# Intel File Transfer System: Integration Guide Version 1.6

Revision History

| Revision Number | Author | Date | Comments |
|---|---|---|---|
| 1.0 | Hubspan | March 26, 2004 | Initial Draft |
| 1.1 | Hubspan | April 6, 2004 | Added section on File Naming conventions |
| 1.2 | Hubspan | April 9, 2004 | Added section on File Versioning |
| 1.3 | Hubspan | April 28, 2004 | Added section on Event Notifications |
| 1.4 | Intel | October 28, 2004 | Added information on new notifications |

| | | | and updated file naming standards. |
|------|---------|-------------------|-------------------------------------------|
| 1.5 | Hubspan | January 4, 2005 | Minor updates to FTP/s section. |
| 1.6 | Hubspan | January 6, 2010 | Minor updates-Associate Connect references |

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## 1    Introduction

The purpose of the Intel File Transfer System Integration Guide is to provide a brief overview of the integration process for a trading entity (TE) to connect with Intel.

Specifically the integration guide will:

▸ Provide an overview of the Intel File Transfer System and roles of Intel, Hubspan, and the TE.

▸ Assist the (TE) in understanding what connectivity methods are available for exchanging files with Intel.

▸ Define the steps to the (TE) will follow to complete the integration.

## 2    Overview – Intel File Transfer System

The purpose of the Intel File Transfer System (FTS) is to facilitate secure electronic exchange of business documents between Intel and their various trading entities (TE) using Hubspan's outsourced Transaction Delivery Network Service as the provider hub.

The high level Integration Architecture is shown in Figure 1.
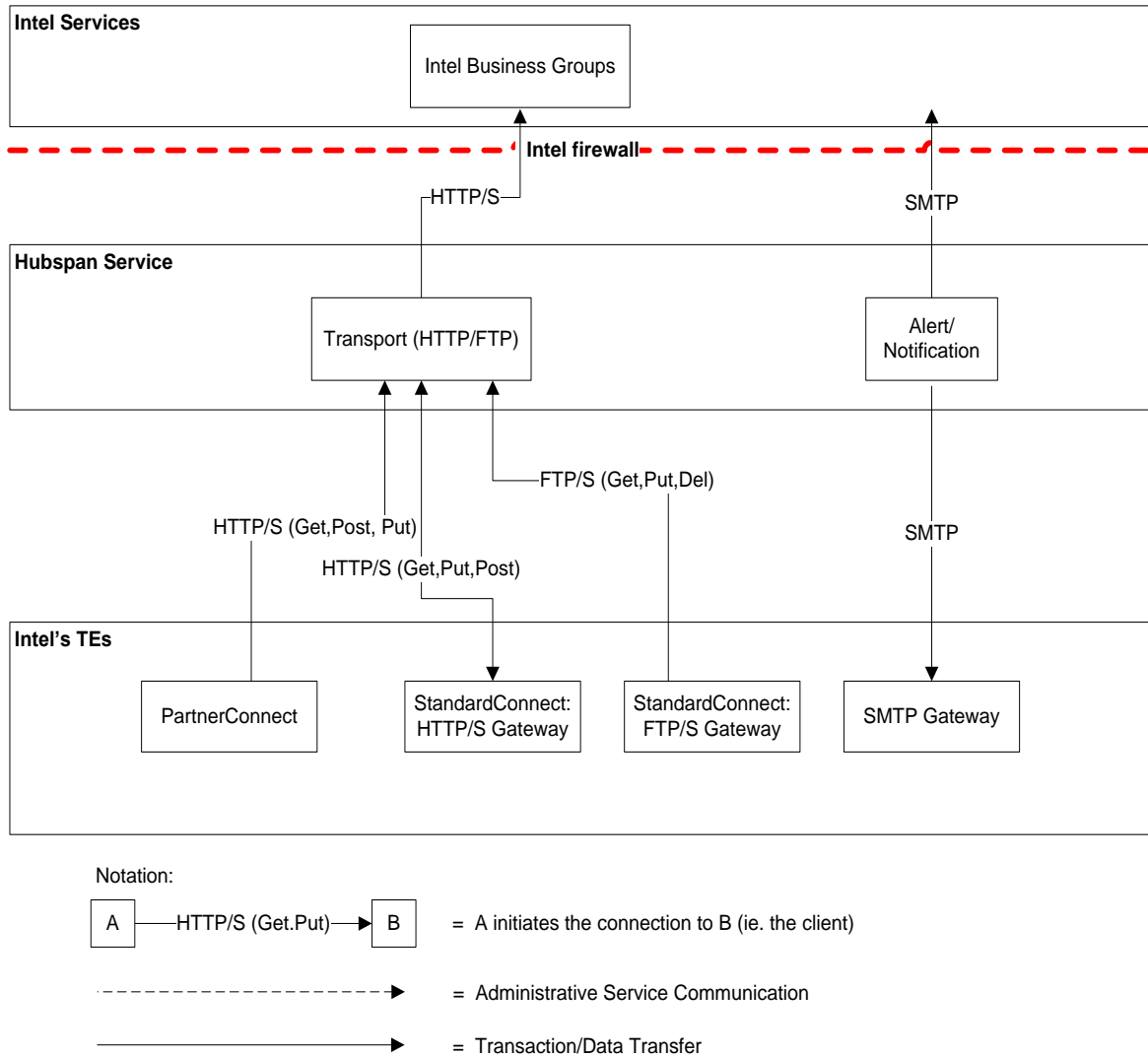
**Figure 1:  High Level Integration Architecture**

