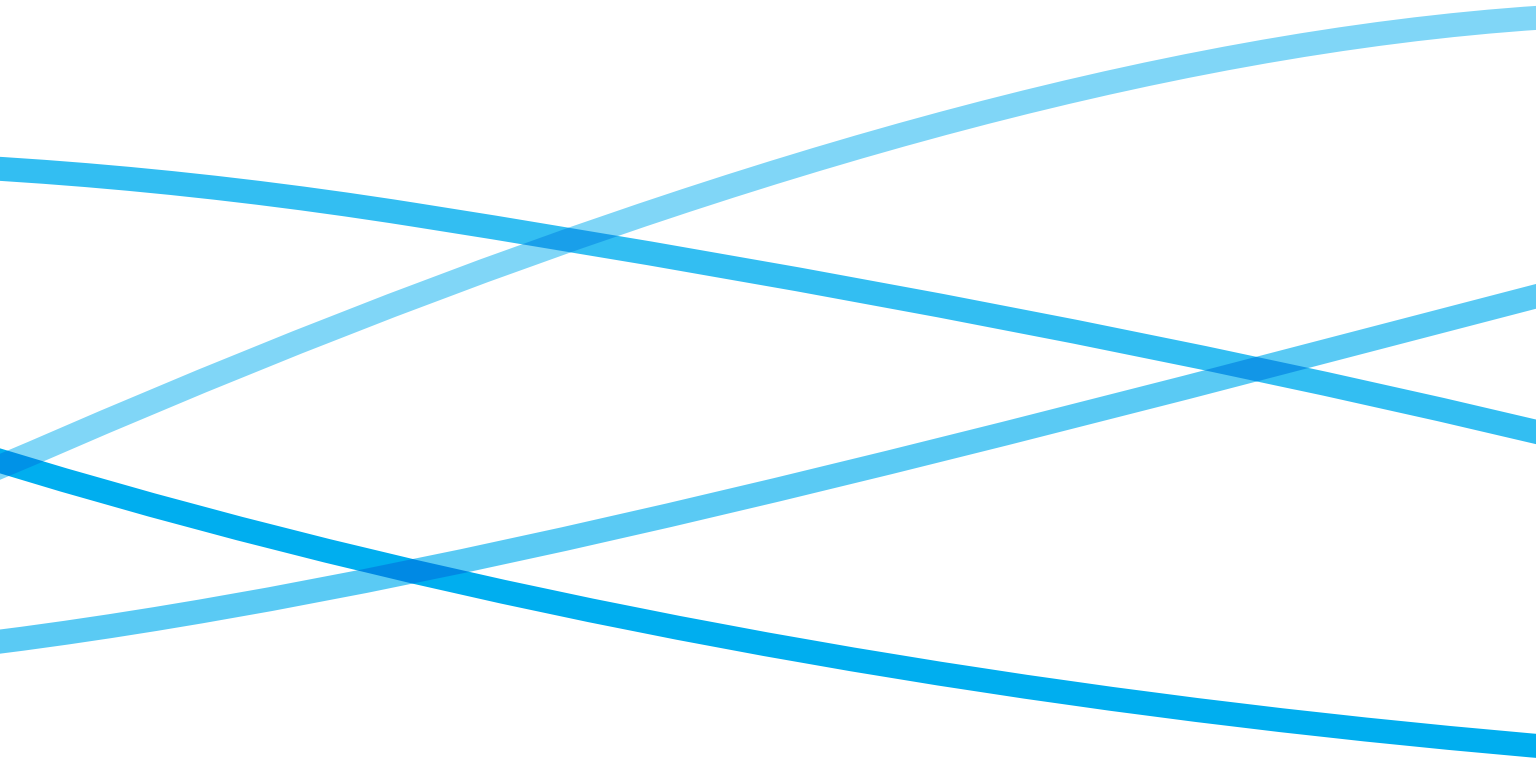
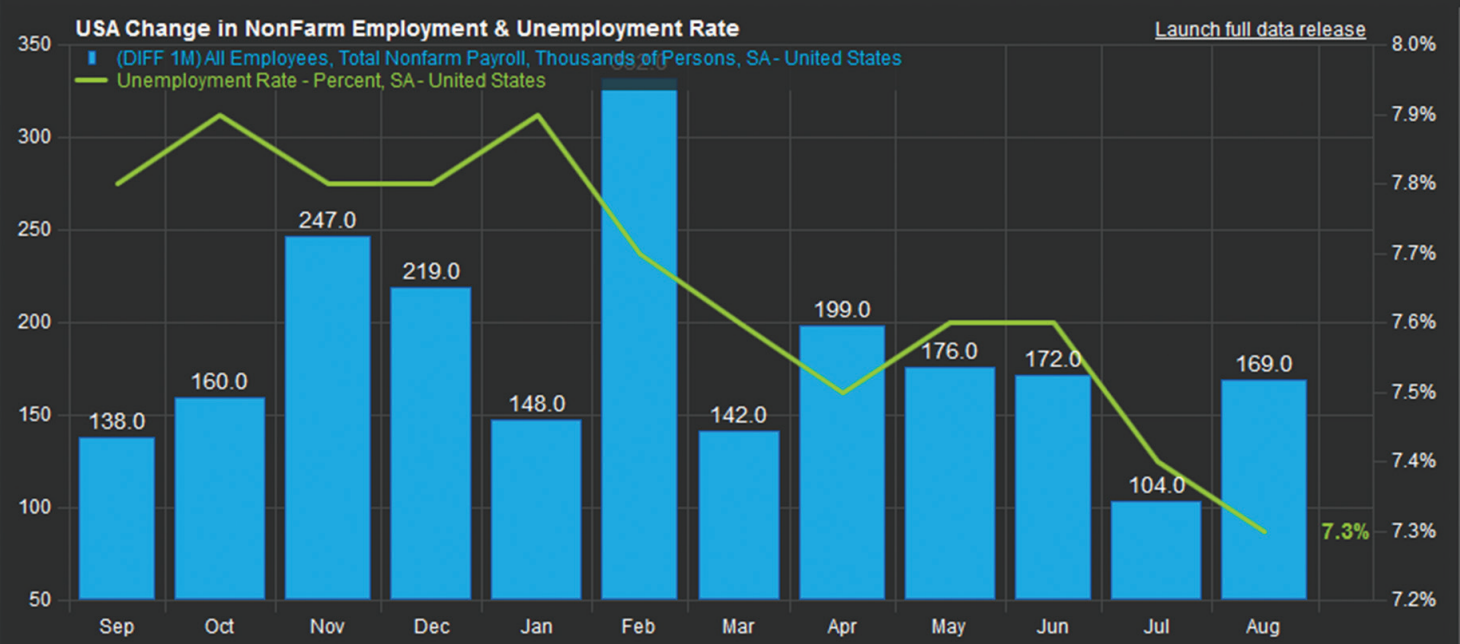
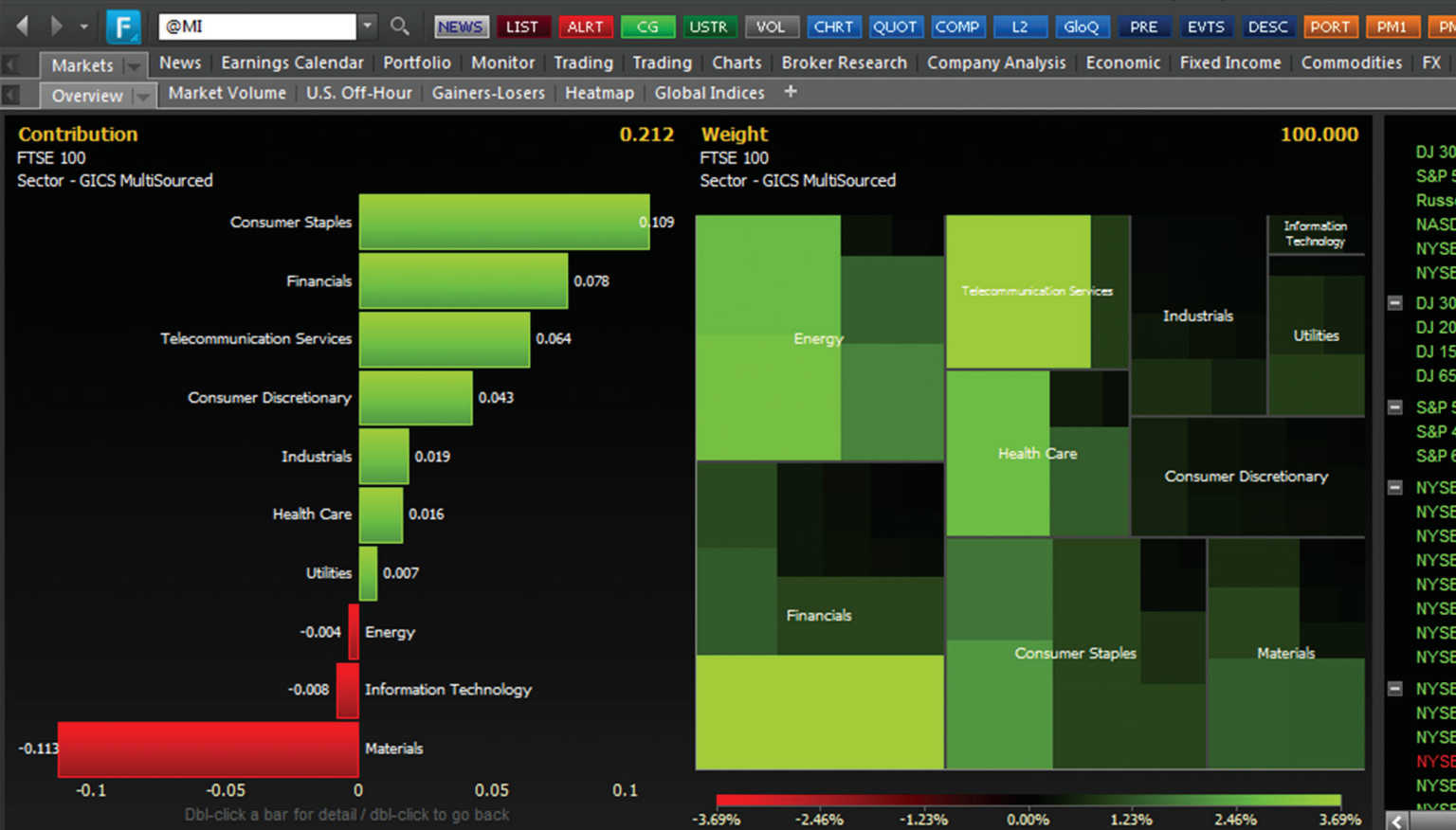


