

Aspen Research Group, Ltd.

Aspen Graphics 3.71 for Reuters SSL

ASPEN RESEARCH GROUP DOCUMENTATION

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ASPEN GRAPHICS 3.71 FOR REUTERS REUTERS SSL

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Document Conventions and Scope

In addition to using the *Microsoft Manual of Style for Technical Publications*¹ for interface naming conventions, computing terms, and general usage, this document uses font conventions to delineate and clarify key aspects of the Aspen Graphics for Reuters SSL environment:



FONT STYLE	MEANING
10 pt Tahoma	Standard body text
10 pt Tahoma bold italic	Document cross-references and italicized emphasis.
"10 PT TAHOMA CAPS WITH QUOTATION MARKS"	Aspen Graphics keyboard command or command string.
Indented 11 pt Verdana	Symbol entry examples.
1. Numbered 10 pt Bold Arial	Sequentially ordered list.
<u>Underlined Arial.</u>	Internet hyperlink.
[Keystroke]+[Keystroke]	Keystroke combinations.
< <i>italics</i> > < <i>italics</i> >	Symbol syntax.
Boxed, shaded Teal Arial	Important Note.
 bold w/graphic	Product Tip.
 Boxed Red Arial with Exclamation Point	Product Warning.

Table 1 Aspen Graphics for Reuters SSL Document Conventions

Document Scope

This release note contains the primary enhancements and innovations in Aspen Graphics Version 3.71 for Reuters SSL, up to and including build 371159, dated June 27, 2000.

¹ **Microsoft Manual of Style for Technical Publications**, © 1998 Microsoft Press, Microsoft Corporation, Redmond, Washington.

Reuters SSL Terms

Application Server

Because the Reuters SSL network supports multiple applications and data feeds, there are actually three possible types of SSL 4.0 applications—a sink application, a source application, and a Reuters Reliable Broadcast Protocol (RRBP) messaging application. Each of these application types is mapped in the IPCROUTE and SERVICES files. The generic term “application server” can refer to any of these three types of servers that are requesting particular types of application data on the SSL network. For the purposes of this document, the Aspen Graphics for Reuters SSL server is the “application server.” It is more technically a “sink application server.”

DACS

Data Access Control System (DACS) is a proprietary Reuters permissioning and entitlement system that complies with the contractual reporting requirements of vendors and exchanges. DACS allows for managing and reporting of data usage control on Reuters networks. DACS is not supported in this release. Instead, Aspen Graphics for Reuters SSL entitlements are regulated using the Aspen Research Group, Ltd. ADMIN network utility. See the **ADMIN Reference Guide** on our Web site at www.aspenres.com/website/documents.htm for details.

Host

Host is another term for the application servers (sink distributors) accessing the Triarch backbone, or SSL SPARCstation. Host names are specified in the Hosts file, located on the NT server under C:\winnt\system32\drivers\etc. See **Sink Distributor** and **Sink Application**, below.

Hosts

The Hosts file, stored on Windows NT servers and workstations in C:\WINNT\system32\drivers\etc associates host names and IP addresses on a network.

IPCROUTE

IPCROUTE is a file containing available SSL servers on a network and their associations to an Aspen node. It is installed in C:\VAR\TRIARCH during the Reuters SSL software installation process. For a particular host machine, a distinct IPCROUTE file entry is made for each of the SSL application type running on that host. The entry tells the SSL library which network machine runs the corresponding SSL server.

ILA

ILA is an acronym for IDN Logical Address, a number uniquely identifying a Reuters SF+ server or keystation (see below).

Keystation

Keystation is a Reuters term for a port into AMS SelectFeed Plus server.

Node

A “node” is a term for the servers attached to the Triarch backbone, whether the server is acting as sink application, sink distributor, or both, as in the case of Aspen Graphics.

Server

In this document, "server" and "application server" refer to the Aspen Graphics for Reuters SSL server. On an SSL network, a server can be any machine that provides information to client applications. See also: **Host**.

Service Distributor

The service distributor is an optional service with SSL 4.0 that performs load-balancing/"traffic-cop" network regulation functions. It is designed to make sure that SSL sink requests are responded to by the most appropriate source server as efficiently as possible.

Services File

SERVICES file, located in C:\Winnt\Sys32\drivers\etc on the Aspen Graphics server. It is installed by the SSL software and regulates the TCP port number for communication from the Aspen server to the SSL sink distributor.

Sink

Sink is a general programming term for a data pool. Data sink streams read from or write to specialized data sinks including strings, files, and pipes.

Sink Application

The sink application is a Reuters term for the server or other machine which makes source server requests on the network backbone.

Sink Distributor

Sink distributor is a Reuters term for the SSL server software which reads and coordinates requests from the source and application servers. Using the service distributor process, it monitors the traffic on the network and acts as the network backbone, providing the data to all of the sink servers/applications and data sources on the network.

Solaris

Solaris is Sun Microsystems' industry-leading UNIX distributed operating environment. The Reuters SSL SPARCstation currently runs Solaris Version 2.6. Solaris Version 7 is expected to be supported in the next Aspen Graphics release.

Source Distributor or Server

Source distributor or server is a Reuters term for the server software processing Reuters data from the IDN Data Center (or third party data vendor). The software writes the data to the LAN after converting it from a telephone data structure to a network structure. On an Aspen Graphics for Reuters SSL network, the Source Server is currently a Sun Sparcstation. Larger Triarch sites may have several SSL machines and run Source on one and sink on another.

SPARCstation

SPARCstation a Sun Microsystems term for their UNIX server running Solaris. It is one of several available SSL hardware systems. On a Reuters SSL network, the Sparcstation acts as the Triarch network backbone, supporting a one to one many relationship with the AMS SelectFeed Plus (source) servers, and the Aspen Graphics NT server and other data hosting applications on a network. See also: **Triarch**.

SSL

SSL is a Reuters acronym for "Source Sink Library". SSL is the Reuters interface for real-time market data. The name comes from its role in coordinating the processes of the source server(s) and the sink server(s). SSL is the protocol used for Triarch—see below.

Triarch

Triarch is a registered trademark name of Reuters, referring to their open system for the distribution of digital financial information in trading rooms. Triarch 2000 is used in over 900 trading rooms worldwide to provide an infrastructure and display environment allowing traders to view all forms of financial information speedily, accurately, safely and in a cost controlled manner. Triarch uses the SSL protocol to collect data from several data sources to a separate and distinct front-end desktop application called Kobra and/or RTW (Reuters Trader Workstation).

Getting Help

Contacting Reuters Technical Support

- ❑ Reuters Technical Support E-Mail: customer@reuters.com
- ❑ Reuters Technical Support Phone: US Number is 800-435-0101. See .RTPAGE Phone/help for a complete listing. Also see .RTPAGE Alert for data content updates.
- ❑ Reuters open systems support website: <http://www.opensystems.reuters.com/waverunner/index.htm>
- ❑ Reuters contact feedback form: <http://www.reuters.com/contacts/gencontact.htm>
- ❑ Reuters commodities, futures, and financial futures page: <http://www.commods.reuters.com/>

Contacting Aspen Research Group, Ltd. Technical Support

- ❑ Aspen Graphics Support Team E-Mail: support@aspenres.com
- ❑ Aspen Research Group, Ltd. Web site: <http://www.aspenres.com>
- ❑ Chicago Office Tel: 312-474-0820, Fax: 312-474-0820.
- ❑ CO Office Tel: (970) 945-2921, Fax: (970) 945-9619.
- ❑ Houston Office Tel: 281-679-1273, Fax: 281-679-1272.
- ❑ London Office Tel: +44 (0) 171 531 1990, Fax: +44 (0)171 531 1991.
- ❑ NY Office: Tel: 212-425-9588, Fax: 212-425-9349.

Features and Benefits of Aspen Graphics for Reuters SSL

Advantages of Reuters SSL Over SelectFeed Plus

Better Server Data Backup/Redundancy

Reuters SSL sink distributor supports multiple connections between the Aspen server and the Triarch backbone, and actively manages application server requests with a service distributor. The sink distributor can connect up to 246 host data (SF+) servers, some of which can be connected to a different Reuters IDN Data Center. This means if an Aspen server, SSL sink distributor, **and** data center went down, another host data server could continue receiving data from an alternate data center, relaying it to an alternate SSL sink distributor, and pass the data to an alternate Aspen server. Reuters calls this feature "Hot Standby." See the *Aspen Graphics for SSL Topology Diagram* on page 30.

Automatic Aspen Graphics Workstation Failover

In addition to backup data server redundancy and load balancing, Aspen Graphics includes support for automatic reconnection and recovery. If an Aspen server suddenly goes offline, the Aspen Graphics workstation can immediately connect to one of eight specified alternate servers. See *Automatic Workstation Failover* in the *Version 3.71 Overview* document for more details.

Support for Multiple Trading Applications and Data Feeds on a Single Network

A single Reuters SSL sink distributor can handle up to 246 host data servers, allowing unprecedented data variety. This allows for multiple applications and different data feeds on the same network. With a multi-monitor Aspen Graphics system and the appropriate software configurations, you will soon be able to display news from Reuters and Forex data from BridgeFeed simultaneously on a Triarch backbone. However, Aspen Graphics Version 3.71 currently supports only Reuters SSL data on SSL networks.

Greatly Expanded Watchlist Sizes/Cost Efficiency

Because a single SSL sink distributor can support up to 256 data source (SelectFeed+) servers, the workstations on the network get the benefit of sharing not just one SelectFeed Plus watchlist, but several. Each source server is uniquely entitled for Reuters data, so there is no cost overlap in the symbols that are on the watchlists. The SSL service distributor automatically routes all workstation requests to the appropriate source server.

Support for New Reuters Instrument Types

Aspen Graphics for Reuters SSL includes support for Reuters delayed RICs, Aspen Graphics exchange statistics symbols, and synthetic total volume and open interest symbols. You can request delayed quotes for certain instrument types even when your network is not entitled for real-time data for those instruments.

Integrated Source Distribution, Database Management, and Data Content Flexibility

SSL includes source distribution and a Reuters proprietary database management system (DBMS) in a single process. This results in the ability to store a potentially unlimited database, to turn database caching off or on, and the ability to use unrestricted data structure formats on the SSL network.

Windows NT Memory Optimization

Aspen Graphics for Reuters SSL includes memory optimization techniques that ensure that the Aspen server uses its resources for optimal data updates and storage. See ***Windows NT Memory Optimization*** in the ***General Version 3.71 Release Notes*** for more details.

Multiple Reconnection Attempts During Long Reuters Data Center Outages

In addition to automatic workstation recovery if the server goes offline, the Aspen Graphics for Reuters SSL server has built in recovery mechanisms if the connections to the Reuters SSL sink distributor or Reuters IDN Data Center are broken.

Before Aspen Graphics Version 3.60b, during a long network outage you may have encountered the message "No data from AMS box," followed later by "Connecting to Reuters," followed by a delay as nothing further happened. This was caused by the communications code only making one recovery attempt. The version 3.60b and 3.71 servers now make repeated communication attempts, with messages to that effect.


Note: If you are experiencing network problems, fix the problems at the source (network card, cables, congestion, etc.) Aspen can and should recover from such failures, but some data (Forex, indices) cannot automatically be retrieved from Reuters and will be lost.

Aspen Graphics for Reuters SSL Features

Miscellaneous Version 3.71 Enhancements

SUPPORT FOR MCP/IPX PROTOCOL

Aspen Graphics Version 3.71 for Reuters includes support for the MCP/IPX between the Aspen server and workstations. Previously, only TCP/IP server/workstations connections were available.

 **Warning! communication between the Aspen server and SSL or SelectFeed Plus servers is TCP/IP only. By default, the server command line argument is IP only. If IPX is added to the command line argument manually, the server System ID will change, and all ADMIN entitlement profiles will be lost. The Version 3.71 installation attempts to modify the existing shortcut to remove the IPX argument—if you have renamed your shortcut, or have several shortcuts, be careful not to launch a Reuters server with the IPX command line on it, unless you want to rebuild the entitlement profiles.**

EXPANDED SUPPORT FOR DOW JONES NEWS

The ADMIN entitlement dictionary was expanded to include 50 new Dow Jones News products, and the formatting of these stories is enhanced. Previously, some Dow Jones news stories did not have carriage return line feeds and were scrolling off the news window. This is now fixed.

