



# Financial Information Forum Market Data Capacity Charts April 2009 Data EXCERPT

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# Table of Contents

Market Data Capacity Statistics	Slides	
<b>Monthly Highlights</b>	<ul style="list-style-type: none"> <li>■ Exchange Messages per Second</li> <li>■ Daily Peak Messages</li> </ul>	
<b>OPRA Capacity Statistics</b>	<ul style="list-style-type: none"> <li>■ FIF Projection Based on OPRA 1 Sec Peak Rates</li> <li>■ Accuracy of FIF OPRA 1 Sec Peak Rate Projection</li> <li>■ FIF Projection Based on OPRA 1 Min Peak Rates</li> </ul>	<ul style="list-style-type: none"> <li>■ Accuracy of FIF OPRA 1 Minute Peak Rate Projection</li> <li>■ FIF Projection Based on OPRA Daily Peak Messages Rates</li> <li>■ OPRA Quote to Trade Ratio</li> </ul>
<b>Consolidated Equity Feeds and OPRA Capacity Statistics</b>	<ul style="list-style-type: none"> <li>■ Comparative 1 Min Peak Rates (Annual and Monthly Increase)</li> <li>■ Comparative 5 Sec Peak Rates (Annual and Monthly Increase)</li> <li>■ 5 Sec Peak Compared to 1 Min Peak (Annual and Monthly Increase)</li> </ul>	<ul style="list-style-type: none"> <li>■ OPRA &amp; Consolidated Equities 5 Second Peak Rates</li> <li>■ OPRA &amp; Consolidated Equities 1 Minute Peak Rates</li> <li>■ Consolidated Equities 5 Second Peak Rates</li> <li>■ Consolidated Equities 1 Minute Peak Rates</li> </ul>
<b>Equity SIP Feeds Capacity Statistics</b>	<ul style="list-style-type: none"> <li>■ CQS 1 Sec Peak Forecasts</li> <li>■ CQS 1 Min Peak Forecasts</li> <li>■ CQS Peak Daily Message Forecasts</li> <li>■ CQS Accuracy Charts</li> <li>■ CTS and UTDF Feeds – 1 Sec &amp; 1 Min Peak Rates</li> </ul>	<ul style="list-style-type: none"> <li>■ UQDF 5 Second Peak Forecasts</li> <li>■ UQDF 1 Minute Peak Forecasts</li> <li>■ UQDF Peak Daily Message Forecasts</li> <li>■ UQDF Accuracy Charts</li> <li>■ NASDAQ UTP Feed Peak Message Rate Data</li> <li>■ Equity SIP Quote to Trade Ratio</li> </ul>
<b>Equities Proprietary Feeds Capacity Statistics</b>	<ul style="list-style-type: none"> <li>■ Nasdaq Proprietary Equity Feeds 5 Second Peak Message Rates</li> <li>■ FIF Projection Based on TotalView - ITCH 3.0/ITCH 3.1 5 Sec and 1 Min Peak Rates</li> <li>■ Nasdaq Proprietary Equity Feeds Peak Message Rate Data</li> </ul>	<ul style="list-style-type: none"> <li>■ FIF Projection Based on NYSE ArcaBook Equities 1 Second (Core)</li> <li>■ BATS TOP Peak Message Rates</li> <li>■ BATS FAST PITCH Peak Data Rates</li> <li>■ Toronto TL1 TL2/CL1 CL2 Peak Message Rates</li> </ul>
<b>Derivative Proprietary Feeds Capacity Statistics</b>	<ul style="list-style-type: none"> <li>■ Nasdaq Proprietary Options Feeds 5 Second Peak Message Rates</li> <li>■ NYSE ArcaBook Options Peak Message Rates</li> <li>■ CME ITC and FIX/FAST Peak Message Rates</li> </ul>	<ul style="list-style-type: none"> <li>■ CEF Classic - Eurex &amp; CEF Peak Message Rates</li> <li>■ CEF Classic – CEF Total, Eurex &amp; CEF Ultra + Eurex Peak Message Rate Data</li> <li>■ Scoach Peak Message Rate Data</li> </ul>
<b>Exchange Peak Message Rate Methodology – SIAC, NYSE Arca, CME Group, NASDAQ OMX (SIP), NASDAQ OMX (Proprietary), Deutsche Börse, BATS, Toronto Stock Exchange</b>		