# TECHNOLOGY OVERVIEW





## TECHNOLOGY OVERVIEW

*Gain high-level insight into FactSet's systems, software, network, security, and deployment best practices. Learn how to deliver FactSet's real-time market data and advanced analytics on any platform simply, quickly, and securely.*

## In this document

This document is designed to provide information on FactSet's deployment and installation processes, infrastructure, connectivity, and support. Here's what you can expect to find:

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## About FactSet

### *Our Business*

Our mission is to provide financial professionals with everything they need to do their jobs effectively and efficiently. Without the tools and applications we develop, clients just have raw data. We make it easy for them to convert this raw data into powerful information they can use in their analysis or reporting.

Our business is based on the idea that FactSet is here to help our clients in any way possible, from helping to build financial models to getting to the bottom of why a certain data point is being pulled.

### *Our Clients*

Our client retention rate has remained an astounding 90% for more than 15 years, a testament to the high degree of service and quality for which we've become known.

FactSet's mission is to provide our 50,000 users at more than 2,500 client sites with everything they need to do their jobs effectively. Our clients — money managers, research analysts, portfolio managers, and investment bankers — access FactSet's information 24 hours a day, 7 days a week.

From downloading data on thousands of companies into a spreadsheet model to customizing returns analysis on portfolio holdings data, we help our clients become more productive.

### *Our Global Presence*

In addition to our **29 global office locations**, we have 13 Points of Presence that span four continents. They include:

- + Boston, MA
- + New York, NY
- + Piscataway, NJ
- + Reston, VA
- + Chicago, IL
- + Dallas, TX
- + San Francisco, CA
- + London, England
- + Paris, France
- + Frankfurt, Germany
- + Tokyo, Japan
- + Hong Kong, China
- + Sydney, Australia

## FactSet Everywhere

### Elegant Workflow

Financial professionals in investment management, investment research, banking, private equity, capital markets, trading, publishing and investor relations all leverage a single, unified FactSet application to enhance their workflow.

FactSet combines equity and fixed income analytics and content (AC) along with streaming real-time (RT) data in a single platform. FactSet integrates hundreds of commercial content sets with a firm's proprietary data, including holdings, rankings, estimates and research. The integration is so seamless that users can combine commercial and proprietary data into visually stunning and effective workspaces that exactly meet their workflow.

### FactSet Everywhere

FactSet is designed to be seamlessly deployed on any fixed or mobile platform. FactSet is available to be used anytime and everywhere. FactSet stores all workspaces, preferences, ticker lists, portfolios, formulas, screens, groupings, and searches – absolutely everything – securely in our data centers. Entitlements are defined and controlled centrally, meaning that each individual's workspace and workflow is available at the office or on the road, without any special setup.

There are three main pillars supporting FactSet that are used everywhere by financial professionals:

- + FactSet Workstation
- + FactSet Connect
- + FactSet Mobile Apps

### Software as a Service (SaaS)

Since all commercial, proprietary, and real-time streaming data lives at FactSet's data centers – the financial professional is free to use FactSet anywhere and anytime.

FactSet Connect is a web-based Citrix site (<https://launch.factset.com>) that allows access to the FactSet platform, including the user's custom workspace, from any private or public Windows, Macintosh, or Linux machine securely using two-factor authentication. FactSet Connect does not integrate with Microsoft Office.

FactSet Mobile Apps allow the financial professional to gain access to news, quotes, portfolios, research, and fundamental data from any iPhone, iPad, Android, or BlackBerry.

Each financial professional is given a factset.net login, which links together all access, entitlements, and content across the Workstation, Connect, and Mobile Apps.

### FactSet Install

The third pillar of the FactSet suite is the FactSet Workstation. Though FactSet is often used while traveling, commuting, or at home – most financial professionals still have a primary desk with multiple monitors where most of their work is performed.

FactSet uses a single MSI to install to any Windows machine, Terminal Server, or Virtual Machine such as Citrix XenApp, Citrix XenDesktop, or VMware. Administrative rights are required for the initial install, but are not required to use the application. FactSet supports all re-packaging and IT environments, and has advanced tools allowing for central databases to automatically map individuals to serial numbers.

With an installation of the FactSet Workstation, add-ins installed for Microsoft Office (2003, 2007, 2010, 2013) including Excel, Word, PowerPoint, OneNote, and Outlook. Features such as DealMaven, =FDS codes, ExcelConnect, ActivePublishing, and VB API access are all installed automatically. Office integration for model creation and analysis, pitch books, presentations, and automation is a vital part of investment banking and research workflows.

FactSet OnlineComponents ensures that all users are running an up-to-date release of the client-side install which means that IT administrators only need to update the MSI package once per year. In environments where users have administrative rights to their PCs, FactSet's AutoUpdate technology will prompt to install the latest FactSet framework when it is available.

Any changes made to a workspace on the FactSet Workstation are immediately reflected in FactSet Connect and FactSet Mobile Apps, and vice versa.

### Entitlements

Application, content, and real-time exchange entitlements are all stored and controlled centrally at FactSet. Combined with all user data being stored at FactSet, this gives each user of FactSet a seamless experience across their local workstation, web-based Connect, and hand-held Mobile Apps. It also eliminates the need for any client-side backup of FactSet configuration and user data.

Professionals can be given real-time, delayed, or no access to each of hundreds of global exchanges, news sources, fundamental content sets, as well as other entity and security data sources. All applications within the platform, such as Portfolio Analysis, Alpha Testing, and Universal Screening can be enabled or disabled on the fly at the individual user level.

