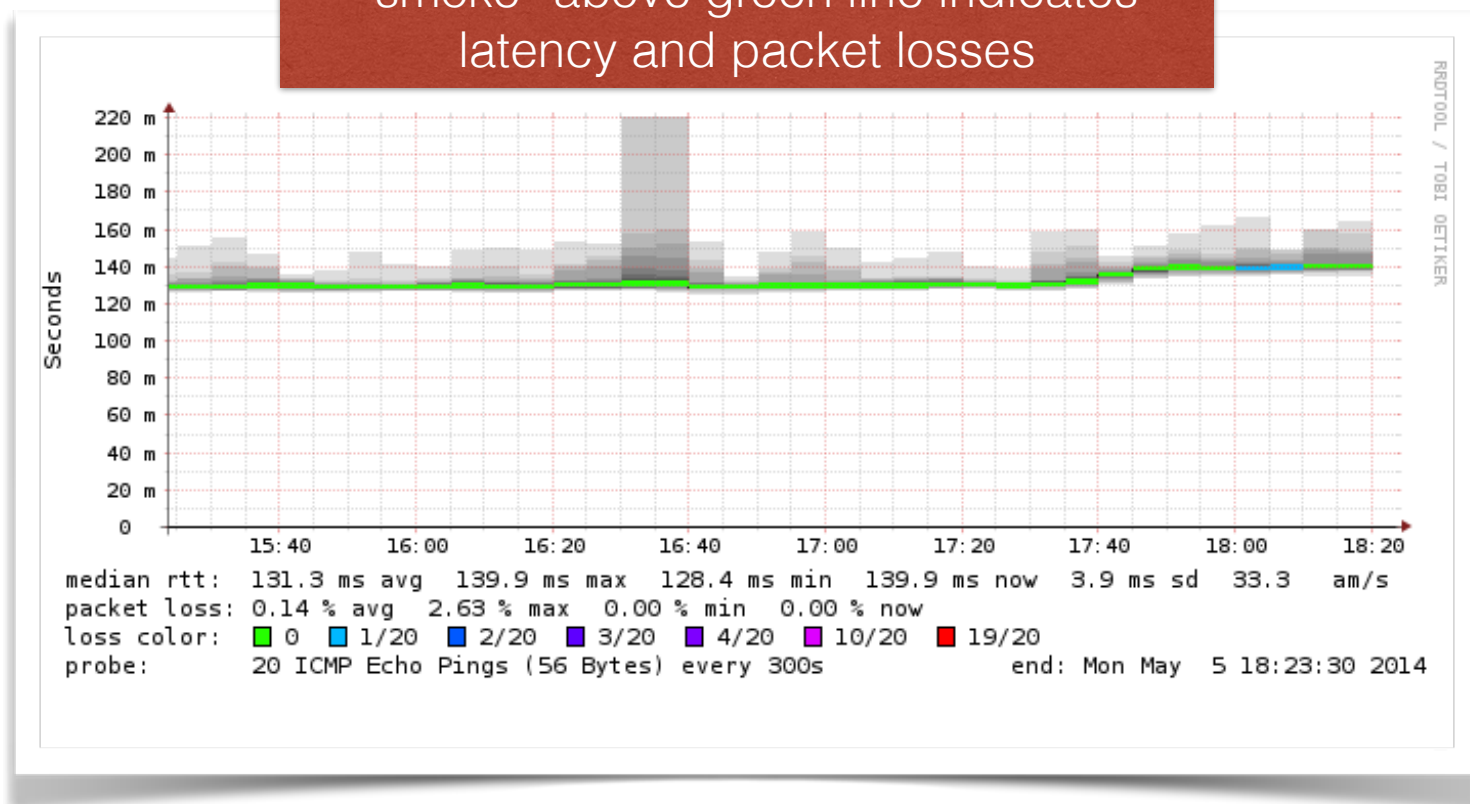
SmokePing measurement

What is “SmokePing”

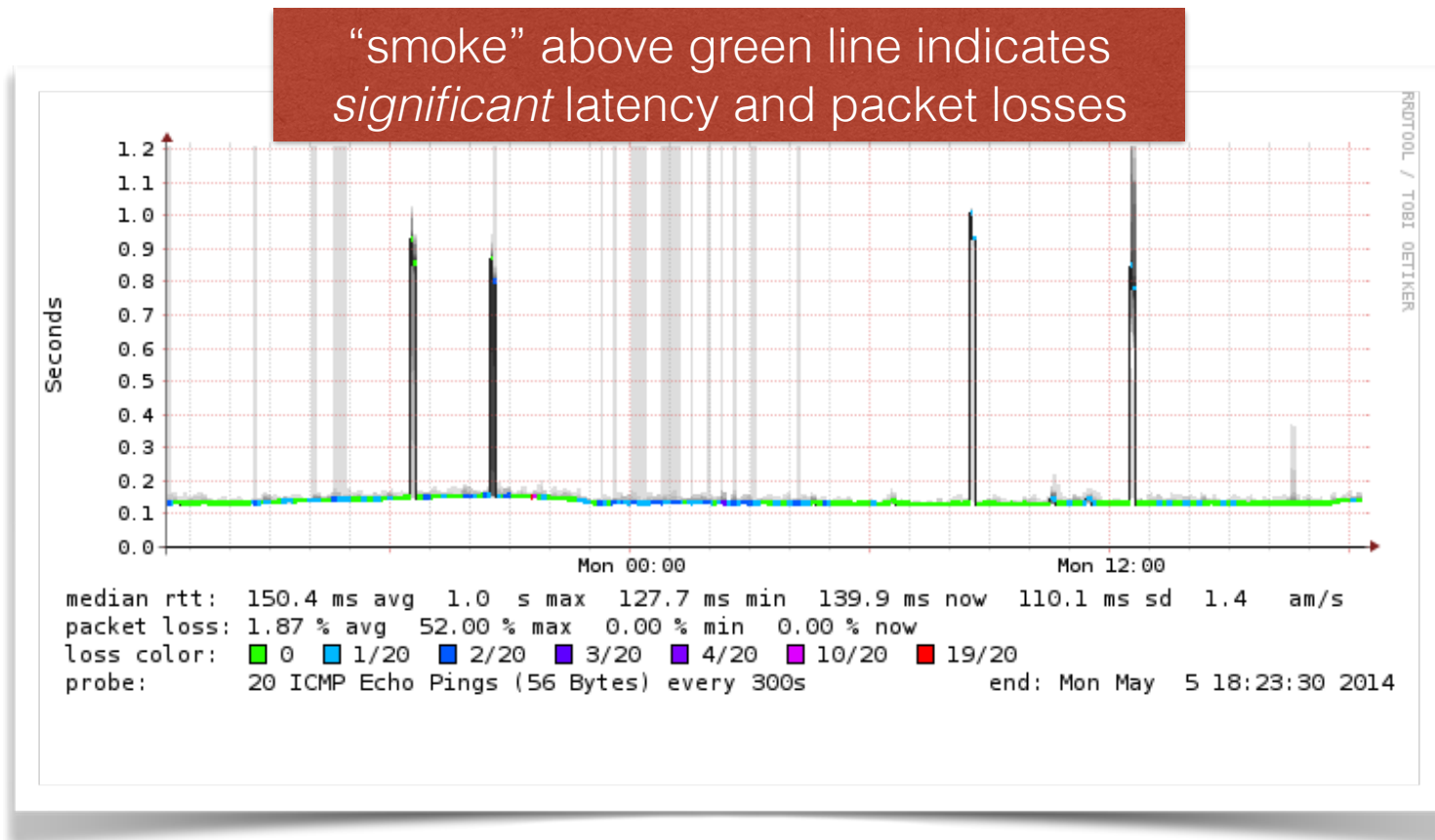
- “smoke” indicates packet loss and latency
- 20 automated ICMP tests every 300 seconds each day
- Source : <http://oss.oetiker.ch/smokeping/>

Last 3 Hours to Hana

“smoke” above green line indicates
latency and packet losses

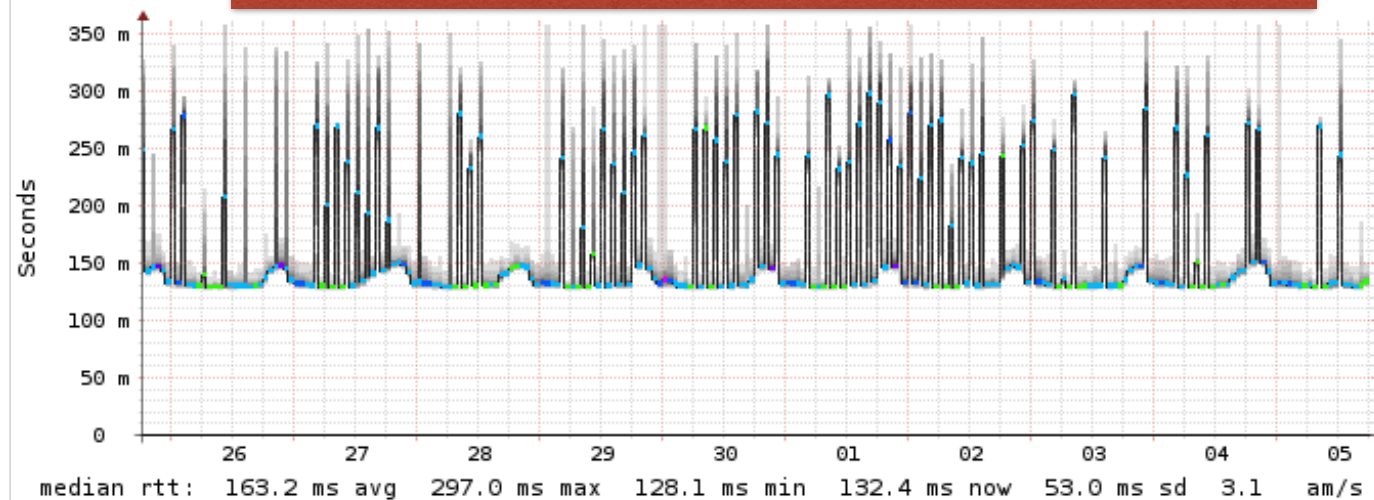


Last 30 Hours to Hana



Last 10 Days to Hana

“smoke” above green line indicates *frequent* and *sustained* latency and packet losses



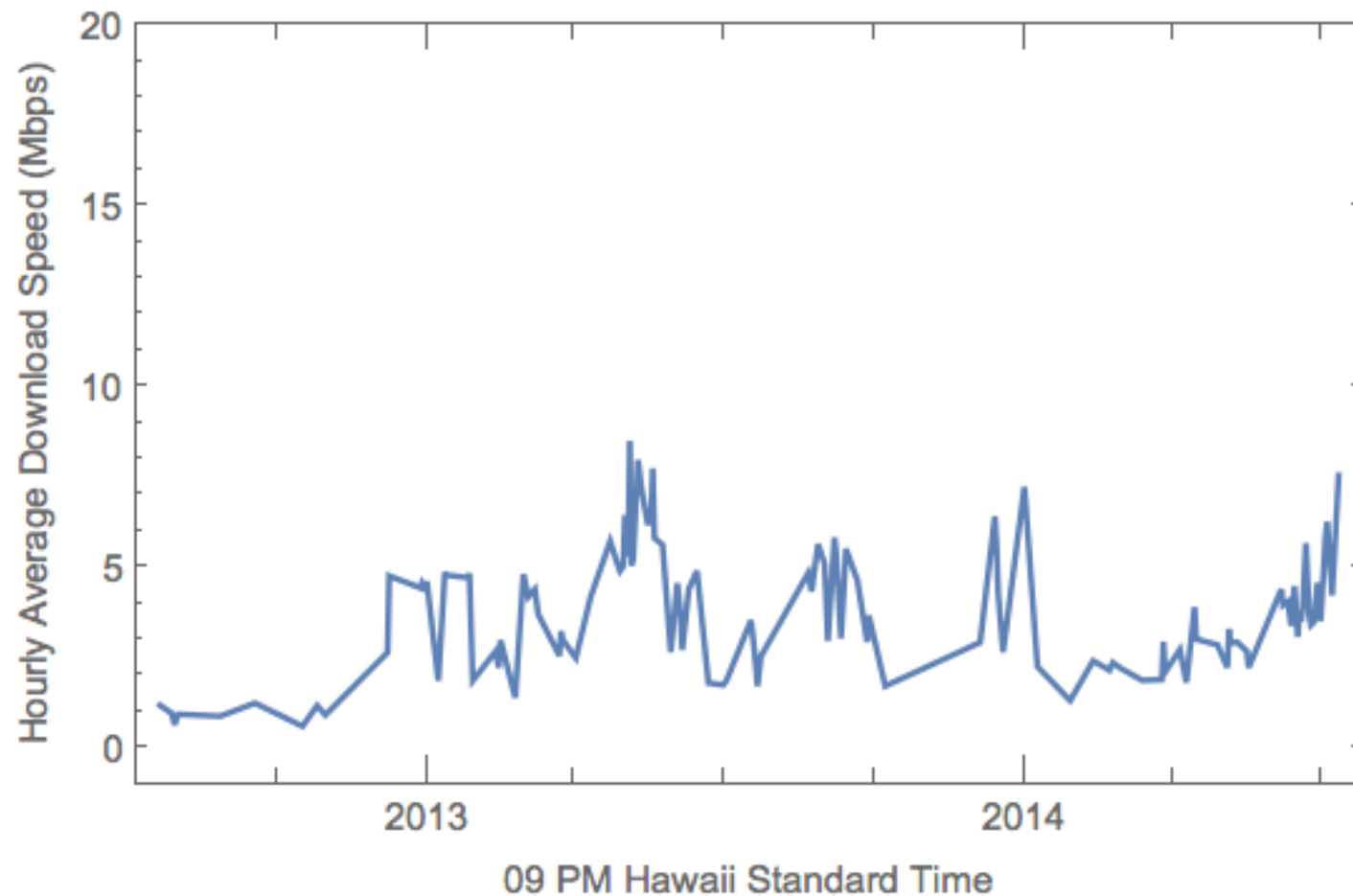
bin/smokeping.cgi?target=Testing.Hawaii

SmokePing Summary

Sustained packet loss and latency is evident for
broadband connections to and from Hana