IMPROVED TICK CORRECTION AND FILTERING

Aspen Graphics Version 3.71 includes a backfill mini-tick-filter. High and Low prices are corrected if a bad tick set them initially. A .REFRESH or automatic backfill detects erroneous prices and works to filter them.

INCREASED DVOL, TVOL, AND UVOL ACCURACY

Because of the nature of interactive data, the longer an instrument is on a watchlist, the more accurate the volume accuracy will be. If you add an instrument to the watchlist at noon, TVOL/UVOL/DVOL will accumulate from that point, but the daily accumulated values will be inaccurate since the entire day's data has not been accounted for. These values will become accurate after the server has been up for a 24-hour period—from session open to session close. Tvol now correctly displays number of trades today instead of total volume, for those instruments where Reuters supports the NUM_MOVES element. These instruments are generally futures contracts where per-trade volume is not reported.

ENHANCEMENTS TO LAST1-LAST8

LAST1-LAST8 now contains information that is more accurate. Aspen Graphics for SSL applies tick corrections to Last1-Last8 values, as long as the tick correction occurs between Time and Time8.

Note: Occasionally, the Time-Time5 values may be blank. This occurs when tick history is not available from Reuters. When backfill data is available, Time-Time5 will be backfilled from the available history.

When putting an instrument on the watchlist, LAST1-LAST5 values are loaded from appropriate data in the Reuters snapshot, if Reuters provides it. In some cases (namely, those cases where tick history is

also not available) the time field will be blank because no time is available. This is filled in as live data becomes available, usually at server startup or after the initial request for an instrument.

FIX TO REUTERS BOND YIELD DATA

Previously, entering a .REFRESH request for Reuters bond yield instruments caused the daily bars to be overwritten by dots representing the Close only. This has been corrected with the TS1PREFER=Setup.txt parameter. See **TS1PREFER (OFF)** on page 42 for more details.

ASPEN SERVER DYNAMIC PRICE SCALING ADJUSTMENT

Aspen Graphics for Reuters SSL adjusts price precision for market instruments automatically. Aspen algorithmically determines if the current precision should be used to establish the current contract price, offering enhanced display and study accuracy. If a particular decimal scale (10^n , not 2^n) is in use and a trade comes in with higher decimal precision, the Aspen Graphics for Reuters SSL server keeps track. If five ticks come in at higher precision than is currently in use, the server increases its sensitivity to display and stores market data in the new scale.

Note: This feature does not adjust downward if the pricing accuracy used by Reuters decreases.

DYNAMIC FOREX CONTRIBUTING BANK DESCRIPTIONS

When entering a Reuters currency symbol (for example, "EUR=" for the Euro) you may notice that the Description field on a Superquote or chart page changes. These instruments display and update the contributing bank codes in real-time. For a listing of Reuters contributing bank acronyms, type ".RTPAGE CONTRIBUTIONS" on your Aspen Graphics workstation.

DISTRIBUTED RTCHAIN AND RTQUOTE WINDOWS

- Aspen Graphics Version 3.71 includes an RTCHAIN and RTQUOTE window as part of the page suite. RTCHAIN is retrieved and filled with all of the instruments in the chain when you click on a RIC chain <0#Root:>.
- RTQUOTE is retrieved and filled with detailed data on a particular RIC when you click on a RIC in an RTPAGE.

Like all Aspen Graphics windows, these windows can be customized and edited to meet your trading and analysis needs—modify the layouts and resave them as windows with the name RTCHAIN and RTQUOTE.

MultiSession Instrument Display Enhancements

CUSTOMIZABLE ELECTRONIC VOLUMES

The Aspen Graphics Version 3.71 Edit Symbol dialog box includes the Volume=1 feature, allowing you to specify whether to use electronic volume values sent by the feed, or apply a default value of 1 to the instrument. This is particularly useful for multisession instruments (including CBOT bonds and Japanese Yen futures.) See **Turning Volume=1 On or Off** below for more information.

TURNING VOLUME=1 ON OR OFF

The Volume=1 field allows Reuters data subscribers to adjust the volume settings for multisession futures and for instruments that trade electronically and in the pit during the same trading session.

The default Volume=1 value for energy and electricity symbols is On, meaning that the contract volume will be 1 across all sessions. Treasury bond, energies, electricity futures, metals, and other multisession futures require setting the contract volume to 1, because the pit session volume is always 1, but the electronic trade volume is broadcast by the exchange. When these trade volumes accumulate across sessions, the resulting volume is inaccurate. There are also some instruments that simultaneously trade electronically and pit in a single session. Example: "SP#".

Note: Turn Volume=1 on only for instruments that trade pit and electronically simultaneously (TU, FV, TY, US), or that trade both electronically overnight and pit during the day (SP, DJ). Instruments that trade electronically only should have Volume=1 turned off because their volume is always correct.

ADJUSTING CASH BOND SCALING GLOBALLY FOR THE NETWORK

In addition to using the Version 8 Symbol Listing, a server administrator may choose to use the **CASHBONDSCALE** parameter (see page 42) on the Aspen Graphics for Reuters SSL server to display cash bond prices 64ths, non-reducible 128ths, 256ths, and any other supported display factor.

Tips for Displaying Multi Session Reuters Instruments

Reuters symbology for multisession instruments varies by exchange. However, not using a session prefix results in the composite symbol. The composite for soybeans, for example, is SX0. The day is 1SX0, the night is 2SX0, and pit-only is 3SX0.

Project A and ACCESS have different session concepts (and GLOBEX yet another). For CBOT beans, see .RTPAGE text page <PROJECTA> or the obsolete <CBT/S>. For NYM there is <NYM/NG>.

A NOTE ABOUT COMPOSITE TREASURY BOND VOLUME

Reuters does not provide real-time volume data for pit-traded instruments. When a volume or open interest figure arrives with a pertinent date (just before the start of pit trading for the day), the daily bar for that date is updated with the new statistic. However, for composite CBOT bonds (and possibly other CBOT Project A financials) the "composite" instrument USxx does not arrive with the combined electronic and pit volume – only delayed pit volume is provided. Reuters historical TS/1 data for the same contract USxx does, however, contain the composite volume.



Tip: We do not recommend using the composite symbol USXX for historic volume. Instead, use the 3USxx.volume for pit volume and ZBxx.volume for electronic volume. Add the two volume values on your chart for composite volume.

ENTERING OPTIONS WITH THE .U EXCHANGE SUFFIX

Effective December 1999, Reuters reduced the amount of OPRA equity (not index) options data they supply in their standard data feed. For any given equity, Reuters supplies options quotes only from the "dominant" exchange for that instrument, the options exchange where most of the trading volume takes

place. Because only one exchange is carried per underlying, you will not be able to compare data across exchanges.

The good news is that you no longer need to know which exchange to request when requesting symbols (.X for PHLX, .W for CBOE, etc.) Instead, the generic suffix ".U" represents the exchange that Reuters has selected for options on a given equity.

AOL100F.U, for example is an AOL June 100 call on whatever exchange (in this case CBOE) Reuters determines to be dominant in AOL. Reuters intends to continually monitor options volume and update their suite of dominant exchanges.

Note: if you require price data for option series from all OPRA contributors, not just the "dominant" exchange, you will need to purchase a separate data feed which will supply all OPRA options data, subject to the usual watchlist type of limitations. This package is currently available from Reuters.

For a complete listing of Reuters option month and strike codes, see .RTPAGE RULES2. Note that stock options (and some stocks) require exchange codes. These can be found on .RTPAGE RULES3.

Expanded Support for Price Scales and Instrument Types

SUPPORT FOR $\frac{1}{2}$ 32^{nds} (1/64^{ths}) AND $\frac{1}{4}$ 32^{nds} (1/128^{ths})

Aspen Graphics for Reuters SSL includes full support for instruments that trade in one half and one quarter 32^{nds}. These instruments include the five-year US Treasury Future (one half 32^{nds}) and the two-year US Treasury Future (1/4 32^{nds}). See the illustration of the two-year US Treasury Future below.



Tip: If the fractional remainder does not appear beside the 32nds, you may need to increase your font size. Choose Text/Larger from your Aspen Graphics menu bar to make the font larger.



Figure 1 Reuters 2 year US Treasury Note Display

SUPPORT FOR NON REDUCIBLE 64^{ths}, 128^{ths}, AND 256^{ths}.

Reuters Instrument Codes such as: "US10YT=RR," "US5YT=RR," and "US2YT=RR," are now accurately displayed, and adjustable with the **CASHBONDS** parameter as described on page 42.

Note: US1YT=RR is always displayed as a decimal value and is not adjustable via CASHBONDS.

ACCURATE SCALING OF JAPANESE YEN FUTURES (REUTERS)

The RTInfo.txt file was enhanced to provide accurate price scaling for Japanese Yen futures. The futures are now accurately displayed in the .9500 range (four decimal places). They were previously displayed to six decimal places.

SUPPORT FOR LIFFE LONG GILT VOLUME

Previously, per-tick volume data for LIFFE instruments, including the Long Gilt (FLGH0) was unavailable. Per-tick volume and open interest data for these instruments is now accurately processed, subject to the length of time the instrument is on the run-time watchlist.

SUPPORT FOR HISTORICAL TICKS FOR PARIS FUTURES (~FEX, ~FSX, ~FCE)

Previously, historical ticks for Paris futures were unavailable from the Reuters historical tick database. With Version 3.71, this data is now available.

USING ASPEN GRAPHICS FOR REUTERS FUTURE SPREAD MACRO SYMBOLS

Aspen Graphics for Reuters SSL supports spread macro expansions using three types of syntax:

- <future root>@S
- <future contract month>@S
- <future contract month or root>@S<contract specifier>

Example: GC@S (for all active Gold spreads) or CLF0@S (for active spreads where the base contract is CLF0), or GC@S2, which returns the first two available Gold spreads. The expanded list is ordered in ascending order by expiration date.



Tip: Use the spread delimiter to limit the number of spread contracts (example: GC@S6). However, the six returned contracts may not always be the first six spreads to expire. You can also specify all spreads for a specific contract month by using the full contract RIC before the @ sign. Example: "WN0@S3" returns the July/March, July00/July01, and July00/July02 spreads.

Limitations of Reuters Future Spread Macros

- The spread is limited to (and designed around) only what Reuters supports, i.e. how the spreads are traded on the floor.
- You can specify a contract name (W) or specific contract (WN0) with the spread macro. The Aspen Graphics # sign macro and Reuters c1 symbols are not supported with the spread macro.

ACCURATE RECOGNITION OF SPREADS AND SPREAD BID/ASKS

Certain spreads (e.g., FEXM0-U0) have a Reuters description indicating they are futures. These were previously unrecognized as "spreads." Additionally, Version 3.71 relaxes the tick filtering process for spreads and forwards since they can have high bid/ask spreads.

SUPPORT FOR TIME AND SALES JAPANESE GOVT BOND DATA

Aspen Graphics for Reuters SSL includes full support for Japanese Government bond data, including time and sales data.

SUPPORT FOR THE TOKYO INTERNATIONAL FINANCIAL FUTURES EXCHANGE (TIFFE)

Reuters has approved transmission of TIFFE data on Aspen Graphics & will begin reporting user totals for the TIFFE.

Note: Tokyo Stock Exchange (TSE) and Osaka Stock Exchange (OSE) data is presently unavailable on Aspen Graphics.

SUPPORT FOR FUTURES OPTIONS MACROS WITH DIFFERING OPTION/UNDERLYING ROOTS

Aspen Graphics for Reuters SSL supports futures options macros where the option root symbol differs from the underlying futures root symbol.

Example: options OGBL9600D0, OGBL9700D0, OGBL9850D0, which have an underling symbol of FGBL.



Tip: If you have an option symbol but would rather display data for the underlying, type the option symbol into the Omaster page. At the bottom right hand corner of the page is the .U (underlying) symbol. Or, type the entire option symbol and add a .U suffix to the symbol to display the underlying on a chart or quote window.