# April 2009 Monthly Highlights

## Exchange Messages per Second

Feed	Statistic	Monthly % Change		Apr-09 (MPS)	Six Month Forecast October 2009
Deutsche Börse Eurex	1 Sec Peak	▲▲	44%	50,362	
NASDAQ UQDF	1 Sec Peak	▲▲	18%	50,471	19% to 45,206 mps
SIAC CTS	1 Sec Peak	▲▲	8%	20,714	
Deutsche Börse CEF	1 Sec Peak	▲▲	3%	145,814	
SIAC CQS	1 Sec Peak	▲▲	3%	135,151	37% to 185,684 mps
NASDAQ TotalView - ITCH 3.1	5 Sec Peak	▲▲	1.3%	139,880	30% to 181,727 mps
NYSE ArcaBook Equities	1 Sec Peak (Core)	▲	33%	252,231	49% to 410,905 mps
NYSE ArcaBook Options	1 Sec Peak (Core)	▲	12%	565,522	
SIAC OPRA	1 Sec Peak	▲	6%	869,108	11% to 520,384 mps
NASDAQ BONO	5 Sec Peak	▲	4%	52,102	
NASDAQ ITTO	5 Sec Peak	▲	4%	63,108	
NASDAQ DAP	5 Sec Peak	▲	4%	61,917	
Deutsche Boerse CEF Ultra + Eurex	1 Sec Peak	▲	2%	30,214	
NASDAQ Level 2	5 Sec Peak	▲	0.8%	35,872	
Deutsche Boerse Scoach	1 Sec Peak	▲	0.5%	62,334	
NASDAQ TotalView – Aggregated	5 Sec Peak	▼	-0.8%	33,369	
NASDAQ UTDF	1 Sec Peak	▼	-4%	10,497	
BATS PITCH	1 Sec Peak	▼	-6%	228,030	
BATS TOP	1 Sec Peak	▼	-12%	80,440	
CME FIX FAST	1 Sec Peak	▼	-19%	10,914	
NASDAQ OMDP	1 Sec Peak	▼	-25%	155	
CME ITC	1 Sec Peak	▼	-34%	24,994	
NASDAQ NLS	5 Sec Peak	▼	-49%	10,365	