SamKnows.com measurement

Hourly Average



atlas.ripe.net
measurements

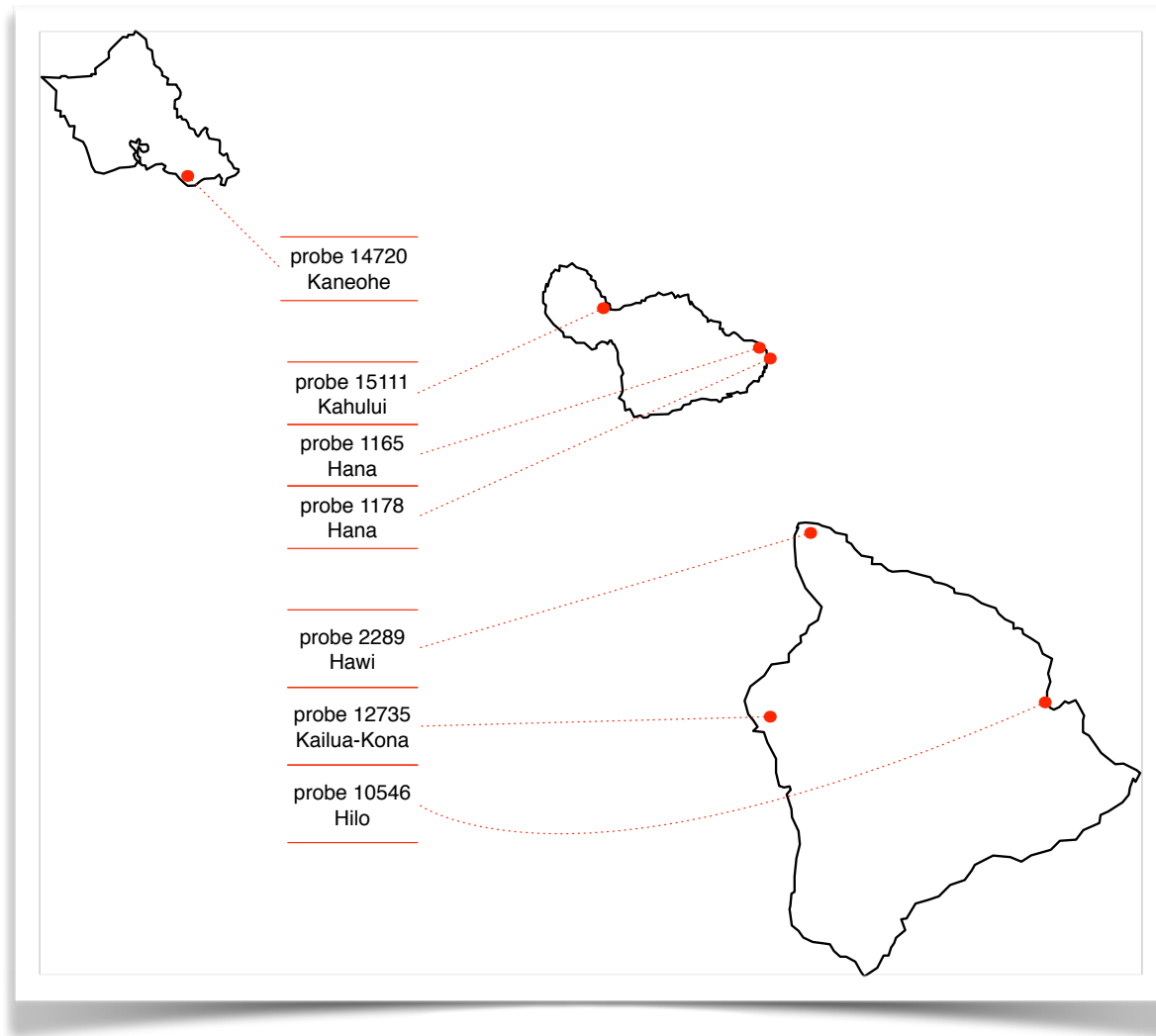
What is an “atlas” probe?

- Dedicated hardware devices for the purpose of measuring network performance and operations worldwide
- 3 automated ICMP ping tests every 240 seconds every day
- Source : <http://atlas.ripe.net>

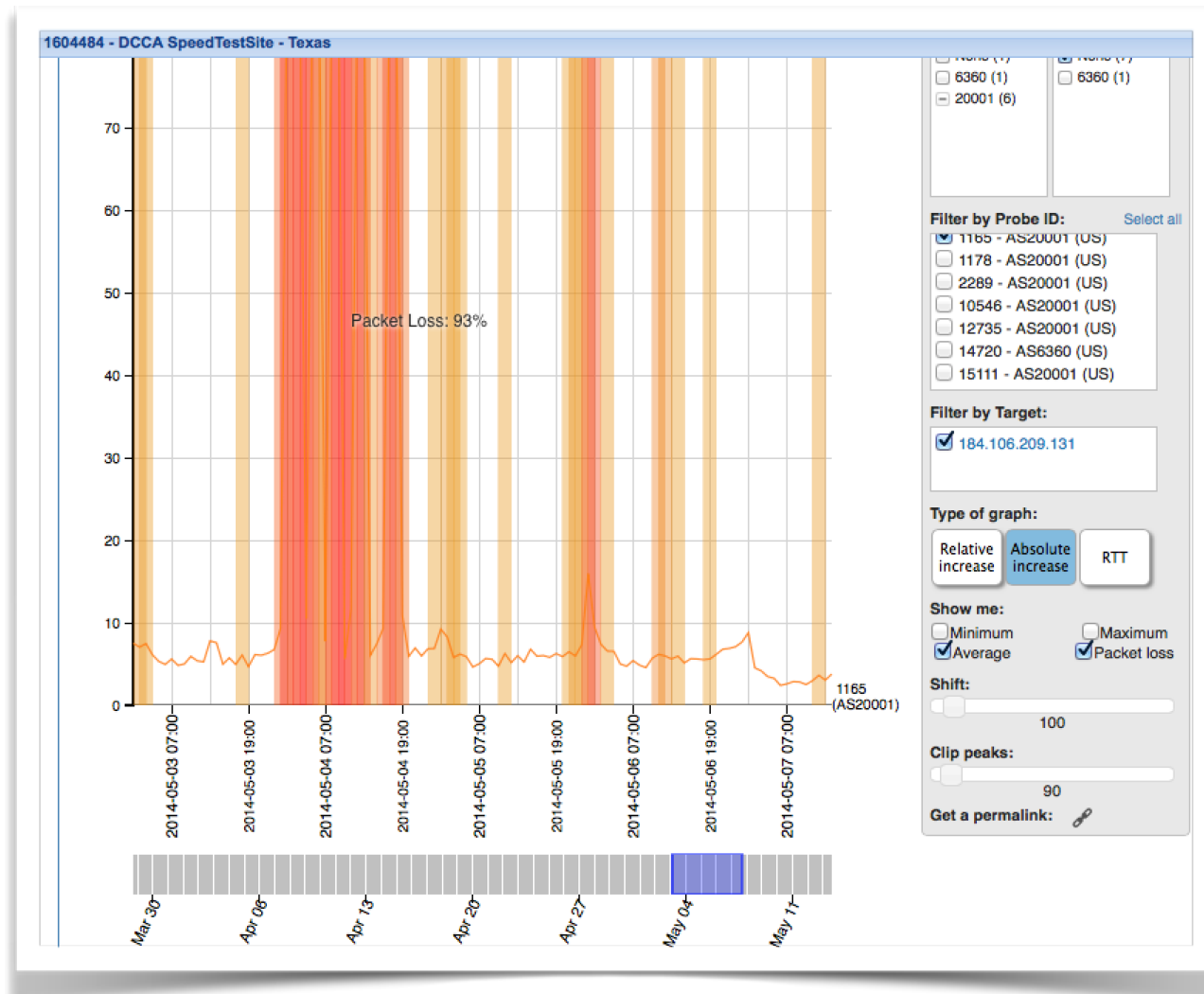
world wide deployment



... including 5 probes in Hawaii

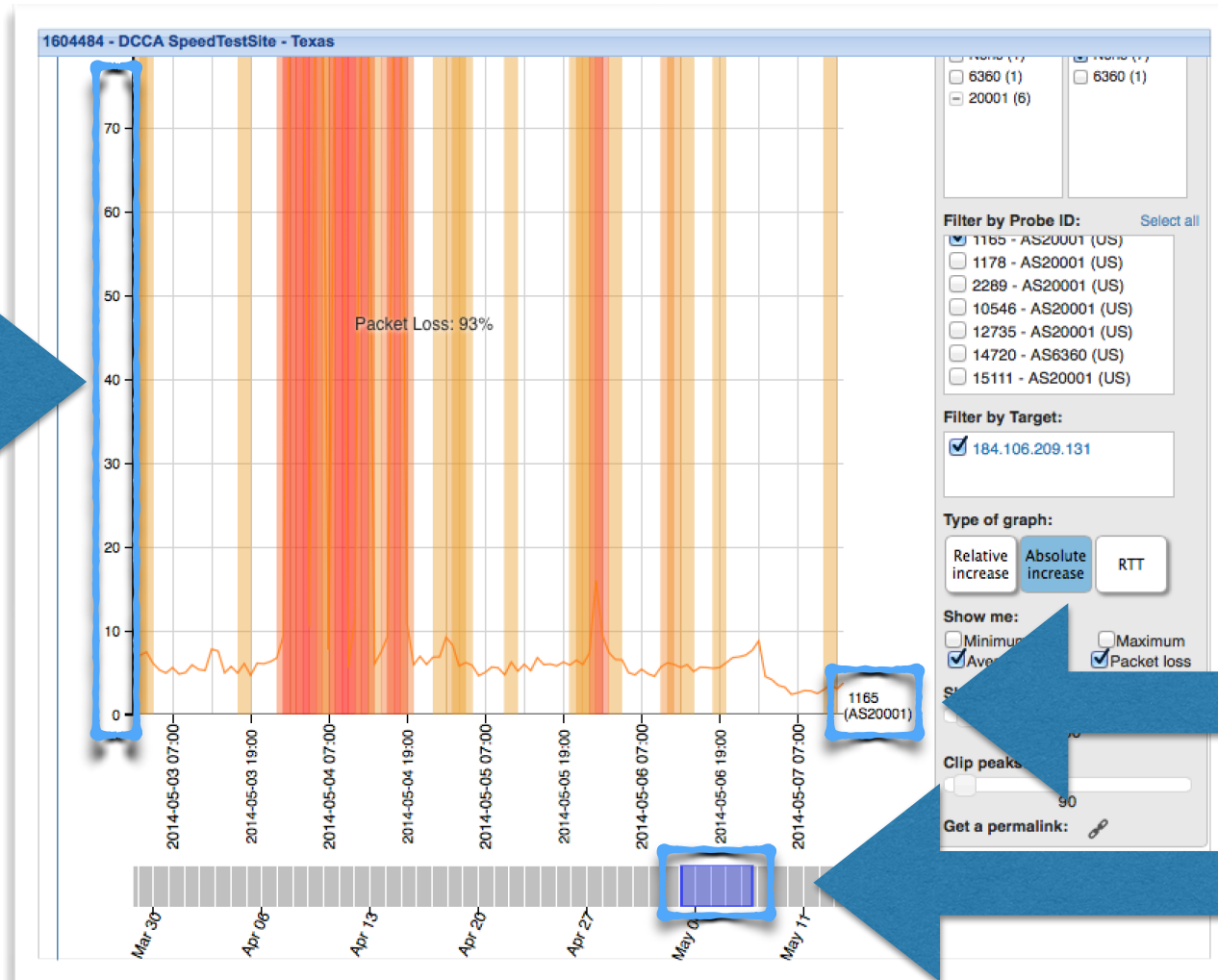
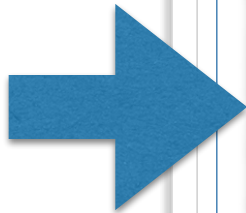


What is an atlas Seismograph?



RTT, Probe ID and Timeline

RTT
value
(in milliseconds)



