
The Quilt, Inc.

IP Transit Internet Services RFP

Round 2 – Semi-Finalist Presentation

Mark Wilcop
Sr. Manager – Public Sector
State / Local Government & Education

Denver Airport Marriott at Gateway Park
Mt. Elbert Room
8:00 a.m. – 9:30 a.m. Mountain Time
Thursday, April 3, 2014

Agenda

- Introductions – Quilt & **tw telecom** Team (5 Minutes)
- Supplemental Information (5 Minutes)
- **tw telecom** Program Summary (5 Minutes)
- Questions Specific to **tw telecom** (5 Minutes)
- Section 1: Technical Questions (10 Minutes)
- Section 2: Services and Pricing Model (10 Minutes)
- Section 3: Peering (15 Minutes)
- Section 4: Customer Support, Operations, and Billing Practices (15 Minutes)
- Section 5: Support for Authorized Quilt Buyer (AQB) Program (10 Minutes)
- Key Contacts (5 Minutes)
- Section 6: Final Questions/Answers (5 Minutes)
- Closing Comments

Introductions

tw telecom Team

Introductions – **tw telecom** Team

- Mike Spivey, Director – Network Services & Engineering
- Dan Steeves, Manager – IP / Data Engineering
- Mark Wilcop, Sr. Manager – State / Local Government & Education

Supplemental Information

Supplemental Information

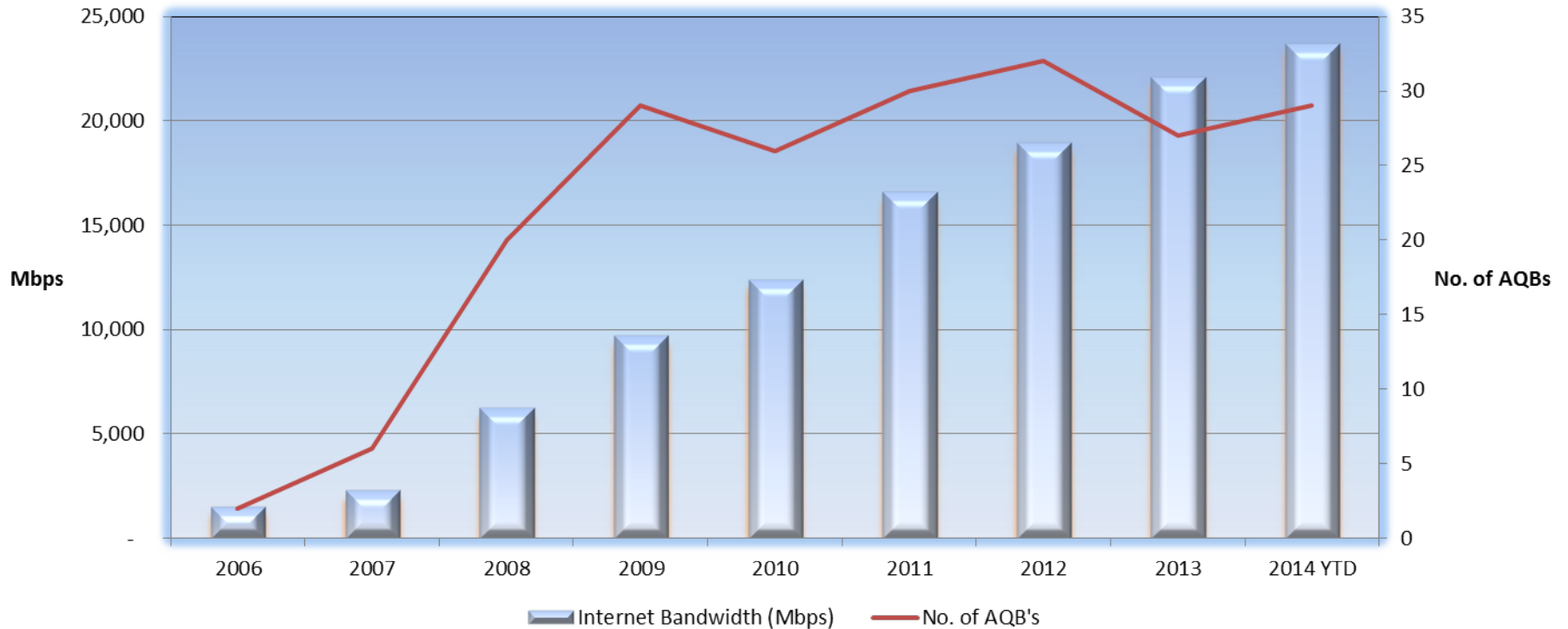
- Appendix 1 – AS Paths
- Appendix 2 – **tw telecom**'s On-net PoPs and Carrier Hotels
- Appendix 3 – Public Peering Policy
- Appendix 4 – List of Peering Entities
- Appendix 5 – IP Network Map
- Appendix 6 – MyPortal Overview
- Appendix 7 – Authorized Use Policy (AUP)
- Appendix 8 – Sample Invoice
- Appendix 9 – Sample End-User Contract
- Appendix 10 – CALEA Information & FCC Form 445
- Appendix 11 – Security Services
- Appendix 12 – Service Level Agreement (SLA)
- Appendix 13 – **tw telecom** AQB List
- Appendix 14 – Revised Pricing Schedule

tw telecom
Quilt Program Summary

Quilt Program Summary

- Authorized Quilt Provider since 2006.
- AQB customer base has increased from 2 members to 29 members.
- Internet bandwidth has grown from 1,500 Mbps to 23,700 Mbps. (2012 = 18,930 Mbps)
- Early adopter / activation of IPv6.
- Monthly Quilt Liaison calls held since 09/15/06.
- High level of customer satisfaction.