SYNTHETIC TOTAL VOLUME AND OPEN INTEREST (“XX-TOT”)SYMBOLS

For many futures symbols (xx), Reuters defines another symbol "xx-TOT" which contains the total open interest for all combined contract months. For example, the quote element "ED-TOT" (uppercase and quotes required) specifies the current open interest for Eurodollar contracts, totaled over all delivery months. Similarly, "LC-TOT" adds the open interest for all Live Cattle contracts, and "W-TOT" contains the open interest total for all Chicago Wheat contracts. "-TOT" data is stored in the server's daily database.

Note: total open interest is stored in both the "Open Interest" and the "Last" field. The total volume is stored in the "Volume" field. This allows for straightforward charting of daily values. A split chart of “xx-TOT” with a volume study creates a split window with open interest on top and total volume below, as in the figure below.

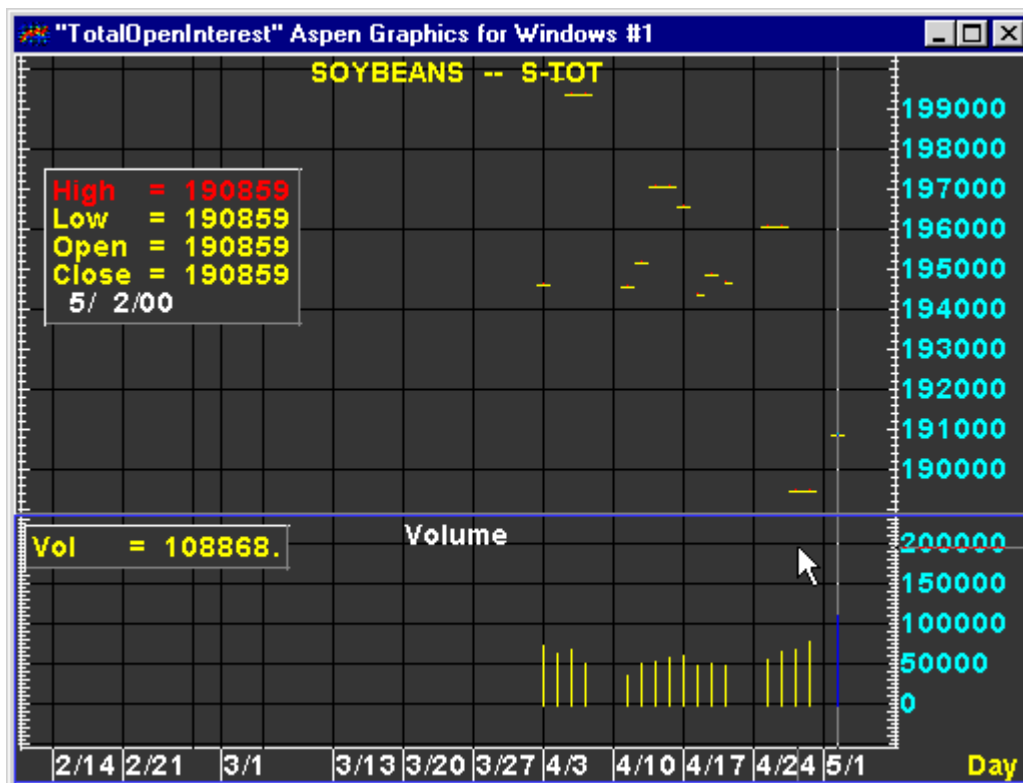


Figure 2 Illustration of -TOT Total Open Interest Symbol for Soybeans

Note: Only futures contracts trading on major US futures exchanges support this symbology. Continuation symbols are not supported with the -TOT suffix. Reuters is incrementally adding support for more exchanges. See .RTPAGE EXCHANGES for more information.

SUPPORT FOR REUTERS EXCHANGE STATISTICS (INCLUDING ARMS)

Both version 3.60b and 3.71 introduce the ability to chart or quote Reuters exchange statistics for major equity exchanges. However, Version 3.71 includes support for the ARMS index (..TRIN.x).

Note: Using the Exchange Filter, enable the desired exchange for "Stats" before attempting to chart an exchange statistic symbol. Reuters exchange statistic symbols require quotation marks.

Reuters Exchange Statistics Syntax

SYNTAX	MEANING
..AI.X	Count of issues advancing on exchange 'X'
..DI.X	Count of issues declining on exchange 'X'
..AV.X	Volume of shares advancing on exchange 'X'
..DV.X	Volume of shares declining on exchange 'X'
..NH.X	Count of new 52-week highs on exchange 'X'
..NL.X	Count of new 52-week lows on exchange 'X'

Table 2 Reuters Exchange Statistics Syntax

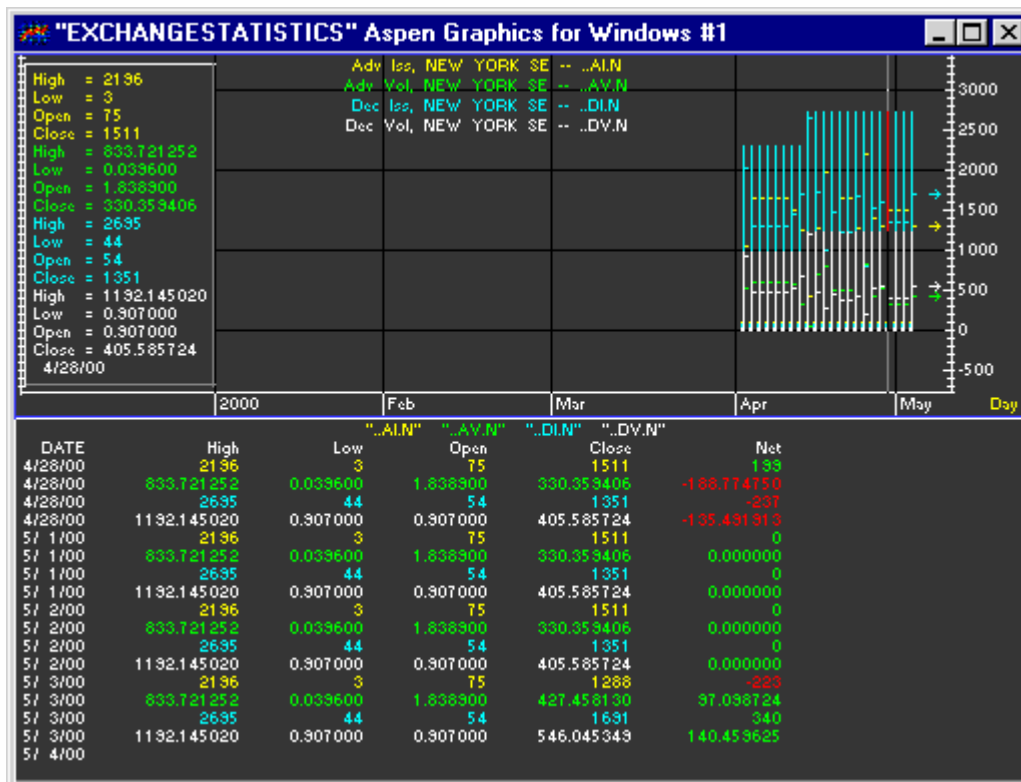


Figure 3 New York Stock Exchange Advancing and Declining Issues and Volume

Note: There are two leading periods in front of each instrument above. The exchange ID 'X' is identical to the one used when requesting an instrument from that exchange; .N for NYSE, .L for London, .O for NASDAQ, etc. These exchange suffixes are listed on .RTPAGE RULES3.

DISPLAYING DELAYED REUTERS SYMBOLS

To display delayed data for fee-based Reuters products, precede the Reuters Instrument Code (RIC) with a forward slash (/), and use the [Shift]+[Enter] Meta Keys. Example: "/GE" displays a delayed quote for General Electric, and "/USH0" displays a delayed quote for the March 2000 US Treasury bond contract.

Note: Delayed quotes are limited to quote pages—there is no delayed historical data, so there is nothing to chart.

DISPLAYING TREASURY BOND 6% SYNTHETIC COUPON RICs

On February 14, 2000 Reuters introduced perpetual contracts (two years of daily data) of 6% synthetic coupon prices under the case-sensitive RICs of:

- "UScm1t"
- "TYcm1t"
- "FVcm1t"
- "TUcm1t"

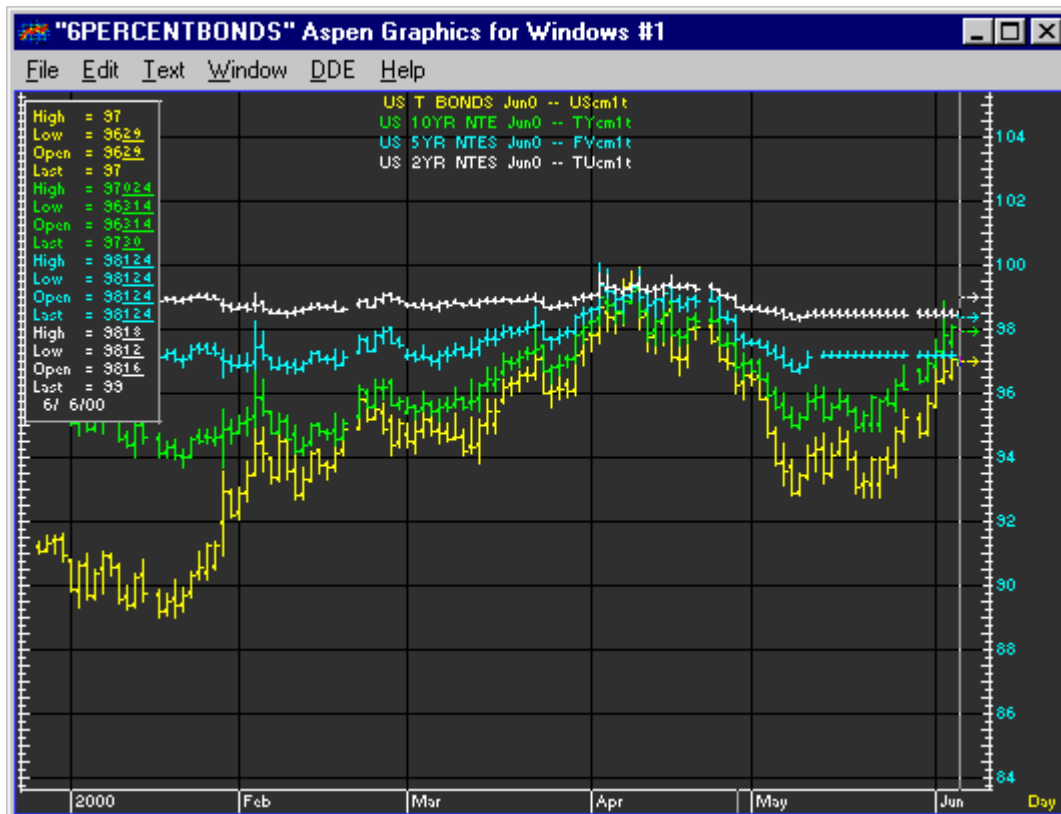


Figure 4 Illustration of Reuters 6% Synthetic US Bonds

These instruments have two years of *daily* back data available via .REFRESH.



Tip: use the [CTRL]+[ENTER] Meta keys when entering these symbols.

DISPLAYING PLATT'S PREV PRICES

Reuters does not supply Prev and Net for Platt's symbols. They are calculated by Aspen Graphics. If you have never requested a particular Platt's symbol before, or your database has been cleared:

- 1. Request a Platt's symbol or put it on the RT Permanent Watchlist at the server.**
- 2. Wait until the next day.**
- 3. Request the symbol again. From then on, you should always have Prev and Net values.**

Installing Aspen Graphics for Reuters SSL

Scenario: Installing and configuring an Aspen Graphics server on a Reuters SSL network. This network includes a Sun Sparcstation running SSL server software and a Windows NT server or workstation running both Aspen Graphics and SSL server software. The Aspen Graphics server connects to the Sparcstation via TCP/IP. The Sparcstation connects to an AMS using TCP/IP over a LAN. The AMS box connects to IDN via proprietary Reuters mechanisms opaque to the rest of the network.