Hana probe
1165

timeline

Packet Loss Bar Graphs

Light Orange

1 of 3 tests failed

Dark Orange

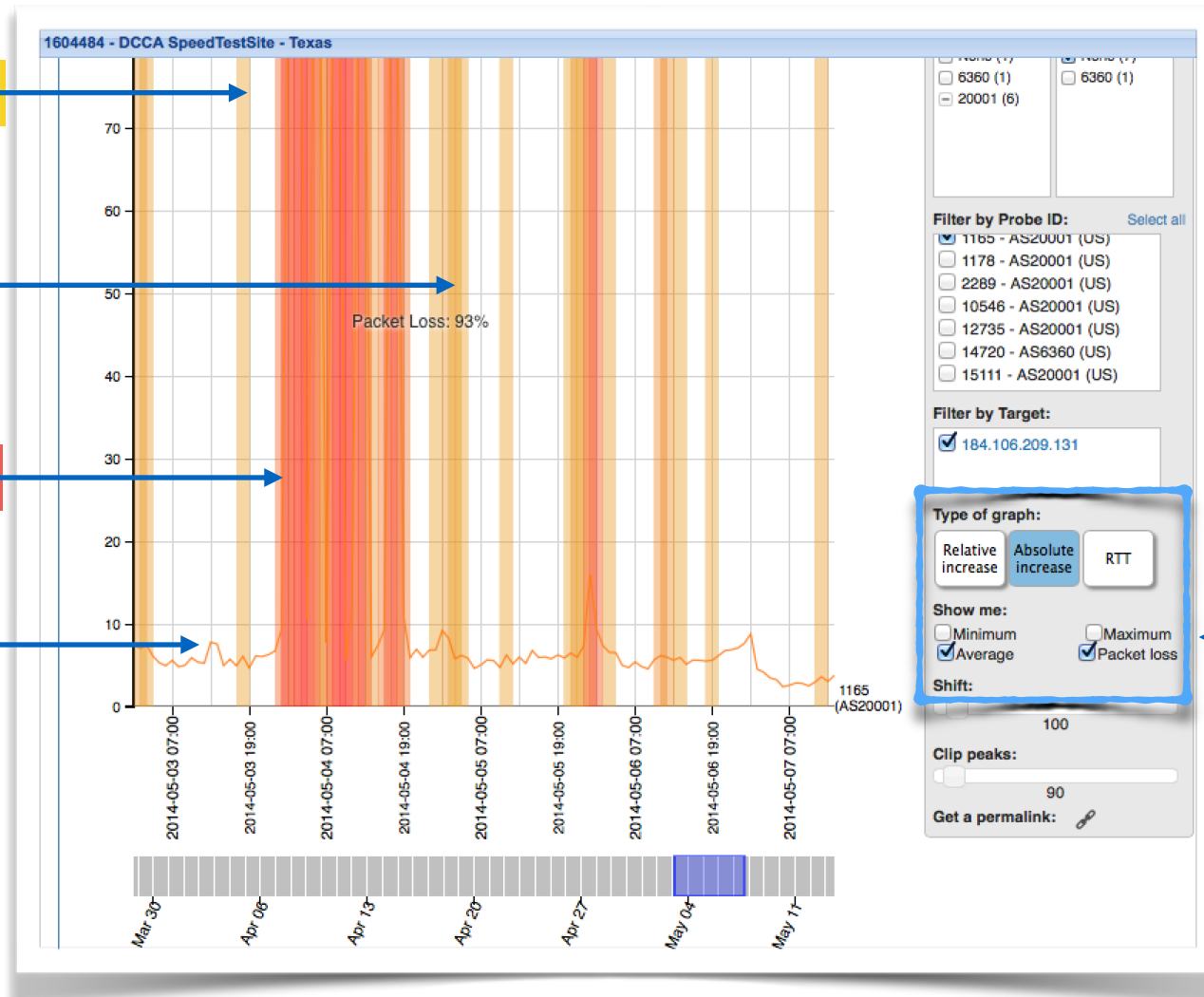
2 of 3 tests failed

Red

3 of 3 tests failed

Line

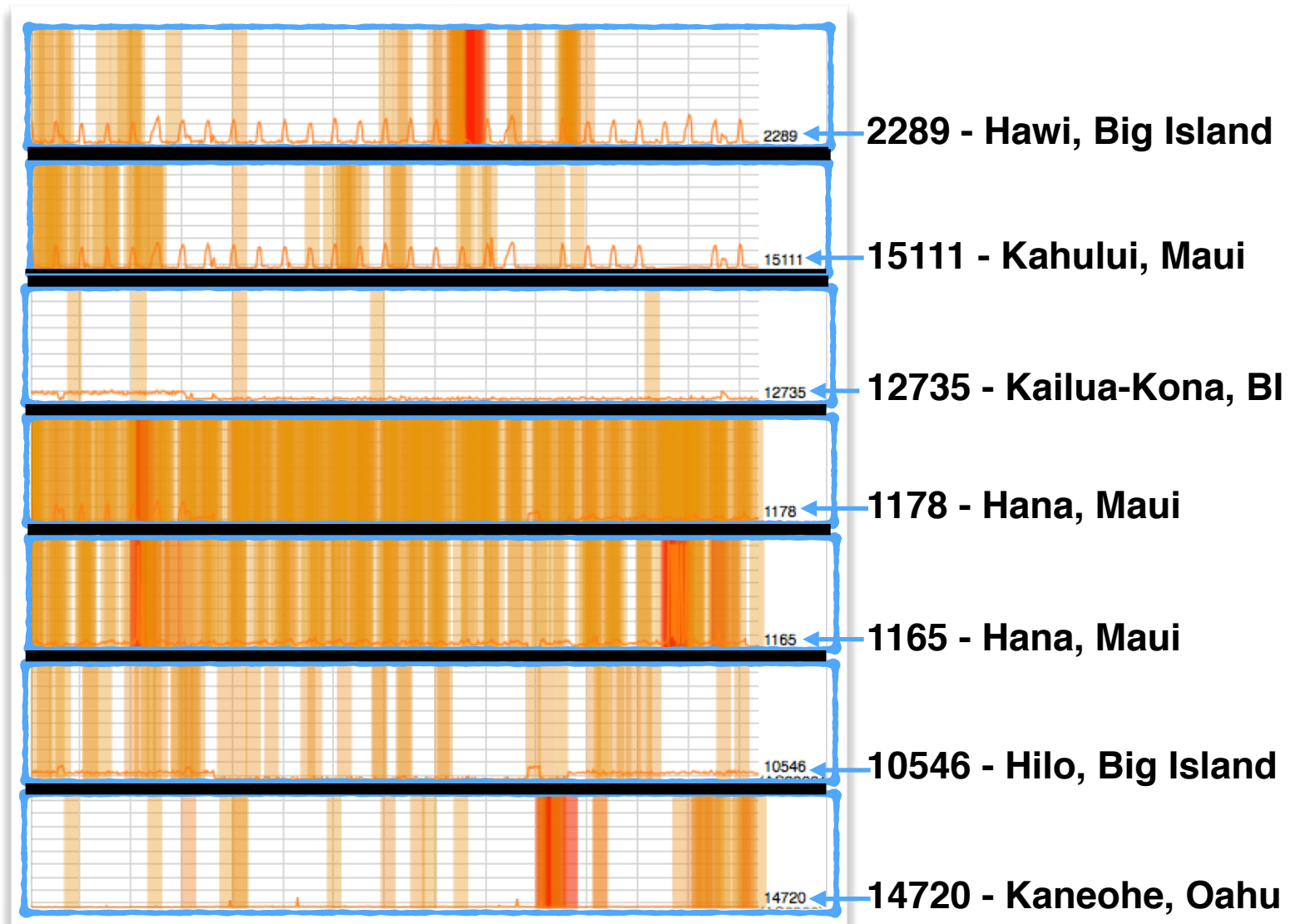
Average increase
(in ms) from the
lowest RTT value
observed.



Type of graph

Average increase
from the lowest RTT
value observed and
display packet loss

Stacked Seismograph



GOOD, MIDDLING and BAD

MIDDLING : periodic line bumps and bars

MIDDLING : periodic line bumps and bars

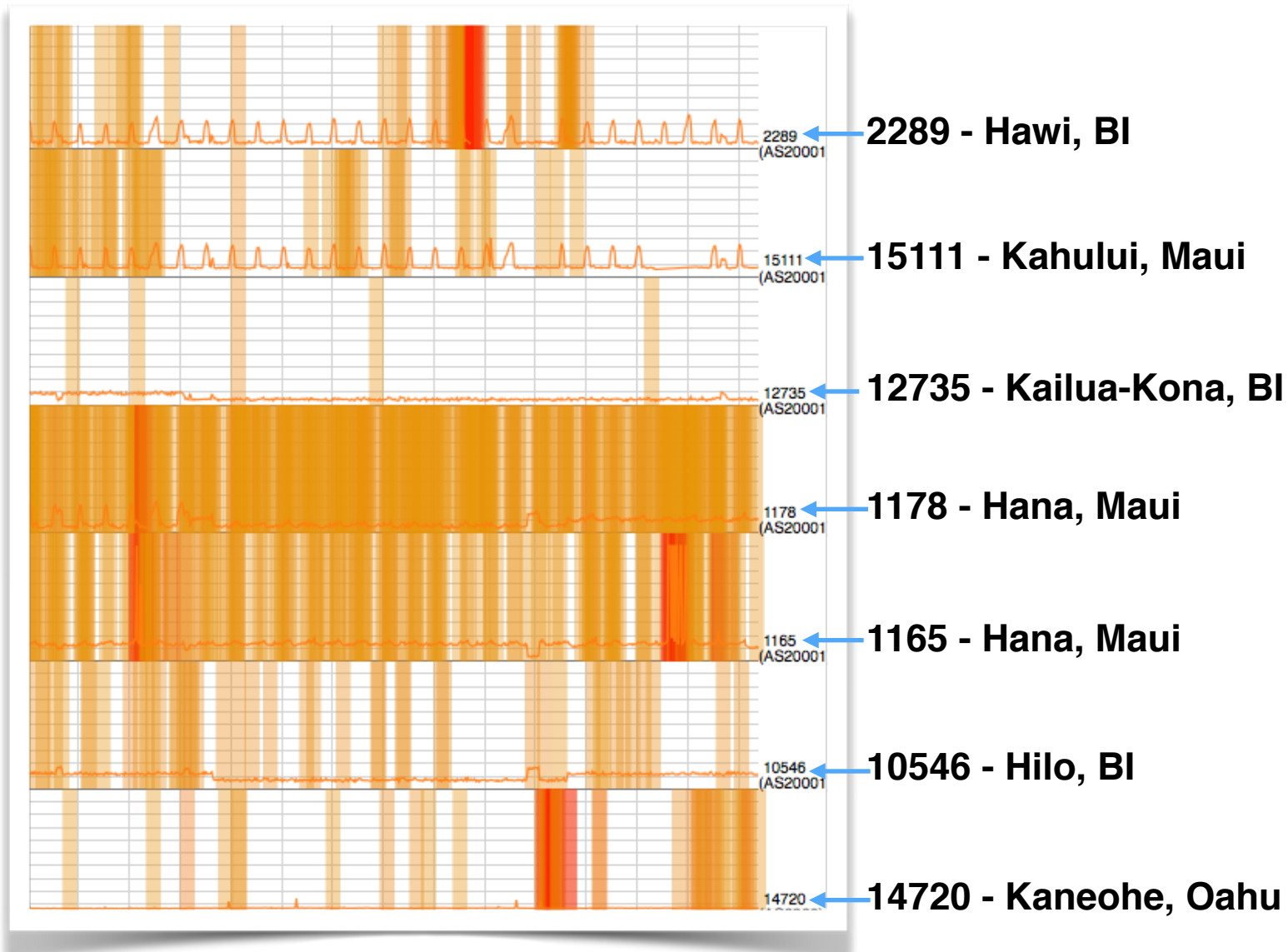
GOOD : low flat line, few bars

BAD : frequent line bumps; all bars

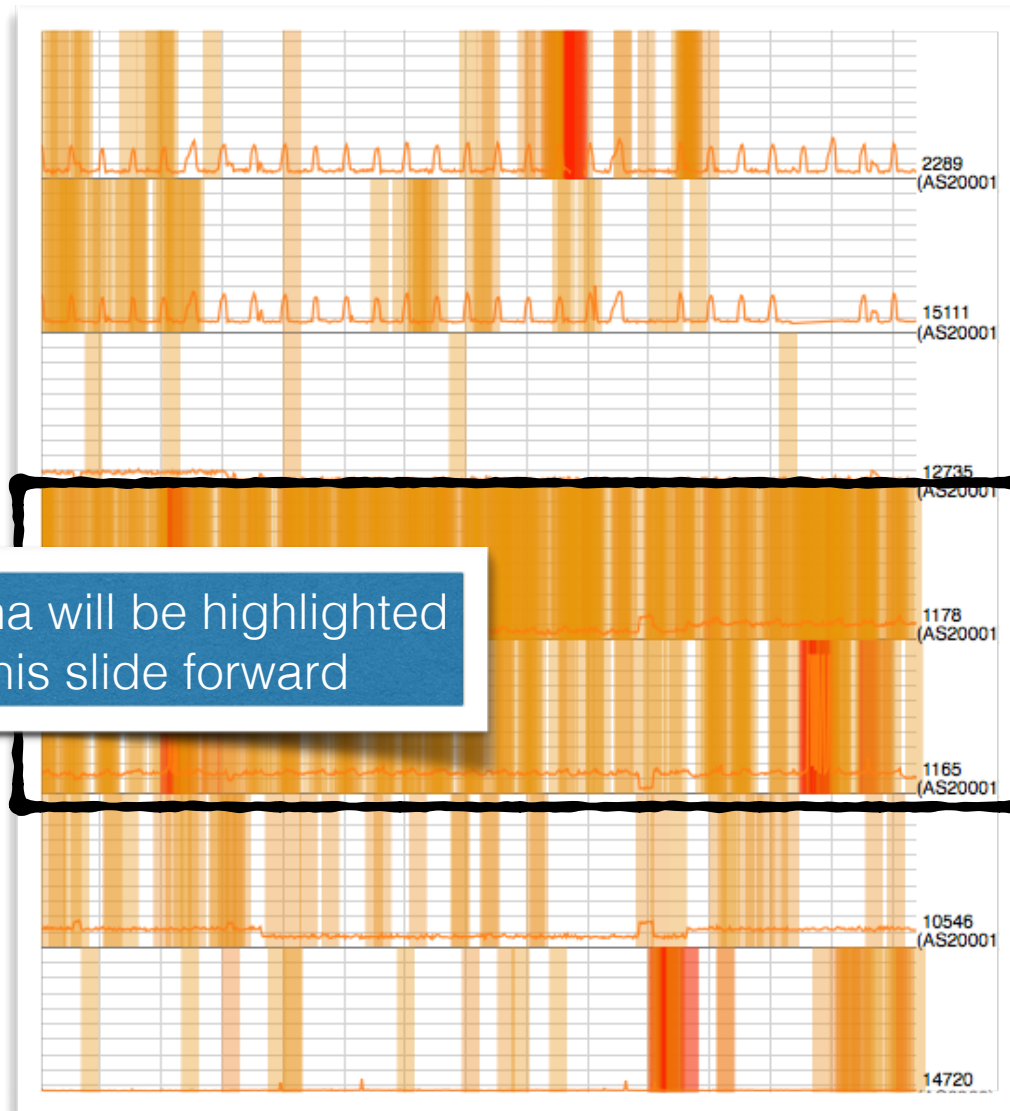
BAD : frequent line bumps; mostly bars

BAD : more line bumps and bars

MIDDLING : line is perfect; bar clusters not so good



One more note...