Quilt Program Summary



Item / Year	2006	2007	2008	2009	2010	2011	2012	2013	2014 YTD
Bandwidth (Mbps)	1,500	2,275	6,230	9,705	12,380	16,580	18,930	22,100	23,700
No. of AQB's	2	6	20	29	26	30	32	27	29

Questions Specific To tw telecom

Questions Specific to **tw telecom**

- We understand the current Quilt aggregation under our **tw telecom** contract to be slightly under 24 Gbps. Address next tier and associated pricing scheduled for aggregated AQB purchases.

Response:

- The next tier for additional price reductions would be an aggregate AQB purchase level of 26 Gbps.
- At this aggregate purchase level, Internet pricing would be as follows:
 - 1 Gbps on 1Gbps Port = \$2.90/Mbps
 - 10 Gbps Port
 - 1 Gbps – 5 Gbps = \$2.90/Mbps
 - 5.5 Gbps – 10 Gbps = \$2.30/Mbps
 - Non-GigaPoP Access pricing would remain the same.

Internet Pricing – Aggregate 26 Gbps

Port	Bandwidth		Current \$/Mbps	Aggregate = 26 Gbps \$/Mbps	Δ \$/Mbps	Δ %
Ethernet 100Mbps	50 Mbps	95 Mbps	\$ 7.00	\$ 7.00	\$ -	0.0%
Ethernet 1Gbps	100 Mbps	175 Mbps	\$ 6.00	\$ 6.00	\$ -	0.0%
	200 Mbps	250 Mbps	\$ 4.37	\$ 4.37	\$ -	0.0%
	300 Mbps	350 Mbps	\$ 4.28	\$ 4.28	\$ -	0.0%
	400 Mbps	450 Mbps	\$ 4.17	\$ 4.17	\$ -	0.0%
	500 Mbps	550 Mbps	\$ 4.10	\$ 4.10	\$ -	0.0%
	600 Mbps	650 Mbps	\$ 3.99	\$ 3.99	\$ -	0.0%
	700 Mbps	750 Mbps	\$ 3.90	\$ 3.90	\$ -	0.0%
	800 Mbps	850 Mbps	\$ 3.80	\$ 3.80	\$ -	0.0%
	900 Mbps	950 Mbps	\$ 3.65	\$ 3.65	\$ -	0.0%
	1 Gbps	-	\$ 3.49	\$ 2.90	\$ (0.59)	-16.9%
Ethernet 10Gbps	1 Gbps	-	\$ 3.49	\$ 2.90	\$ (0.59)	-16.9%
	1.5 Gbps	-	\$ 3.44	\$ 2.90	\$ (0.54)	-15.7%
	2 Gbps	-	\$ 3.34	\$ 2.90	\$ (0.44)	-13.2%
	2.5 Gbps	-	\$ 3.29	\$ 2.90	\$ (0.39)	-11.9%
	3 Gbps	-	\$ 3.24	\$ 2.90	\$ (0.34)	-10.5%
	3.5 Gbps	-	\$ 3.19	\$ 2.90	\$ (0.29)	-9.1%
	4 Gbps	-	\$ 3.14	\$ 2.90	\$ (0.24)	-7.7%
	4.5 Gbps	-	\$ 3.09	\$ 2.90	\$ (0.19)	-6.2%
	5 Gbps	-	\$ 3.04	\$ 2.90	\$ (0.14)	-4.7%
	5.5 Gbps	-	\$ 2.99	\$ 2.30	\$ (0.69)	-23.1%
	6 Gbps	-	\$ 2.94	\$ 2.30	\$ (0.64)	-21.8%
	6.5 Gbps	-	\$ 2.89	\$ 2.30	\$ (0.59)	-20.5%
	7 Gbps	-	\$ 2.84	\$ 2.30	\$ (0.54)	-19.1%
	7.5 Gbps	-	\$ 2.79	\$ 2.30	\$ (0.49)	-17.7%
	8 Gbps	-	\$ 2.74	\$ 2.30	\$ (0.44)	-16.2%
	8.5 Gbps	-	\$ 2.69	\$ 2.30	\$ (0.39)	-14.6%
	9 Gbps	-	\$ 2.64	\$ 2.30	\$ (0.34)	-13.0%
	9.5 Gbps	-	\$ 2.59	\$ 2.30	\$ (0.29)	-11.3%
	10 Gbps	-	\$ 2.49	\$ 2.30	\$ (0.19)	-7.8%

Questions Specific to **tw telecom**

- If selected as an Authorized Quilt Provider, are you currently registered, or would you be willing to register to do business in New Jersey?

Response:

- Yes, **tw telecom** is certified to do business in New Jersey.
- We will coordinate with The Quilt to provide the required state documents when requested.

Section 1

Technical Questions

1. Technical Questions

- a. Do you support jumbo frames end-to-end across your network (and at what levels? e.g., 9000 byte MTU for Ethernet end-to-end)?

Response:

- **tw telecom's** Ethernet Internet Service (EIS) uses a default MTU of 1500 bytes with Direct Internet Access services using either 1500 (T1) or 4470 bytes (T3/POS).
- The network can technically support an MTU up to 9000 bytes within the **tw telecom** backbone.
- Once traffic leaves the **tw telecom** network, it would be fragmented to 1500 bytes in most cases.
- **tw telecom's** Extended Native LAN Service (ENLAN) (L2VPN/VPLS) services support a 9000 byte MTU.

b. What is your AS number(s)?

Response:

- ASN 4323

c. List the unique AS paths and unique directly connected AS's.

Response:

- Detailed information on AS paths and directly connected ASNs appears in **Supplemental Information, Appendix 1.**

d. What is your process for internal performance monitoring? What performance metrics are available to customers? What kind of performance and troubleshooting tools do you make available for customers?

- **tw telecom** tests latency, jitter and pack loss between PoPs.