Designated individuals at firms can be given self-service rights to add and remove entitlements to individual users within their firm or department.

# Software Packaging and Deployment

## Simple Deployment

FactSet's suite of software is flexible enough to be easily installed by a single user or transformed, packaged, and distributed to thousands of desktops. Choose to install FactSet as individual Workstations or as part of a corporate thin-client or streaming application farm. Since nearly all of the content and functionality of FactSet software resides in FactSet's data centers, it is not necessary to put a complicated or large package on each user's desktop.

## Flexibility

FactSet can be installed on office workstations or on laptops. In addition, all FactSet software fully supports Citrix / Terminal Server or Virtual Machine environments. FactSet Technology Solutions Engineers can assist in deploying the FactSet suite of applications within your environment.

## Easy Multi-User Installations

Installing into a XenApp/Citrix or Terminal Server environment is straightforward. FactSet applications have been extensively tested in multi-user environments. Contact your salesperson or consultant for detailed instructions and case scenarios.

## Support for Locked-Down Environment

FactSet supports locked-down (minimal privilege) workstations provided that the initial installation occurs with administrator rights. Enhanced rights are needed during the installation process to register Microsoft Office add-ins, DLLs, and ActiveX controls.

## Options for Repackaging

The main installer for FactSet is MSI-based and allows for easy transformation and repackaging. Create transforms using programs like WinInstall and Wise for Windows. MSIs can be pushed out to desktops using Active Directory group policies or a variety of commercial products, including SCCM (SMS) and Altiris.

## Intuitive Configuration

The FactSet installers are simple and comprehensive. They auto-detect the installed versions of Microsoft Windows and Microsoft Office, configuring themselves automatically.

## Upgrades

A new FactSet framework is released approximately every 12-18 months. AutoUpdate functionality alerts users when a new release of software is available to be installed. FactSet OnlineComponents automatically keeps all users seamlessly

up to date and running the best release of FactSet, without requiring administrative privileges, using FactSet Virtual Module technology. FactSet supports all software released in the previous eighteen months. The most recent software is always available at [www.factset.com/download](http://www.factset.com/download).

## Centralized Data

All workspaces, portfolio holdings, returns, models, screens, and formulas defined and used on FactSet are stored in our secure data centers. Since user-defined data is stored centrally, data is available and synchronized automatically between the FactSet Workstation, FactSet Connect, and Mobile Applications.

## Microsoft Office Integration

The FactSet install seamlessly integrates with Microsoft Office, adding extensive functionality to Excel, Word, PowerPoint, OneNote, and Outlook, along with rich API and VBA support. Office Integration is not available in FactSet Connect.

## Minimum PC Specs

CPU	3.0 Ghz P4 or higher
Memory	2 GB minimum
Local Disk	1.5 GB free space
Windows	8, 8.1, 7, Vista, XP
MS Office	2013, 2010, 2007 SP3, 2007 SP2/SPI, 2003 SP3
Adobe Reader	11.0, 10.1, 9.5, 8.3, 7.1
Internet Explorer	11, 10, 9, 8, 7

## Recommended PC Specs

CPU	Dual Core Processor +
Memory	3 GB +
Local Disk	1.5 GB free space
Windows	7
MS Office	2010 SP3
Adobe	9.5
Internet Explorer	9

For software compatibility, installation instructions, and user guides, please visit [www.factset.com/download](http://www.factset.com/download).

## Portfolio Integration

FactSet's Client Data Integration team works with clients' IT staff to extract holdings data from portfolio accounting and order management systems to ensure a daily update of positions.



Once holdings are on our system, users can launch FactSet's Portfolio Analysis to begin analyzing performance, fundamental characteristics, composition, and risk across portfolios and time. In addition, FactSet's real-time data lets analysts and asset managers compare up-to-date holdings with benchmarks in real time.

Once a single automated integration process is in place, users can enjoy the benefits of access to an unlimited number of portfolios on FactSet.

FactSet is experienced with portfolio accounting software as well as order management systems, and has holdings delivery arrangements with many custodians, prime brokers, and third-party accounting systems.

The automated integration process includes these steps:

### 1. Extract Data

FactSet works with you to establish a customized extraction and parsing process that converts security-level data from your portfolio accounting and order management systems. FactSet has worked with most commercial accounting systems and will walk through simple steps to extract and normalize data from specific systems or multiple systems. Cash positions are consolidated and futures/options are adjusted through processing on the accounting system.

Data fields will be extracted into a text file based on your particular FactSet entitlements and personal preferences. If a custodian or prime broker is involved, FactSet will work directly with that firm to add your holdings to their feed.

### 2. Compress and Encrypt Files

The text files generated by the one or more accounting systems are bundled together and prepared for transfer to FactSet's mainframes. The files should be zipped to reduce size. FactSet recommends the use of SFTP to transfer data over the Internet or FactSet Managed Infrastructure. FTP transfers, with or without PGP encryptions, are also supported.

### 3. Upload Data

Using Windows Scheduler (or Unix cron), the bundled and optionally encrypted files are sent via your chosen file transfer mechanism to FactSet. Clients with FactSet Managed Infrastructure (WAN) circuits send these files over that private network; others opt to send these files over the public Internet. Once the files are received, FactSet's Cornerstone utility automatically triggers the reconciliation and parsing processes.

A complete guide to Portfolio and Client Data Integration is available at [www.factset.com/download](http://www.factset.com/download). This guide provides

more details on the FactSet File Transfer System (FTS) and offers insight into how FactSet helps you extract, transmit, and parse proprietary data in a secure, reliable fashion.

### 4. Parse and Insert Holdings

FactSet creates a parser definition that specifies the layout and contents of your holdings text file. Parsers are triggered automatically upon receipt of the holdings files to our system. The parser then loads and inserts your data into FactSet's uniform database structure, called Open FactSet Database (OFDB). Files are immediately available for use within FactSet's analytical engines and real-time displays.

### 5. Validate Information

FactSet's portfolio reconciliation utility validates and confirms any major or unexpected valuation or holdings changes and warns on various other common cash, security, returns, and trade conditions. You can set your own thresholds and tolerances and customize a delivery method for alerts. FactSet also monitors parser logs and status to verify that the parsing process completed successfully, whether we receive holdings directly from you or through a third party.

FactSet supports these and other accounting systems:

- + Advent Axys™, APX™, Geneva™
- + SS&C Portia™
- + Checkfree® APL™
- + MacGregor
- + Eagle Pace
- + Charles River
- + Princeton Financial PAM®
- + EzeCastle
- + INDATA IMS

## Data Delivery and Web Services

FactSet offers a range of web service, batch production, and content delivery mechanisms that do not rely on the installation of client software and offer flexible transports and formats to bring your applications to life with content.

Access, format, and retrieve diverse commercial and proprietary datasets through a choice of symbology and customized business logic. You can access raw and calculated data, ranging from real-time quotes to extensive history, in a format that another application can consume. The following products encompass the power of FactSet's content integration without using the FactSet Workstation.

### Cornerstone

Cornerstone is a powerful, production-class scheduling and calculation engine that lets you define recurring production (batch) data delivery jobs. These jobs create custom datasets that can be delivered via (S)FTP, with flexible scheduling options designed to ensure data arrives in a timely and accurate manner. You can use a secure web browser to create, schedule, and view all inbound and outbound jobs.

### Real-Time Exchange Datafeeds

Receive streaming financial exchange data, tick-by-tick data, and tick history data via FactSet's proprietary API. FactSet provides all the elements necessary to build complete market-data feeds into internal systems. All TCP/IP, failover, and connectivity is performed within the API. Efficient zlib stream compression is applied to maximize the amount of data that can be sent over limited bandwidth.

### OnDemand Datafeeds

OnDemand is an interactive request/response method for pulling data from FactSet. This authenticated, enterprise-class, platform-independent web service allows secure HTTPS calls for data ranging from single data items to complex aggregate calculations. Websites and internal applications can request data in formats ranging from XML to fully formatted HTML tables, as well as fully rendered and formatted charts. All requests are made to a single secure web address in a unified syntax.