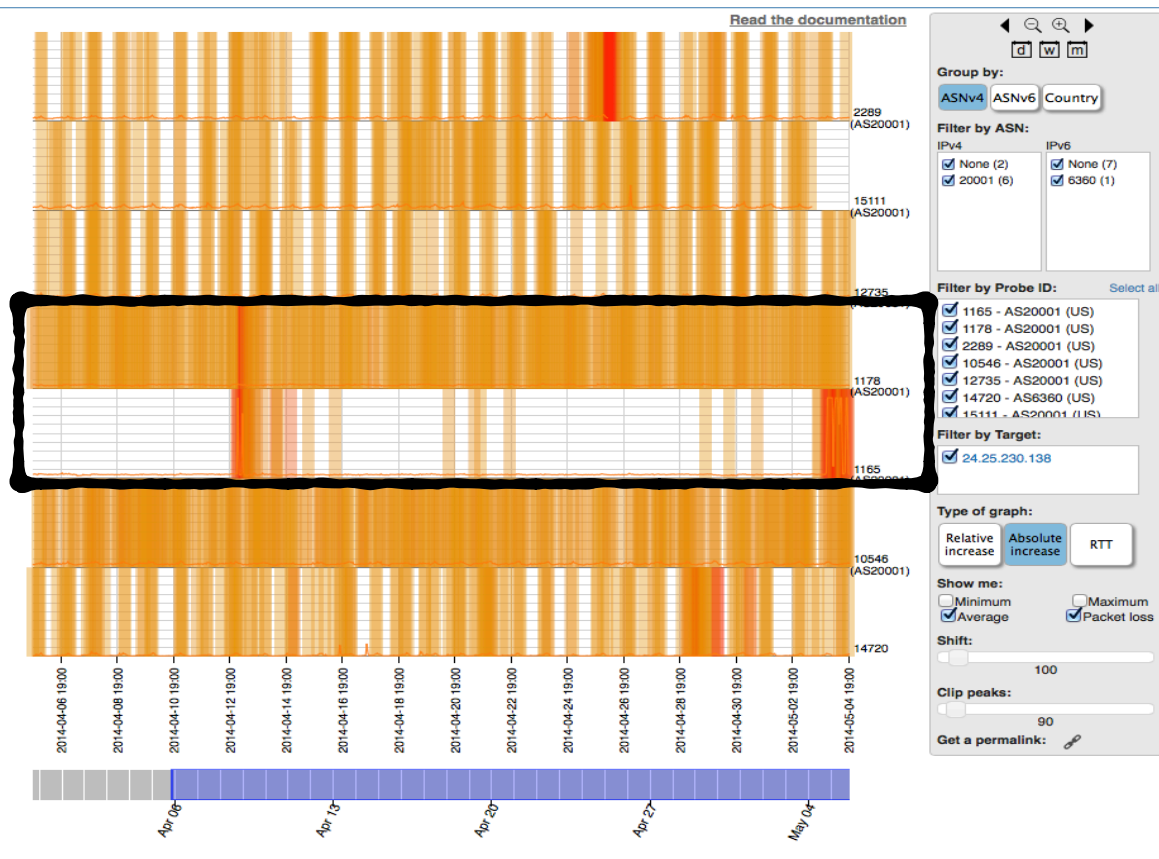
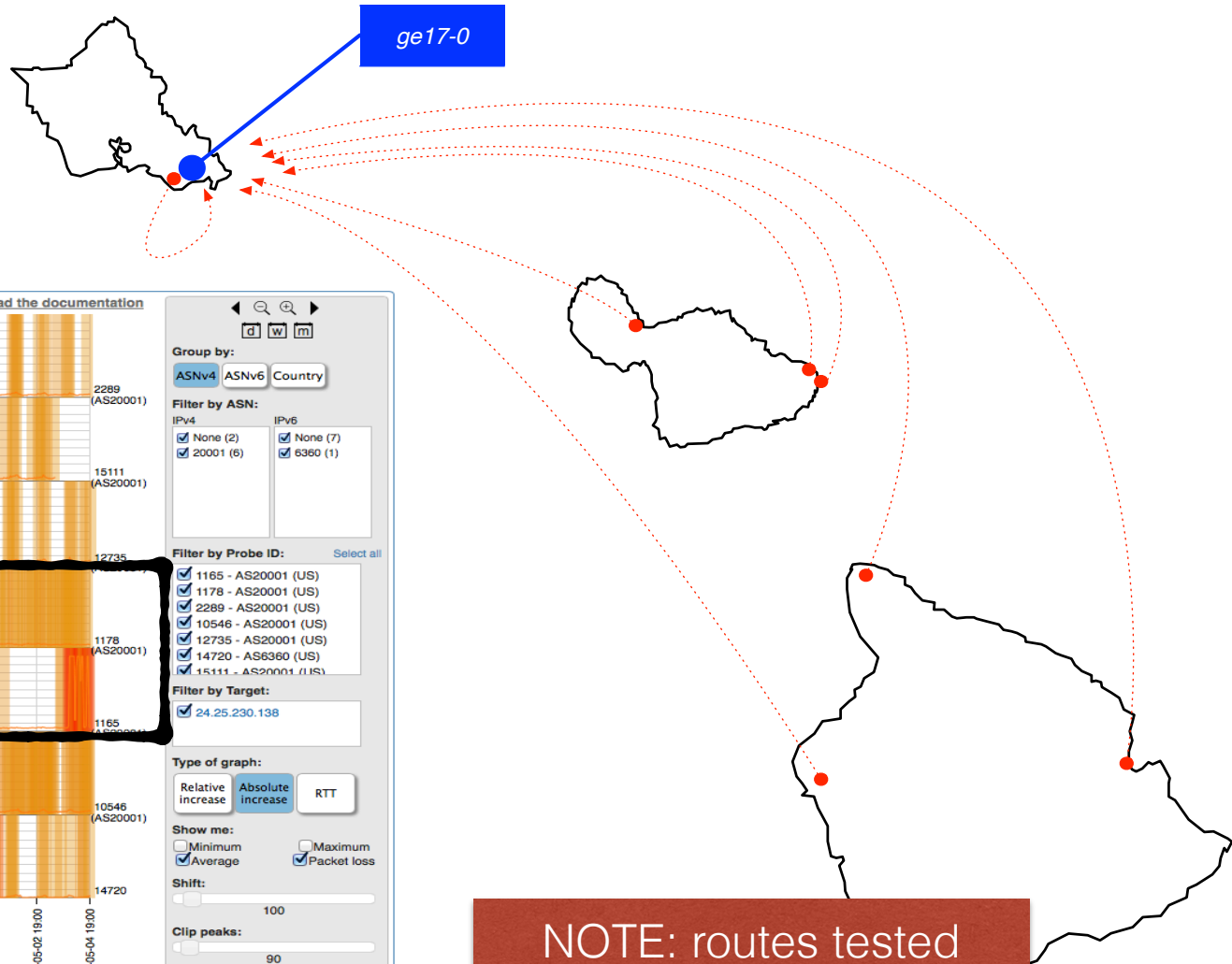


atlas probes in Hana will be highlighted
in black from this slide forward

atlas measurements
exclusively within
TWC managed network segments

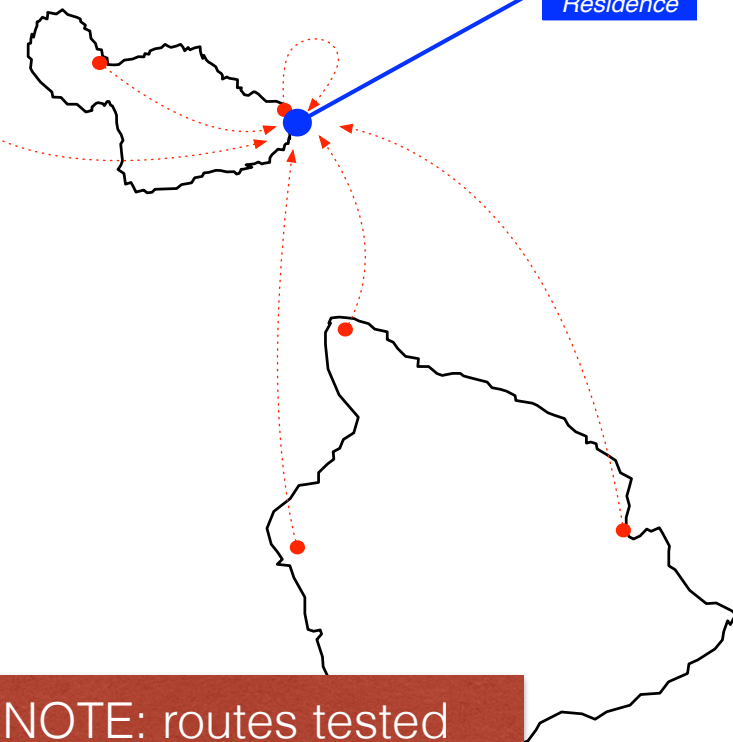
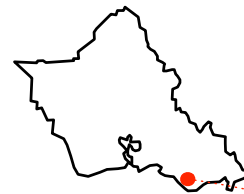
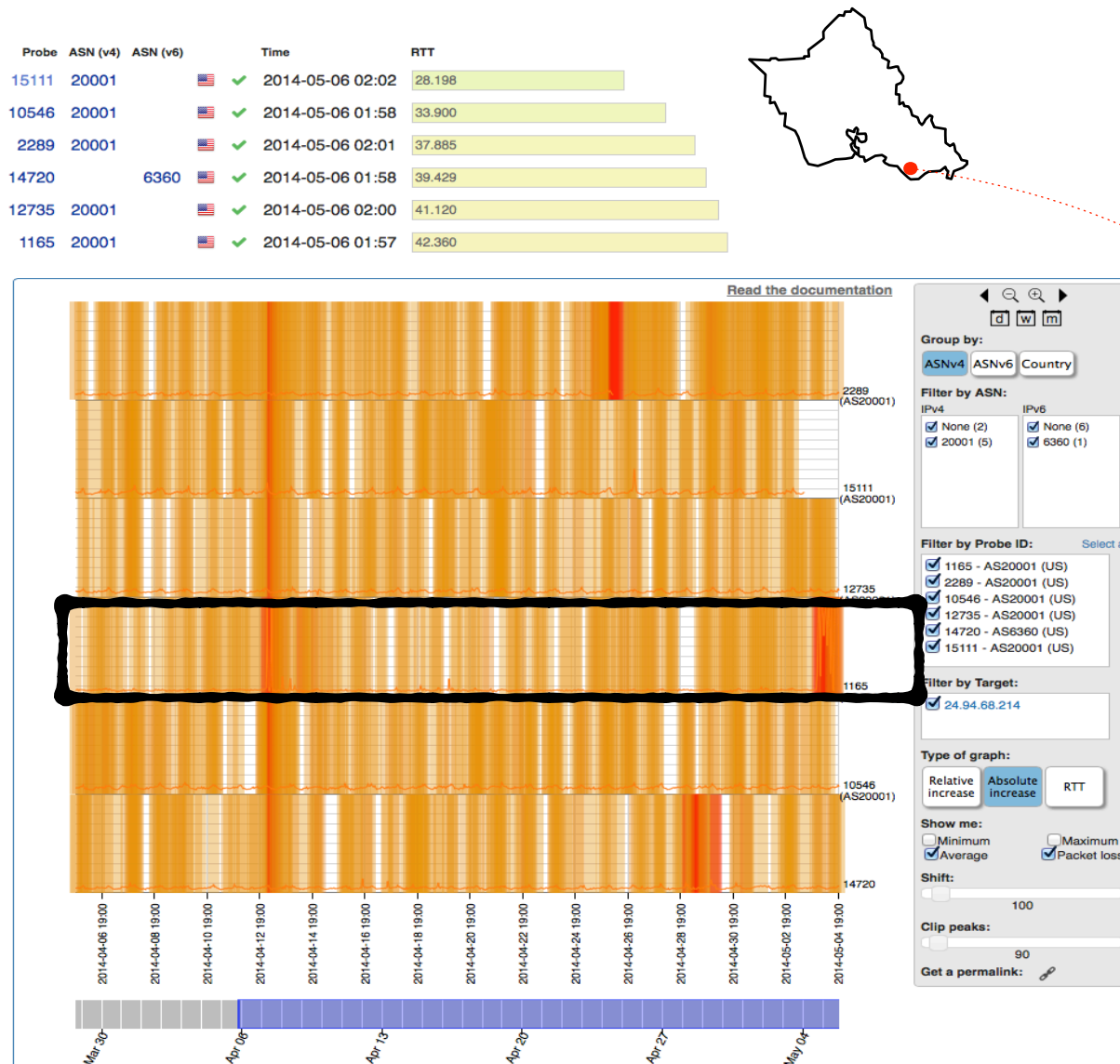
**“Ping ge17-0.mauiHiHana-ars1.hawaii.rr.com”
(12 ms is fastest; 22 ms is slowest)**

Probe	ASN (v4)	ASN (v6)		Time	RTT	Hops
1165	20001			✓ 2014-03-30 22:30	11.673	2
1178	20001			✓ 2014-03-30 22:31	11.797	1
2289	20001			✓ 2014-03-30 22:30	22.501	7
10546	20001			✓ 2014-03-30 22:30	23.255	8
12735	20001			✓ 2014-03-30 22:32	17.605	7
14720		6360		✓ 2014-03-30 22:30	8.489	9
15111	20001			✓ 2014-03-30 22:33	18.172	6



NOTE: routes tested
never leave TWC
managed networks

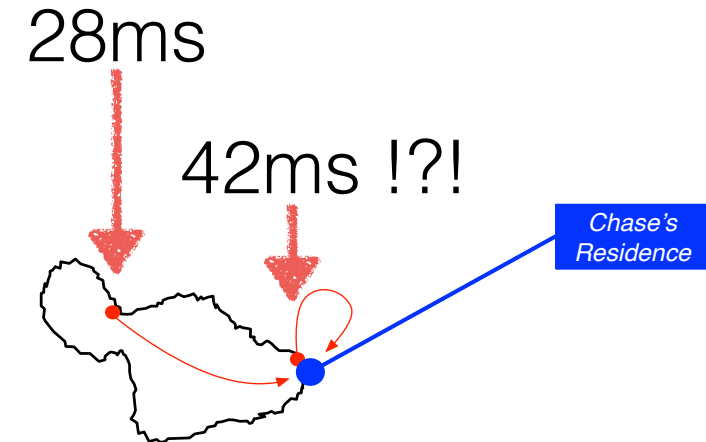
“Ping Chase’s House” (28 ms is fastest; 42 ms is slowest)



NOTE: routes tested
never leave TWC
managed networks

“Ping Chase’s House” (28 ms is fastest; 42 ms is slowest)

Probe	ASN (v4)	ASN (v6)	Time	RTT
15111	20001		2014-05-06 02:02	28.198
10546	20001		2014-05-06 01:58	33.900
2289	20001		2014-05-06 02:01	37.885
14720		6360	2014-05-06 01:58	39.429
12735	20001		2014-05-06 02:00	41.120
1165	20001		2014-05-06 01:57	42.360



- The fastest route is 28ms RTT from Kehei. 28ms is half the time it takes for round trip from Hawaii to the mainland and back again in optical fiber.
- The slowest route is 42ms RTT from an atlas probe 10 miles away — almost enough time to reach the mainland and return using optical fiber
- All tested routes on TWC managed network segments