Results are available at

<https://customerportal.twtelecom.com/IPCorePerformance/>

- **tw telecom** also has a public Looking Glass (<http://lglass.twtelecom.net>) available to perform tests from the edge routers within the network.

- AQB's can also access performance information 24 x 7 via **MyPortal**, **tw telecom**'s on-line self-service tool.

e. Do you have 100G capability in your backbone? If not, what is your roadmap or plans for 100G capable infrastructure?

Response:

- **tw telecom** currently offers 100 GigE transport service.
- The roadmap for 100 GigE Layer 2 or Layer 3 services includes will continue to be evaluated during the next 12 months, with general deployment largely based on price points and capacity needs.

Section 2

Services and Pricing Model

2. Services and Pricing Model

- a. Present an Overview of proposed Quilt aggregate price card.

Response:

- **tw telecom**'s Quilt aggregate price card includes the following elements:
 - Standard 100 Mbps / 1 Gbps / 10 Gbps Service Delivery options.
 - Non-GigaPoP access pricing.
 - Port charges in the GigaPoP waived.
 - Installation charges waived.
 - Pricing is contingent on the availability of facilities and capacity.

Service Delivery Options

Port	Minimum	Maximum	Increments
Ethernet 100Mbps	50Mbps	95Mbps	5Mbps
Ethernet 1Gbps	100Mbps	250Mbps	25Mbps
	300Mbps	1Gbps	50Mbps
Ethernet 10Gbps	1Gbps	10Gbps	500Mbps

Internet Pricing (\$/Mbps)

Port	Bandwidth		\$/Mbps
Ethernet 100Mbps	50 Mbps	95 Mbps	\$ 7.00
Ethernet 1Gbps	100 Mbps	175 Mbps	\$ 6.00
	200 Mbps	250 Mbps	\$ 4.37
	300 Mbps	350 Mbps	\$ 4.28
	400 Mbps	450 Mbps	\$ 4.17
	500 Mbps	550 Mbps	\$ 4.10
	600 Mbps	650 Mbps	\$ 3.99
	700 Mbps	750 Mbps	\$ 3.90
	800 Mbps	850 Mbps	\$ 3.80
	900 Mbps	950 Mbps	\$ 3.65
	1 Gbps	-	\$ 3.49
Ethernet 10Gbps	1 Gbps	-	\$ 3.49
	1.5 Gbps	-	\$ 3.44
	2 Gbps	-	\$ 3.34
	2.5 Gbps	-	\$ 3.29
	3 Gbps	-	\$ 3.24
	3.5 Gbps	-	\$ 3.19
	4 Gbps	-	\$ 3.14
	4.5 Gbps	-	\$ 3.09
	5 Gbps	-	\$ 3.04
	5.5 Gbps	-	\$ 2.99
	6 Gbps	-	\$ 2.94
	6.5 Gbps	-	\$ 2.89
	7 Gbps	-	\$ 2.84
	7.5 Gbps	-	\$ 2.79
	8 Gbps	-	\$ 2.74
	8.5 Gbps	-	\$ 2.69
	9 Gbps	-	\$ 2.64
	9.5 Gbps	-	\$ 2.59
	10 Gbps	-	\$ 2.49

Non-GigaPoP Access Pricing (Monthly Recurring Cost)

Port	1-Year	2-Year	3-Year	5-Year
100Mbps	\$ 228	\$ 205	\$ 193	\$ 182
1Gbps	\$ 400	\$ 360	\$ 340	\$ 320
10Gbps	\$ 1,600	\$ 1,440	\$ 1,360	\$ 1,280

DDOS Scrubbing (Monthly Recurring Cost)

Port	Bandwidth		DDOS Scrubbing (NRC)	DDOS Scrubbing (MRC) (pricing based on internet circuit's bandwidth for static, and PIR for burstable)
Ethernet 100Mbps	50 Mbps	95 Mbps	\$500	\$560
Ethernet 1Gbps	100 Mbps	175 Mbps	\$750	\$960
	200 Mbps	250 Mbps	\$750	\$960
	300 Mbps	350 Mbps	\$750	\$1,760
	400 Mbps	450 Mbps	\$750	\$1,760
	500 Mbps	550 Mbps	\$750	\$2,640
	600 Mbps	650 Mbps	\$750	\$2,640
	700 Mbps	750 Mbps	\$750	\$2,640
	800 Mbps	850 Mbps	\$750	\$2,640
	900 Mbps	950 Mbps	\$750	\$2,640
	1 Gbps	-	\$750	\$2,640
Ethernet 10Gbps*	1 Gbps	-	\$750	\$2,640
	1.5 Gbps	-	\$750	\$3,934
	2 Gbps	-	\$750	\$4,862
	2.5 Gbps	-	\$750	\$5,789
	3 Gbps	-	\$750	\$6,715
	3.5 Gbps	-	\$750	\$7,643
	4 Gbps	-	\$750	\$8,570
	4.5 Gbps	-	\$750	\$9,496
	5 Gbps	-	\$750	\$10,424
	5.5 Gbps	-	\$750	\$11,350
	6 Gbps	-	\$750	\$12,277
	6.5 Gbps	-	\$750	\$13,205
	7 Gbps	-	\$750	\$14,131
	7.5 Gbps	-	\$750	\$15,058
	8 Gbps	-	\$750	\$15,986
	8.5 Gbps	-	\$750	\$16,912
	9 Gbps	-	\$750	\$17,838
	9.5 Gbps	-	\$750	\$18,765
	10 Gbps	-	\$750	\$19,692

* DDoS Scrubbing for 1.5 Gbps to 10 Gbps requires an ICB for capacity check.

b. How would you support multiple customers on a single 10GE port?

Response:

- VLANs on **tw telecom** side of the circuit.
- Single customer per port limitations for certain solutions.
- As in the past, **tw telecom** will continue to consider the unique requirements of an AQB on an Individual-Case-Basis (ICB).

c. What is your customer IPv6 offering? Are there any restricted blocks?