- Double arrow indicates record peaks

# April 2009 Monthly Highlights

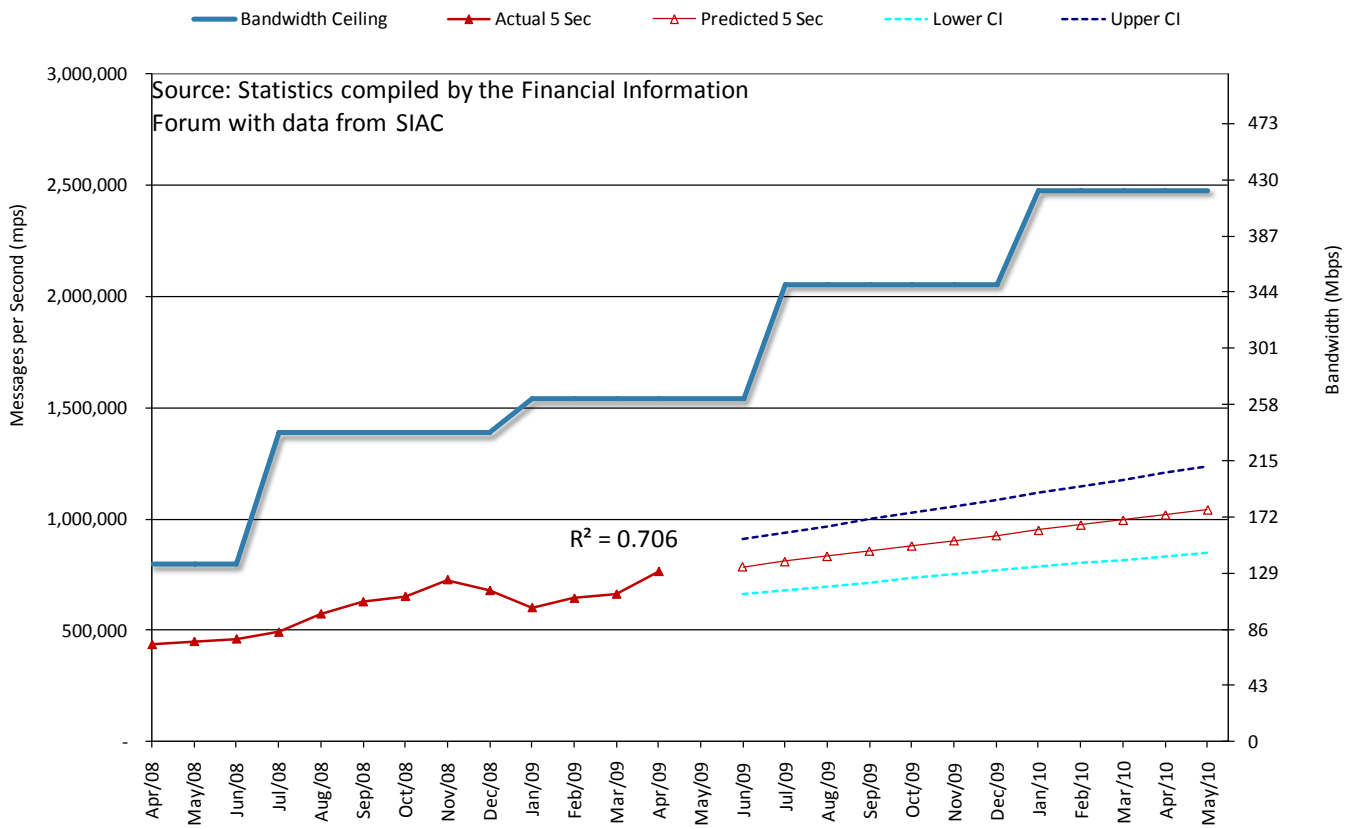
## Daily Peak Messages

Feed	Monthly % Change Daily Peak messages		Apr-09 (MSGs)	Six Month Forecast October 2009
NASDAQ OMDF	▲	19%	276,596	
SIAC OPRA	▲	6%	3,777,001,413	66% to 770,505,404 msgs
NASDAQ DAP	▲	5%	253,786,944	
NASDAQ ITTO	▲	4%	272,022,826	
NASDAQ UTDF	▲	4%	10,991,292	27 % to 4,780,877,568 msgs
Deutsche Börse CEF	▲	1.1%	704,700,497	
NASDAQ TDDS	▼	-3%	78,440	
NASDAQ UQDF	▼	-7%	142,371,602	
SIAC CTS	▼	-10%	39,245,389	
NASDAQ BONO	▼	-10%	141,300,401	
Deutsche Börse Eurex	▼	-12%	177,032,677	
NYSE ArcaBook Options	▼	-11%	1,658,751,363	
CME ITC	▼	-13%	83,164,010	
CME FixFast	▼	-13%	53,125,910	
SIAC CQS	▼	-14%	464,531,120	34% to 190,580,366 msgs
Deutsche Boerse CEF Ultra + Eurex	▼	-15%	147,775,851	
Deutsche Boerse Scoach	▼	-16%	458,847,564	
NASDAQ Level 2	▼	-17%	182,147,846	
NASDAQ TotalView - Aggregated	▼	-17%	362,202,762	
NASDAQ TotalView - ITCH 3.1	▼	-21%	579,182,764	
NYSE Arcabook Equities	▼	-25%	618,027,293	
BATS TOP	▼	-26%	148,621,480	
BATS PITCH	▼	-28%	396,305,823	
NASDAQ NLS	▼	-52%	25,083,339	
NASDAQ BTDS	▼	-53%	62,344	

- Double arrow indicates record peaks.