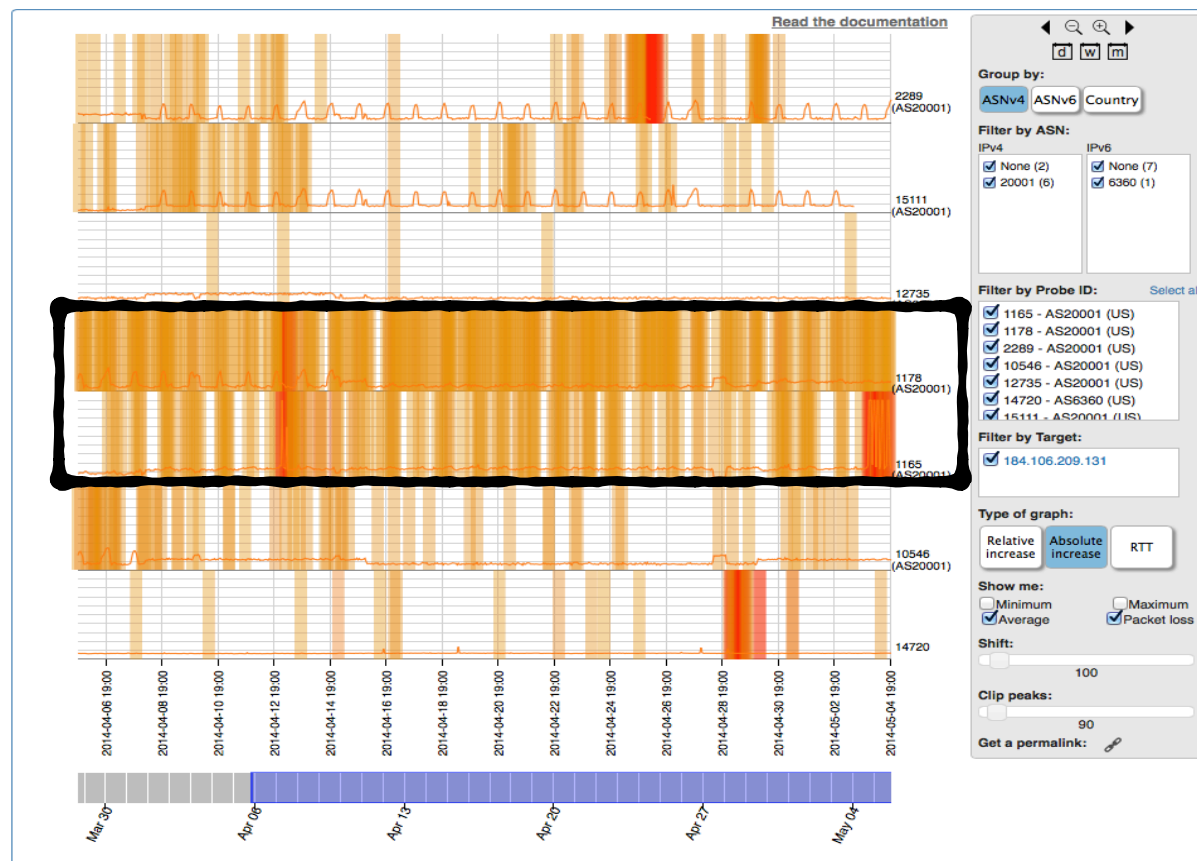
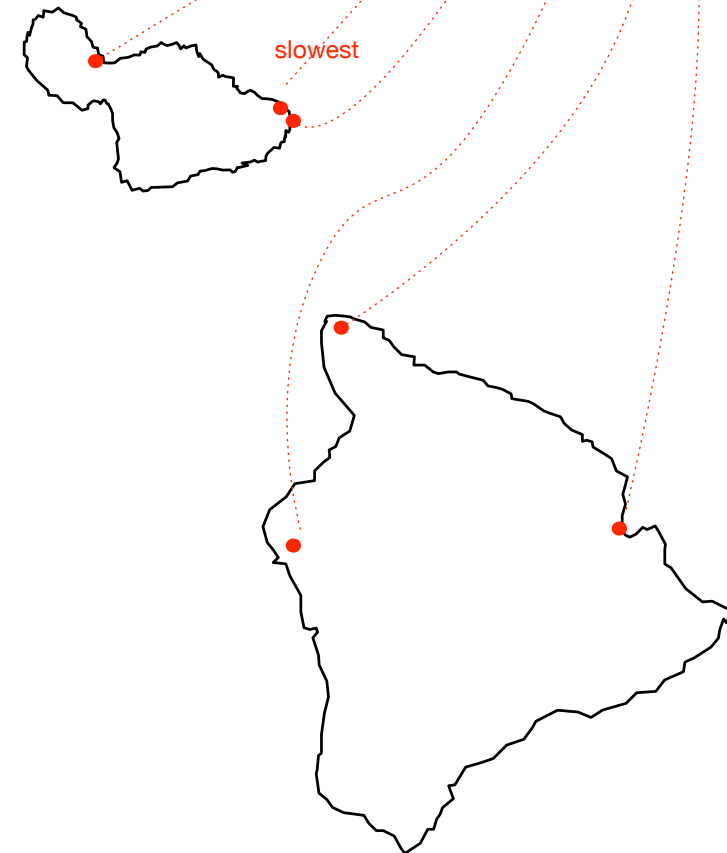
atlas egress measurements
from TWC managed network
segments to the rest of the world

“Ping DCCA SpeedTest site in Texas” (117 ms is fastest; 146 ms is slowest)

Probe	ASN (v4)	ASN (v6)		Time	RTT
14720		6360	✓	2014-05-06 02:02	117.568
12735	20001		✓	2014-05-06 02:00	126.937
10546	20001		✓	2014-05-06 02:02	128.592
1178	20001		✓	2014-05-06 02:01	129.720
2289	20001		✓	2014-05-06 01:58	138.865
15111	20001		✓	2014-05-06 02:04	143.029
1165	20001		✓	2014-05-06 02:01	146.140

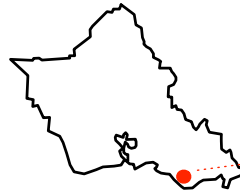


SpeedTest
site in Texas



“Ping Netflix in San Jose” (71 ms is fastest; 102 ms is slowest)

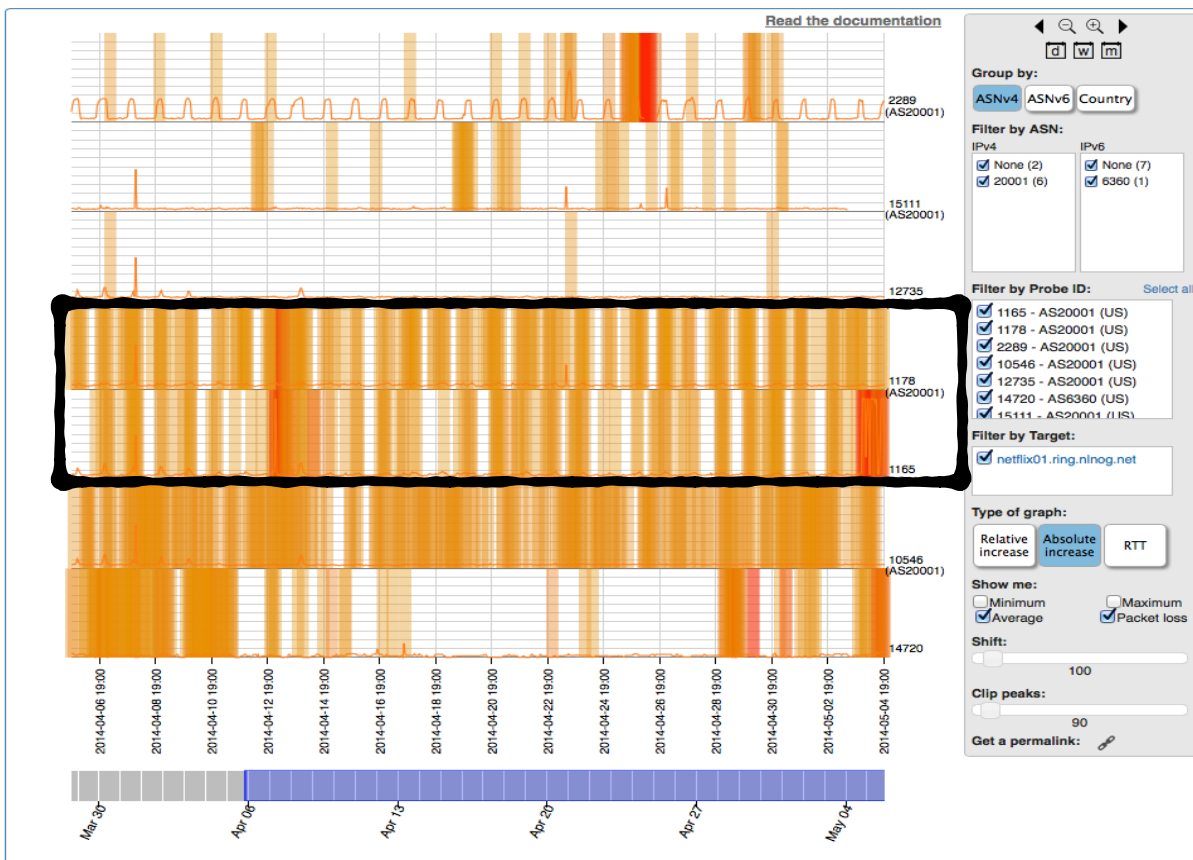
Probe	ASN (v4)	ASN (v6)	Time	RTT
12735	20001		2014-05-06 00:44	72.359
10546	20001		2014-05-06 00:45	75.231
15111	20001		2014-05-06 00:46	75.741
1165	20001		2014-05-06 00:46	78.701
2289	20001		2014-05-06 00:42	79.489
1178	20001		2014-05-06 00:45	79.732
14720	6360		2014-05-06 00:45	102.056



varies from fastest, to slowest

SpeedTest
site in Texas

slowest slowest



network congestion

Network Congestion

WORK IN PROGRESS

Analysis is underway to confirm that Hana's 1st and 2nd Hop network connections to Oahu are network congested in excess of 70% significant portions of time.

Confirming network congestion is typically above 70% would indicate TWC is not following its own policies

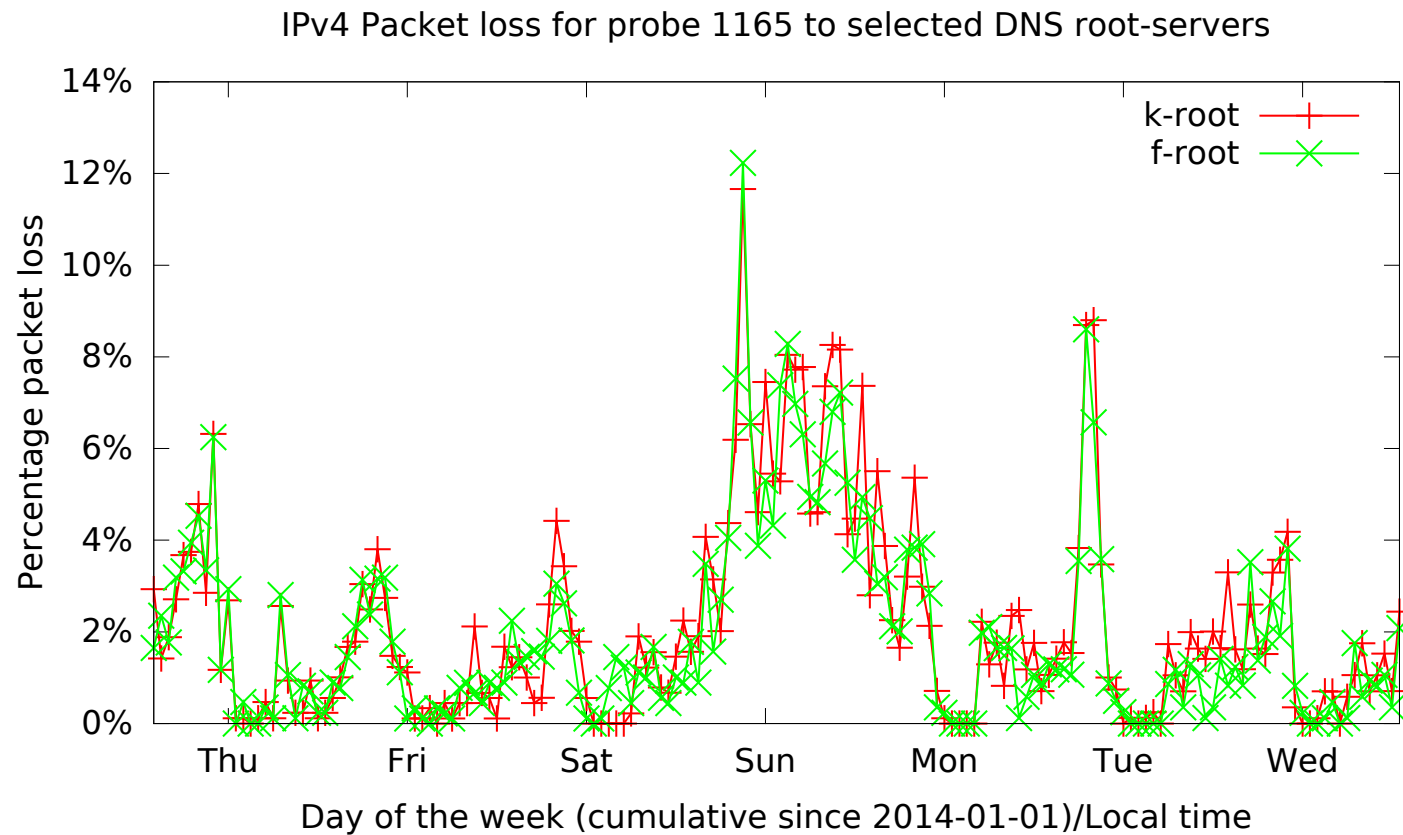
Therefore, the following slides are motivational background material highlighting there is 2 years of network measurement under analysis

Signs of Network Congestion

- Packet drop rates in excess of 1%
- At peak utilization, 95% of network measurements are nearly double the RTT value of low utilization
- End-user experience where display of web-browser, streaming media and other services alternates from fast, slow, or offline over a 10 minute interval

network congestion
(packet loss)