## 2.1   Intel

Intel Business Groups (BG) represent individual systems belonging to various business units within Intel.  The Intel Business Groups are the sender or receiver of secure files from the TE.

## 2.2   Hubspan

Hubspan brokers all connectivity between TE and Intel.  The connectivity service provided by Hubspan includes: transport, routing, security/authentication, transaction reconciliation, status reporting, TE profile management and a client-side tool.

## 2.3   Trading Entities

The trading entities send files to, or receive files from the Intel Business Groups.  This document serves as a guide for the integration process.

## 3    Task List and Project Scheduling

### 3.1   Task List

Trading entities will need to undertake the following tasks in order to complete the integration process with Intel:

- ✓ **Choose connectivity option to send/receive documents from Intel**
- ✓ **Complete Hubspan Trading Entity form**
- ✓ **Configure system for testing OR download, install and configure PartnerConnect**
- ✓ **Test Connectivity with Hubspan**
- ✓ **Complete End to End testing with Intel**
- ✓ **Go Live**

These tasks are documented in detail in the subsequent sections of this document.

### 3.2   Scheduling

From a resource perspective, each TE may have different individuals involved in the integration. In general, there would likely be a business contact and a technical contact involved to ensure the integration is meeting both the business and technical requirements of the TE.

Depending on the resource availability during the integration, the project can be implemented within 2 weeks.  This following is a very high-level project plan:

**Week 1 Configuration and Initial Testing**: The TE will select their method for connection and provide registration information to Intel.  After receiving configuration information from Hubspan, the TE will configure their test system or install PartnerConnect\*.  The TE will then complete initial connectivity testing which ensures the TE is able to communicate outside their firewall and send documents to Hubspan and that Hubspan is able to send documents to the TE if applicable.

**Week 2 End to End Testing and Production Acceptance**: End to end testing is the full document transfer cycle or 3-way testing including the TE, Hubspan, and Intel.  After this testing is complete, all parties will need to configure their production environments before the TE completes a production acceptance test.

***Important Note***: The integration will need to be coordinated between the TE, Hubspan and the Intel Business Group.

 *\*- if determined by Hubspan and the TE, AssociateConnect may be substituted.*

## 4    TE Connectivity Options

There are several standard document exchange options available for the TE. These options are provided such that the TE can choose the option that best fits their business and technical requirements. All of these options are functionally equivalent. The options fall into two categories:

- StandardConnect – a trading entity can use standard Internet protocols to securely exchange documents with Intel.

- PartnerConnect – a trading entity can use software provided by Hubspan to undertake document exchange.

Trading entities should select the option that is easiest for them to install and maintain over time. Although Intel has the ability to support variants on these options it is suggested that trading entities select from the standard options to keep implementation and maintenance effort to a minimum.