Response:

- **tw telecom** offers a dual stack setup for IPv6 (not separate ports or VLANs).
- Not supported on managed routers used for customer CPE.
- /64 for directly connected customers.
- /56 preferred for routed deployments.
- /48 or larger for any provider independent (PI) space, which the customer has been assigned.

d. What are your plans for offering 40G and 100G customer interfaces?

Response:

- **tw telecom** currently offers 100 GigE transport service.
- The roadmap for 100 GigE Layer 2 or Layer 3 services includes will continue to be evaluated during the next 12 months, with general deployment largely based on price points and capacity needs.

e. Please provide a list of all your current U.S. on-net locations from which you allow fiber inter-connects. What facilities are you in that we can use? What are the types of fees that may be assessed at these various locations? Check all fees that may apply for a particular location.

Response:

- **tw telecom**'s most common method of interconnection is through our PoPs/Carrier Hotels or Quilt defined GigaPoPs (85 on-net).
- The AQB is responsible for any applicable cross-connect fees.
- **tw telecom** is open to considering multiple locations across the nation.
- A list of On-net PoPs and Carrier Hotels is included in **Supplemental Information, Appendix 2.**

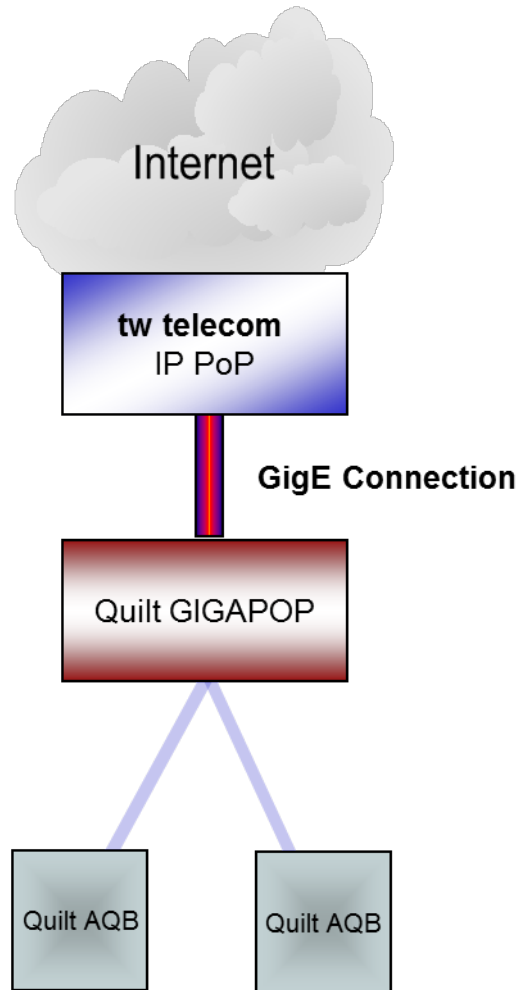
f. If you are responding to the bundled commodity internet service and last mile local access option, please present an overview of the bundled service and pricing tiers.

Response:

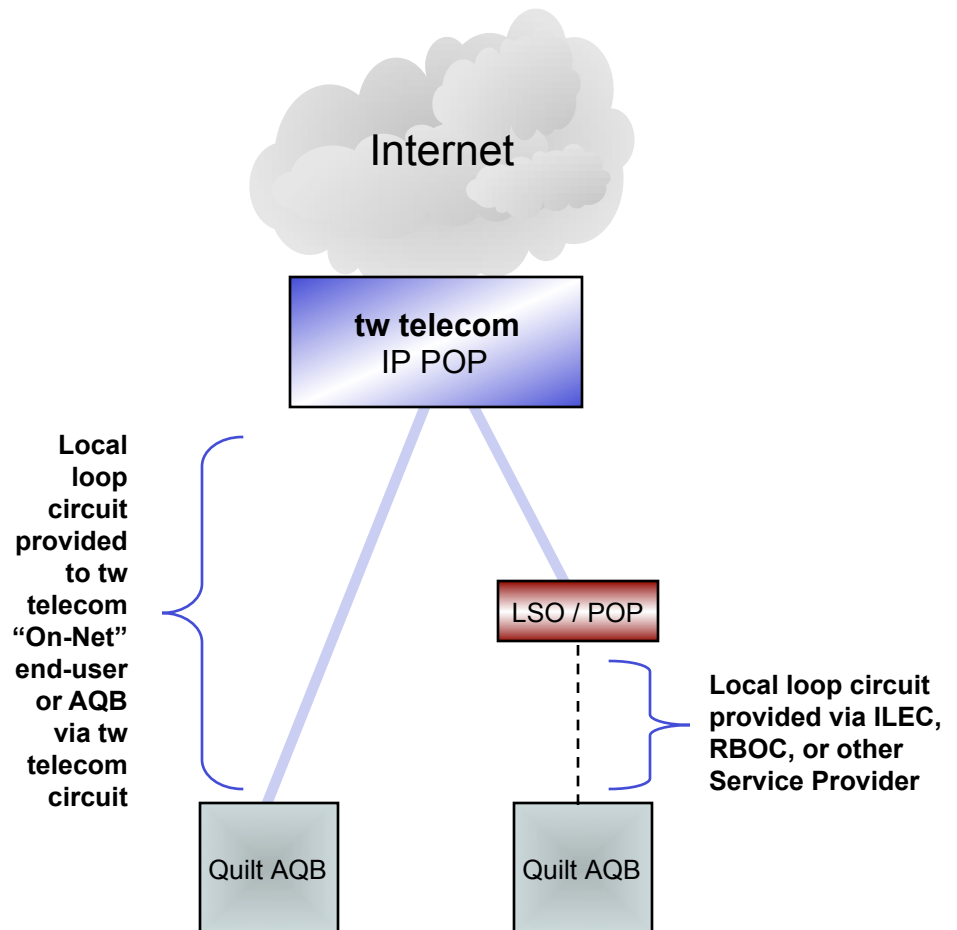
- Bundled commodity internet service and last mile local access options are offered for ports of 100 Mbps, 1 Gbps, and 10 Gbps.
- Multiple term options are offered for **tw telecom** on-net access, including 1, 2, 3, and 5 year.
- The monthly Recurring Cost (MRC) for a bundled commodity internet service and last mile local access would be as follows:
 - $(\text{Internet Bandwidth} \times \$/\text{Mbps}) + \text{Last Mile Access (MRC)}$
 - » Last Mile Access pricing is determined on whether the circuit is **tw telecom** on-net or off-net.
- Pricing is contingent on the availability of facilities and capacity.