Average packet loss in one week of measurements $> 1\%$



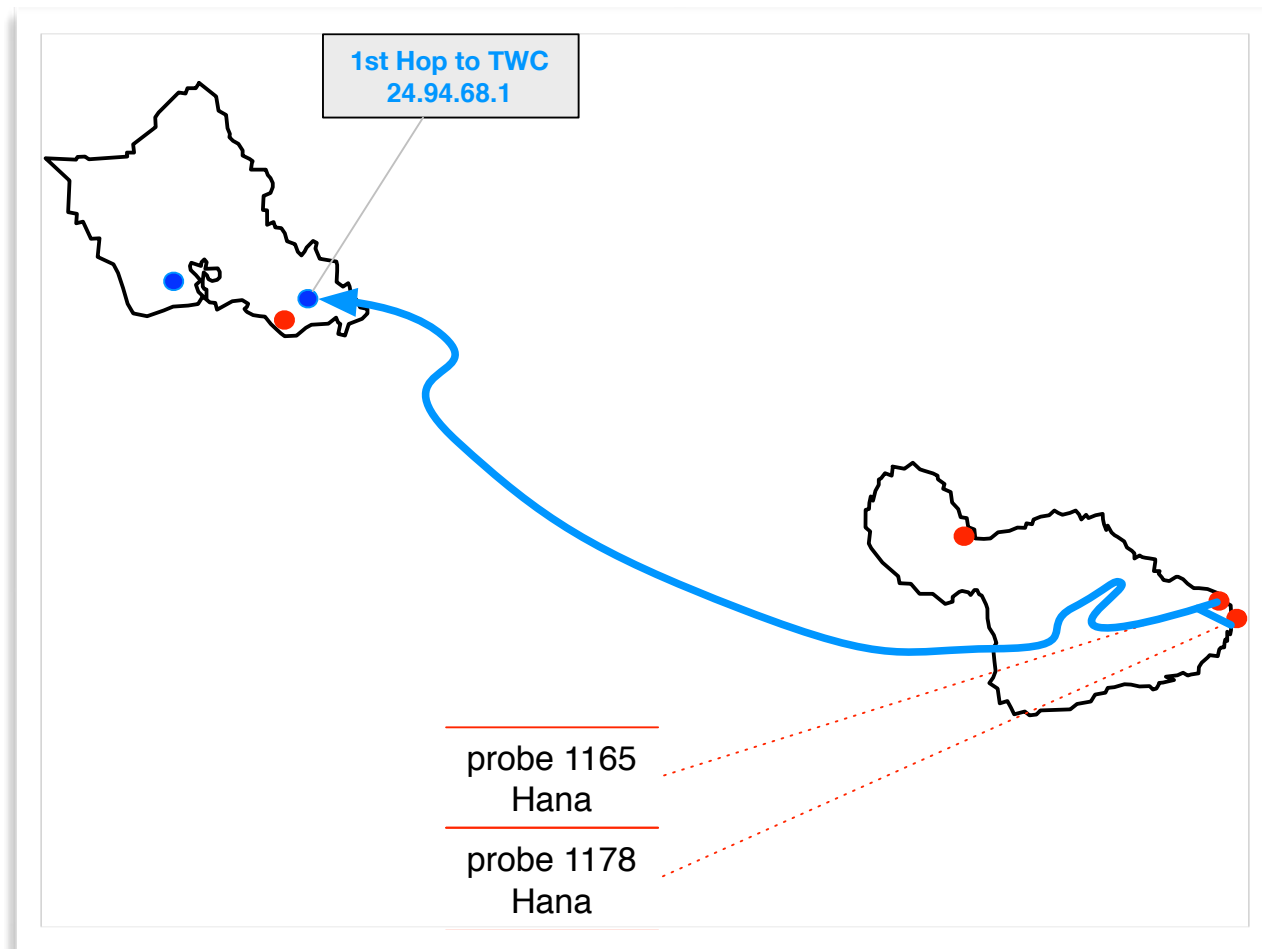
Packet loss

More content to be filled in here subject to data mining

network congestion
(RTT values)