# OPRA Capacity Statistics

## FIF Projection Based on OPRA 5 Second Peak Rates



Actual 5 Sec Peak	
May-08	448,413
Jun-08	459,488
Jul-08	489,775
Aug-08	571,538
Sep-08	625,829
Oct-08	650,287
Nov-08	724,596
Dec-08	676,247
Jan-09	599,586
Feb-09	641,617
Mar-09	660,067
Apr-09	<b>761,339</b>
Predicted 5 Sec Peak	
Jun-09	783,718
Jul-09	806,715
Aug-09	830,480
Sep-09	854,244
Oct-09	877,241
Nov-09	901,005
Dec-09	924,002
Jan-10	947,766
Feb-10	971,531
Mar-10	992,995
Apr-10	1,016,759
May-10	1,039,756

- While a good fit to historical data, OPRA ceilings indicate that other factors are driving bandwidth ceiling requirements
- OPRA Ceiling: 1,540,000 mps (263 Mbps); July 7, 2009: 2,053,000 mps (351 Mbps); Jan 5, 2010: 2,475,000 mps (423 Mbps); July 13, 2010: 2,805,000 mps (479.7 Mbps).
- FAST for Symbology network activated on November 17<sup>th</sup> 2008.

# OPRA Capacity Statistics

## Accuracy of FIF OPRA 5 Second Peak Rate Projection

Month	OPRA - 5 Second Accuracy													
	Actual	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08	Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09
Apr-08	434,518	99%	-	-	-	-	-	-	-	-	-	-	-	-
May-08	448,413	100%	100%	-	-	-	-	-	-	-	-	-	-	-
Jun-08	459,488	101%	102%	102%	-	-	-	-	-	-	-	-	-	-
Jul-08	489,775	98%	99%	100%	99%	-	-	-	-	-	-	-	-	-
Aug-08	571,538	87%	88%	89%	88%	88%	-	-	-	-	-	-	-	-
Sep-08	625,829	83%	83%	84%	84%	84%	87%	-	-	-	-	-	-	-
Oct-08	650,287	82%	83%	84%	83%	83%	87%	90%	-	-	-	-	-	-
Nov-08	724,596	76%	77%	78%	77%	77%	81%	84%	88%	-	-	-	-	-
Dec-08	676,247	84%	85%	86%	86%	86%	90%	94%	98%	104%	-	-	-	-
Jan-09	599,586	98%	98%	100%	100%	100%	105%	109%	115%	122%	122%	-	-	-
Feb-09	641,617	94%	95%	97%	96%	96%	101%	106%	111%	119%	119%	114%	-	-
Mar-09	660,067	94%	95%	96%	96%	96%	101%	106%	112%	121%	120%	115%	111%	-
Apr-09	761,339	84%	84%	86%	86%	86%	90%	95%	100%	109%	109%	103%	99%	96%

- Percentages indicate how close the predicted value was to the actual 5 Second peak. For example, the prediction made based on March 2009 data for April 2009 was 96% of the actual value of 761.339 mps.
- Due to the variable nature of FIF predictions, firms may consider applying a multiplier to the projected values for internal capacity planning.
- Projections from the past twelve months (Mar 08 to Mar 09) have under-predicted by a maximum 16% and over-predicted by maximum of 9%.
- Projections are based on a linear regression of twelve months historical data.