Bundled Options

On-Net GigaPoP Access



Non-GigaPoP Access



Section 3

Peering

3. Peering

- a. What are the requirements an organization must meet for you to be willing to do settlement-free peering with them? Can you provide us a copy of your settlement free peering policy?

Response:

- **tw telecom's** Public Peering Policy document is included in the **Supplemental Information, Appendix 3**.
- At a high level, **tw telecom** requires peers to interconnect with geographic diversity (East, West, and Central Regions) and at a level of at least 350M (Ingress + Egress @ the 95th percentile).
- **tw telecom's** peering requirements are listed in our Public Peering Policy document, which can be located at the following site:

<http://www.twtelecom.com/support-information/customer-resources/product-resources/peering-policy/>

b. Are you aware of any particular strengths in your private peering portfolio that make it quantifiably unique?

Response:

- Strong peering relationships including national and international Tier 1 ISPs.
- 753 Gbps of established peering capacity.
- 154 unique configured Autonomous System peers.
- 693 configured peering sessions.
- 225+ configured IPv6 peering sessions.
- 85%+ of all IP traffic is delivered directly to its destination (AS).
- Geographically diverse private and public peering interconnect sites.
- Proactive monitoring and management of peering to optimize traffic flows and planned growth.

c. How many transit peering agreements do you have?

Response:

- **tw telecom** has two (2) transit peering agreements.

-
- d. Do you purchase transit from any other vendors (this would be to account for customer traffic destined for someone with whom you do not privately peer)?

Response:

- Yes. **tw telecom** purchases transit from AT&T and Verizon.

-
- e. Will you offer a no-charge option to obtain provider's customer-only BGP routes?

Response:

- Yes. Customer only routes are available with Direct Internet Access (DIA) / Ethernet Internet Service (EIS) services at no additional charge.

-
- f. Will you offer a no-charge acceptance of Quilt aggregator advertised routes?

Response:

- Yes. **tw telecom** supports route updates via an Internet Routing Registry (IRR) object at no additional charge.

-
- g. Will you offer a no-charge acceptance of Quilt aggregator advertised ASPATHS?

Response:

- No. **tw telecom** does not offer filtering by ASPATH.

h. Where possible, please provide the names of the entities with which you peer, in alphabetical order.

Response:

- A detailed listing of **tw telecom's** peering entities is provided in the **Supplemental Information, Appendix 4.**
- Aggregate peering numbers (652) per region, or location appears is as follows:
 - EQUIX Ashburn – 144
 - PAIX Atlanta – 20
 - EQIX – Chicago – 77
 - EQIX Dallas – 72
 - Denver – 4
 - EQIX L.A. – 59
 - Honolulu – 7
 - NOTA Miami – 22
 - NYIIX New York – 52
 - PAIX New York - 33
 - PAIX Palo Alto – 58
 - EQIX San Jose – 60
 - SIX Seattle – 44

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- i. Details of bandwidth between NAPs and other ISPs including existing and planned interconnection points with other ISPs.

Response:

- Please refer to **tw telecom's** IP Network Map in **Supplemental Information, Appendix 5**, which details bandwidth and interconnection points between NAPs and other ISPs.

- j. For-free interconnection points with other providers; provider name, location of interconnect and bandwidth.

Response:

AT&T (All 10 GigE)

- Ashburn, VA
- Atlanta, GA
- Chicago, IL
- Dallas, TX
- Los Angeles, CA
- San Jose, CA

Verizon (All 10 GigE)

- Ashburn, VA
- Atlanta, GA
- Chicago, IL
- Dallas, TX
- Palo Alto, CA
- Seattle, WA

- k. Please provide a map of your U.S. and global peering locations. At which of your peering locations are you doing IPv6? What is a total number of peers and % of peers at each location?

Response:

- All peering locations are IPv6 enabled.
- **tw telecom** has 125 IPv6 BGP sessions with 36 different networks.
- 35% of our peers have IPv6 BGP sessions established and our top percentile traffic volume peers are included in that percentage.
- **tw telecom**'s IP Peering Map is included as **Supplemental Information, Appendix 5.**

Section 4

Customer Support, Operations, and Billing Practices

4. Customer Support, Operations, and Billing Practices

- a. Do you have one billing system that can handle all of your offerings?

Response:

- Yes. **tw telecom** utilizes one billing system for all of our offerings.
- All invoice data is available through “MyBilling” if the customer desires to consolidate the billing information beyond the level of detail provided in the invoice.
- “MyBilling” is accessible through **tw telecom’s** self-service web-portal, which is named “MyPortal”.
- Further information on **tw telecom’s** “MyPortal” is included in the **Supplemental Information, Appendix 6.**

MyBilling ScreenShot

[Help](#) | [Customize](#) | [Contact us](#) | [Logout](#)

[MyHome](#) | [MyBilling](#) | [MyDisputes](#)

Welcome Portal

Account Number: 20

12 Month Historical Trending

Charges Taxes Payments

Current Billing Snapshot

MONTHLY BILLING INFORMATION

Last Invoiced Amount: \$16,842.20	Current Charges: \$14,605.39
Payments Received: \$16,842.20	Current Taxes: \$2,261.36
Outstanding Balance: \$0.00	* Balance Due: \$0.00

* Reflects payments and adjustments as of 12:00 AM (Midnight) MT.