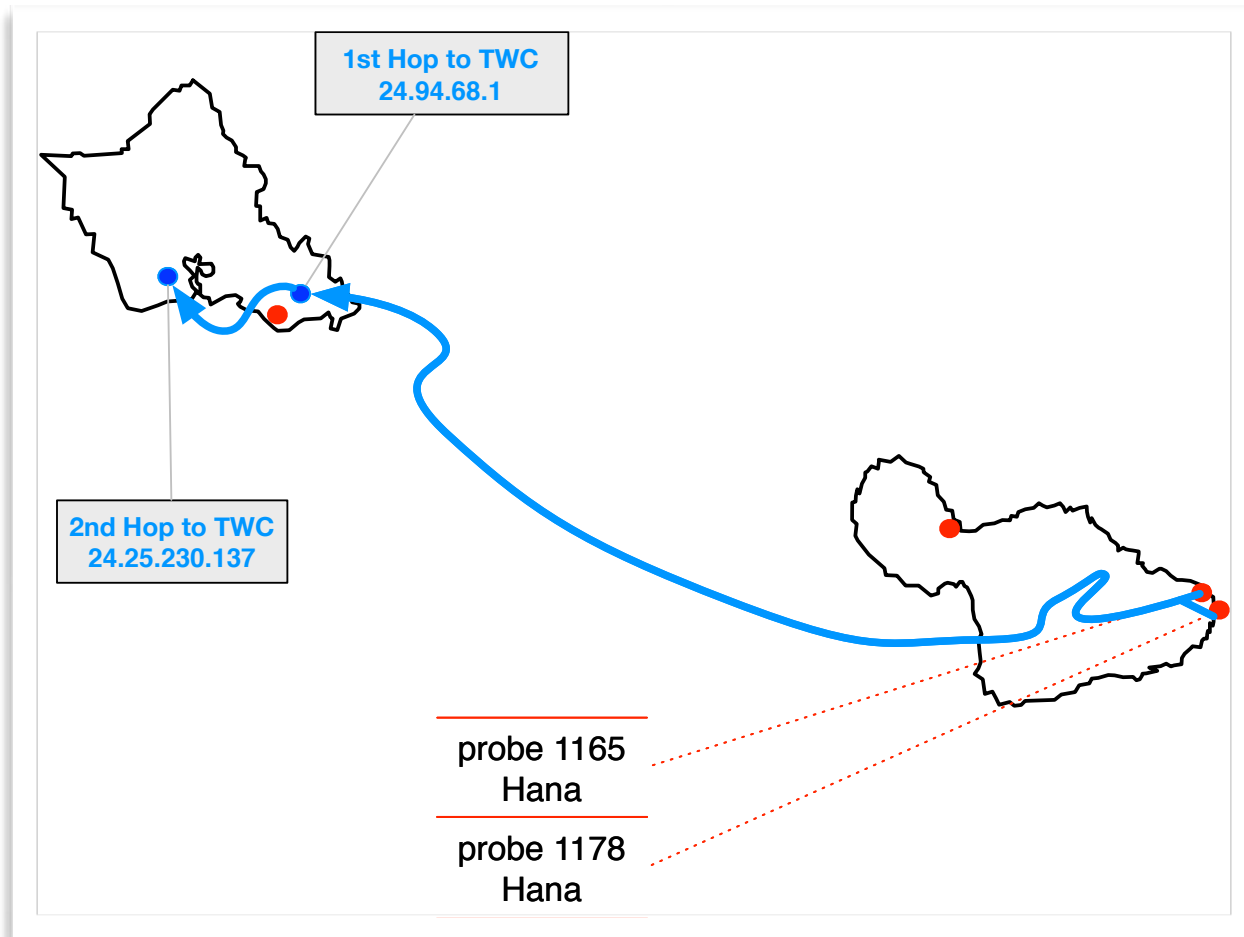
1st Hop RTT

Hana to 24.94.68.1 in Oahu

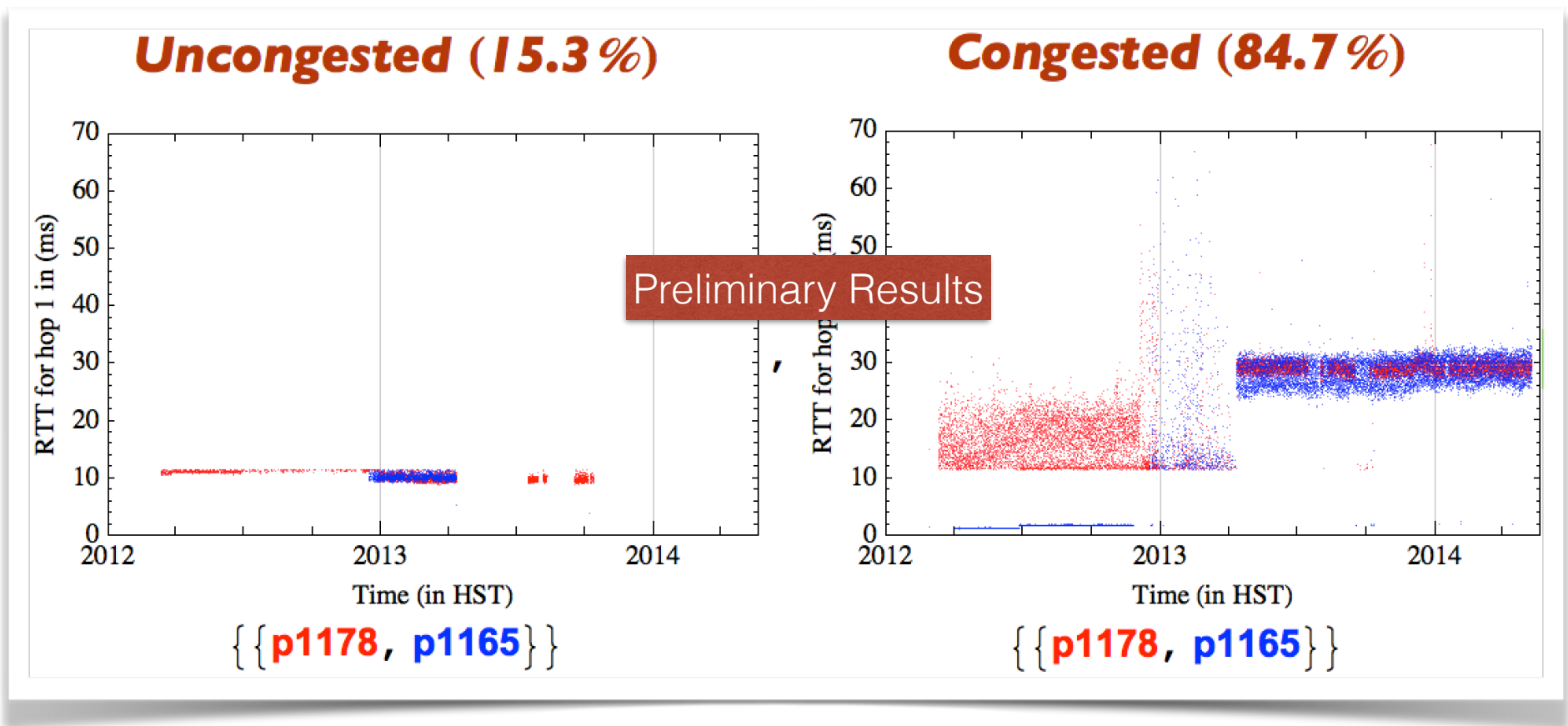


2nd Hop RTT

Hana to 24.25.230.137 in Oahu

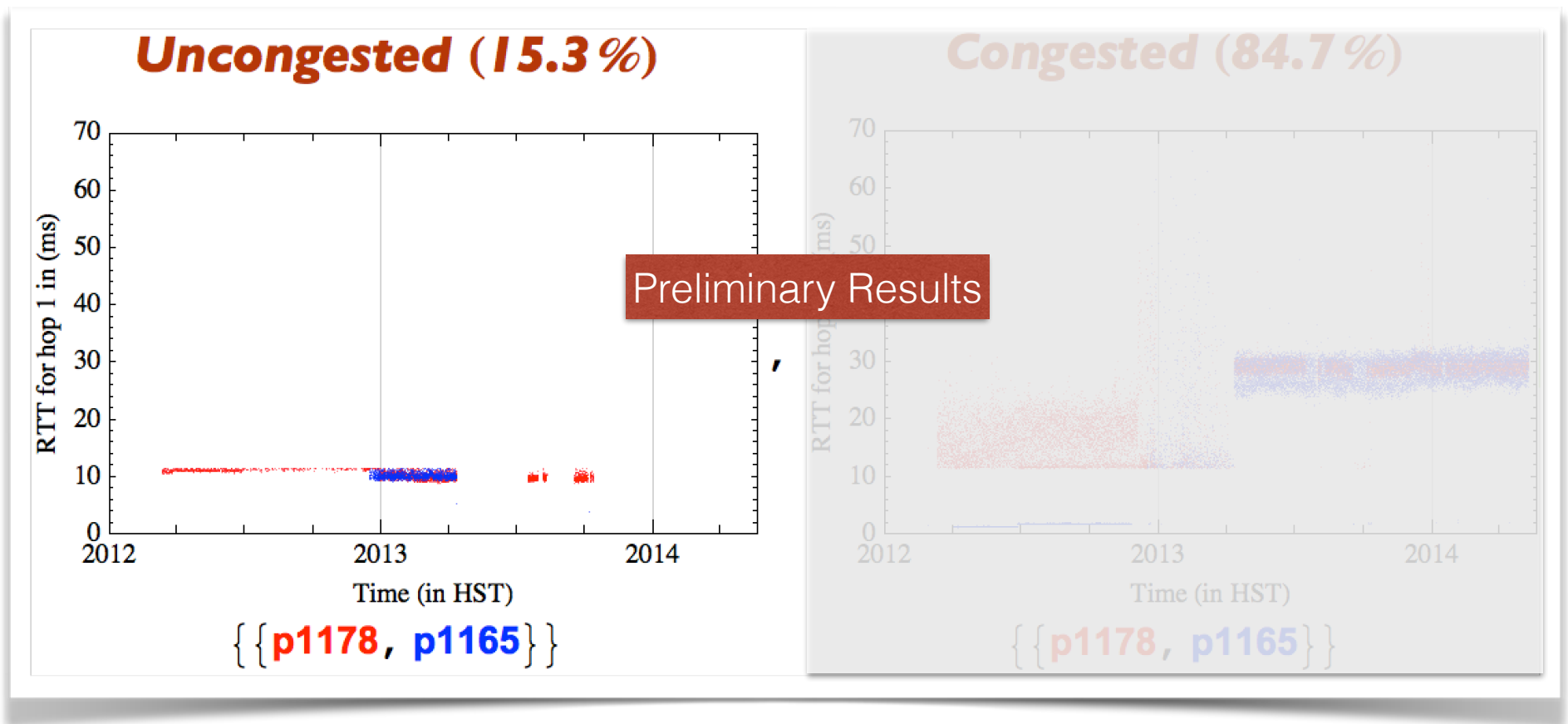


1st Hop from Hana, HI to TWC 24.94.68.1 on Oahu, HI

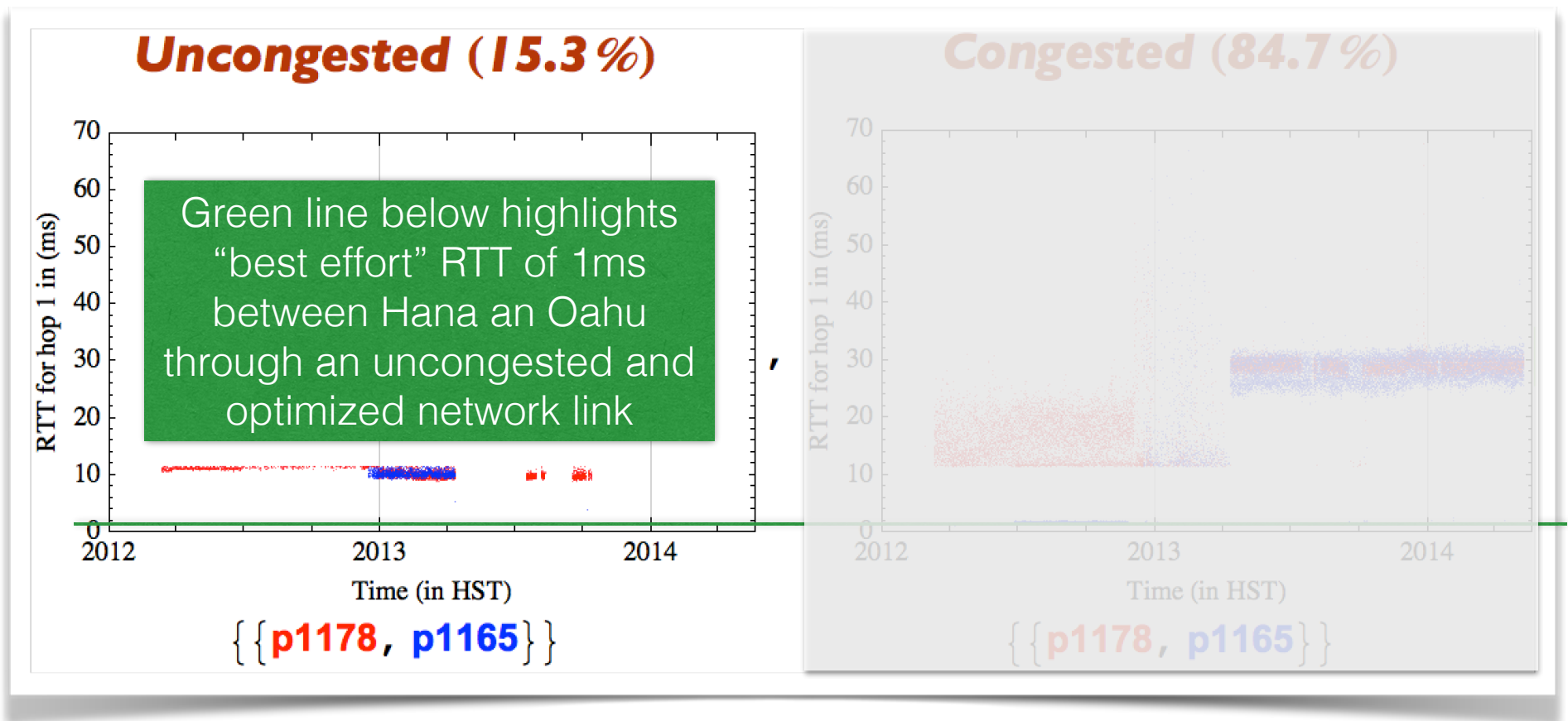


Each point is the 1 hour median of RTT values collected. Sample frequency is typically 60 per hour

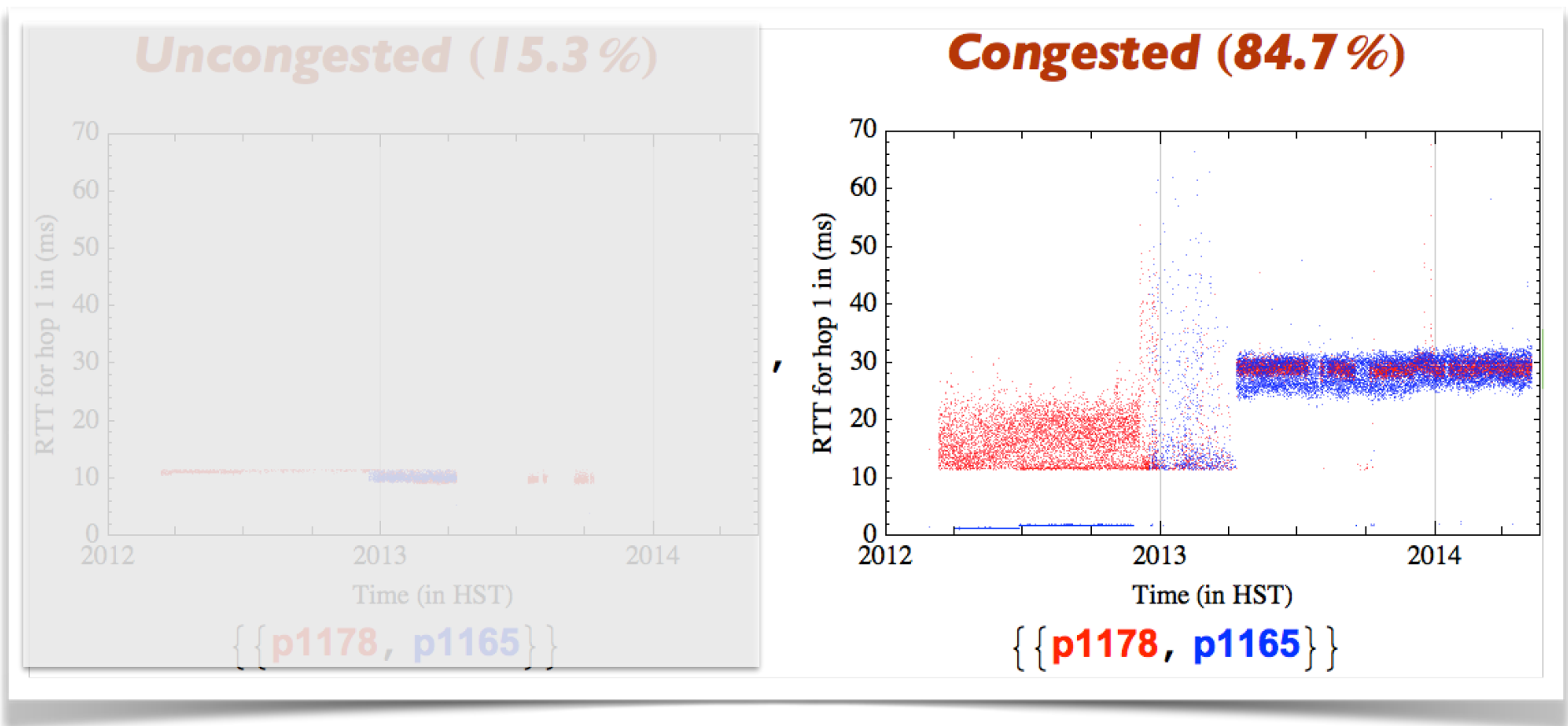
Uncongested is a heuristic evaluation as to when the link is at low utilization level



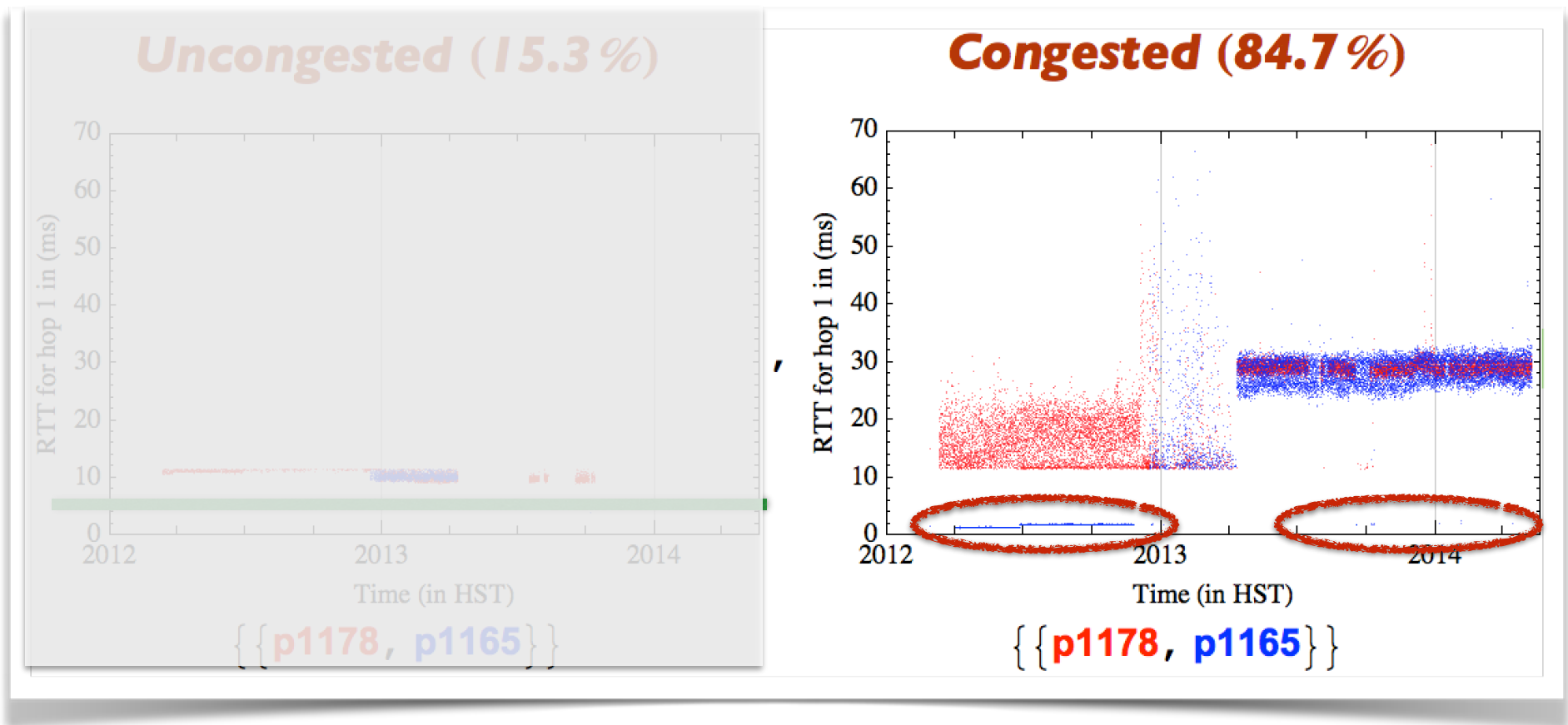
RTT between Maui and Oahu should be 3ms to 5ms via Microwave and fiber



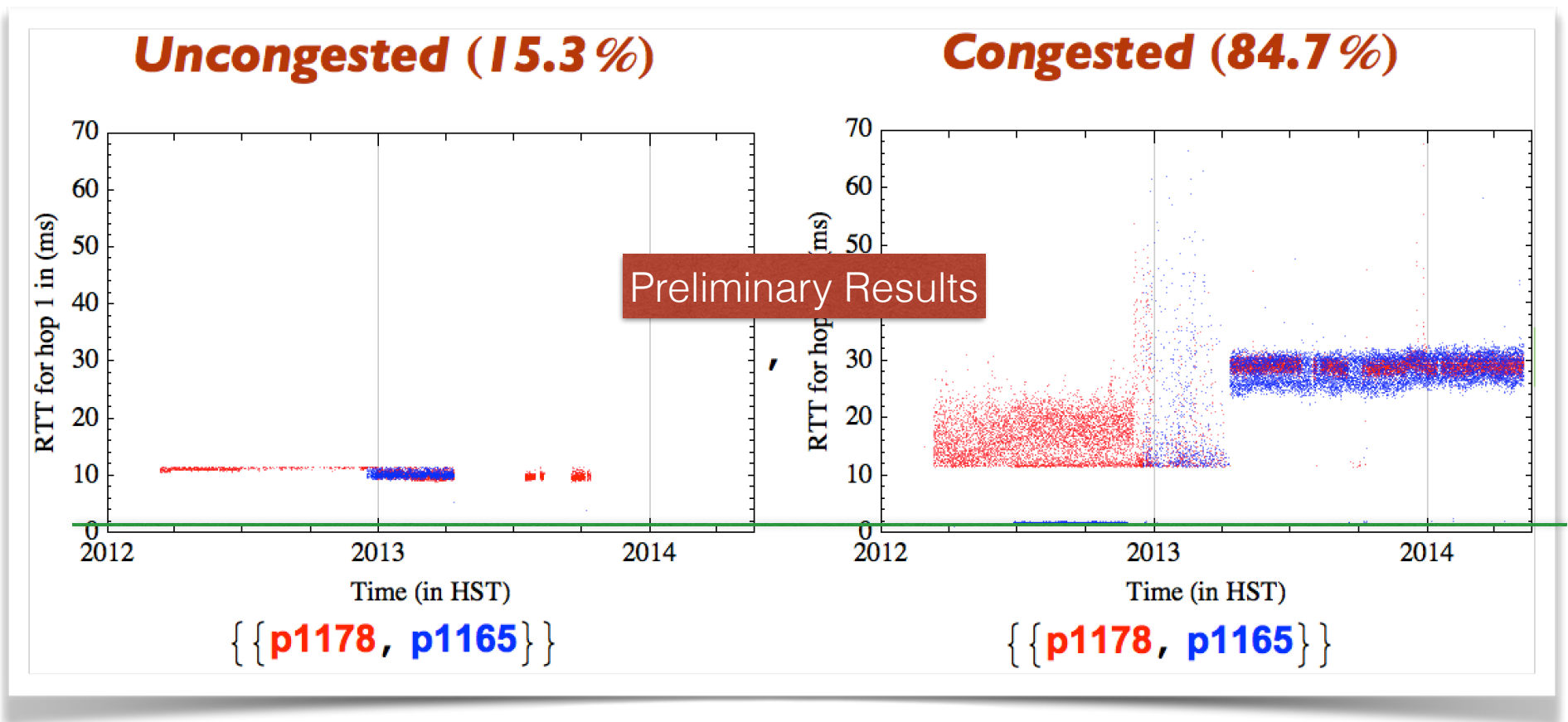
Congested are values from TWC network gear under load