### 4.1   StandardConnect

This option is best suited for trading entities that have an existing B2B infrastructure or those that already have a simple file transfer protocol (FTP) client that they wish to leverage to exchange documents with Intel. This existing infrastructure may be B2B software from vendors such as IBM

or webMethods, homegrown software implementing standard Internet protocols, or standard FTP/SSL clients.

Intel's StandardConnect uses a variety of standard Internet protocols as described in Table 1 below.

| Protocol | Authentication | TE Mode | Notes |
|----------|----------------|---------|-------|
| HTTPS PUT | Basic Auth: Userid/Password | Client/Server | |
| FTP/s PUT | UserId/Password | Client only | SSH is not a supported option |
| FTP/s GET | UserId/Password | Client only | SSH is not a supported option |

**Table 1. StandardConnect Protocol Support**

### 4.1.1  HTTPS PUT

The HTTPS PUT method would be utilized by the TE (mode: HTTP client) to transmit a file to Intel via Hubspan.  In addition, Hubspan would utilize the HTTPS PUT method to transmit a file to the TE (mode:HTTP server) from Intel.

A secure transport mechanism (SSL) and Basic Authentication are required for any HTTP methods for this project.  HTTP Basic Authentication utilizes a userid and password combination.  Most HTTP client packages provide functionality to support HTTP basic authentication.

#### 4.1.1.1  Send Files to Intel

The TE must have an application capable of generating a HTTPS PUT request.  The message to be transferred to Intel must be transmitted in the "body" of the HTTPS PUT.  The following MIME headers are to be used with the HTTPS PUT request:

```
Host: [hubspan server]
Content-Type: application/octet-stream
Content-Length:  [Message length]
```
**Example 1. MIME Headers**

The URI will form a logical path indicating the recipient and filename.  It should take the following form:

https://baseurl/IntelBusinessGroup/Filename

Example 2 below illustrates a PUT of the file "PO1000.pdf" destined for the Intel Business Group identified by "IntelEBS".

```
PUT https://hubspan.net/mh/server/IntelEBS/PO1000.PDF HTTP/1.1
Host: hubspan.net
Content-Type: application/octet-stream
Content-Length: [Message length]

[Message to be transmitted]
```
**Example 2. HTTPS PUT**

#### 4.1.1.2  Receive Files from Intel

The HTTPS PUT method would be utilized by Hubspan to transmit a file to the TE from Intel.  In this case the TE would need to have a HTTPS server available to receive the documents from Hubspan.  The Message-Packaging is the same as described above in section 4.1.1.1.

If the TE would like to utilize the HTTPS GET method to retrieve files from Hubspan, this is available using the AssociateConnect client described below in Section 4.2.

## 4.1.2  FTPSSL

FTP/SSL can be used by the TE to send and retrieve files from Intel through Hubspan. FTP/SSL supports only username/password authentication. If a TE chooses to use FTP/SSL, they must act as the client for all transactions. The TE must actively download files from, and upload files to, the Hubspan server. This is different from an HTTPS connect where the TE is a passive server when receiving files from Intel through Hubspan. Appendix A provides a list of supported FTP/s clients that have been specifically tested for the Intel File Transfer System.

For FTP/SSLclients, the TE will need to configure settings such as:

Host name: exampleftpsecure.net
Username: usernamehere
Password: passwordhere
Server Type: FTP/SSL (Auth SSL)
Encryption: 128bit

**Example 3. Sample FTP/SSL configuration information**

The home directory of each FTP/SSL user will have two designated directories: **Outbox** (data from TE destined for Intel) and **Inbox** (data from Intel-destined for TE). The TE will need only navigate to the appropriate directory before sending or retrieving files. If the TE is going to be sending files to more than one business group or application at Intel, they must ensure they are in the correct subdirectory when sending or retrieving files.