SSL Network System components

- Windows NT Service Pack 4 or 6a server running Aspen Graphics NT server or workstation software and the latest version of SSL software.
- Sun SPARCstation 20 or higher running Solaris 2.6, Sun OS Release 5.6 and SSL 4.05 Load 2 or higher.
- AMS SelectFeed Plus server (s) running UNIX.
- TCP/IP network connections from the SSL SPARCstation(s) to the AMS server(s).
- Network cabling from the SSL SPARCstations to the Aspen Graphics NT server.

SSL SPARCstation Hardware and Software Requirements

The SPARCstation hardware and operating system software is arranged through Sun[®] Microsystems. To locate the nearest Sun[®] Microsystems sales office, visit the Sun Web site at: <http://www.sun.com/sales/> or call 1-800-SUN-0404.

Solaris Operating Environment

Following is an excerpt from the Sun Microsystems Web site at: <http://www.sun.com/finance/background/index.html#core>

“With more than 12,000 available applications, Solaris is the industry-leading UNIX distributed operating environment. More than 1,000 of these applications are financial services solutions, developed to take advantage of the multitasking and networking capabilities of Solaris. The multithreaded Solaris environment contributes to the high transaction processing and throughput benchmark results for Sun servers running key financial services applications.”

Aspen Graphics Server Hardware and Operating System Requirements

Detailed below are the available Microsoft Windows platforms and minimum hardware specifications required to run an Aspen Graphics server in the SSL environment. To enhance performance, we recommend a faster (RAID) Level 5 hard drive, more RAM, and a larger CPU cache. These measures may significantly increase performance of Aspen Graphics for Reuters SSL.

OS & HARDWARE	NT SERVER	NT WORKSTATION
O/S	NT 4.0, SP 4 or 6a	ALL PLATFORMS
HARD DRIVE	12GB (SCSI)	500MB (IDE or SCSI)
I/O PORT	16550 UART	N/A
MODEM	56K	N/A
MONITOR	800X600	800X600
MOUSE	BUS	BUS OR SERIAL
PROCESSOR	PENTIUM III 500 MHz	PENTIUM II 200 MHz
CPU Cache	1-2MB	512KB
PRINTER	N/A	ANY*
RAM	256MB [^]	64MB
NETWORK	TCP/IP	TCP/IP
VIDEO	VGA	SVGA

Table 3 Hardware Requirements

* Any printer supported by Microsoft Windows. [^]SDRAM or RDRAM.

Minimal 3.71 Memory Requirements

Note: These values include virtual memory and are the absolute minimum required for Aspen Graphics to even launch. The program itself requires 8 MB. At least 6 MB of this 8MB should be non paged. The more physical non-paged memory the better. Displaying more than a few charts, or using complicated formulas, cyber charts, or logging several workstations into a server will require more RAM.

Warning: More than 384 MB of RAM devoted exclusively to Aspen Graphics may actually degrade performance. If your server or standalone has more than 384 MB, consider decreasing the memory allocation using the MEM= command line argument.

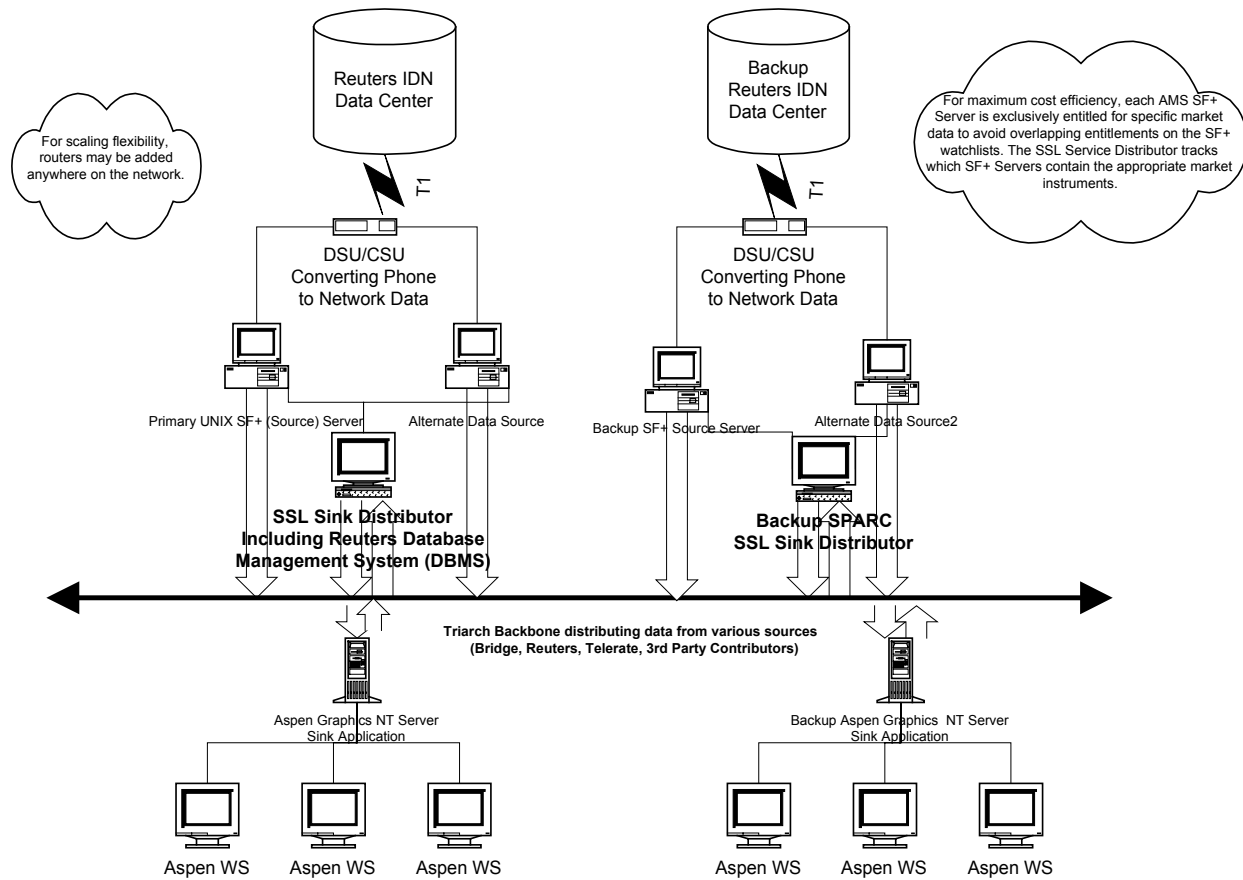
PLATFORM	BARE MINIMUM	FUNCTIONAL MINIMUM
Server	32MB	40MB
Standalone	20MB	32MB
Workstation	16MB	20MB

Table 4 Aspen Graphics Minimal Random Access Memory (RAM) Requirements

Reuters SSL Installation Sequence

1. **Contact Aspen Research Group Sales for the latest Aspen Graphics server and workstation software.**
2. **Contact your Reuters and/or Sun sales representative(s) for the latest SSL SPARCstation hardware and software.**
3. **Make sure your Aspen server supports TCP/IP networking. At the server, choose Start/Control Panel/Network/Protocols. Make sure you have node names and IP addresses for both the Aspen and SSL servers.**
4. **Arrange for a Reuters technician to set up the SSL hardware and install the SSL software on *both* the Sparcstation and NT (Aspen Graphics) server. In addition to installing a required DLL, the SSL installation process adds the Sun SPARCstation port number to the SERVICES file, located in C:/Winnt/Sys32/drivers/etc on the Aspen Graphics server.**
5. **Find out and note the total available watchlist size for your SSL installation. This figure is derived by the total capacity of all AMS SF+ servers on the network, combined with the setting of an SSL configuration parameter. The Aspen Graphics server needs to know the total number of instruments that can be updating at one time. The total should be based on what SSL can actually deliver, minus the watchlist use of any other SSL applications on the network.**
6. **Install the Aspen Graphics Server software. This process performs three main functions:**
 - **ADDS THE NAME AND IP ADDRESS OF THE SSL SPARCSTATION TO THE SERVER'S HOSTS FILE, LOCATED IN C:/WINNT/SYS32/DRIVERS/ETC.**
 - **ADDS THE SPARCSTATION INFORMATION TO THE IPCROUTE FILE, LOCATED ON THE ASPEN SERVER UNDER IN C:\VAR\TRIARCH .**
 - **ADJUSTS THE REQUIRED SETUP.TXT PARAMETERS ON THE ASPEN SERVER. (LOCATED IN C:\APEX).**
7. **Configure the AMS SF+ server.**
8. **Start the SSL sink distributor.**
9. **Start the Aspen Graphics server.**
10. **Create and assign user entitlement profiles for the network using the ADMIN utility.**
11. **Log in to the Aspen Graphics server with your workstation.**

Multiple Aspen, Source Server and SSL Sink Distributor Network Topology



Network requests are routed to the SSL Service Distributor, then the Sink Distributor. The Service Distributor decides which SelectFeed Plus source server should service the request. Responses are sent straight back to the requesting application. The Service Distributor can be connected to the Source Servers, via a network card LAN connection or concentrator line. There is virtually no limit on the number of SF+ servers that can be connected to an SSL Service Distributor.

Figure 5 Aspen Graphics for SSL Topology Diagram

Installation Step 1: Install SSL Hardware and Software

To establish your SSL network, first install SSL software on the SSL sink distributor (Sun Sparcstation), then on the Aspen Graphics (Windows NT) server or workstation serving as the host server. Install the Aspen Graphics server software last. The Aspen Graphics server installation process searches the registry path HKEY_LOCAL_MACHINE\SOFTWARE\Reuters for evidence of SSL software. If SSL software is not found, the Aspen Graphics server installation automatically terminates.

CONTACT REUTERS FOR SSL SOFTWARE INSTALLATION

Aspen Research Group, Ltd. does not distribute, install, or support Sun hardware or Reuters SSL software. Contact Reuters and Sun to arrange for the Sun hardware, SSL software and the Reuters technician to install it.

SSL INSTALLATION: BEFORE YOU BEGIN

1. The Hosts and IPCROUTE configuration files are self-documenting. As a result, this document provides you only the default settings and example syntax.
2. Aspen Graphics server installation terminates if SSL software is not detected on the Windows NT server registry during the Aspen Graphics server software installation process. The server installation searches HKEY_LOCAL_MACHINE\SOFTWARE\Reuters for evidence of a SSL application, so always install the SSL software first!
3. The Aspen Graphics server installation automatically applies many of these settings for you. In particular, Aspen Graphics for SSL server installation updates the Hosts, IPCROUTE, and Setup.txt file. Aspen Graphics server installation does not update the Services file. This file is created and modified by the SSL software installation process.
4. Always install the complete SSL software onto both the Aspen server and the SPARCstation. Do not copy or mix/match the SSL installation files from one machine to the other.

REQUIRED REUTERS SSL SOFTWARE VERSIONS

- ⇒ SSL Version 4.0.5 load 2 or higher. This is installed by the Reuters technician on the Windows NT Server and on the Sunsparcstation.
- ⇒ Sun Solaris Version 2.6 on the SSL sink distributor. In this example, the SSL sink distributor has the node name SSLSYSTEM and the IP address 10.53.102.19.
- ⇒ Windows NT 4.0 Service Pack 4 or 6a. Aspen Graphics server software runs on either NT Workstation or NT Server software.
- ⇒ Aspen Graphics Version 3.71 or higher. For the purposes of this document, we will call this server ASPENSRV, and assign it an IP address of 10.53.102.11.

Installation Step 2: Install Aspen Graphics Server Software

BEFORE YOU BEGIN

Make sure that SSL installed on the NT server or workstation that you are going to use as an Aspen server. In particular, check for SSL4W32.DLL in the Winnt/System32 directory. Aspen Graphics server software installation will abort if SSL is not detected during the setup process.

