



Shipping & Mailing
Outbound and Inbound Package Management

SendSuite® Tracking Specification White Paper

Introduction

The SendSuite® Tracking Package Tracking and Delivery Management system incorporates an option for database management providing a robust and scalable solution for organizations requiring a larger scale-computing environment for accountable mail and package tracking. SendSuite Tracking consists of web-enabled programs operating within generic PC-based hardware platforms. In addition, SendSuite Tracking supports special purpose computing equipment such as portable data collection devices and barcode printers, to provide automation and information processing functions associated with the recording of package movement within an organization. The SendSuite Tracking software is compatible within the environments described in this documentation.

Customer based software modules running on designated SendSuite Tracking workstations provide user presentation services including application-based security for transactions associated with the receipt and delivery of packages and the online maintenance of support tables. File and print services, and network security are provided to the SendSuite Tracking software by the workstation operating system software.

This document is intended to provide an overview of the systems requirements necessary for installation.

System Configurations

The SendSuite Tracking software can be installed on a web/application server, with access to Microsoft® SQL Server® database management software. The application and databases may be hosted by Pitney Bowes or installed at the customer site. If a dedicated SQL server is not provided, SQL Express will be installed automatically.

SendSuite Tracking can also be installed in a stand-alone configuration on Windows® 8.1 and 10 using SQL Express. This configuration will be self-contained will not allow external Smart Client connections.

This document outlines the technical requirements for the most current release of SendSuite Tracking. For previous versions, please refer to the SendSuite Tracking Platform Compatibility Matrix.

Note: Pitney Bowes does not supply servers.

The actual configuration of workstations, file servers and database servers can vary depending upon customer circumstances. Listed in this document are minimum and recommended requirements for hardware and software for each computer component of the system. Use the Environment Descriptions and Considerations table as a guide to determining the most appropriate configuration.

Note: It is the responsibility of the customer to obtain and install an SSL certificate, with the exception of PB- hosted installations.



Critical note for HTTPS with SendSuite Mobile: Only certificates provided by a certified authority (CA) are supported for SendSuite Mobile. Self-signed certificates are not supported.

Environment Descriptions and Considerations

Description	Appropriate For
SendSuite Tracking Customer-Hosted	<ul style="list-style-type: none">• WAN Environments where there are multiple sites either in a campus setting and/or geographically dispersed.• The database and application servers are NOT located on the same LAN as the processing stations• Customers seeking a Web-based Solution• Multiple sites either in a campus setting and/or geographically dispersed• Multiple users processing inbound packages• Workstations located in multiple locations within multiple facilities• High "IT" involvement; server & network support & backups, standards definition, disaster recovery etc.
SendSuite Tracking PBI-Hosted	<ul style="list-style-type: none">• Enterprise Customers and/or WAN or LAN Environments where customers want to reduce their Total Cost of Ownership• Customers seeking a Web-based Solution• Multiple sites either in a campus setting and/or geographically dispersed• Multiple users processing inbound packages• Workstations located in multiple locations within multiple facilities• "IT" involved in decision-making, however have some involvement in the deployment (i.e. Ports, etc)

SendSuite Tracking Software Installation

The IT systems administrator should provide Pitney Bowes with the appropriate parameters to Pitney Bowes installation personnel.

Note: The customer is responsible for licensing, configuring and maintaining SQL Server.

Pre-Installation Security/Permissions

The IT systems administrator should provide Pitney Bowes with temporary Windows administrator permissions to the SendSuite Tracking server. This is required to be able to execute the SendSuite Tracking installation package which uses the Windows Installer (MSI) engine.

Stand-alone Single User Workstation

The Stand-alone option also known as "Single Box" is an all-in-one deployment of SendSuite Tracking on a Windows workstation consisting of main SendSuite Tracking application services, SendSuite Tracking client, and SQL Server Express database on a single computer. Remote client connections are not allowed. This deployment option is only recommended for a customer with:

- Low daily package volume.
- Single user processing receipts and lookups.
- Low number of delivery routes covering a small number of employees in organization.

Hardware Requirements

- 2 GHz CPU or higher
- 4 GB RAM minimum
- DVD/CD-RW drive
- Network Interface Card (NIC)
- SVGA color monitor, 1024 x 768
- 40 GB available disk space
- Sufficient USB ports for associated peripherals

Operating System Software Requirements

- Windows 8.1 (32-bit or 64-bit)
- Windows 10

Database Requirements

- SQL Server/Server Express 2012
- SQL Server/Server Express 2014
- SQL Server/Server Express 2016
- SQL Server/Server Express 2017

Web Browser Requirements (Administrator Module only)

- Internet Explorer 9 or higher
- Mozilla Firefox 5 or later
- Chrome

Single Server

This deployment of a combined web server and database server best fits a single mail center in a single building where the network latency will most likely be very low. This deployment option is only recommended for a customer who will use the software at a single location with one or more mail centers within the same building. This deployment option is only recommended for a customer with:

- Volumes for this configuration should be 300 packages or less per day.
- A deployment of SendSuite Tracking on a Windows server.
- Consists of main SendSuite Tracking application services and SQL Server on a single server computer.
- Remote customer connections are allowed.