### 4.1.2.1  FTP/SSL Put

The FTP/SSL Put method will be used by the TE to transmit a file to Intel via Hubspan. A login and password as well as the directory information will be provided to the TE by Hubspan. Routing to Intel is determined via the Directory/Folder name.

cd \Outbox\IntelEBS
put INVOICE-100.PDF

**Example 4. FTP/SSL PUT**

### 4.1.2.2  FTP/SSL Get

The FTP/s Get method will be used by the TE to retrieve files from Intel via Hubspan.

cd \Inbox\IntelEBS
get PO1000.PDF

**Example 5. FTP/SSL Get**

### 4.1.2.3  FTP/SSL Delete

The FTP/SSL Delete method will be used by the TE to remove files from their FTP/SSL **Inbox** after successfully downloading them via the Get command.

cd \Inbox\IntelEBS
delete PO1000.PDF

**Example 5. FTP/SSLGet**

## 4.2  PartnerConnect

The PartnerConnect option is best suited for trading entities that have no existing B2B infrastructure and wish to use software provided by Hubspan specifically to undertake secure document exchange. AssociateConnect requires a computer with an Internet connection and Windows XP or newer operating system. For more specifics regarding PartnerConnect, please refer to the documentation entitled "PartnerConnect Installation Guide", covering this software in detail.

Authentication between PartnerConnect and Hubspan will be handled via user id and password scheme and SSL will provide the necessary security over the public network.

PartnerConnect will be made available for download in zipped format.  An unzip utility is required at the client site for the installation of PartnerConnect.

Some configuration is required after installing PartnerConnect.  The configuration settings may include the following:

- • Hubspan Server (test and production) URLs – Provided by Hubspan

- • PartnerConnect User ID and password to access Hubspan Server service – Provided by Hubspan

- • Error Notification email alias, password and email server address for PartnerConnect to send notifications to (optional).

- • Client Side proxy server address and information (if applicable)


## 5    Configuration at Intel and Hubspan

The TE will be contacted by the Intel (BG)to discuss the timing of integration with the Intel File Transfer System.  The Intel (BG)  will provide a registration form to the TE.  The TE should return the completed form to Intel.  After configuration at Intel, the form will be forwarded to Hubspan.

Once Hubspan has received this form, the TE will be configured in the Hubspan test environment.  When the configuration is complete, the TE will receive an email from Hubspan with the necessary configuration information for testing.


## 6    Configure Test environment or install PartnerConnect

The configuration necessary for testing will depend upon the method chosen by the TE.  Most of the information such as username, password, and URLs will be provided by Hubspan.  There may be other configuration on the TE side due to firewall and other technical requirements.

### 6.1   StandardConnect

### 6.1.1  HTTPS configuration

Configuration information (URL, username and password) for sending files will be provided by Hubspan.  The configuration steps required will be dependent on the software or application the TE will be using to send via HTTPS.  To receive files, a TE must configure their web server to accept HTTPS PUT requests.  The TE should carefully consider security issues when using HTTPS PUT.  Please see your web server's documentation for further information.

### 6.1.2  FTP/SSL client configuration

For FTP/SSL users, the username and password need to be set as well as the address of the file server.  Again this information will be provided by Hubspan.

Some possible configuration settings for FTP/SSL clients are:
Host name:   ftp.hubspan.netUsername: username
Password:  password
Server Type: FTP/SSL (Auth SSL)
Encryption: 128bit

## 6.2   PartnerConnect

The installation and configuration steps are outlined in a separate document entitled "PartnerConnect Installation Guide".

## 7     Connectivity Testing

Connectivity testing is the first test between the TE and the Hubspan service.  This ensures the TE is able to communicate outside their firewall and send to or receive files from Hubspan.

## 7.1   StandardConnect

### 7.1.1   HTTPS

The connectivity test will involve the TE attempting to send a HTTPS put of a test file to the Hubspan server.  If the TE is going to receive files from Intel, Hubspan will attempt to put a file on the TE server.

### 7.1.2   FTP/SSL

The TE will attempt to login to the FTP/SSL server and put a test file in their Outbox.  After this is complete, they should try to change directories and retrieve a test file from their Inbox (this test file will be placed on the server by Hubspan).

## 7.2   PartnerConnect

After completing the configuration steps, the TE should use either the graphic user interface (GUI), the batch files, or shell scripts to send a test file to Hubspan.  The TE should try to retrieve a file (this test file will be placed on the server by Hubspan).