ACCOUNT INFORMATION

Past Due 30 Days: \$0.00	Past Due 90 Days: \$0.00
Past Due 60 Days: \$0.00	Past Due 120 Days: \$0.00

Pay your bill online **PayNow** Pay your bill online

HELP CENTER

[Download User Guide](#)
[Reporting](#)
[Frequently Asked Questions](#)

Bill delivery method: Paper [Edit](#)

Email Reminder: NO [Edit](#)

Download Center

You can download billing data for the account number you are currently viewing. Simply select the file type you would like to download to see all of the available files. Refer to [Data Definitions](#) for assistance.

[Click Here](#) to view reports.

File Type
Invoices (PDF)
Conference
Circuit
Invoice
Usage

12 Month Summary

Invoices are in PDF format which requires Adobe Acrobat Reader. To view and download an invoice, click the Invoice Number for the invoice, select the "Save As" button, and assign a place to save the file on your desktop.

Invoice Date	Invoice Number	Current Charges	Current Taxes	Amount Due Last Bill	Total Current Balance
20091115	3250237	\$14,605.39	\$2,261.36	\$0.00	\$16,866.75
20091015	3195660	\$14,584.03	\$2,258.17	\$0.00	\$16,842.20
20090915	3140509	\$14,574.09	\$2,278.63	\$0.00	\$16,852.72
20090815	3085524	\$14,548.96	\$2,270.59	(\$196.45)	\$16,623.10
20090715	3023200	\$14,683.13	\$2,294.28	(\$370.56)	\$16,606.85
20090615	2964839	\$13,856.45	\$2,267.34	\$19,472.51	\$35,399.85
20090515	2910537	\$16,411.86	\$2,670.43	\$19,840.39	\$38,728.91
20090415	2864123	\$16,946.83	\$2,699.79	\$0.00	\$19,646.62
20090315	2814133	\$15,908.26	\$2,595.60	\$16,776.20	\$35,278.15
20090215	2743146	\$14,176.60	\$2,389.95	\$20,590.64	\$36,949.45
20090115	2687892	\$17,096.27	\$2,862.39	\$419.96	\$20,378.62

b. Provide us with a copy of your Acceptable Use Policy (AUP)?

Response:

- A copy of **tw telecom's** AUP is included in the **Supplemental Information, Appendix 7.**
- **tw telecom's** AUP may also be accessed on our external website at:

http://www.twtelecom.com/cust_center/acceptable_use_policy.html

c. Can you provide us a sample customer bill?

Response:

- Yes. A sample customer bill (invoice) is provided in the Supplemental Information, Appendix 8.

- d. What are your escalation procedures and contacts for pre-sales, provisioning, post-installation and billing?

Response:

- **tw telecom** coordinates our alliance with the Quilt and AQB's on a National level and Local Market level.
- Executive Program Sponsor
 - Ken Folderauer, President – Public Sector
- National Quilt Program Leadership
 - Mark Wilcop, Sr. Manager – State / Local Government & Education

-
- Escalation Contacts
 - Pre-sales – Mark Wilcop
 - Local Market Sales – Local Market Account Manager
(in close coordination with Mark Wilcop)
 - Provisioning – Local Market Provisioning Team
 - Post-Installation – Local Market Sales Team
 - Billing – Local Market Account Manager

- e. Can you provide us a copy of your End User Contract?
- i. Does the End User Contract permit pass through to customer of taxes, government fees, surcharges, fees, etc. that were not in place at time of contract execution or otherwise not explicitly identified in the Agreement or on an Order Form?

Response:

- Yes. A copy of **tw telecom's** Internet Service Order Form is provided in the **Supplemental Information, Appendix 9**.
- **tw telecom's** Internet Services Agreement includes Standard Terms and Conditions.
- **Item 6. Charges, Billing, Taxes and Payment, Section (c)** addresses the handling of taxes. Two important items include:
 - The customer will be liable for taxes, government fees, and surcharges which are assessed by or paid to a appropriate taxing authority within the applicable statute of limitations period.
 - The term "Tax" does not include any tax on **tw telecom's** corporate existence, status, income, corporate property, or payroll taxes.

- ii. Do you have any hyperlinks in your contracts that you are unwilling to replace with hard text at the time of contract ratification? Please explain those.

Response:

- Yes. Included in **tw telecom's** Internet Services agreement are hyperlinks to our Internet Policy (IP Policy) and Authorized Use Policy (AUP).
- Due to the dynamic nature of the Internet and Internet related policies, the use of hyperlinks are preferred to permit the most current dissemination of these policies to our customers and **tw telecom** personnel.
- If it is desired, **tw telecom's** customers are able to access our most current IP Policy and AUP via these hyperlinks at the time of contract ratification.

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- iii. If at some point you were to lower your price offerings to The Quilt, would AQB's be required to sign a new term to receive the new prices?

Response:

- No. AQB's would not be required to sign a new term to receive new prices.

- f. Please provide confirmation that you have filed CALEA compliance information with the FCC.

Response:

- The following CALEA compliance information is included in the **Supplemental Information, Appendix 10.**
 - American Council on Education – The Application of CALEA to Higher Education Networks.
 - FCC Form 445.
- **tw telecom's** network is CALEA compliant.
- The Quilt and its members must determine whether their networks are subject to CALEA.
- If the Quilt and/or its members determine that their networks are subject to CALEA, they can undertake compliance activities themselves or utilize a "Trusted Third Party" to implement their CALEA compliance program.
- However, please note that **tw telecom** is not established to act as a Trusted Third Party for its customers and therefore the Quilt members would have to find those services elsewhere.

g. NOC Services

- i. What are your 24 x 7 NOC locations and the hours they are in the call rotation?