**Graphic Formats:** jpg, gif, pdf

**Text Formats:** xml, csv, html, pipe

DataDirect is used to supply back-office, front-office, and quantitative applications with data for display and analysis. It offers the flexibility to populate public websites with simple quotes and graphs and to power complex quant applications with aggregate data for sophisticated decision-making.

Authentication options include both basic authentication and a more secure rotating-key authentication mechanism for transfer of sensitive or proprietary data. The only requirements are a web browser or a web service call from languages/frameworks such as Visual Basic, Java, C# (.NET), or C++ code. Sample code is available by request.



# Managed Network Infrastructure Options

FactSet's Managed Infrastructure (WAN) offers industry-leading dedicated connectivity.

	Internet	Option 2	Option 3	Option 2T	Option 3T
<b>Transit Technology</b>	Client Internet	2 x IPsec VPN Internet T1	2 x Private T1	1 x IPsec VPN DS3/Ethernet at each of 2 sites	1 x Private DS3/Ethernet at each of 2 sites
<b>FactSet Users</b>	Depends on Client	250	250	1,000+	1,000+
<b>Load Balancing</b>	Depends on Client	Fully Automatic	Fully Automatic	Fully Automatic	Fully Automatic
<b>Redundancy</b>	n/a	N+1 per site	N+1 per site	Geographic N+1	Geographic N+1
<b>Multi-Site Support</b>	Depends on Client	Optional	Optional	Required	Required
<b>Capacity Scaling</b>	Depends on Client	No	No	Yes	Yes
<b>24/7 Monitoring</b>	No	Yes	Yes	Yes	Yes
<b>24/7 WAN Support</b>	Yes	Yes	Yes	Yes	Yes
<b>Provided Equipment</b>	None	(2) Cisco 2801 (2) Site Servers	(2) Cisco 2801 (2) Site Servers	(1) Cisco 7301 (0 - 6) Servers in each of two sites	(1) Cisco 7301 (0 - 6) Servers in each of two sites

## Plug and Play

All FactSet equipment is delivered configured and ready for racking. All Ethernet cables, power cables, and mounting brackets are supplied. Typical time to install in a rack and power-on is 20 minutes.

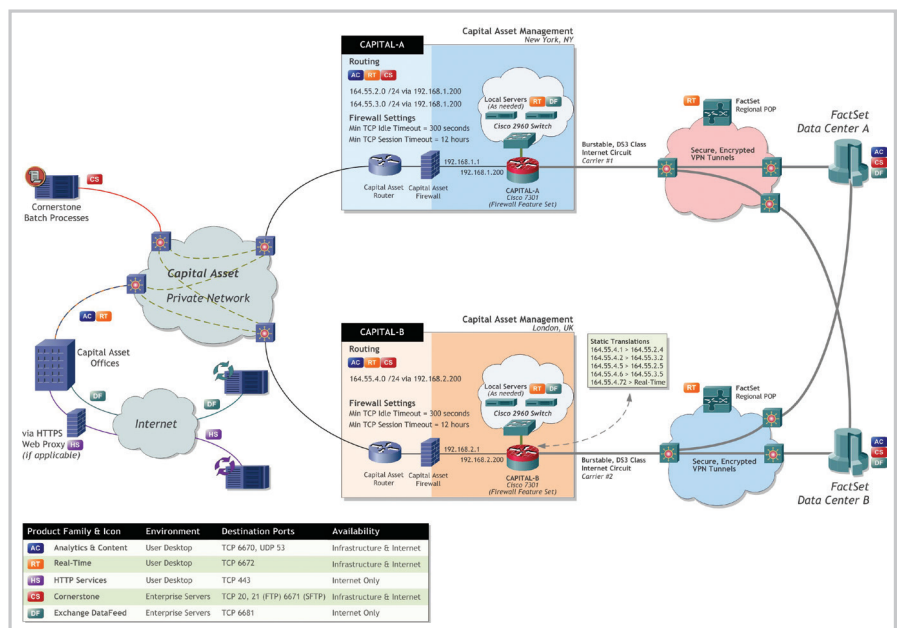
## Mix and Match

Select the foundation for an optimal solution that satisfies your technology, budgetary, and compliance requirements. A FactSet engineer will be available to explain the process, discuss implementation details, and assist in developing a proper design.

## Best of Breed

FactSet Managed Infrastructure solutions are built for N+1 redundancy. The failure of any component will not affect connectivity to FactSet. Critical real-time applications and nightly production jobs will connect. For an additional level of redundancy, a second geographically diverse Managed Infrastructure site can be deployed. FactSet clients can rely on a high level of availability for mission-critical applications.

Because multicast, or broadcast, is not used for communication, each desktop receives only data that is requested, thereby reducing complexity and bandwidth requirements while increasing security.





# Firewalls, Routers, Rules, and Proxies

FactSet software uses outbound-initiated, unicast TCP/IP to communicate with FactSet’s servers and mainframes.

Three primary TCP connections are initiated by FactSet. The first connection is made using SSL encryption over port TCP 6670. This connection terminates at one of two FactSet data centers. The connection can use FactSet’s Managed Infrastructure (WAN) and/or your Internet depending on preference and policy.

FactSet’s analytic connection leverages a display-oriented, low bandwidth paradigm. All processing, calculation, and storage occurs in FactSet’s secure data center environment. Clients average 2-5 kbps of bandwidth with occasional bursts. FactSet’s real-time component will initiate a streaming connection on TCP 6672. Data aggregation caching servers, either privately located on site or in POPs (points of presence) around the Internet, are the endpoints that the real-time platform will seek.

HTML content within FactSet will always traverse your Internet connection using HTTPS. This content will take advantage of any HTTP Internet proxies defined within Internet Explorer manually or via a proxy.pac file. It is recommended that you whitelist the URLs listed in the “Whitelists” section.

## Internet

FactSet supports full connectivity over the Internet. This method allows for connections while users are out of the office, on public wireless, or at home. Using the Internet can be a cost-effective solution for business continuity and disaster recovery from alternate locations and to provide connectivity to remote or satellite offices. All ports are outbound initiated only.

### Analytics and Content TCP 6670

64.209.89.1	(host)
64.209.89.2	(host)
192.234.235.1	(host)
192.234.235.2	(host)

### Portfolio Uploads TCP 6671

64.209.89.0	(255.255.255.0)
192.234.235.0	(255.255.255.0)

### Real-Time TCP 6672

208.184.40.0	(255.255.255.0)
64.95.112.160	(255.255.255.224)
208.44.129.192	(255.255.255.224)
64.124.108.192	(255.255.255.240)
70.42.57.192	(255.255.255.240)
84.233.158.64	(255.255.255.240)
81.201.101.128	(255.255.255.240)
206.165.137.224	(255.255.255.240)
202.177.200.64	(255.255.255.240)
202.167.227.0	(255.255.255.240)
119.27.58.0	(255.255.255.240)
202.58.139.0	(255.255.255.248)

## Application Proxies

The FactSet TCP 6670 and TCP 6672 stream is a proprietary binary protocol and cannot be intercepted or proxied by any HTTP or application proxy (SQUID).

FactSet natively supports SOCKSv4 and SOCKSv5 servers with or without authentication. Both the analytic (TCP 6670) and real-time (TCP 6672) components can connect using SOCKS proxies such as Blue Coat and Microsoft ISA. Destination NAT (network address translation) is also supported. For more information, see the FactSet Installation Guide at [www.factset.com/download](http://www.factset.com/download).