Note: If the mail centers are located in separate buildings then avoid this configuration.

Multi Server

This deployment option should be typical for any customer that has more than one mail center at more than one location.

- A deployment of SendSuite Tracking on multiple Windows servers (web and database).
- Consists of main SendSuite Tracking application services on an application server computer and SQL Server on a separate server computer.
- Remote customer connections are allowed.

Note: All customers have to be on the same LAN/WAN. In other words, sites with their own network that is not connected to a parent network cannot access the server.

Web Farm, Clustered Database and Load Balancer

This deployment should be only for customer who wishes to have very high availability.

Note: All customers have to be on the same LAN/WAN. In other words, sites with their own network that is not connected to a parent network cannot access the server.

Dispersed WAN

This deployment is intended for customers who have WAN deployments and in very dispersed environments. In multi-time zone scenarios, this configuration should be considered if the customer has the necessary budget. The web farm and clustered databases WILL NOT increase performance but allow for uptime across time zones so that there a high chance that all packages can be processed. Performance issues will involve network latency. Before deployment network latency checks should be done and customer informed of potential issues.

Minimum Server Requirements

The customer must provide a dedicated server in a non PB-hosted WAN/LAN environment. The requirements listed below are for SendSuite Tracking only and do not reflect capacity for any other Pitney Bowes software. We recommend the server be a physical machine and not a virtual machine. This is so that the I/O performance of the database in a production environment is not hindered.

The SendSuite Tracking databases will be created on the SQL Server at the time of installation and setup. A SQL account with System Administrator privileges is required during the installation process. The account is used only by the installer and is discarded once software installation is complete.

SQL Server Security Requirements

This section defines the minimum SQL permissions required to install, upgrade, or operate SendSuite Tracking. This information can be provided to a customer DBA should the customer's security constraints prohibit either of the following scenarios:

- Use of the sa or equivalent login for installations and upgrades
- Assignment of the db_owner role to SST_User

SQL Login for Installation/Upgrading

While use of the sa login is preferred, Installation and upgrades can be executed with a SQL login with at least the following Server Roles:

Server Role	Justification
dbcreator	Allows the installer to execute scripts that will create the following databases: <ul style="list-style-type: none">• SSAdmin• SST• TAPlusRepository
public	n/a
securityadmin	Allows the installer to create and configure the SST_User SQL login.

Furthermore, the SQL login used for installation must be assigned to the public role on the master database.

SST_User Login

By default, the SendSuite Tracking installer creates the SST_User login with the following configuration:

Database	Server Role	User Mapping: Role Membership
SSAdmin	public	db_owner
		public
SST	public	db_owner
		public
TAPlusRepository	public	db_owner
		public

In an environment where db_owner is explicitly forbidden, the SST_User login may be reduced to the following configuration once installation is complete:

Database	Server Role	User Mapping: Role Membership	Explicit Permission
SSAdmin	public	db_datareader	Grant: execute
		db_datawriter	
		db_ddladmin	
		public	
SST	public	db_datareader	Grant: execute
		db_datawriter	
		db_ddladmin	
		public	
TAPlusRepository	public	db_datareader	Grant: execute
		db_datawriter	
		db_ddladmin	
		public	

Default Language

Because all date formats in the SendSuite Tracking databases are mm/dd/yyyy, the default language for SST_User must be English (us-english) and must never be altered.

Supported Collations

The following collations are supported

- SQL_Latin_General_CP1_CI_AS
- SQL_Latin_General_CI_AS

Microsoft SQL Server Licensing Considerations

The Microsoft SQL Server Database Management System (DBMS) is licensed by Microsoft in a number of different configurations. Customers have the responsibility of ensuring they are properly licensed to use the SQL DBMS for Server and Customer access.

Customers may reference the Microsoft web site at www.microsoft.com to review the pricing and licensing requirements of SQL Server.

Server communication

- SQL Server Default port = TCP-1433, but is configurable.

Note: The customer is responsible for licensing, configuring and maintaining SQL Server.