Evidence it is possible for Hana traffic to reach Oahu in 1ms



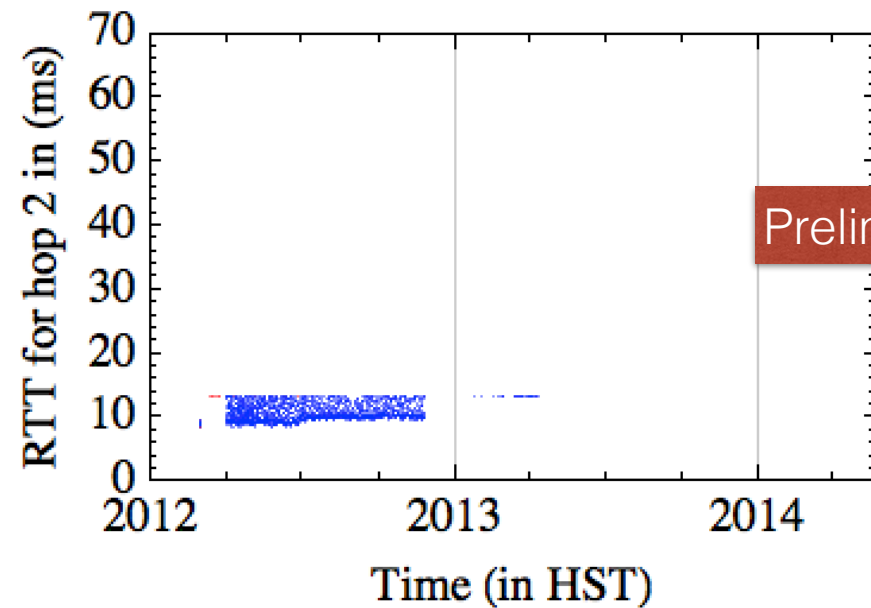
1st hop (again) before viewing 2nd hop result



Each point is the 1 hour median of RTT values collected. Sample frequency is typically 60 per hour

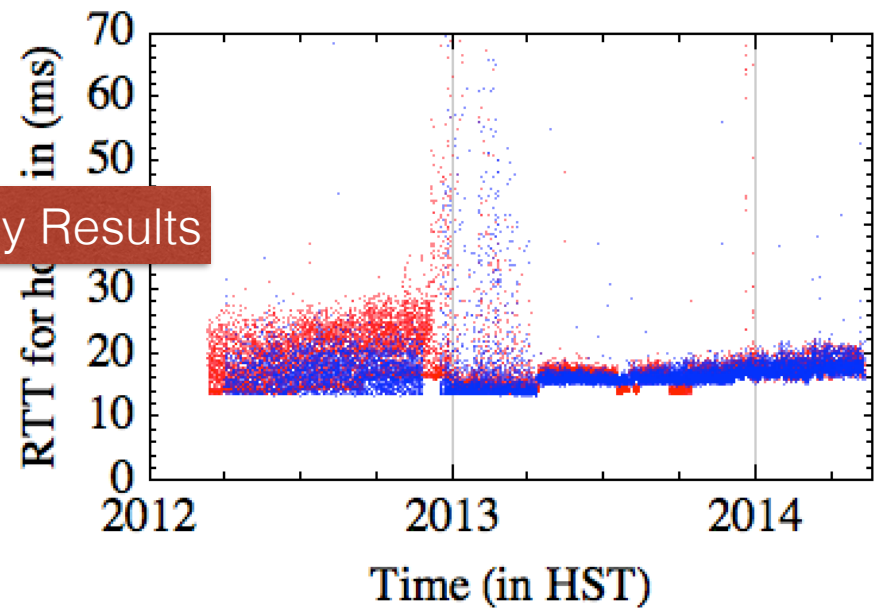
2nd Hop from Hana, HI to TWC 24.25.230.137 on Oahu, HI

Uncongested (6.93 %)



{ { **p1178**, **p1165** } }

Congested (93.1 %)

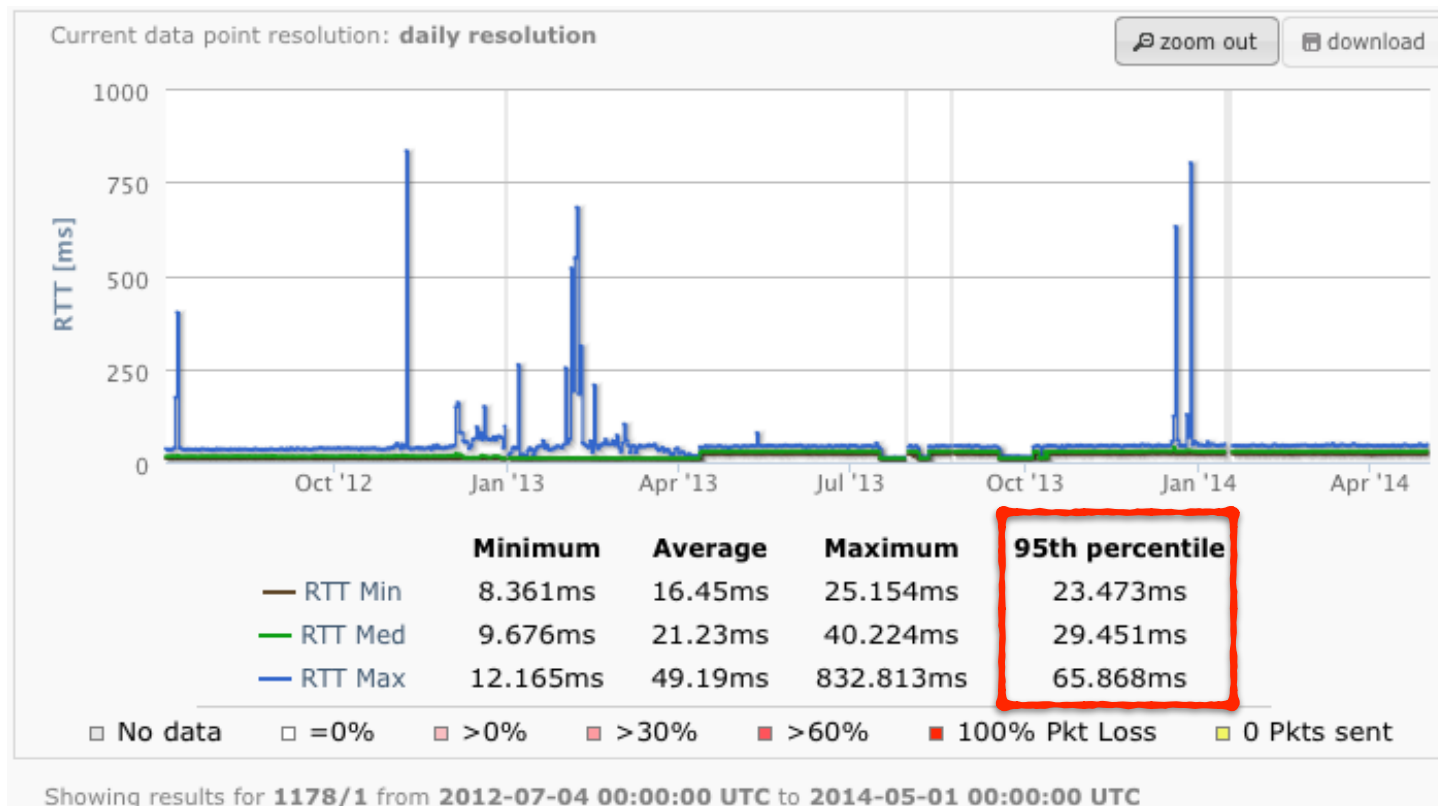


{ { **p1178**, **p1165** } }

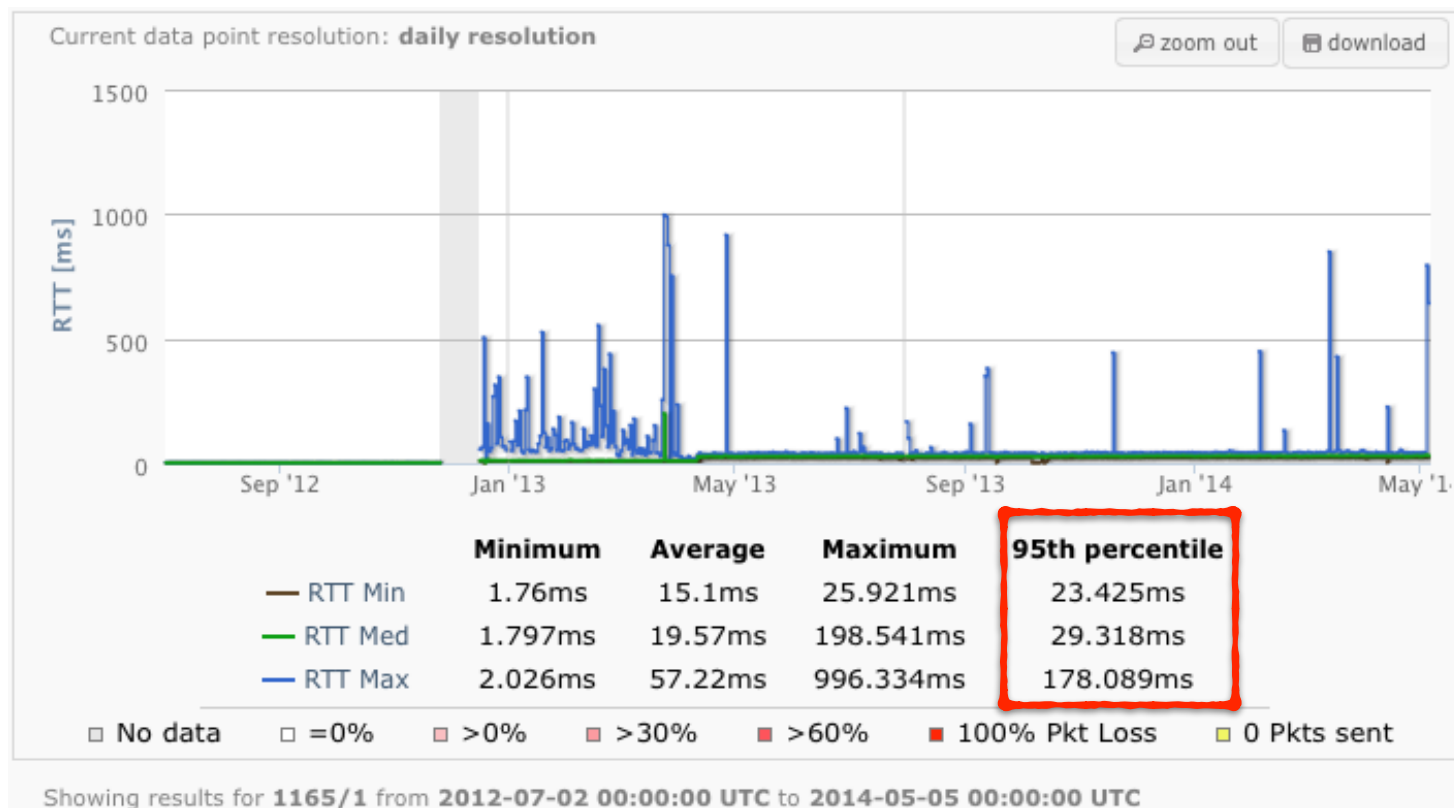
Each point is the 1 hour median of RTT values collected. Sample frequency is typically 60 per hour

1st Hop
1d RTT average values
Hana to Oahu
June 2012 to May 2014

p1178 : 1st hop Hana to Oahu



p1165 : 1st hop Hana to Oahu



atlas.ripe.net Summary

- atlas probes in TWC High Speed Internet service areas of Oahu, Maui, and Big Island confirm sustained packet loss and latency is evident for TWC managed network segments to and from Hana, and other TWC service sites
- Hana is consistently showing BAD quality of service metrics compared to other TWC service areas in Hawaii
- 2 years of atlas.ripe.net measurements make clear the TWC High Speed Internet service to Hana is frequently network congested and at times, unavailable for multiple days

Observations

Observations

- Measurements of TWC's High Speed Internet service for Hana are consistent with a pattern of network congestion resulting in unpredictably fast, slow and unusable broadband services spanning several years and typically peaks during prime time viewing hours between 6pm and 12am — with severe congestion during weekend and holidays when concurrent use by Hana subscribers is higher than normal
- TWC's broadband management policies are said to upgrade network links and equipment upon reaching 70% congestion - but TWC's network congestion reports and policies detailing how long and how frequent congestion is observed before taking action to upgrade are not available for outside review
- TWC's proposal to double microwave transit capacity from 198Mb/s to 396Mb/s will slightly improve but ultimately will fail to alleviate significant network congestion for 350 Hana TWC High Speed Internet users allotted each with 10Mb/sec download rates — particularly as Hana resident's broadband usage increasingly extends beyond casual web browsing and email delivery.
- Capacity planning estimates based upon current Hana broadband utilization is a “false summit” and will under-estimate future demand due to current network congestion that creates a negative feedback loop for end-user experience.
- TWC's past, current and future broadband provisioning ensures there is no competitive alternative to TWC CableTV, nor does TWC offer reliable access to services such as VoIP and other virtual meeting technologies that are available elsewhere in TWC High Speed Internet Service areas

Recommendations

Recommendations

- HBC to define a Service Level Agreement (SLA) with TWC to define minimum Quality of Service (QuOS) metrics, including concurrent traffic capacity
- HBC and TWC to monitor QuOS compliance by way of measurement infrastructure whose performance results are timely, accurate and open to the public
- TWC to adjust infrastructure to meet requirements defined under SLA
- Revise SLA on an annual basis to adjust for new technologies and evolving traffic streams and demands