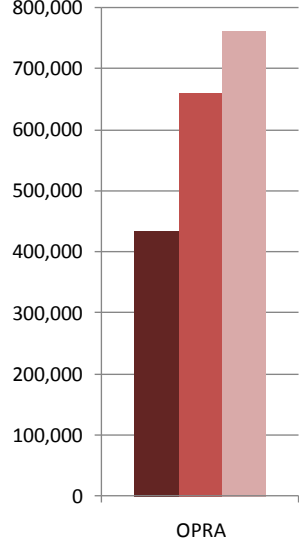
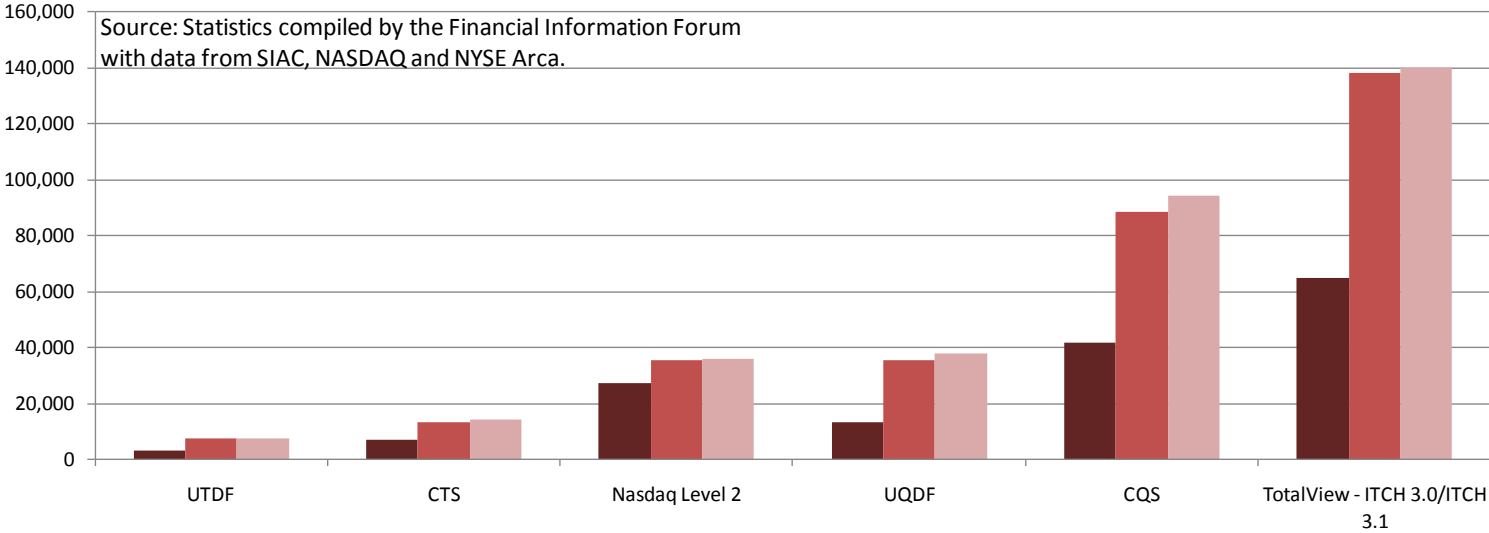
# Consolidated Equity Feeds and OPRA Capacity Statistics

## Comparative 5 Second Peak Rates (Annual and Monthly Increase)

Feed	Apr-08	Mar-09	Apr-09	Monthly % Change	Annual % Change
UTDF	3,206	7,499	7,589	1.2%	137%
CTS	7,260	13,363	14,264	7%	96%
Nasdaq Level 2	27,223	35,576	35,872	1%	32%
UQDF	13,301	35,622	38,012	7%	186%
CQS	41,886	88,393	94,371	6.8%	125%
TotalView - ITCH 3.0/ITCH 3.1	64,906	138,064	139,880	1%	116%
ArcaBook Equities	83,632	143,282	149,967	5%	79%
OPRA	434,518	660,067	761,339	15%	75%
<b>Totals</b>	<b>675,932</b>	<b>1,121,866</b>	<b>1,241,294</b>	<b>11%</b>	<b>84%</b>
<b>5 Sec Peak Total as % of 1 Min Peak</b>	<b>130%</b>	<b>140%</b>	<b>172%</b>	<b>23%</b>	<b>33%</b>

<b>Annual Traffic Increase</b>	<b>1.836</b>
<b>Annual Traffic Percent Change</b>	<b>84%</b>
<b>Monthly Traffic Percent Change</b>	<b>11%</b>