THE ASPEN SSL SERVER INSTALLATION PROCESS

After selecting Reuters SSL from the Select Data Feed dialog box (shown below)

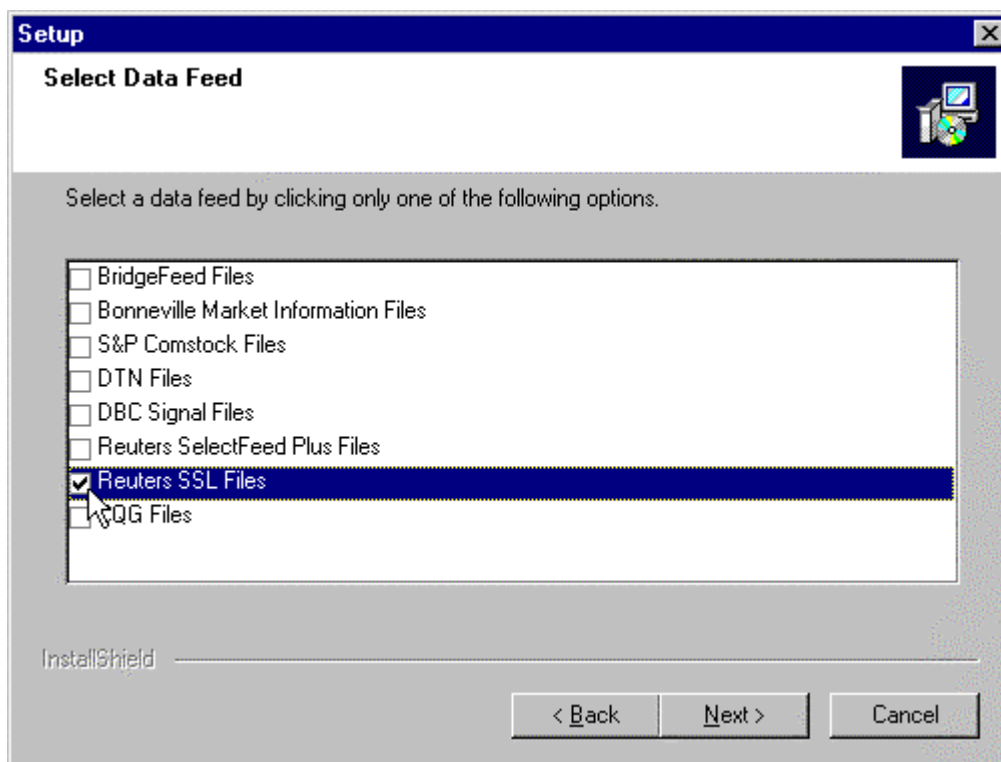


Figure 6 3.71 Installation Select Datafeed Dialog Box

The setup process asks you to confirm that you have chosen Reuters SSL.

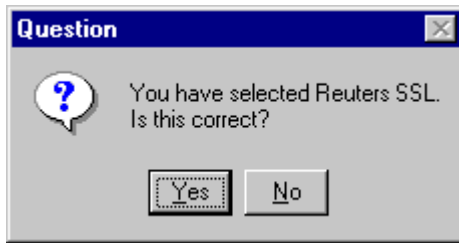
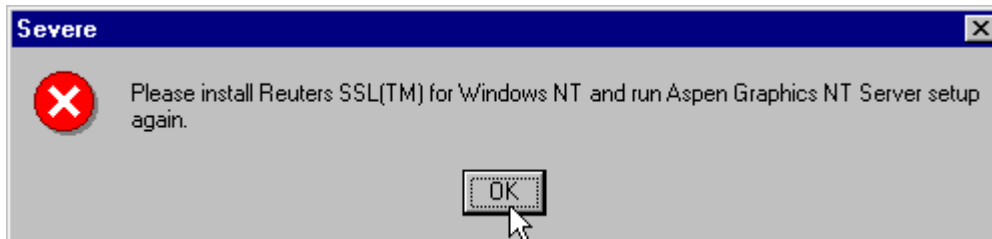


Figure 7 Feed Confirmation Dialog

It then searches for the existence of SSL software. If the SSL software (SSL4W32.DLL) is not found, a severe error results and setup fails. See below.

SSL Severe Error



After SSL software is installed on the NT server, setup will proceed to the series of dialog boxes shown below. These dialog boxes write to the HOSTS, IPCROUTE, and Setup.txt files on the Aspen server.

The HOSTS file requires a SSL node name and an IP address. Therefore, the first dialog box asks for the Aspen server node name. The default of `Aspensrv` is prefilled, but is adjustable. At this point, setup has already determined the server's IP address. Using this address, setup looks for the IP address in `winnt\system32\etc\HOSTS`. If it exists, setup uses the associated node name for the default Aspen node in this dialog box. If it does not exist, Aspen uses a default node name of 'Aspensrv' and creates the IP/node association in HOSTS. You can choose to use the existing association, or create a new one by entering an alternate Aspen node name here. Typing an alternate node name overwrites the existing node/IP address association.

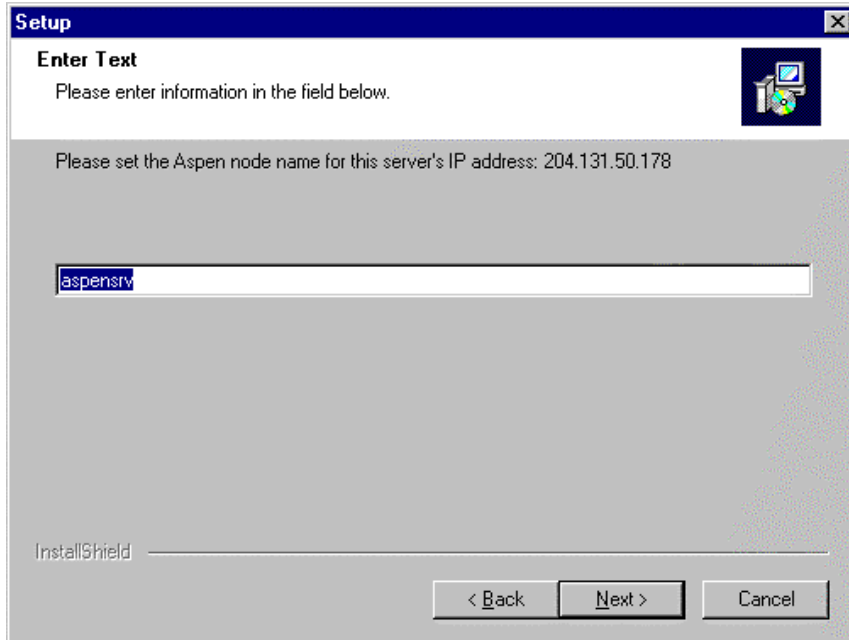


Figure 8 SSL Node Name Dialog Box

Next, the Aspen SSL server installation searches for IPCROUTE and offers the selection of the associated node names in the dialog box. Setup has gathered information about the IPCROUTE file and with this information has resolved the nodes associated with the selected Aspen node (or the old Aspen node as recorded in HOSTS). With this as the original file content, a dialog box appears as shown below. This dialog box shows a list of available nodes defined in IPCROUTE.

Because the only Reuters node associated with 'aspensrv' is 'sslsystem', sslsystem is selected by default.

Note: By default, items selected in this dialog box are the Reuters nodes currently associated with the selected Aspen node (or the previous Aspen node). At this point, you can select other available Reuters nodes.

Selecting Next displays the Set Watchlist Size dialog box. This dialog box writes your entry in the **MAXWATCHLIST=** parameter of the Aspen Graphics server's Setup.txt file. See page 42 for a description of **MAXWATCHLIST=**. If there is no pre-existing setting, the displayed value defaults to 9600. If there is a pre-existing setting, it is applied to the dialog box shown below.

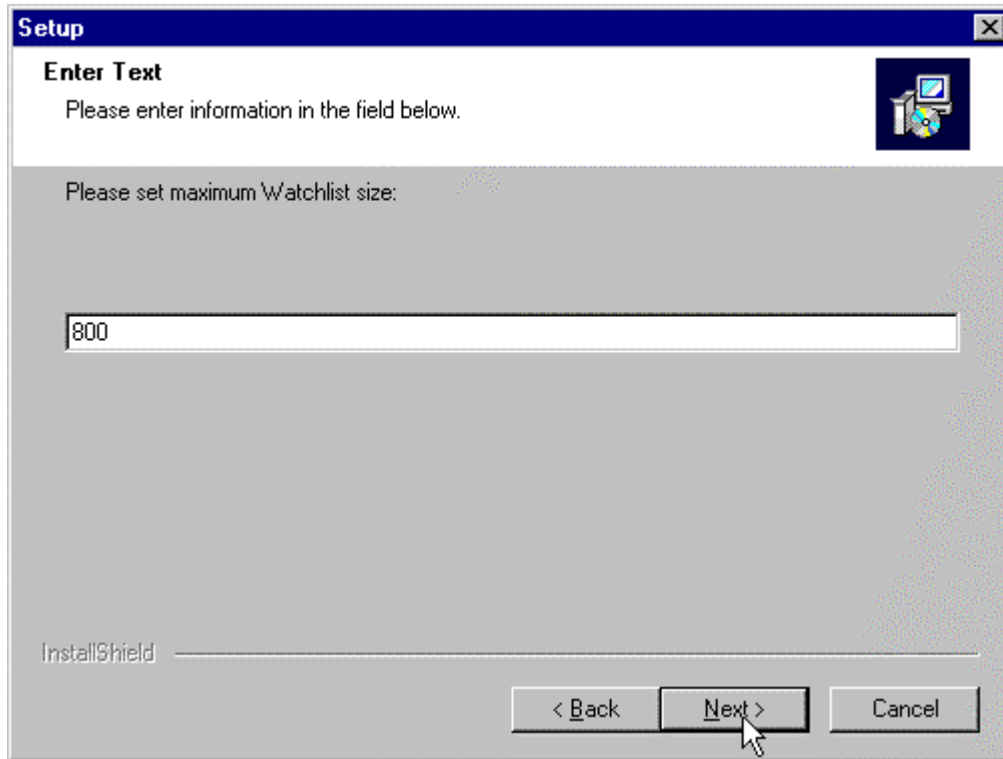
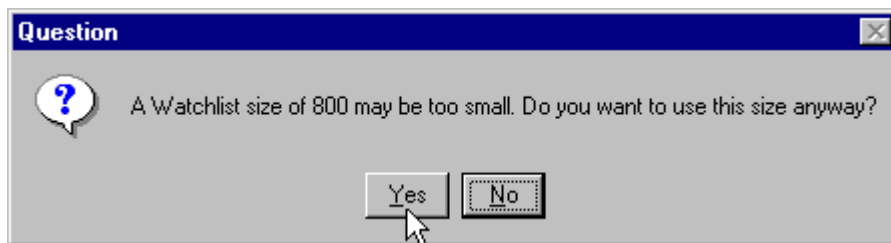


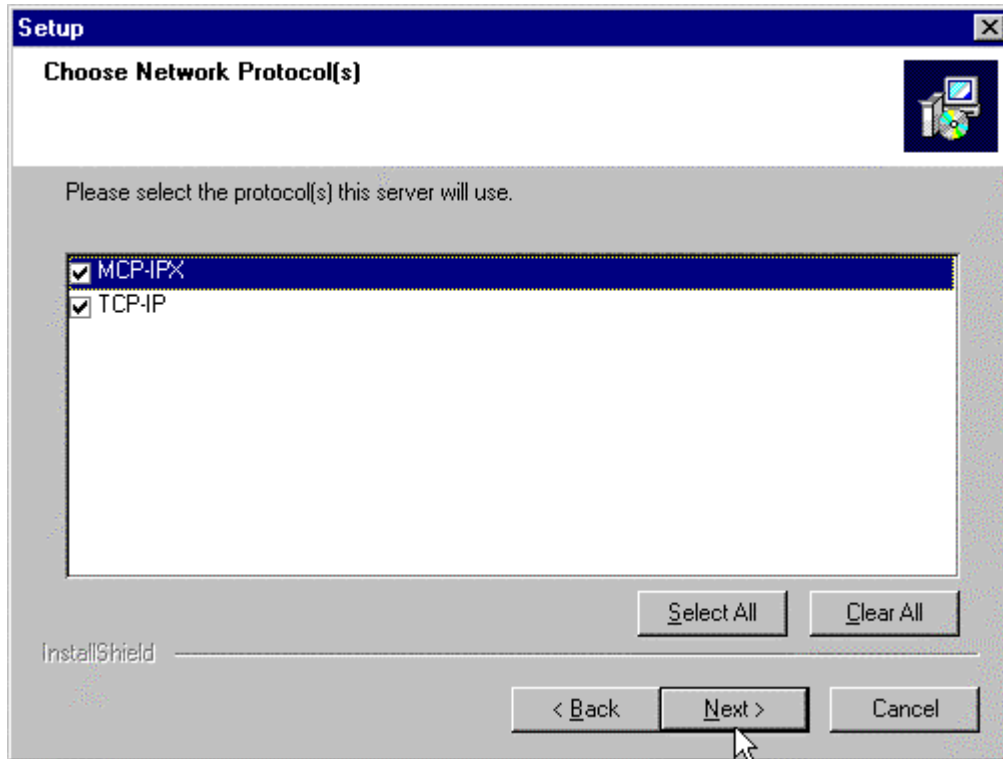
Figure 9 Set Minimum Watchlist Size dialog box

Note: values less than 1200 or more than 9600 will result in a question/confirmation dialog box:

Selecting Next displays the Watchlist Size confirmation dialog box,



Selecting Next displays the Choose Protocol dialog box. Although Reuters SSL and SF+ require TCP/IP, both protocols are selected by default. The MCP-IPX selection has no effect, but SSL requires that IP be checked. If IP is not checked, an error message will result.