## Whitelists

Any HTTPS inspection points such as Firewalls, Web Proxies, or Content Filters should add the following URLs to their exception list. Traffic to these addresses should not be scanned or blocked. The FactSet URLs in the list below are contained within:

64.209.89.0 (255.255.255.0)  
192.234.235.0 (255.255.255.0)

### FactSet URLs

[https://\\*.factset.com](https://*.factset.com)  
[https://\\*.callstreet.com](https://*.callstreet.com)  
[https://\\*.lionshares.com](https://*.lionshares.com)  
[https://\\*.factsetmergers.com](https://*.factsetmergers.com)  
[https://\\*.mergermetrics.com](https://*.mergermetrics.com)  
[https://\\*.sharkrepellent.net](https://*.sharkrepellent.net)  
[https://\\*.globalfilings.com](https://*.globalfilings.com)

### OCSP & CRL URLs

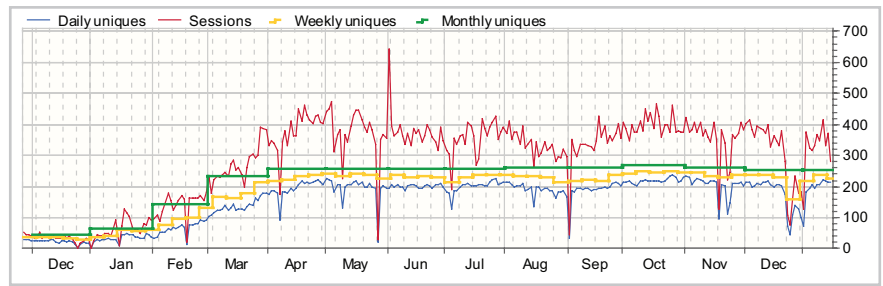
<http://ctldl.windowsupdate.com>  
<http://crl.thawte.com>  
<http://ocsp.thawte.com>  
<http://cs-g2-crl.thawte.com>  
<http://ts-ocsp.ws.symantec.com>  
<http://ts-aia.ws.symantec.com>  
<http://ts-crl.ws.symantec.com>  
<http://crl.usertrust.com>  
<http://crt.usertrust.com>  
<http://ocsp.usertrust.com>

It is recommended that the FactSet application directories are whitelisted within any antivirus, security, or user virtualization software. Please see the FactSet Installation Guide for more information.

# Capacity Planning

FactSet baselines, monitors, and provides alerts on all devices on our network. This system encompasses everything in our data centers, including our redundant ticker plants, mainframe clusters, and hundreds of terabytes of replicated SAN storage.

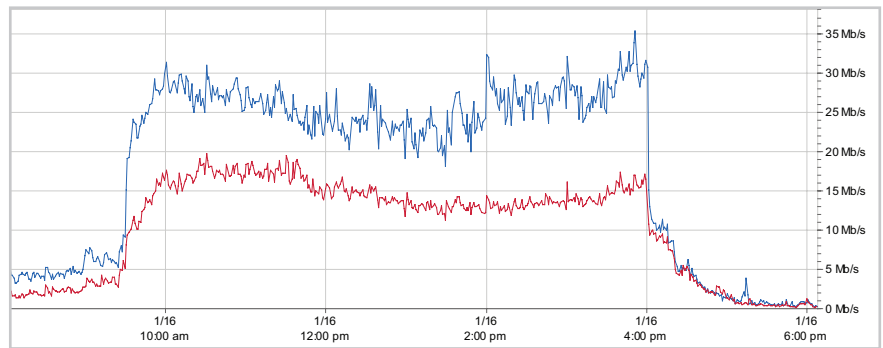
In addition to our core network capacities, FactSet closely monitors the physical and application health of every managed circuit and server. We email weekly reports showing the usage of any FactSet Managed Infrastructure (WAN). FactSet can inform your network staff of where users are running FactSet and how much bandwidth they consume throughout the day, reported by city.



Global deployment usage analytics

This information permits detailed, accurate capacity planning within an enterprise's own internal network and serves as a launchpad for real world business continuity planning.

FactSet possesses Connection Intelligence™ that automatically determines the best server during startup. As a result, load on the network and on the servers is automatically and efficiently distributed. If a particular branch office experiences degraded performance, FactSet can tell your network engineers exactly how much bandwidth our applications are consuming. If a business unit is planning to add new users, our internal profiling tools can assist in accurately forecasting how much bandwidth will be required.

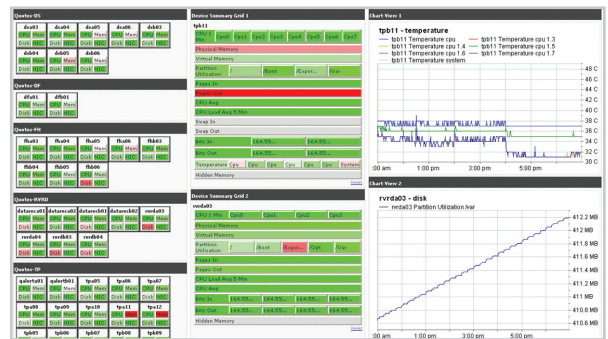


Bandwidth monitoring

As market volatility and trading volumes continue to rise, FactSet offers unparalleled insight into the capacities of internal Frame Relay, MPLS, GRE/IPsec, Internet, DWDM/SONET, and Metro Ethernet links that are critical to serving the data needs of financial professionals.

FactSet engineers will work with your technical staff to plan the infrastructure impact on networks, firewalls, routers, workstations, and circuits. Capacity planning includes a 12 to 18 month time horizon and will also consider the impact of upcoming FactSet content additions and user count growth on your system.

City	State	Serial Count	Username Count	Tickers	Bandwidth
Birmingham	Alabama	1	1	96	3872
Charlotte	North Carolina	14	1	3680	57408
Greensboro	North Carolina	1	1	85	2880
Greenville	South Carolina	1	1	220	3200
Greenwich	Connecticut	1	1	328	3888
Jacksonville	Florida	7	1	2322	29304
Lancaster	Pennsylvania	1	1	168	2840
McLean	Virginia	1	1	91	3064
Miami	Florida	2	1	393	7752
Morristown	New Jersey	1	1	120	3144
Palm Beach	Florida	1	1	937	5880
Palm Beach Gardens	Florida	1	1	33	2472
Philadelphia	Pennsylvania	6	1	697	19664
Richmond	Virginia	2	1	518	8240
Sarasota	Florida	1	1	313	3704



Real-time ticker plant monitoring

## Business Continuity Planning

FactSet works closely with you to ensure that the deployment of software, infrastructure, and disaster recovery plans meets mandated business continuity policies.

### *Application Failover*

All FactSet applications are able to connect to any and all deployed FactSet Managed Infrastructure. No configuration is necessary on an individual workstation on a status quo or emergency basis. FactSet is intelligent and will find the best available connection. In the case of a severe network failure at a client site, all FactSet applications can, policies permitting, connect via the public Internet to our data centers and POPs.

### *Geographic and Route Diversity*

When deploying infrastructure, FactSet closely examines the routing of all circuits and the location of equipment to ensure there is no single point of failure.

### *Internet Connections*

SSL AES encryption is used to secure the transport of all proprietary data between FactSet and our data centers. This method permits connections from home machines and laptops living on untrusted networks without sacrificing security. All FactSet products support Internet connectivity on cable modems, DSL lines, cellular/wireless access points, and public Internet hotspots.

### *Remote Access*

FactSet offers every individual with a licensed serial number access (non-concurrent) to FactSet via an installed FactSet on a local machine or corporate Citrix farm, via FactSet Connect from any Internet-connected PC, Mac or Linux machine, and via mobile apps on a BlackBerry, Apple, or Android device. Serial numbers have access to all the same workspaces, portfolios, screens, formulas, libraries, and content regardless of access method—therefore corporate Citrix farms and/or FactSet Connect offer a ready-made business continuity mechanism.

### *Central Data Storage*

Since all data on FactSet's platforms is stored centrally within FactSet's data centers, the loss of any office building or individual workstation will not affect access to critical proprietary FactSet data.

### *Data Recovery*

All client content at FactSet is synchronized between data centers and backed up multiple times daily to tapes, with a comprehensive retention policy. An automated process to restore deleted files, formulas, screens, and content can be initiated at your request.

### *Data Center Redundancy*

FactSet operates two geographically separate, live data centers on the east coast of the United States. Client data is replicated in real time between sites. Should a major event temporarily disable a data center, all clients using that data center as a primary are automatically re-routed to their secondary data center.