*Note*: For those that are only sending files to Intel or only receiving files from Intel, they need only test the direction of file transfer applicable to their integration.

## 8     End to End Testing with Intel

After connectivity testing is complete, the next step is to complete end-to-end testing with the Intel Business Group.  The end-to-end test should emulate the desired production activity.  For example, if the TE will be sending and receiving secure files from Intel, both methods should be tested.

The end to end testing will need to be coordinated between the TE, Hubspan and the Intel Business Group to ensure all parties are available to monitor and verify test results.

## 9     Production Configuration and Go-Live

Once end-to-end testing has been successfully completed between the TE and the Intel Business Group, the TE will have completed the prerequisites to move this process to the production environment.

New configuration information will be provided to reflect the production environment.  A production acceptance test can be scheduled and co-coordinated by Hubspan and the Intel BG if the TE desires this final check before going live.

The TE, Hubspan and the Intel Business Group agrees to a Go-Live date.

## 10  File Naming and Operating System Portability

To allow portability across various operating systems such as Windows, Mac OS X, and Unix/Linux variants, it is critical that a common set of file naming standards be observed.  These standards were developed with the file naming restrictions listed below in mind.

### 10.1  Windows Operating Systems Restrictions

Reference: *(http://msdn.microsoft.com/library/default.asp?url=/library/en-us/fileio/base/naming_a_file.asp)*

1. The following characters are invalid as file or folder names on Windows using NTFS: / ? < > \ : * | " and any character you can type with the Ctrl key.
2. In addition to the above illegal characters the caret ^ is also not permitted under Windows Operating Systems using the FAT file system.
3. File and folder names may be up to 255 characters long with Windows using the FAT file system.
4. File and folder names may be up to 256 characters long with Windows using the NTFS file system.
5. The length of a full path under both systems is 260 characters.
6. In addition to the characters listed above, the following conventions are also illegal:
    - Placing a space at the end of the name
    - Placing a period at the end of the name
7. The following file names are also reserved under Windows:
    - com1, com2, com3, com4, com5, com6, com7, com8, com9, lpt1, lpt2, lpt3, lpt4, lpt5, lpt6, lpt7, lpt8, lpt9, con, nul, and prn.
    - Avoid these names followed by an extension (for example, NUL.tx7).

### 10.2  Mac OS X Restrictions (AssociateConnect Only)

1. The following characters are invalid as file or folder names on Mac OS x:  / ? < > \ : * | " and any character you can type with the Ctrl key.
2. File and folder names beginning with a dot (".") are not permitted.

### 10.3  Intel SFT File Naming Standards

Based on the restrictions listed above, the following list is a set of recommended file naming standards for the Secure File Transfer project:

1. Limit file and directory names to the characters A-Z, a-z, 0-9, hyphen, and underscore and space.

2. Space (blank) character must not be leading or trailing.

3. COM[0-9], COM[0-9].*, LPT[0-9], LPT[0-9].*, NUL, NUL.*, PRN, PRN.*, AUX, AUX.*, CON, CON.* are invalid file names or directory names.

4. File and directory name comparison should be case-insensitive (foo.txt == Foo.TXT == FOO.TXT)

5. Limit filename to 64 characters because Hubspan AssociateConnect requires additional path parameters to indicate Sender and Recipient.  Total path may be up to 260 characters (including drive letter).

    eg.  D:\<192-path-chars><64-chars-filename>NUL (64 char file name + 192 path characters + 4 characters = 260)

*Important Note*: The space (blank) character used in file names may not work on all operating systems.  To avoid possible failure during file transport, the Intel Business Group and TE who wish to use this feature will need to ensure that both operating systems support this capability during the integration process.

## 11  File Versioning

In the Intel File Transfer system, it is possible to exchange a file with the same filename multiple times.  Under certain conditions, this can cause a conflict between two or more instances of the file.  These scenarios are detailed below.

### 11.1  Scenario 1: Conflict at Hubspan

1. The receiver of a file, Trading Entity A, is using an asynchronous method to download files such as PartnerConnect or FTP/SSL.
2. Intel uploads a file destined for Trading Entity A.  Before Trading Entity A downloads that file, Intel uploads another file with the same name.