Selecting Next displays the Start Copy dialog box and completes the installation process.

SSL SPECIFIC INSTALLATION DIALOG BOXES AND RELATED ASPEN SERVER SETTINGS

The Aspen Graphics SSL server installation applies the necessary settings to the HOSTS, IPCROUTE, and Setup.txt files on the Aspen Graphics server.

Note: The Aspen Graphics SSL server installation does not affect the SERVICES file.

SSL FILE AND REGISTRY SETTINGS AFFECTED BY THE ASPEN SERVER SSL INSTALLATION

- IPCROUTE
- HOSTS
- SETUP.TXT

Note: SSL exists as an application on the Aspen Graphics server—not as a “service.” However, you will not see SSL running in the NT Server’s Task Manager or anywhere else on the NT server.

HOSTS AND IPCROUTE BACKUPS AND SETUP LIMITATIONS

Note: Pre-existing HOSTS and IPCROUTE files are backed up to apex\temp\

DEFAULT SSL ASPEN GRAPHICS SERVER COMMAND LINE PROPERTIES

The Aspen Graphics server command line properties are nearly identical to those of a SelectFeed plus installation. The only difference is that the feed id argument for SelectFeed Plus is RT, but for SSL, the feed id argument is SSL. See the example below.

SSL Command Line Argument Example: *C:\ApexSSL\agvasn.exe ssl qpages=0 ip ipx dir C:\ApexSSL*

VERIFYING SINK SETTINGS: EFFECT OF ASPEN SERVER INSTALLATION ON HOST/NODE NAMES

Sink settings are stored in the IPCROUTE file, located on the Aspen server at C:\VAR\TRIARCH. There can be several sink entries, for example:

```
triarch_sink.sinklib:pepsi:sslsystem
triarch_sink.sinklib:apsensrv:sslsystem
triarch_sink.sinklib:ankh:isis
triarch_sink.sinklib:apsensrv:isis
```

In this example, pepsi, apsensrv, and ankh are host names. Isis and sslsystem are SSL sink distributor node names. If, during the installation process, you deselect one of these associations, the association will be remarked out in the IPCROUTE file. See **Editing the IPCROUTE File** on page 39 for more information.

The installation process defines and displays these associations in the dialog box, and then verifies the IP addresses corresponding to each node by reading the HOSTS file.

Additional IPCROUTE Entries: srclib and msglib

After the IP address is verified, installation adds the other two IPCROUTE entry types to IPCROUTE. Using the same syntax and associations for the sink settings, the installation process adds two new entries:

- `triarch_dbms.srclib`
- `triarch_rrbp.msglib`

These entries are defined in more detail in **Editing the IPCROUTE File** on page 39.

Installation Step 3: Configure the Aspen Graphics NT Server

Editing the IPCROUTE File

IPCROUTE is located on the NT server at C:\VAR\TRIARCH. The IPCROUTE file identifies machines by their host names; i.e. the system's response to entering "hostname" on the command line of that machine. IPCROUTE tells the Aspen Graphics NT server where to find the SSL sink distributor. Open the file, and locate the lines for the "Sink Distributor Entry," "Source Distributor Entry," and "RRMP Message Distributor Entry," and add the lines in the example below.

IPCROUTE SYNTAX

IPCROUTE line entry syntax is:

```
<service_name>.<client_type>:<client_host>:<server_host> {<backup_server_host> ...}
```

DEFAULT ASPEN SERVER NODE NAME AND HOST NAME: SSSLSYSTEM AND ASPENSRV

The default SSL node name is SSSLSYSTEM.

The default SSL host name is Aspensrv.

DEFAULT IPCROUTE FILE ENTRY EXAMPLE

The Aspen Graphics SPARCstation requires an entry in each of the three sections of IPCROUTE: the Sink Distributor, the Source Distributor, and the RRMP Message Distributor service names.

When adding these lines, substitute the actual node names for the example names given below:

```
#
#----Sink Distributor Entry----
#
triarch_sink.sinklib:aspensrv:sslssystem
#
#
#----Source Distributor Entry----
#
triarch_dbms.srclib:aspensrv:sslssystem
#
#
#----RRMP Message Distributor Entry----
#
triarch_rrbp.msglib:aspensrv:sslssystem
```



Warning: if there is a firewall between the Aspen server and SSL, add the RENEGOTIATE_PORT argument to IPCROUTE. See the description of - RENEGOTIATE_PORT on page 47.

Note: If no IPCROUTE file entry is made for a particular SSL application type running on a host machine, the SSL library looks for the required SPARCstation on that host machine by default.

ADJUSTING SPARCSTATION/HOST ASSOCIATIONS USING IPCROUTE

The last element of an IPCROUTE sink entry identifies an available SPARCstation.

For example:

```
sslsystem  
isis
```

Associates the Aspen host (Aspensrv) to sslsystem, isis. It is possible to use this to associate multiple hosts to sink entries, or to add another entry for a new SPARCstation.

Editing the SSL Hosts File

C:\WINNT\SYSTEM32\DRIVERS\ETC\HOSTS is a file containing the names and IP addresses for local systems.

Modify the file to include the two SSL-related node names and addresses in the simple address-name format demonstrated below.

HOSTS FILE SYNTAX

<Local System IP Address> <Local System Name>

HOSTS File Example:

```
10.53.102.11  
10.53.102.19 sslsystem
```

Because there can be several host/sink associations, do not be surprised to see other entries in this file. Each entry must be on a separate line.

EDITING THE SSL SERVICES FILE

Winnt/sys32/drivers/etc/services is a file that regulates the TCP port number for communication from the Aspen server to the SSL sink distributor. It is installed during the SSL software installation process and should generally not be edited.

SERVICES FILE SYNTAX

Services File Syntax is:

<s>_ <name>_<numeric identifier> < port number>/<protocol> [aliases...] [#<comment>]

Services File Examples:

```
s_name_1      8101/tcp    triarch_sink  
s_name_3      8103/tcp    triarch_dbms  
rrbpd         8500/tcp    triarch_rrbp
```


Editing the Aspen Graphics Server Watchlist

If there is no MAXWATCHLIST= parameter in the Aspen server Setup.txt, the default setting is in effect. However, it is likely that the default MAXWATCHLIST= will fit your needs exactly. This section offers suggestions for editing your Aspen server watchlist(s) to divide your data load evenly.

RECOMMENDED ASPEN GRAPHICS WATCHLIST SETTINGS

Generally, you want to set the Aspen Graphics watchlist large enough to match the number of RICS you have purchased from Reuters, minus the number of RICS in use by other applications on the network.

You can use MAXWATCHLIST= to set your watchlist between 300 and 14000. Entering a value below 1200 during the Aspen Graphics server software installation issues a warning dialog box that the value is unusually low. Entering a value above 9600 issues a warning that the value is unusually high.

Current memory usage causes the 14000 upper limit. If setup.ins (your backed up setup.txt) lacks a MAXWATCHLIST= setting, the displayed value defaults to 9600. If setup.ins has a setting, the previous setting is applied.

If You Set the Watchlist Too Large

Setting the watchlist too large is almost as bad as setting it too small. If you set the MAXWATCHLIST= parameter higher than the number of RICS you have purchased from Reuters, the SSL software will impose a smaller value on the Aspen server by halting updates on randomly-chosen instruments. You may lose ticks on important instruments and continue receiving ticks on less-important instruments. By telling the Aspen server a head of time how much watchlist you have allocated, it will be able to function correctly and prevent this situation.



Tip: You can see how much of a watchlist your Aspen Graphics server is actually using by displaying the Status Window (keyboard command .STAT), and looking at the WLIST field. The FREE field is the number of extra watchlist slots you have available from WLSIZE. Note: even "FREE" slots will be used; they are noted as "FREE" only because they are not required at the moment. "FREE" is not synonymous with "unused." Instead, free is synonymous with "available."

Aspen Graphics for Reuters SSL Setup.txt Parameters

Required Reuters SSL Setup.txt Parameters

For a complete listing and description of these parameters and other file entries required to install Aspen Graphics for Reuters SSL, please see the *Aspen Graphics for Reuters SSL Setup and Troubleshooting Guide* on our Web site at <http://www.aspenres.com/website/documents.htm>.

MAXWATCHLIST (800)

Because the Aspen server will use exactly the number of entries specified by this parameter, you want to set it to match your total SSL watchlist minus the needs of any other application on the network. Please make sure that the total number of watchlist slots for your Reuters SSL clients does not exceed your AMS SelectFeed Plus watchlist capacity. Set the value only to what you are going to realistically use. See *Recommended Aspen Graphics Watchlist Settings* on page 41 for more information.

NEWSRIC(N2_UBMS)

Generally, the default of N2_UBMS is adequate, but the SSL sink distributor can be configured to subscribe to news broadcasts by another name. To configure a different name, set NEWSRIC to the new name.

SERVERID (404)

For now, this is a placeholder, and defaults to 404. When DACS is implemented, this number will be the Reuters Assigned DACS ID and the default will change depending on whether or not DACs entitlement control is in use.

SERVERSEQ (0)

This parameter defaults to zero. However, if there are multiple servers connected to a single Reuters SSL box, each server must have a distinct identifier number. We recommend numbering each server sequentially, beginning at zero. Use serverseq to assign this unique identifier number.

SSLSERVICENAME (IDN_SELECTFEED)

Usually the default value of IDN_SELECTFEED is sufficient, but the SSL sink distributor can be configured to call the Reuters IDN Data Center by other names. If you have configured a different name, then use SSLSERVICENAME to set that name.

Optional Aspen Graphics for Reuters SSL Setup.txt Parameters

CASHBONDSCALE (32)

CASHBONDSCALE is a workstation setup.txt parameter that allows you to specify a price scale for cash bonds. The default is 32 (32nds) but you can select 64, 128 or 256. The number specifies the denominator of the fraction—all prices are displayed in nonreducible terms. If one of these values is not specified, or some scale other than these four values is specified, the default display scale is 32nds.

CONSOLE LOGGING=(OFF)

The console logging parameter allows you to control whether a Beta or logging (PD) Aspen Graphics for Reuters SSL server displays non-error console messages. By default, the parameter is turned OFF, so non error console messages are not displayed. If you would like to display all console error messages for diagnostic and troubleshooting purposes, set it to ON .

Default Example: Console Logging=OFF

REMOVE DATA IN FUTURE(32)

This parameter removes intraday and daily data that has a timestamp in the future from the server's intraday and daily databases. The number after the parameter is the number of days in the future that will be searched for and removed. The default is 32, which allows for a one month time horizon. To disable this feature, set the value to zero.



Tip: Because a large number of days can exhaust memory resources, it is not recommended that a number greater than 100 be used for this parameter.