### *Thin-Client Computing*

Thin-client computing options range from XenApp/Citrix, to on-demand software provisioning, to VMware/Xen virtual machines. FactSet is compatible with all of these and others. FactSet software can be pre-deployed to farms of such machines and held in standby at business continuity locations so that in the event of a major issue, clients receive uninterrupted local or remote access to FactSet services.

### *Compliance*

Federal regulations, such as Section 404 of the U.S. Sarbanes-Oxley Act, address corporate application and data processes. As FactSet is a critical part of many organizations' financial and reporting workflows, we encourage proper planning to ensure FactSet can assist in attaining compliance with various financial regulations.

### *Definition: Business Continuity Planning*

Planning efforts to determine the processes and procedures an organization needs to put in place to ensure that essential business functions can continue during and after a disaster. Business continuity planning seeks to prevent interruption of mission-critical business services, and to re-establish full functionality as swiftly and smoothly as possible. FactSet's ability to encrypt traffic allows for flexibility in a firm's disaster recovery planning in the event of transportation strikes, pandemics, office space restrictions, or natural disasters.

# Application and Technology Support

Service is the foundation of FactSet's business. FactSet offers unlimited phone support and onsite training for users, plus network, application, and security support.

## *Unlimited Phone Support*

You have unlimited access to FactSet consulting services, available 24 hours a day, 7 days a week. From a quick question to step-by-step guidance through a complex task, consultants will help you find answers and maximize the value of FactSet. Each firm is assigned a consultant who becomes intimately familiar with client needs and processes. This knowledge enables the consultant to suggest and build innovative, personal solutions. Consultants are available to train users, assist with projects, and keep you informed of the latest enhancements to FactSet.

If necessary, consultants will quickly escalate issues to appropriate technical operators, specialists, or engineers. FactSet's corporate disaster recovery strategy includes a global call center with a distributed follow-the-sun model for phone support services. FactSet also mitigates the risk of single office disruption with reliable, secure VPN capabilities for employees. Find your local FactSet support number at [www.factset.com/about/supportnumbers\\_list](http://www.factset.com/about/supportnumbers_list).

## *Software Quality*

To create software of the highest quality, engineering teams continually strive to produce and refine products to meet our clients' needs. Software enhancements receive a rigorous set of quality assurance tests prior to installation. Changes are then automatically tested to minimize unforeseen problems. Teams regularly review and improve processes to better streamline the development of new software, improve the handling of unforeseen production situations, and most importantly, prevent such events from occurring.

## *Operations Support*

FactSet Operations is staffed 24 hours a day, in multiple network operations centers, to help you with technology and application questions or concerns. All circuit and equipment issues, connectivity problems, and installation issues are handled by Operations staff. When needed, critical or complex issues are escalated to appropriate engineering groups promptly.

## *Incident Tracking*

FactSet's optimized incident handling system automatically routes thousands of requests per week to appropriate teams. Every request we receive is tracked through to completion with full audit trails and accountability.

## *Tailored Training*

Each year, FactSet hosts dozens of free training seminars in cities around the world. You can also find regularly scheduled workshops in our New York, Boston, Chicago, London, France, and Tokyo training centers. If you need custom training, your consultant can arrange personalized training sessions at your office.

## *Remote Assistance*

FactSet specialists and engineers have access to assist clients via FactSet Remote Assistance – a technology which allows FactSet personnel to see what is happening on the desktop and offer technical, as well as application guidance. Remote Assistance enables efficient troubleshooting and quicker resolution of complex issues, since it allows FactSet personnel to see exactly what users are seeing.

## *Online Help*

FactSet Online Assistant is an advanced information network that provides comprehensive documentation for all of FactSet's applications and databases, including detailed instructions, formulas, examples, and multimedia tutorials.

+1.877.FACTSET  
24/7 Global Intelligent Call Routing  
[www.factset.com/about](http://www.factset.com/about)

## Security Overview

FactSet's comprehensive security awareness program guides employees through identifying risks and implementing protective measures to provide services securely. This program includes policies and procedures for managing client data, application development lifecycles, system administration, and incidents.

### Incident Handling

Security information is correlated from intrusion detection systems, firewalls, routers, switches, and servers for intelligent monitoring and alerting to response teams. Our incident response plan empowers and prepares teams to handle security events in an organized and controlled manner. Central to the plan is appropriate communication and coordination with FactSet's security, legal, and senior management groups throughout the identification, response, post mortem, and steady state phases of the plan.

### Communications

SSL encryption is used to secure the transport of sensitive data between FactSet data centers and clients for the following environments:

- + FactSet using SSL encryption on TCP 6670
- + Web-based content and applications using port TCP 443 (HTTPS)
- + SFTP for file transfers
- + STARTTLS for email

This system provides secure, end-to-end data transmission from client computers on any public or private network. For additional file transfer information, refer to the Portfolio Integration and Data Delivery sections of this document. FactSet continually evaluates engineering efforts to improve the security of file transfer protocols and integrates advances into our existing, proven, and reliable processes. Firewalling, access control lists, IDS, syslog, and other network controls create additional layers in our defense-in-depth approach to securing the infrastructure.

### Physical Security

FactSet's staffed data centers employ the following controls:

- + Video surveillance and recording
- + Electronic keycard provisioning for authorized personnel
- + Visitor management procedures
- + Fire/smoke detection and suppression
- + Redundant and diverse communications, utility power, UPS, and generators
- + Monitoring and alarms

### Access Control

FactSet authentication components are made up as follows:

- + **Username:** unique for each group within a firm
- + **Serial Number:** identifies a unique individual with access to FactSet
- + **Token:** a dynamically updated hash

This flexible approach enables deployment options that can be tailored to fit your security and distribution policies.

Lockout protections for invalid login attempts include a self-service reset mechanism via our automated one-time passkey email system, AutoValidate. Each client organization manages and maintains an approved list of email domains.

Authorization for authenticated workstations can be provisioned in the following ways:

- + Through your FactSet Account Team
- + Through the FactSet Self Service Portal by your authorized purchaser

### Self Service Portal

With the Self Service portal, administrators are empowered to purchase and cancel FactSet Workstations and authorize the purchase of real-time exchanges and news feeds. They can also view subscription reports and manage users' contact information (e.g. name, support contacts, email addresses, and more).

### File Manager

Access to content that your firm has chosen to upload can be controlled using File Manager. Administrators can manage users, user groups, and categories of files. They can grant access to specific files or category of file, and enable data protection approaches like barriers between business units.

Because File Manager allows control over all the files your firm stores on FactSet, it also provides the Audit Trail feature to track which files have been moved or deleted.

Client data is stored in logistically isolated databases on FactSet's SAN architecture, providing reliable separation.

### Access Audit

FactSet employees may need to access your data for support purposes. Employees are required to specify a business reason for each request that is logged. Client security teams can choose to receive a daily digest audit report of all such access to ensure you know who has access to your data and why.

## Data Security

Integration of holdings, transactions, returns, internal research notes, rankings, formulas, and models drives the fundamental usefulness of the FactSet application. Process, policy, and technology combine to protect the security of your data at FactSet.

FactSet regards client proprietary data as the most sensitive data on our system. The layers of control, policy, and process serve as a foundation to protect our clients' data while residing at FactSet or in transit. Our data centers, global network and systems are under FactSet direct control and operation at all times, and employees are extensively trained on proper interaction with client data.

### Secure Data in Transit

FactSet's File Transfer System is a hardened platform which allows the secure transfer of data between clients and our data centers. All clients are encouraged to use key-based SFTP (SSH/FTP) for transit encryption with optional PGP for file-based encryption. Password and Key+Pass SFTP is also available. The interactive FactSet application uses 256-bit AES OpenSSL to encrypt the connection from the individual desktop to FactSet's data centers. All HTTPS and OpenSSL communication is secured using FactSet's certificates, employing a 2048-bit key with corresponding certificate signed by a trusted CA. For clients who may email their account team sample data or sensitive information, FactSet uses STARTTLS email encryption to ensure that SMTP communications are secured. Thus all conduits for proprietary data transfer between FactSet and our clients are encrypted.