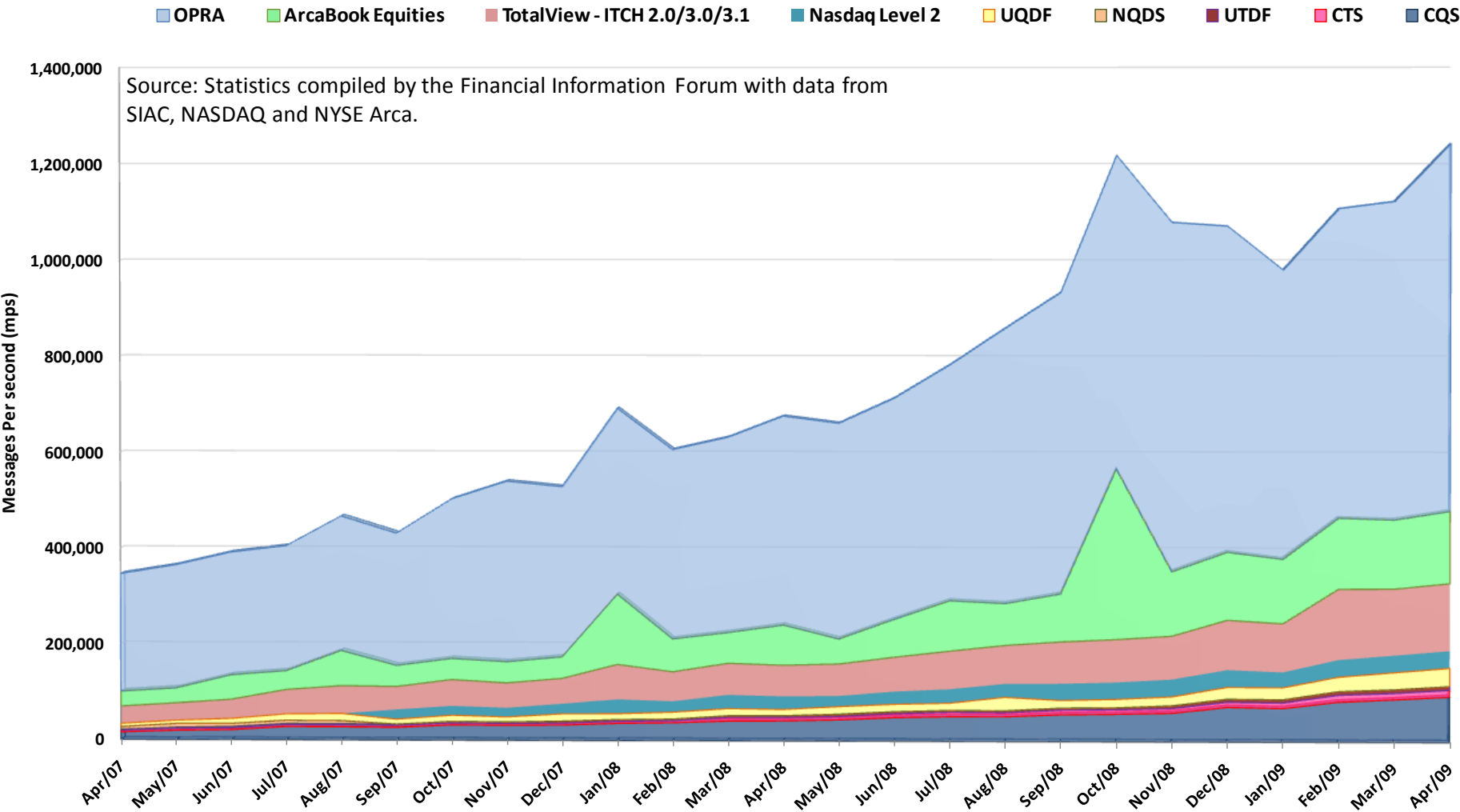
■ Apr-08   ■ Mar-09   ■ Apr-09



Note: TotalView ITCH 2.0 has been discontinued in 2009. TotalView ITCH 3.0 data shown for Apr 2008 and Mar 2009; TotalView ITCH 3.1 data shown for Apr 2009  
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# Consolidated Equity Feeds and OPRA Capacity Statistics