Response:

- Yes. **tw telecom** operates two (2) 24 x 7 x 365 Network Operations Centers (NOCs).
- **tw telecom** operates NOCs in Denver (Greenwood Village, CO) and St. Louis (O'Fallon, MO)

ii. Do you offer technical support services that give the customer primary contacts higher than the Layer 1 NOC? Can you describe technical support services offered to customers higher than tier 1 NOC? What types of flags or capabilities do you have in your systems to recognize AQB's as advanced customers?

Response:

- **tw telecom's** technical support services are initiated at Layer 1 through contacting the NOC.
- AQB's are flagged in the account name as a member of the Quilt Consortium.
- Access to higher level technical support is provided via **tw telecom's** escalation process.

iii. What are your NOC escalation procedures?

Response:

- If there has been no resolution/status on an AQB's existing Trouble Ticket, the AQB should call **tw telecom's** Denver Network Operations Center at 1 (800) 829-0420 (24 x 7 x 365) and request to speak to a Manager.
- If calls are not addressed after 15-minutes, contact:
 - George King, Director Customer Assurance
 - (303) 566-1757 (Office)
 - (720) 810-9626 (Mobile)
 - george.king@twtelecom.com

- If calls are not addressed after 15-minutes, contact:
 - Kaily Bissani, VP Customer Assurance
 - (303) 566-1277 (Office)
 - (720) 326-9682 (Mobile)
 - kaily.bissani@twtelecom.com
- If calls are not addressed after 15-minutes, contact:
 - Beth Lackey, Sr. VP – Denver Operations Center
 - (303) 566-1224 (Office)
 - (303) 808-2201 (Mobile)
 - beth.lackey@twtelecom.com

h. Security services

i. What security services do you provide?

Response:

- A comprehensive discussion of **tw telecom's** security services are provided in the **Supplemental Information, Appendix 11**.
- These security services include:
 - IP Backbone Network Security
 - Distributed Denial of Service (DDoS) Mitigation Services

ii. What are your contract procedures for reporting security incidents?

Response:

- Our customers' first point of contact is **tw telecom**'s NOC, specified in **Section 8** of our contract.
- Our first priority is to protect the **tw telecom**'s network performance and not allow security incidents to be further exploited through public announcements.
- **tw telecom** has developed close partnerships with our internet equipment vendors to assess potential security vulnerabilities.
- Formal security notifications are dependent on the severity of the security incident.
- Typically, **tw telecom** is aware of security incidents in advance of the vulnerabilities becoming public knowledge.

iii. What is your DoS response time?

Response:

- **tw telecom**'s DDoS Scrubbing service utilizes technology from Arbor Networks that is deployed in the network.
- **tw telecom** monitors customer's traffic for potential DoS attacks and alerts generated by our monitoring platform identifies potential threats at varying levels --- low, medium, and high.
- High alerts, which are most correlated to being a potential attack are investigated and are closed if determined to be benign or escalated to a customer contact if determined to be a potential attack.
- The SLA for investigating and escalating a high alert is 15 minutes.

iv. What are some details regarding trace back capabilities and policies?

Response:

- All **tw telecom** Internet customer are subject to the Acceptable Use Policy, attached in the **Supplemental Information, Appendix 7**.
- In cases where evidence of confirmed abusive Internet traffic is originating on **tw telecom**'s network, direct action is taken.
- For abuse traffic affecting the customer that is originating "off-net", **tw telecom** will use its relationships with other ISPs to inform the ISP of abuse originating on their network.

i. Service Level Agreements (SLAs)

i. Do you have an SLA?

Response:

- Yes. **tw telecom's** SLAs are detailed in our Internet Service Level Agreement which is included in the Supplemental Information, Appendix 12.

ii. What are the terms and conditions of your Service Level Agreements (SLAs)? Do you have commitments on items like these?

a. Installation Interval Commitment

Response:

- For Internet Services provisioned completely on **tw telecom**'s Network, our installation goal is within 17 business days from the date the Service Order is received by **tw telecom**'s Provisioning Network Operations Center (PNOC).
- For Off-net Services (provisioned through another provider), **tw telecom**'s installation goal is within 17 business days from the date the Service Order is received by the PNOC, plus the underlying provider's actual installation interval.

b. Network Availability

Response:

- **tw telecom's** Internet Services will be available to Customer at least 99.99% of the time in a calendar month or Customer will receive service outage credits referenced in the **Supplemental Information, Appendix 12, Section II.**
- A service outage causing network non-availability is defined as the inability to transmit and receive data due to a failure in **tw telecom's** equipment or network.
- Credits are based upon a percentage of the monthly recurring charge ("MRC") for the non-performing Internet Service.

c. Latency

Response:

- **tw telecom's** Internet Services will have an average round-trip transmission of 45 milliseconds or less between **tw telecom's** Internet POPs in the forty-eight contiguous United States and an average round-trip transmission of 75 milliseconds or less between **tw telecom's** Internet POPs in the forty-eight contiguous states, plus Hawaii.
- If **tw telecom** fails to meet the applicable Latency standard, credits will be calculated per the table included in the **Supplemental Information, Appendix 12, Section II.**

d. Packet Loss

Response:

- **tw telecom's** Internet Services will have packet delivery of 99.9% or greater.
- Packet Delivery is determined by averaging sample measurements taken during the most recent full calendar month between **tw telecom** Internet POPs.
- If **tw telecom** fails to meet the applicable Packet Delivery objective, credits will be calculated per the table included in the **Supplemental Information, Appendix 12, Section II.**

- e. Provider will notify Quilt network aggregator of loss of service or other problem within one hour and of repair within 1/2 hour of completion?