Default Example: Remove Data In Future=32

SSLTHROTTLE(64)

SSLThrottle is a server setup.txt parameter that regulates the number of outstanding requests at the SSL server at any one time. While the default of 64 requests is satisfactory for most uses, customers with more than one SSL server per Aspen server may see better performance from higher values. Customers with very small systems (several clients on one SSL server) may find a smaller value more suitable. This parameter should not be used with AMS-based Reuters systems.

Default Example: SSLTHROTTLE=64

Prohibited Aspen Graphics for Reuters SSL Setup.txt Parameters

TS1PREFER (OFF)

By default, a .REFRESH request no longer changes existing Forex cash bond prices and yields in the daily database. The result: existing cash bond prices and yield bars are maintained, but bad data is not correctable via .REFRESH. If you would rather use Reuters TS/1 (close only) cash bond data instead of the existing data in your database, you can override this feature by turning TS1PREFER on. Turning TS1PREFER on will take the TS/1 data over the existing stored data, and will overwrite the server database with the TS1 (close only) data.

Default Value Example: TS1PREFER=OFF



Warning! Do not adjust the TS1PREFER parameter without first contacting Aspen Research Group Technical Support. If you discover an instrument that has inaccurate daily bars, we prefer to fix it for everyone in collaboration with Reuters rather than mask the symptom by turning TS1PREFER on. Additionally, on instruments other than cash bond prices and yields, a .REFRESH request may change the Close price if the close at TS1 differs from the Aspen Graphics stored value.

Installation Step 4: Configure the AMS Box

Default AMS News Mode: NEWS X-PASS

SSL does not support "Story Broadcast" mode, also known as "NEWS ONPASS" mode by the AMS box. If you are upgrading to SSL from a direct Aspen to AMS Selectfeed Plus connection, set the SSL Keystation to "NEWS X-PASS" mode at the AMS box.

ENUM Type Numeric

If possible, set the AMS box to ENUM TYPE: NUMERIC (as opposed to TEXT). Numeric format is a superior choice since software will be reading Reuters tick messages and numeric processing is cleaner. Some applications, especially where the arriving data is displayed without interpretation, are designed around TEXT types.

Step 5: Start and Configure the SSL SparcStation

1. On the Sun station, go to the directory `/opt/triarch/isfs4.1.3.L2.Solaris/isfs/bin`.
2. Double-click the icon `sfeed_startup.sv`. A command window should appear and start to execute the feed.
3. Right mouse click on command window's blue background to bring up a pop up menu.
4. From the pop up menu, choose Programs, then Command Tool.
5. At the # prompt, type: `cd/opt/triarch/*s/isfs/bin`
6. At the next prompt, type: `./sfeed_mon` This command will bring up a status monitor.
7. Hit the M key. You should see counters increase. If you do not have any SSL applications running, only news alerts will be counted.
8. Start the feed monitor by bringing up a command prompt.

Installation Step 6: Start the Aspen Graphics Server

Starting the Aspen Graphics Server

After installing the SSL software, Aspen Graphics software, and properly configuring the SERVICES, IPCROUTE, HOSTS, and Setup.txt files, you are ready to start the Aspen Graphics server. Before double-clicking the icon to start the application, you may want to double-check the command line properties, illustrated below.

SSL COMMAND LINE FEED IDENTIFIER: SSL

If you are starting the server from a DOS prompt, use SSL as the command line feed ID. RT is the command line for a SelectFeed Plus network only.

DEFAULT SSL ASPEN GRAPHICS SERVER COMMAND LINE PROPERTIES

The Aspen Graphics server command line properties are nearly identical to those of a SelectFeed plus installation. The only difference is that the feed id argument for SelectFeed Plus is RT, but for SSL, the feed id argument is SSL. See the example below.

***SSL Command Line Argument Example: C:\ApexSSL\agvasn.exe ssl
qpages=0 ip ipx dir C:\ApexSSL***

SSL Network Optimization/Troubleshooting

NETWORK WATCHLIST LOAD BALANCING

There can be multiple SSL SPARCstations accessing multiple AMS boxes, and multiple isolated applications accessing the SSL network. There is no way for the Aspen server to know how much watchlist it is supposed to have out of all this. So the value must be entered manually via the Aspen server's Setup.txt using the MAXWATCHLIST= parameter described on page 42.

The Aspen server will not use more than the value it is given, but:

- The Aspen server will almost surely use all that it is given via MAXWATCHLIST.
- That number has to be sufficient for the networks needs.
- Cannot exceed the limitations of the AMS boxes.

ADJUSTING SSL TIME OUT VALUES

MOUNT_WAIT_TIME

By default, the Aspen server waits 20 seconds for a response from the SSL sink distributor. To adjust the length of time the Aspen server waits to connect to the SPARCstation, use the MOUNT_WAIT_TIME parameter inside the Aspen server's IPCROUTE file.

The format of this parameter is:

MOUNT_WAIT_TIME = XX, where XX is an integer value from 1 to N in units of seconds.

This parameter does the following:

- If defined, this parameter determines the time-out interval for establishment of the TCP/IP channel connection between the SSL4.0 Application and its corresponding SPARCstation.
- If this parameter is not defined, this time-out interval will be 10 seconds by default.
- Once the TCP/IP channel is established, the SSL Library issues a mount request to the sink_dist/src_dist/rrbpd and waits for acknowledgement.
- a) When mounting to a sink_dist, the SSL application will wait for a response for X seconds before timing-out the request, where X is the greater of "mount_wait_time" or 20. (If the mount_wait_time parameter is not defined, the time-out interval will be 20 seconds.)

WHEN A FIREWALL SEPARATES THE ASPEN SERVER AND SSL

If the sink application (Aspen Graphics) and the SSL sink distributor are separated by a firewall, make this the first line in IPCROUTE: RENEGOTIATE_PORT=0. This entry must be on the first line of IPCROUTE.

The second line should read: TRIARCH_SINK.SINKLIB(HOST NAME):DISTRIBUTOR NAME

WHEN USING DACS ENTITLEMENT

ASPEN Server Default SSL User Name

ServerID and Serverseq are combined with the ASPENRES to form the username that the Aspen server needs to access the SSL system. Consequently, you must enter the **ServerID** parameter, described on page 42.

Example: default SSL user name: 404_ASPENRES_0.

Note: You will only need to enter a Default SSL User Name if DACS is in use. Aspen Graphics Version 3.71 does not currently support DACS entitlement checking.

Aspen Graphics Data Grooming/Maintenance Commands

ENHANCEMENT TO KILL_BAD COMMAND

Kill_Bad is a command entered at the server standalone. On ComStock, it is designed to clean out all symbols with an _0 from the master table. On all other feeds, Kill_Bad removes instruments with erroneous exchange mappings. The intended target of the command is programmed into our software and cannot be adjusted.

Previously, Kill_Bad did not remove symbols that were on unrecognized exchanges. If the exchange number is greater than the largest exchange number recognized by the software, the bad symbol is now removed. This should remove some of those annoying symbols that take up server data file space.

Example: Kill_Bad

REMOVE DATA IN FUTURE (32)

This setup.txt parameter removes intraday and daily data that has a timestamp in the future from the daily and intraday data files. Tick data is not removed because it does not affect the analytics used by our program.

The number after the parameter is the number of days in the future that will be searched for and removed. The default is 32, which allows for a one-month time horizon. To disable this feature, set the value to zero.

Because a large number can exhaust memory resources, it is not recommended that a number greater than 100 be used for this parameter.

Aspen Graphics for Reuters SSL Troubleshooting

DISCREPANCIES IN THE DAILY LOW AND CLOSE

In addition to display differences due to trading rules for daily and intraday bars, Reuters daily bars are occasionally not quite what is in the contract at the end-of-day. For example, the low on the Euro ("EUR=") is occasionally five ticks lower in the Reuters TS/1 database than it is at the close of trading. On other instrument types, the closing price may be off by two or three ticks.

Therefore, each night, Aspen Graphics uses its end-of-day processing routine to call TS/1 to retrieve the past few days' worth of data for Forex instruments. We believe that the TS/1 database is updated by the time our End-of Day processing begins (at 3:30 A.M E.S.T).

Troubleshooting Daily Bar Range Discrepancies

The daily open, high, and low values are not calculated by Aspen Graphics--they are taken as provided by Reuters. This is so that TS/1 data will match our archived daily data. If there is no daily bar for a particular symbol, it is because the symbol was not on the watchlist for that particular day. When an instrument falls off the watchlist, Aspen Graphics erases the daily bar so that you can be assured of getting the TS1 daily bar the next time the instrument is requested.

Note: If an instrument is not on the watchlist all day, the high and low values may not be correct. Discrepancies can also occur if the trading hours in RTinfo.txt are inaccurate. If you encounter a problem, please verify your symbol info.txt trading hours and look for the instrument on the server's RT Permanent Watchlist. Please see the exchange's Web site for the most up to date and accurate instrument trading hours and rules.

FORCING A REUTERS SYMBOL UPDATE

Occasionally, when using a quote macro in your permanent watchlist, not all of the contracts in the macro may expand, resulting in "straggler" contracts that do not update. If you encounter this:

1. Verify that the appropriate macro or symbol is in your server's permanent watchlist, by pulling up the **RT Permanent Watchlist dialog box** (keyboard command: .RT).
2. Shutdown the server.
3. Add the NOFEED command line argument to the server's command line (see **NOFEED** on page 51).
4. Restart the server.
5. Reindex all symbols in your database (keyboard command .REINDEXA).
6. Shutdown the server.
7. Remove the NOFEED command line.
8. Restart the server.



Tip: Always use NOFEED when reindexing the Aspen Graphics for Reuters server. During the reindexing process, Reuters is unable to determine why the Aspen server is unresponsive, and will break the formal network connection with it. In theory, the server and feed could recover the interactive network connection when reindexing completes. But the success of this recovery depends on the Reuters feed implementation. It might work fine one release and fail the next. This is why we recommend the use of NOFEED during database maintenance.

NOFEED

NOFEED tells the Aspen data parser not to attempt an interactive connection. The server will run but no network connection will be made to the Reuters IDN Data Center. Users can still access existing data, but news or pricing data will not appear since there is no incoming data. This allows the Aspen server to function in environments where the feed is not yet installed, is not functioning, or is not desired. The NOFEED command line argument is designed for system setup or database maintenance.

NOFEED Example: C:\APEX> AGVASN RT NOFEED



Tip: Use NOFEED and the .REINDEXALL command to “jumpstart” a symbol in a permanent watchlist macro chain that stops updating. See “*Forcing a Reuters Symbol Update*” on page 50 for more information.

THE REQUE STATUS WINDOW FIELD

- For Reuters SSL connections, the server status window "REQUE" column shows the fluctuation number of *requests* outstanding to SSL. On Reuters SSL REQUE represents a level of requests that fluctuates (increases or decreases) depending on the load. This figure is not cleared at the end of day.
- For an AMS link, this entry shows the number of messages that have been *requeued* due to backpressure from the AMS box. Therefore, AMS REQUE is a running total that increases continually until it is cleared at end-of-day.

RIC N2_UBMS Down

When this Reuters SSL service is down, the Aspen Graphics for Reuters SSL server displays a red banner ("**SSL unable to open news RIC N2_UBMS**"). This indicates a delay in receiving the news RIC. This banner is informational only and usually appears only for a few seconds during startup. News stories generally start arriving at that point and the red banner goes away as news processing begins.

Occasionally, however, news stories do not come in until the server makes multiple requests for the news.

In either case, if market news has not arrived, the Aspen Graphics for Reuters SSL server will flash the red banner and periodically request news service from SSL. As soon as news arrives, the red banner disappears.

REUTERS RUN-TIME WATCHLIST LOGGING

Aspen Graphics Version 3.60b and Version 3.71 both include support for Reuters watchlist logging. Whenever the watchlist changes (but no more than once a minute), the watchlist is dumped to C:\apex\RT\currlist.txt. Use currlist.txt to help you analyze usage patterns and troubleshoot data bottlenecks.

Each watchlist entry fits on one line, as in:

```
SPM0 L1 R1 U1 GMTadd 13:15 Jan 25, 2000
+T L0 R0 U0 GMTadd 13:57 Jan 25, 2000
TAN L0 R1 U1 GMTadd 13:53 Jan 25, 2000
```

In the example above, we see the instrument RIC at the far left, three fields called the *LRU triplet*, and the time (in GMT) the instrument was added to the watchlist.