Note: For Single server or Multi server deployments, the platform of the operating system on the customer workstation is independent of the platform of the operating system on the application and/or database server. For example, if there is a multi-server deployment where both the application and database server are on 64-bit platforms, the customer workstations can be either 32-bit or 64-bit platforms.

Note: For customer-provided servers and processing stations, all other applications running on these need to be reviewed during the Pitney Bowes pre-sales and SIP process.

Client Workstation Hardware Requirements

- 2.0 GHz CPU or higher
- 4 GB RAM minimum
- DVD/CD-RW drive
- Network Interface Card (NIC)
- SVGA color monitor, 1024 x 768
- 20 MB available disk space
- Sufficient USB ports for associated peripherals

Client Workstation Operating System Software Requirements

- Windows 7
- Windows 8.1 (32-bit or 64-bit)
- Windows 10

Client Workstation Web Browser Requirements (Administrator Module only)

- Internet Explorer 9 or higher
- Mozilla Firefox 5 or later
- Chrome

Server Hardware Requirements

- Dual-core or Quad-core CPU, 2.0 GHz or higher
- 4 GB RAM minimum, 8 GB RAM recommended
- 40 GB available disk space
 - **Note:** 20 GB (OS) on the C: drive, 20 GB (applications) on the D: drive
- DVD drive required
- Network Interface Card (NIC)

Server Operating System Requirements

- Windows Server 2012
- Windows Server 2012 R2
- Windows Server 2016
- Windows Server 2019

Database SQL Server Requirements

- SQL Server/Server Express 2012
- SQL Server/Server Express 2014
- SQL Server/Server Express 2016
- SQL Server/Server Express 2017

Software Requirements

- .NET Framework 3.5 Features (applies to Server 2012 only and must be enabled manually)
- For workstation-grade operating systems, the SendSuite Tracking Installer will install the required .NET Framework if it is not present.

The following components must be enabled. If not already installed, the SendSuite Tracking installer will install:

- IIS
- ASP.NET
- MSMQ
- MSTDC, if the application server and database server are on separate boxes
- Microsoft .NET Framework 4.7
- .NET AJAX Support

Recommended Bandwidth

- LAN: T1
- Wan: T3

USB Port Requirements

- Barcode scanner
- Counter signature pad
- Label printer
- Tracking Assistant single bay cradle
- Report printer
- 2D Imaging scanner

Port Configuration Requirements: Processing Workstation, SendSuite Mobile, SendSuite Link, SMS (optional)

HTTP

- 80
- 8080 (SendSuite Link / Mobile)
- 9990 (WildFly)

HTTPS

- 443
- 8443 (SendSuite Link / Mobile)
- 9990 (WildFly)

SMS (optional)

When using the SMS notification feature, bi-directional access must be permitted to <https://api.twilio.com/2010-04-01>.

VM

Support is available. Refer to the Virtual Machine Environment section of this document.

Services installed on the Application Server (Used by TAPlus only)

ArrivalConduit	Used to receive and respond to commands generated by the TAPlus during synchronization. The conduit determines if the command can be processed directly, or if additional information is required from the Tracking Server. If the command requires interaction with the Tracking Server, a request is placed on the message queue. Not used for SendSuite Mobile.
ArrivalServerAdapter	Interfaces to the Tracking server. The Arrival Server Adapter is responsible for removing a request off of the messaging queue and submitting it to the Tracking server for service. Additionally, the ArrivalServerAdapter is responsible for starting/stopping the Tracking server(s). Not used for SendSuite Mobile.
Decisionpoint Terminal Server v3.5	A third-party application that manages the connection to the TAPlus Handheld device during the synchronization process. Not used for SendSuite Mobile.
DP_IIS_LoadBalancer	A service that routes transactions evenly among the active SendSuite Tracking application servers. Not used for SendSuite Mobile.
SendSuite Admin Service	Responsible for running scheduled Import/Export jobs, archiving data if it is turned on in the Administrator module, and cleanup of temporary files left behind by Crystal Reports on a daily basis at midnight.

Hosted Deployment

Note: Hosting does not support multi-tenant implementations.

SendSuite Mobile LAN Networking Considerations

Android OS Jelly Bean 4.1.2 and Marshmallow 6.0.1 are not capable of resolving hostnames to IP addresses in certain LAN/WAN environments. Due to this constraint, it is advisable that the SendSuite Link application server be assigned a reserved IP address (Static IP). Often, the SendSuite Link application server is the same as the SendSuite Tracking application server. This constraint is not applicable to PB Hosted solutions nor is it likely to be applicable in situations where the SendSuite Link server is otherwise made public.