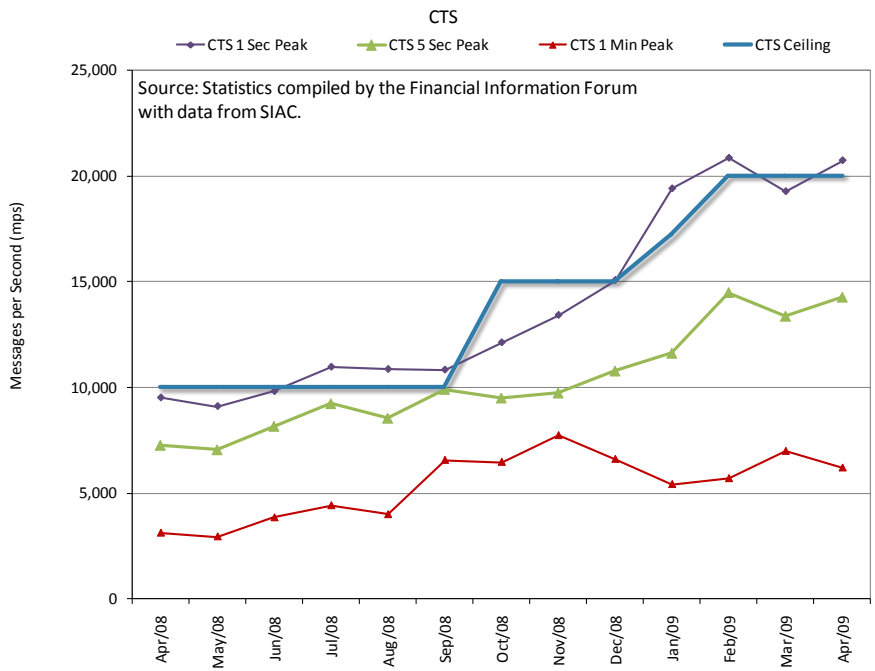
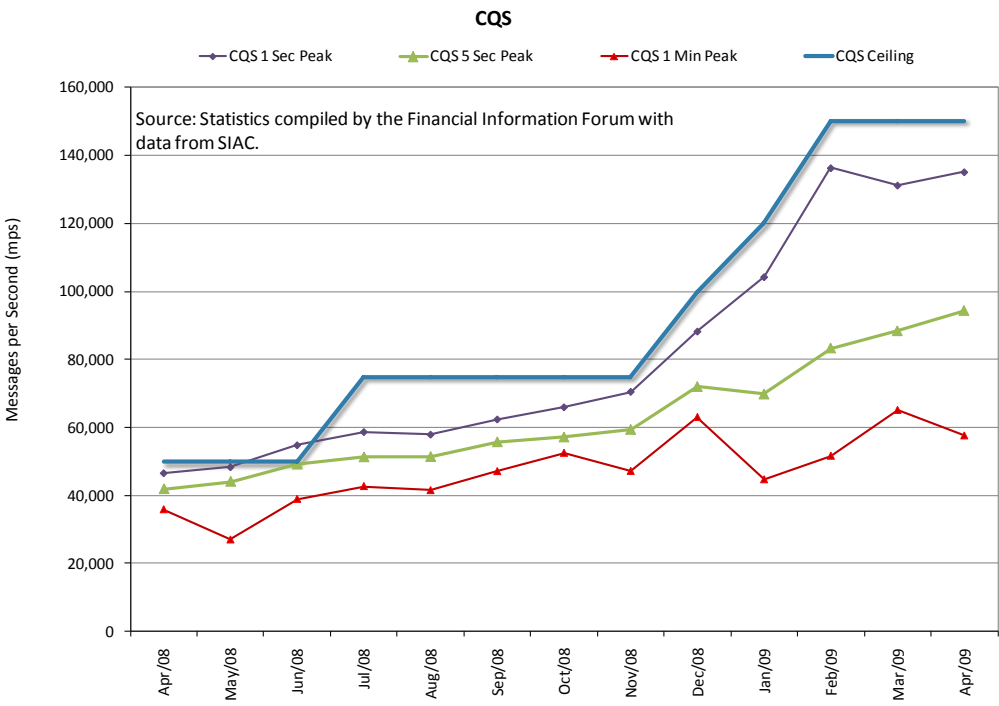
## OPRA & Consolidated Equities 5 Second Peak Rates



Note: TotalView data is based on: TotalView ITCH 2.0 shown from Apr 2007 to May 2007 ; TotalViewITCH 3.0 Shown from June 2007 to March 2009. TotalView ITCH 3.1 shown from April 2009 onwards. TotalView ITCH 2.0 has been discontinued in 2009. TotalView Legacy has been discontinued since June 2007.

# Equity SIP Feeds Capacity Statistics

## CTS and UTDF Feeds – 1 Second & 1 Minute Peak Rates



- On Monday, July 27<sup>th</sup>, 2009 CTS will expand to the new 26 multicast lines.
- On Monday, June 1<sup>st</sup>, 2009, CQS expanded to 24 multicast lines

**Current Ceilings**

- CQS Ceilings: 150,000 mps, 78.3 Mbps. May 2009: 220,000 mps, 114.80 Mbps. Jan 2010: 250,000 mps, 143.60Mbps.
- CTS: 20,000 mps (6.5 Mbps), July 2009 30,000 mps (10.7 Mbps), January 2010 50,000 mps (17.8 Mbps)

Note: UTDF 1 Sec Peak Data has been available since January 2009