TRIPLET VALUE	MEANING
L0	Instrument is not part of the locked watchlist.
L1	Instrument is part of the locked watchlist.
R0	Instrument can now be removed from the watchlist to make room for another.
R1	Instrument cannot be removed from the watchlist (because it is locked or referenced by a user).
U0	Instrument is not locked on watchlist and is not currently being watched at a user WS
U1	Instrument is currently being watched at a user WS, or is locked.
+	Instrument is just now being added to the watchlist is identified with a leading + in the left margin. In the example above, T was just added to the run-time watchlist. Therefore, the LRU triplet values for it are not yet valid. They will be valid at the next server start-up.

Table 5 Reuters LRU Triplet Code Descriptions

Note: When an instrument is removed from the watchlist, the daily bar is cleared out, along with the contract high/low/open and last.

4744 CONSOLE ERROR LOGGING

A console error 4744 is a diagnostic error indicating that the end of a data packet is not being properly processed. There is a limit of ten errors per server restart. 4744 console errors are logged to c:\apex\rt\code4744.txt and should be e-mailed to Aspen Research Group, Ltd. Technical support at: support@aspenres.com.

SSL Error Messages and Error Resolution

Frequently Asked Reuters SSL Questions

How Many Host Servers Can I Connect to an SSL 4 Sink Distributor?

246 hosts (the same as in SSL 3.2). This information is in the sink_dist.cpd file. The parameter 'maxMounts: {1 - 246}' defines the maximum number of mounts which can be mounted to the IPC server concurrently. The default value is eight mounts.

How Do I Determine My IDN Logical Address (ILA) or Configuration?

At the AMS SelectFeed plus box, either type "LGAD" or click on Help/About Reuters Terminal/Configuration. This will give you a Configuration pop-up window. In the middle of this window, under the Data/Software section is a line titled IDN Delivery. This line will read one of the following:

- IMI (for standalone Reuters Terminals)
- LAN RTS (for networked Reuters Terminals),
- LAN SSL (for Triarch Reuters Terminals)
- AMS (for Networked Broadcast Reuters Terminals).

There will also be a TC and a KS number. The TC is the logical address of the server. The KS is the logical address for that particular workstation.

Why Does my AMS Backlink (Concentrator Line) Frequently Disconnect?

One possible reason is the limitation imposed by the useable bandwidth of the telephone line connecting the AMS to a concentrator in the Reuters data center. The concentrator port has an output buffer which helps to compensate for times when the data stream to the AMS uses all the available telephone line bandwidth. During times of heavy traffic, the concentrator buffer may fill. When this happens, the concentrator must reset its connection to the AMS to clear the output buffer. The AMS sees only that its backlink has suffered a momentary communications outage. The most effective way to address this issue is to use the AMS Dynamic Cache configuration, which sources most popular data items from a high-bandwidth broadcast line. Less popular data items, Time and Sales, and Time Series data are available only through the AMS backlink.

Miscellaneous Issues Resolved in this Release

- Reuters changing their Yield to Liberty Bank had caused us to no longer record Highs and Lows on our % yield instruments. This was fixed.
- Reuters Previous missing on Forex instruments. This was fixed.
- Watch for treasury yield close prices being lost or overwritten on refresh. Also bring up a daily chart of a yield instrument such as %US10YT=RR and observe that .REFRESH fills in daily values. Only closing values are available. Additionally, place %FR1YT=RR on the watchlist for a 24 hour period. Observe bad yields early AM ET. Verify the bad values have been filtered.
- Expiry on futures, especially energy contracts did not appear to be working. The last bar on CLH0 for example will be replicated until it is manually expired. This adversely affected continuation charts in particular, and has since been resolved.
- Japanese Govt bonds stopped updating at random times during the Tokyo day This should be fixed in Version 3.71.
- There was a double bar and sometimes a missing bar on Forex daily rollover. This has been fixed.
- Asian Index daily bars are now accurately displayed.
- Reuters previous values were changing for equities.
- There was a shifting daily bar on various systems both here and in the field. The daily bar chart build a bar on day in the future and did not build today's bar. This was fixed.
- There was a problem with .NDX, .SPX not drawing today's bar even after market open, we saw intraday bars but not today's daily bar.
- Duplicate or very similar bars are displayed on yesterday's and today's on forex symbols like "JPY=" right around the beginning of the new day's trading.
- If any treasuries are in the watchlist we were retrieving only close data when the system came back up. This has been fixed.
- Dow Jones News-some stories were without carriage return line feeds and were scrolling off the window. This was fixed.
- When none was selected in the data retrieval window, the server or standalone software crashed. This has been fixed.
- 1477—saving double split transparent windows as a page created a damaged/corrupted page. This is fixed.
- 1480—Rescale menu anomalies. Adjusting chart rendering methods in the Rescale Menu no longer has unexpected effects on the appearance of a chart.

- Treasury yields and forex symbols were not properly passed to RTQUOTE or RTCHAIN windows. This has been fixed.
- 1541 Scaling and display of HOJ0, MPc1, HU#, DM#, JY#, SF#, and many other futures has been enhanced for Version 3.71.
- 1818 Late London Stock Exchange trades were previously inaccurately displayed.
- Fix for intraday and daily chart data discrepancies. reflecting different highs and lows as compared to Cobra on all the asian symbols.
- 1815—using the RTQUOTE feature returned a “No command” error, even though the request goes off and is fulfilled eventually. Example .RTPAGE de\futex1, clicking on DAX,FOX, or EUREX symbols in angle brackets. This is fixed.
- 1820--Aspen for Reuters workstations were sometimes display nothing on a chart or quote window, even after a symbol was entered. This has been fixed.
- 1863 When an Aspen Workstation is shut down by the server, I.e. closing the server while the user is still logged in, it will DR Watson if the user tries to Login again without closing the application. 1. Start the Aspen workstation. 2. Once the workstation is connected, shut down the server. 3. After the workstation is disconnected, enter .LOGIN. Do not exit the workstation. Login from the command line. 4. Wait for the system to DR Watson. 5. To start the workstation again double click on the icon. Because you will have crashed. 05-05-00@09:51:37-pat-I have the Drwatson logs with this crash in it, but now it is not happening any more.
- 1570-- SH2Z (CTRL+Z) was locking the workstation up. This has been fixed.
- 1613—FGBL# data integrity has been fixed-- intraday and daily data anomalies.
- 1810—Related to BTS 1663, 1666. Our daily bars were not updating in real time when the market was in session. A 0 minute chart compared to a daily chart show different last prices for the same instrument during the day. The zero minute chart is displaying the current trade price while the daily chart was displaying a price that was not updating at all. This has been fixed.
- 1816 The click sensitivity of the news window and program menus was too great. Clicking on a menu option (eg Done) carries through to the underlying news window and retrieves the story. This has been fixed.
- 1821—there were no bids or asks for energies (propane). This has been fixed.
- 1824—periodically, the Aspen for SSL server undergoes news reindexing. The only way to stop this was is to bring down the server and restart it—may be related to the DJ news stories. This has been fixed.
- 1869 We were failing to display today's bar. Instead we were putting the data for today on a bar in the future, namely tomorrow' bar. This was occurring across several different exchanges and markets.
- 1867 We were randomly failing to display prices in the Previous and net fields on S&Ps and bonds. This has been fixed.

- 1769—Existing Forex O,H,L,C values are no longer overwritten during a .REFRESH.
- 1868 On Reuters, the Open and Close were matching on a daily bar for the Yield symbols like "%US30YT=RR". This has been fixed.

Current Limitations of Aspen Graphics for Reuters SSL

- DACS entitlement is not supported in Aspen Graphics for Reuters SSL Version 3.71.
- Daily and Intraday bar differences on forex and metals instruments.
- Tokyo Stock Exchange (TSE) and Osaka Osaka Stock Exchange Data (OSE) data are currently unavailable to our subscribers.
- There is an indirect access fee for NYSE subscribers using Aspen Graphics with Reuters.
- RICS in color rules or formulas tend to delay the workstation login process. This should only happen during the initial login—once it is marked as non-existent, there won't be a subsequent delay.
- The workstation may pause while the server backfills options data. This can happen even if the workstation user is not entitled for options.
- Futures option history is not available from the Reuters central database.
- Bid and Ask Equity Volumes are not in 100's—they are generally 1 or 2 digit numbers—the multiplier is implied. The multiplier is exchange-specific and is not provided to Aspen.
- Page corruption is appearing randomly and irrespective of feed. The symptoms are that a user will attempt to start Aspen, a message 'Page Damaged' message appears, and the application exits.
- 1105 Aspen continuation charts are filled with gaps because expired contract data is not available from Reuters. Continuation charts on interactive feeds may also take a long time to appear.
- 1325—NYSE, AMEX, NASDAQ equity volumes are inconsistent and not in 100's
- 1483—underlying added to an option book instead of the option, when entering an option symbol in an option book. Similar to BTS 1638, in which the underlying, not the option, is sold from an Option book.
- 1484—test the option macro specifier (example: s#@c17) to make sure the specifier is working properly.
- 1538—reports of .REFRESH from TS1 stopping during high volumes of refresh requests. Create a page with several weekly charts and do a \.REF.
- 1663, 1666—daily and intraday forex discrepancies—have these been resolved or explained by trading rule/trading hour differences??
- 1680 inaccurate bids and asks on Japanese Govt Bonds.
- 1700—similar to 1483 above, options converted to underlying when an options book is

dragged into a quote page.

- 1772—adding quotation marks to a symbol in the RT Permanent Watchlist dialog box creates a second instrument with quotation marks instead of editing the initial symbol.
- 1803--If an instrument is in the permanent watch list its historical data almost always changes during a refresh. Enter a symbol that is known to be on the permanent watch list on a daily chart. Take note of the displayed prices for the chart. Do a .refresh. Note the changes in the displayed data. Instruments we tried were YIXH0, YBAH0, YTCH0, YTTTH0.....Also watch the bars for FGBSM0, and FGBMM0.7
- 1814—Version 3.71 supports the quote macro @s (example CL@S) to designate spreads, and it works well without a specifier. However, sometimes using a specifier to limit the number of spread contracts can give you unexpected results. Example W@S4 gives you the first 3 expected spreads WK0-WN0, WK0-U0, Wk0-Z0--and one out of sequence spread: WN0-H1.
- 1819--2BON0 (May bean oil for the overnight session), has settle values appearing outside of the night trading times—generally around 2:39 in the afternoon. Session times for this instrument are 8pm-5am. We see similar phantom settles for 2RRN0 (2:46), and Oats 2ON0 (2:24).
- 1822—mysterious page names (numbers) appearing in list of pages after a ws failover.
- 1825—PREV on certain symbols appears to change throughout the day—see post on aspen.bugs. This appears to affect mainly NASDAQ stocks and indexes.
- 1864 Option Book crasher. 1. Enter .Book.2. Enter a new book 3. Get into aggregate mode.4. Select position in aggregate mode 5. Click on examples 6. Left click on an example as if selecting it as an example.7. When it doesn't place the selected example in as a strategy, click on example again. 8.Wait for Dr. Watson to notify the workstation of the failure.
- 1870 Initial requests of equities on a chart will sometimes draw a series of identical bars while the backfill refresh takes place. Instead of a blank chart, there are several bars lined up together. When the real data arrives, the bars align themselves appropriately.

Related Resources

Aspen Research Group, Ltd. Documentation. Aspen Graphics documentation page at: <http://www.aspenres.com/website/documents.htm>.

Aspen Research Group, Ltd. ***Aspen Graphics Version 3.71 General Release Notes***

Aspen Research Group, Ltd. ***Aspen Graphics for Reuters Reference Guide***.

Aspen Research Group, Ltd. ***Aspen Graphics for Reuters SSL Setup and Troubleshooting Guide***.

Aspen Research Group, Ltd. ***Aspen Graphics for Reuters Symbology QuickStart***.

Reuters. Reuters Web site at <http://www.reuters.com>

Reuters open systems support website: <http://www.opensystems.reuters.com/waverunner/index.htm>

Sun Microsystems. Sun Web site at <http://www.sun.com>