Virtual Machine Environments

Virtual Machines can be used for the SendSuite Tracking Application Server. These virtual machine images should be configured just like their physical counterparts according to the published hardware and software requirements. Additional tuning of these requirements may be needed depending on your environment. Performance of the SendSuite Tracking VM should be monitored over the first 6 months of deployment to see if the VM is performing optimally. Shared VM environments can often impact the performance of other VMs depending on the usage and I/O. If users experience poor performance with a VM-hosted server consideration should be made to migrate the VM to less active VM host.

While it is technically feasible to host the application database on a virtual machine it is not recommended. This is because DBMS software is very I/O intensive and it is much easier to tune a physical machine than a virtual machine.

Note: Customers can use any VM product desired, however, it is their responsibility to setup, configure, and maintain. Pitney Bowes does not test in all commonly-used VM environments.

Authentication

Overview

All users are defined in SendSuite Tracking using the Administration module.

Customer hosted (on premise)

- Product Authentication: This is the standard out of the box means of logging into Tracking. User IDs and passwords validated by the SendSuite Tracking application.
- Auto-logon supported by Windows authentication: Password verification is disabled when users are successfully logged into the corporate PC, The Tracking User ID must be the same as the user's Windows ID. Auto-logon uses .NET to obtain the Windows credential from the customer workstation.
- Auto Logon is only available for deployments behind your company's firewall.
- LDAP using Active Directory: Interactive login not validated by the SendSuite Tracking database.
- Users are validated by the LDAP host.

Note: A valid user account must first be created or already exist within SendSuite Tracking in order for any user to access the system. Passwords are validated by the system in Product authentication mode. In LDAP mode the user ID and password are validated against the configured LDAP host system. In Auto-Logon or Key Exchange authentication modes the system only validates the user ID but not the password. Key Exchange makes use of a unique access token that, when configured, is automatically provided by the customer workstation.

Hosted deployment

- Product Authentication: This is the standard out of the box means of logging into Tracking. User IDs and passwords validated by the SendSuite Tracking application.
- Key Exchange: Intended for SendSuite Tracking installations in hosted environments, Key Exchange Auto-Logon emulates the SSO user experience. SendSuite Tracking generates a customer key for each software instance during the installation of the application server software. A new key can be generated if necessary by a server administrator. Each enterprise is provided with their key to use during the SendSuite Tracking customer installation process. Once installed and configured, SendSuite Tracking generates an access code based on the user ID, a unique token, and customer key, and grants access if it matches the code generated by the application server.
 - Note that login requires access to the customer key and access code creation method, and that each login requires unique authentication. A new key can be generated if necessary.

Components of SendSuite Tracking

Client

SendSuite Tracking Client is the customer application used to process packages. The life cycle of a package is managed by this application, in addition to reporting. No business logic resides on the workstation. The Client is based on .NET technology and does not require ActiveX controls.

Designer

SendSuite Designer is the application used to create and modify screens, email templates, label templates and Powerlogic.net.

Administrator

The web browser-based SendSuite Administrator module is used to configure Tracking, and administer the system. Primarily the administrator of the system will use this application.

SendSuite Tracking SQL Database Environment

The install process creates and populates the databases listed. During the installation, a SST_User SQL account will be created, which will have db_owner permissions. (Accounts have db_owner permissions.)

Database	Description
SST	<p>The main database for SendSuite Tracking</p> <ul style="list-style-type: none">• Contains all transactional tables (package data, package history...)• User login information for mailroom users (permission, passwords...)• System configuration information. (general system, screens, handheld configuration.)
SSAdmin	<p>Used by web admin</p> <ul style="list-style-type: none">• Contains non-transactional reference, configuration, and intermediate storage tables that are used by the web-based administrator module.

Database	Description
TAPlusRepository	<p>Used for TAPlus handheld synchronization</p> <ul style="list-style-type: none"> • All synchronization sessions are captured in this database, it's an intermediate storage area as once the handheld completes the synch the data can be deleted and not affect the system, it can be reviewed in the event of an error but seldom is, since the system also uses file base logging that captures the same information. • Maps the device ID to an internal name used by the system.
Development Languages	
<ul style="list-style-type: none"> • SendSuiteTracking software is developed in C# with Microsoft® Visual Studio®. • Software on SendSuite Mobile Tracking Assistants is developed in Xamarin • Screens are developed in SendSuite Designer 	

Support Files

The following VFP Runtime files are added to the \Windows\System folder during the Tracking installation:

VFP Runtime Library

VFP9R.DLL	VFP9 Runtime Library
VFP9RENU.DLL	VFP9 Runtime Library Resource
VFP9RUN.EXE	VFP9 Runtime Executable (Displays Current Version of VFP Runtime)

Note: VFP libraries are in use to support legacy business logic; however, they will be phased out with upcoming releases.