### 11.2  Scenario 2: Conflict at the Destination

1. Intel sends a file to a Trading Entity A.
2. The Trading Entity A downloads the file to, or the file is uploaded to, their download directory.
3. This file is NOT removed from the download directory.
4. Intel sends another file with the same name to Trading Entity A.
5. The Trading Entity A downloads this new file to, or the file is uploaded to, their download directory.

### 11.3  Conflict Avoidance and Resolution

The most efficient way to resolve the conflicts described above is to avoid them altogether.  This can be achieved by requiring a unique filename for each file transmitted between an Intel Business Group and a TE.  A simple way to create unique file names would be to add a time/date stamp or a unique id number to a file name (e.g. *myfile_20040403_1613.txt)*.

If unique file names are not used, a conflict resolution mechanism must be implemented.  There are two industry standard solutions.

1. Create a new version of the file by altering the filename (e.g. renaming *myfile.txt*, *myfile(2).txt*).
2. Always overwrite the old file with the new one.

Overwriting is the only option currently supported by the Hubspan Transaction Delivery Network Service and PartnerConnect.  Specific Intel Business Groups or trading entities not using PartnerConnect may implement other conflict resolution mechanisms.

## 12  Trading Entity Event Notifications

Certain events in the Intel File Transfer System can trigger Event Notifications, which are sent to a TE.  These are used by the TE both for reconciliation, and as a call to action (e.g. to manually download a file from Hubspan).  This section details how they are delivered, which party (Intel or Hubspan) delivers them, and the options for receiving these notifications.

### 12.1  Transport Mechanism

All Event Notifications will be sent via SMTP to an address specified by the TE.

### 12.2  Notification Delivery

Intel will deliver all Event Notifications except one, which will be delivered by Hubspan. Hubspan will deliver an Event Notification after a file has been successfully downloaded from Intel and is on the Hubspan server awaiting pickup by the TE.  This notification will be sent by default for all trading entities who choose an asynchronous retrieval method such as PartnerConnect or FTP/SSL.  This notification will not be sent by default for trading entities who choose a synchronous retrieval method such as HTTP PUT.

## 12.3  Notification Options

Before being configured in either the Hubspan or Intel systems, the TE will choose which notifications they would like to receive.  The TE may choose to receive any of the following notifications:

- The Intel (FTS) will be unavailable (e.g. for maintenance).  Please note that this notification is not optional.  (Sent manually by Intel's Support team)

- A file sent **by** my company has been received by Hubspan and has been scheduled for delivery to Intel.

- An error has occurred and a file sent **by** my company did not reach its destination. (This covers errors in both the Intel and Hubspan systems.)

- A file sent **by** my company exceeded the maximum time allowed for delivery specified by Intel.

- A file sent **by** my company has been successfully delivered to Intel.

- A file sent **by** my company has not yet been picked up by Intel and will be deleted from the system.

- A file sent **by** my company was not picked up by Intel and has been deleted from the system.

- A file sent **to** my company by Intel is ready for pickup at Hubspan. (Sent by Hubspan)

- My company has received a file that was sent by Intel.

- A file sent **to** my company has **not** yet been picked up and will be deleted from FTS.

- A file sent **to** my company was **not** picked up by the recipient and has been deleted from FTS.

- A file sent **to** my company was **overwritten** at Hubspan because another file with the same name was sent by Intel before the first one was delivered to my company.

## Appendix A

The following list of FTP/SSL software products have been tested and verified for use with the Secure File Transfer project. The list is not exhaustive and will be updated when additional product testing occurs. None of the companies below are affiliated in any way with Intel Corporation.

| Client FTP | Vendor |
|---|---|
| FileZilla | filezilla-project.org |
| WS FTP Pro | www.ipswitch.com |
| Core FTP | www.coreftp.com |
| Smart FTP | www.smartftp.com |
| Cute FTP Pro | www.cuteftp.com |
| Go FTP | www.goftp.com |
| IglooFTP | www.iglooftp.com |
| Valicert Secure FTP | www.valicert.com |
| FTP Voyager | www.ftpvoyager.com |