### Extraction Standards

#### FactSet's Client Data Integration

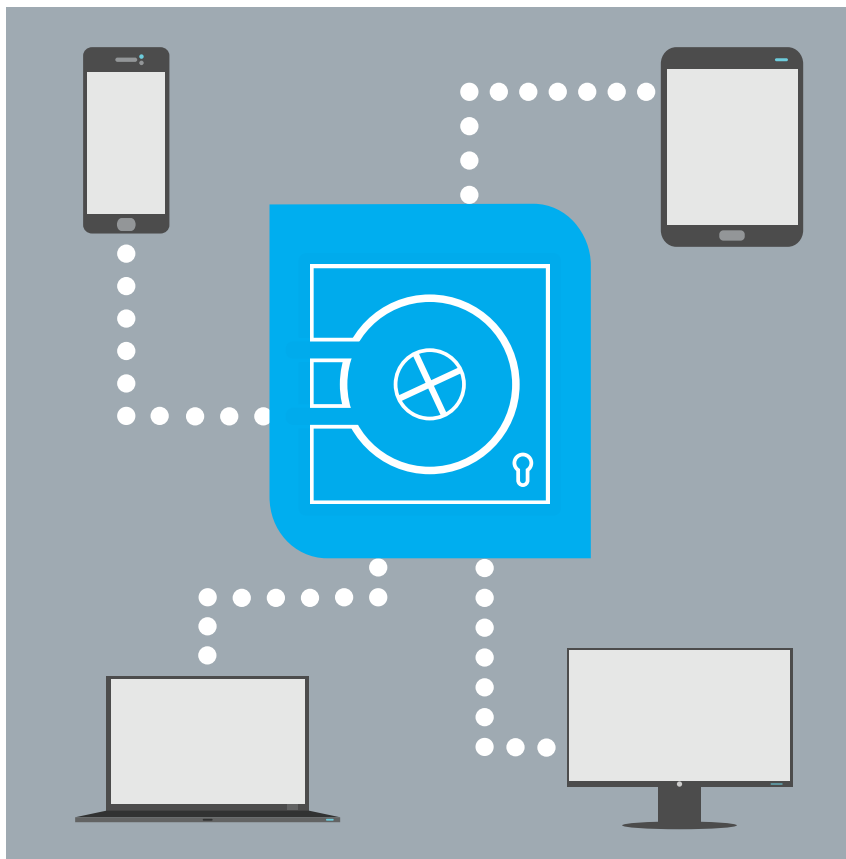
**Technology Overview** (found at [http://www.factset.com/files/download/files/pdf/FactSet\\_Client\\_Data\\_Integration.pdf](http://www.factset.com/files/download/files/pdf/FactSet_Client_Data_Integration.pdf)) goes into more

depth on the automated extraction of data from client-side or cloud-based Accounting Systems, Order Management Systems, Data Warehouses, and Research Management systems. A dedicated data integration team, consisting of dozens of specialized engineers, have experience dealing with 2000+ buy-side clients, 120+ custodians and dozens of commercial software vendors - and have turnkey solutions for extraction of data. Our solutions do not extract personally identifiable information (PII), nor is PII necessary for proper operation of FactSet applications. Uploaded client data is strictly for that client's use only - no third parties ever have access to specific client data of any sort.

### Secure Data at Rest

Once data is decrypted, it is forwarded onto end-use systems such as our hardened VMS mainframe clusters, where parsing is performed and portfolios are updated. FactSet loads and parses many millions of portfolios every day with no human intervention. Data isolation is ensured by the use of operating system level protections on the files as well as process permissions. No access can be gained for batch or interactive processes without a call to our Secure Client subsystem which tracks and grants access to properly-permissioned entities. Client data stored in non-mainframe storage vehicles such as SQL and NoSQL systems are keyed for access based on a unique cipher per client. These systems enforce hardened authentication, authorization, and data isolation controls that are assured for proper security by FactSet's security team.

All proprietary data is stored solely in FactSet's data centers. No client data is synchronized and made vulnerable on client PCs, as the FactSet software is merely a thick client used for display of market and company data as well as integration into Microsoft Office. A lost laptop would not be a vector for data leakage, from a FactSet perspective.



## *Access Controls - Clients*

Users are identified by their factset.net ID which maps into a unique Username and Serial on our system. In order to gain access interactively through FactSet, a two-factor authentication must occur using a time-expiring, one-time passcode sent to the email address FactSet has on record. Emails will only be sent to the corporate domains controlled by a client, non-corporate domains cannot receive email unless expressly requested by the client. The two-factor email approach is the same across all access methods - installed app, web properties, mobile apps, Connect and instant messenger. Business or strategy groups can be further restricted to read/write entitlements on specific portfolios, files or directories by a designated administrator through a self-service application called File Manager - which is a live, fine-grained authorization system.

## *Access Controls - Support*

Personnel with specific roles, such as Consultants and support Engineers, can gain access to client workspaces and data for the purposes of assisting clients with issues. All access is timed, with a one-hour default, and logged. Daily digest summaries of all accesses can be automatically emailed to compliance, market data, or security groups. Employees are governed by Security Policy with a specific Acceptable Use Policy (AUP) and Data Governance Policy which offers a specific framework for the handling of client data and other data classes of varying sensitivities. Employees with access to client data are subject to background checks.

## *Defense in Depth*

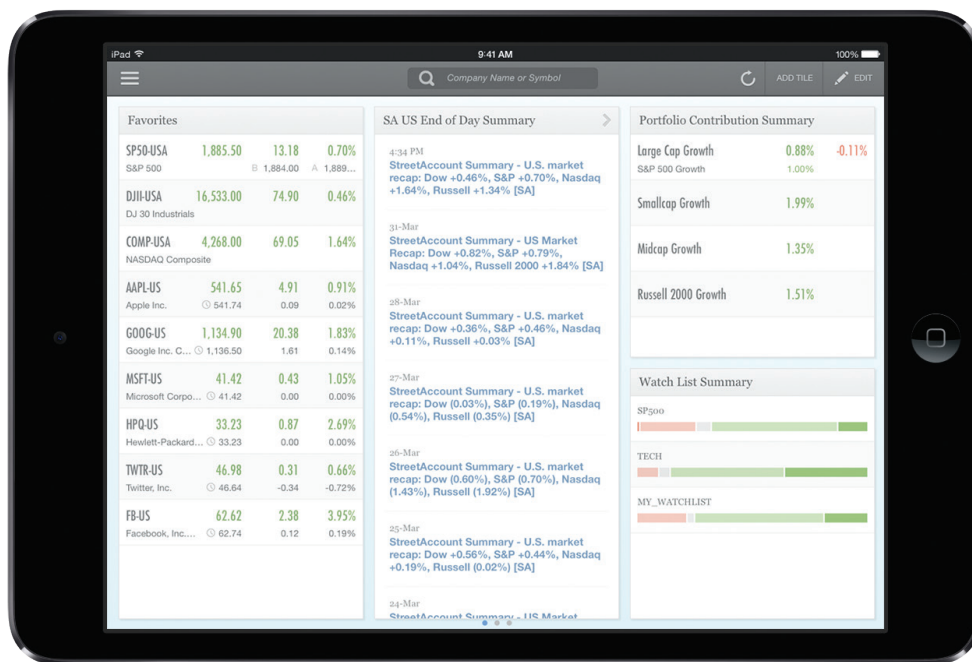
FactSet takes a layered approach towards data security using principles of defense in depth, principle of least privilege, secure defaults, separation of duties, and cyclical vulnerability assessments. Internal assessment based on security best-practices such as OWASP, BSSIM, and OSSTMM are performed on a regular basis by FactSet's security team. Independent attestations are sought yearly through FactSet-sponsored third-party vulnerability assessments. Threats are identified and dealt with using a combination of network firewalls, application-layer firewalls, security intelligence and monitoring platforms, URL filtering, malware and virus prevention systems, extensive system logging, DMZ isolation, and other best practices. Two security groups - a security infrastructure group that oversees the architecture and design of systems, and a security assurance group that embeds itself in FactSet's core software development lifecycle (SDLC) - ensure that FactSet's products and services are designed to a secure standard. Employee's laptops are encrypted and a machine certificate-based VPN is required for off-site access.