Response:

- If a **tw telecom** customer experiences a service impacting issue, we will call the customer within one (1) hour following the opening of a Trouble Ticket and provide status.
- The customer will be also be contacted as soon as problem is restored.
- A Trouble Ticket will be automatically closed after three (3) attempts are made to contact the customer.
- The final closing of the Trouble Ticket is contingent on speaking with the customer.

-
- f. SLA commitments for mutually agreed upon installation dates?

Response:

- Working in close coordination with the AQB, **tw telecom** will seek to arrange a mutually agreed upon installation date.

iii. Do you offer credits for failure to meet these SLA targets?

Response:

- Yes. Please refer to the **Supplemental Information, Appendix 12** for a complete explanation of the credits offered to AQB's for **tw telecom's** failure to meet the defined SLA metrics.

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- iv. If yes, are the credits applied proactively or does the client have to request the credits (credits automatically applied)?

Response:

- The AQB will initiate requests for credits with their local market sales account representative.

Section 5

Support for AQB Program

5. Support for AQB Program

- a. Regarding existing IP-Transit Internet service agreements in place with Quilt Authorized Buyers:
- i. If proposer is currently an Authorized Quilt Provider, how would services purchased against prior Quilt agreement(s) be transitioned to the new program?

Response:

- Services purchased against prior Quilt agreements would continue in accordance with the existing contract term.
- Upon contract expiration, **tw telecom** will discuss future bandwidth requirements with the AQB and provide pricing.
- If pricing is reduced during the AQB's contract term, **tw telecom** will re-rate existing IP-Transit service agreements in accordance with the new/lower price schedule.

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- ii. Specify how these circuits would be counted toward any aggregation levels and how their current pricing would transition to the new pricing. A transition plan for services purchased under existing Quilt agreements is required.

Response:

- The total aggregate volume level achieved under the prior agreement would be the basis from which pricing would be applied to the new price schedule.
- This transition plan for services purchased under existing Quilt agreements is consistent with our 2012 Quilt transition process.

- iii. For current Authorized Quilt Providers and other proposers, state whether services purchased by Quilt Authorized Buyers against other (non-Quilt) agreements may be transitioned to the new program and provide terms for transition.

Response:

- **tw telecom** recognizes the importance of transition periods for AQB's and is committed to coordinating with the Quilt and AQB's during a transition period.
- AQB's who currently have a non-Quilt agreement with **tw telecom** are encouraged to transition to the new program.
- Terms of the transition would be evaluated based on:
 - The expiration term of the AQB's current non-Quilt agreement with **tw telecom**.
 - The overall net-impact to the Monthly Recurring Revenue (MRR)/ capital investment financials associated with transitioning the AQB from a non-Quilt agreement to the Quilt agreement.

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- iv. Explain how these transitioned services will be counted toward any aggregation levels.

Response:

- Bandwidth associated with AQB services transitioned from a non-Quilt agreement to a Quilt agreement would be counted towards determining the new total bandwidth aggregation level.

- v. At a minimum, transition plans should include the ability for Quilt Authorized Buyers to amend existing agreements, regardless of whether or not they are Quilt agreements, to reflect then-current Quilt pricing and terms during the term of the Quilt Master Services Agreement and for Quilt to count the respective capacity toward any relevant aggregation level.

Response:

- **tw telecom** is in complete agreement with this statement, subject to the criteria previously addressed in Item 5.a.iii.

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- vi. Based on the Quilt Authorized Buyers list, identify existing customers who are Quilt Authorized Buyers and, to the extent possible, provide contract terms associated with them.

Response:

- A summary of **tw telecom's** existing Quilt AQB's appears in the **Supplemental Information, Appendix 13**.
- Due to customer confidentiality restrictions in our standard Internet Terms and Conditions, **tw telecom** is not permitted to release customer specific information.

- vii. If customers cannot be identified or any part this information cannot be provided due to non-disclosure agreements in effect with existing customers, please indicate such customers with the label “NDA Customer” and state the current capacity provided to such unidentified customer.

Response:

- **tw telecom's** existing Quilt AQB's are identified as “NDA Customer #” and are shown in the **Supplemental Information, Appendix 13.**

viii. If there is an aggregate review schedule, will you perform it quarterly on 3/31, 6/30, 9/30, and 12/31? This is the Quilt's preference.

Response:

- Yes. **tw telecom** considers our Quilt Liaison meetings critical in demonstrating our on-going commitment to our alliance with the Quilt.
- **tw telecom** currently performs an aggregate review on a monthly basis with our Quilt Liaison, but will change to quarterly if desired.
- Since our first selection as an Authorized Quilt Provider, **tw telecom** has not missed a single monthly Quilt Liaison meeting, with the first meeting held on 09/15/06.

- ix. Will you be able to report circuit sales and selling price to the Quilt liaison the last day of every month? (Preferably a complete list of qualifying circuits with highlighted additions.)

Response:

- **tw telecom** currently reviews bandwidth sales, selling prices, AQB bandwidth upgrades, pending opportunities, and IPv6 activations with our Quilt Liaison on a monthly basis.
- Changes to the list from the previous month are highlighted for each section and reviewed during our monthly Quilt Liaison calls.

Key Contacts

Quilt Program – Key Contacts

- Mark Wilcop, Sr. Manager – State / Local Government & Education
 - (303) 566-1858 (Office)
 - (303) 884-8989 (Mobile)
 - (303) 290-0812 (Home)
 - mark.wilcop@twtelecom.com
- Ken Folderauer, President – Public Sector
 - (301) 361-3525 (Office)
 - (443) 421-1419 (Mobile)
 - ken.folderauer@twtelecom.com

Questions / Answers

Closing Comments

Thank you