In summary, FactSet uses best-in-class technology, a conservative security posture, integration of security engineers with software engineers, and extensive machine/process surveillance to ensure that data residing at FactSet is secure. For more information or to explore any of the above concepts, please contact your account team to schedule a call with our engineering senior management.

## Mobile Apps

FactSet offers native applications for iPhone®, iPad®, Android®, and BlackBerry® mobile devices. Access to these applications is active for FactSet users by default, but can be de-activated by request.

FactSet Mobile Apps includes native applications for iPhone, iPad, Android, and BlackBerry that are installed locally to the users device. It is designed for simple deployment and uses minimal storage, memory, system, and network resources.



### Deployment

#### iPhone and iPad

**Deployment:** FactSet for iPhone and iPad is available as a free download from the App Store or through iTunes.

#### Android Deployment:

FactSet for Android is available as a free download from the Google Play Store.

#### Over The Air (OTA)

#### Deployment for BlackBerry:

A user will navigate their BlackBerry Browser to <http://m.factset.com/> downloads. Here, they will choose "FactSet for BlackBerry," and will then be prompted to download the application to their

device. For firms that deny OTA downloading from external sites, the download files are available in the FactSet Mobile App Deployment Package that can be downloaded from [www.factset.com/download](http://www.factset.com/download) and can be posted to an internal web server to which end users have access.

**BlackBerry Enterprise Server (BES) Push:** The application is distributed to end users via the BES as determined by a firm's IT policies. The FactSet for BlackBerry Deployment Package is available for download from [www.factset.com/download](http://www.factset.com/download) and full details on the "push" procedure are available from Research in Motion.

### User Access

**Initial iOS or Android Registration:** Once the app has been installed on a user's iPhone, iPad, or Android device, a one-time registration and configuration process is required. The process is outlined on Online Assistant pages 16437 (iPhone), 16618 (iPad), and 17258 (Android). Once the app has been installed on a user's device, users simply need to enter their corporate email address or factset.net account. A six-digit one-time passcode will be emailed to their corporate email address. Enter the passcode in the app and registration is complete.

**Initial BlackBerry Registration:** Once the app has been installed on a user's BlackBerry, a one-time registration and configuration process is required. The process is outlined on Online Assistant page 15641. For large BlackBerry rollouts, FactSet recommends using the PIN login system, which requires no end user involvement.

**Subsequent Logins:** After a successful login, credentials are securely stored on the device, and the user will not need to re-enter them for subsequent logins. A 4-digit PIN can be configured for the iPhone and iPad for added security.

**Simultaneous Logins:** Users can log in from only one device at a time. Attempts to log in via multiple devices will invalidate the previous session. This security feature applies to the FactSet Workstation, FactSet Connect, iPhone, iPad, Android, and BlackBerry based FactSet sessions.

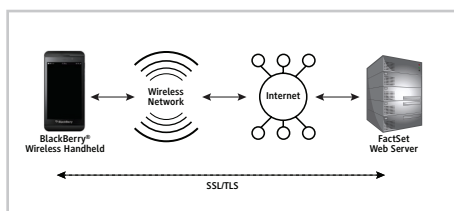


**Lost Device:** In the event of a lost mobile device, the user can disable access to the application from the Mobile Configuration dialog in FactSet by setting Mobile Access to OFF. You can also change the password to invalidate the credentials stored on the device.

## Communications – HTTPS

iPhone, iPad, BlackBerry, and Android devices communicate securely with FactSet via HTTPS. All traffic between any device and FactSet’s servers is secured using HTTPS. For BlackBerry smartphones depending on the selected configuration, the device may or may not communicate directly with FactSet’s servers. In either case, the entire communication stream from handheld to FactSet is encrypted and secure. Clients should allow communications to \*.factset.com.

**Encryption:** All communications between the BlackBerry device and the FactSet servers are encrypted.



There are two configurations:

**BlackBerry Internet Service (BIS) Configuration:** The BlackBerry negotiates the secure connection to FactSet’s servers via Research in Motion’s BIS. The entire connection is secured using HTTPS.

**BlackBerry Enterprise Server (BES) Configuration:** The BlackBerry is configured to communicate with a BlackBerry Enterprise Server with Mobile Data Service (BES-MDS), encrypted using Triple DES/AES protocols. The BES-MDS then makes the HTTPS request on behalf of the handheld using SSL/TLS protocols.

An HTTPS certificate is used to create a secure connection and to uniquely identify our servers to the browser. FactSet has chosen an HTTPS certificate which is supported by default on the BlackBerry device configured in either of its browsing configurations.

The app proactively pulls information to the user’s device on a periodic basis, populating the device’s resident storage and displaying the latest pulled information upon viewing request. The frequency of data updates may depend on many factors, including usage, BlackBerry device status, and local market hours.

## Local Data Security

The most recent dataset pulled via the data fetch procedure outlined above is stored on the user’s device until it is superseded by a subsequent fetch. Application data is stored under the same restrictions as all other device data and adheres to policies set by the BES Administrator. Data is encrypted on the iPad/iPhone using Apple’s native API for Secure Data Storage. All data is stored in this secure manner. In addition, all data files are encrypted using secure 256-bit AES encryption on iPhone, iPad, and Android devices. For further details, please refer to <http://sqlcipher.net/design/>.



## FactSet Instant Messenger

FactSet Instant Messenger is designed to be a lightweight compliance-friendly application that can be easily deployed by the end user and used with or without a FactSet Workstation installed.

### *Simple Deployment*

FactSet Instant Messenger starts running with few clicks and requires no configuration. Since the application uses Microsoft ClickOnce, administrative rights are not required and the app is installed per user, not per machine. FactSet IM users sign on using their factset.net ID which is permanent for a user's entire career.

On first sign on to any machine, there is a simple activation step requiring a one-time passcode sent to the user's corporate email for initial validation. Subsequent logins leverage encrypted token exchanges so users get single sign-on (SSO) with their Windows account.

### *User Communities & Networks*

Since FactSet IM is built on XMPP standards, it is designed to connect and communicate with a range of consumer, enterprise, and professional IM networks. FactSet is open for direct federation with enterprises that have an XMPP compliant IM platform.

### *Access Control and Compliance*

Like all products at FactSet, access to FactSet IM is granted on a per-firm or per-user basis. Additional controls and features can be applied on user, department or firm level, at the discretion of the market data or compliance manager. This allows granular decisions to be made regarding who can speak to who, within each company as well as throughout federated partners and networks.

FactSet IM comes natively with compliance integration with a large range of partners including client-deployed Actiance devices as well as scheduled delivery of message digests to Smarsh, Global Relay, and others for a complete cloud-based compliance solution.

### *Support for Locked Down Environment*

FactSet Instant Messenger does not require special permissions to install or update and does not make use of the Windows Registry. The application uses industry-standard XMPP over HTTPS and seamlessly operates with all web proxies and inspection firewalls without any need for configuration. No ports need to be opened, and no software packaging is required – it just works out of the box, and because it is Microsoft ClickOnce it will check and run the most appropriate certificate-signed version on each launch.

### *Centralized Data*

All user settings, message history, application layout, and groups are securely stored within FactSet's data centers. Data is synchronized automatically, and no messages or contact lists are stored on the user's machine.

### *Simplicity & Elegance*

The unified factset.net ID will be used to gain access to all FactSet products. It consists of first name and last name such as john.smith@factset.net and can be used to access the FactSet Workstation, Mobile devices, Instant Messenger, FactSet Connect, and other web content in a secure way through launch.factset.com without the need for cumbersome physical tokens or biometric devices.



## **Online**

[www.factset.com](http://www.factset.com)

## **About FactSet**

FactSet is a leading provider of financial information and analytic applications to investment professionals around the globe.

## **For More Information**

To learn more about FactSet, contact [sales@factset.com](mailto:sales@factset.com).

## **Product Overview**

[www.factset.com/products](http://www.factset.com/products)

## **Contact FactSet**

[www.factset.com/contact](http://www.factset.com/contact)

## **Client Support**

[www.factset.com/about](http://www.factset.com/about)