Infrastructure – Environment – Workflow Readiness

Client Name: Red Diamond Homes Loans, LLC
Client ID: 11210086

Implementation Consultant:

Contents

Encompass Infrastructure and Environment Readiness

An important part of the implementing Encompass software and services is ensuring that your workflow, technical infrastructure, workstations and end users are ready to utilize all the features, functions, and services. In order to ensure a successful roll out of the systems and gain immediate value in your partnership with Ellie Mae, the Ellie Mae team will work with your IT group to qualify key aspects of your IT environment – ensuring that a solid foundation exists on which to support the many functions of the software.

The team will focus on infrastructure, workstation configuration, and user readiness.

Infrastructure: The Encompass system facilitates the integration of dozens of industry network services, and roles within your organization and the loan life cycle. In order to perform effectively, a solid network infrastructure must exist. Performance and reliability of the system is dependent on multiple factors, including network bandwidth, ISP routing, PC specifications, number of business rules, concurrent users, number of loans, archive strategy, reporting strategy, number of custom fields, custom input forms, alerts and third-party applications.

User Readiness: The other key area is your people. We want to ensure they are ready to perform their day-to-day duties thus ensuring a smooth roll out.

Discovery

|	Notes	Reviewed By	Reviewed Date	Target Audience
How would you characterize the performance of the system in place today?				IT
How would you characterize the overall performance and reliability of your network and IT infrastructure today?				IT
What is the average age and hardware configuration of the typical workstation within your organization?				IT
Does the business own and the IT group manage all/some of the workstations within your organization?				IT
What is the geographic topology/distribution of organization (i.e.: spans time zones, coast-to-coast, multi-HQ, branch offices, individual remote/distributed users)				IT
Are there systems that you are integrating/interfacing with today (commissions, reporting, data analysis).				IT

Knowledge Base | Resource Center

		Reviewed By	Reviewed Date	Target Audience
This document refers to resources in the Knowledge Base https://resourcecenter.elliemae.com/ResourceCenter/ To find an article, type the article number into the Knowledge Base search box, located on the right hand side of the screen. (e.g. Knowledge Base Article 2043).	**Support Resources** ▸ Updated Firewall Proxy Whitelist ▸ Video Tutorial Links ▸ Quick Reference Guide Menu ▸ Encompass Help Resources Video Tutorial ▸ Ellie Mae Status Center Video Tutorial ▸ Resource Center Webinar for All Users ▸ Resource Center Webinar for Named-Contacts ▸ Links to Online Help Systems ▸ System Requirements & Compatibility Matrix ▸ Documentation Library Search 2043			IT/Encompass Admin
Did you establish your 5 contacts? Have you gotten access to the Resource Center yet and do you know how to input a Support ticket?				IT/Encompass Admin
Have you been to the Ellie Mae Status Center at: https://emstatuscenter.elliemae.com/ ? Use this page to check on the overall Encompass system status, scheduled maintenance, bulletins, etc.				IT/Encompass Admin

System Guides

In order to accomplish these tasks, your IT group will need to perform some infrastructure checks and configuration changes. The guides below are meant to bring your IT staff up to speed on what it will take to manage the infrastructure to ensure a successful rollout of Encompass.

| System Guides	Destination	Reviewed By	Reviewed Date	Target Audience
Workstation Requirements	http://help.elliemae.com/DocumentationLibrary/360/SystemRequirements.pdf			**IT**
SmartClient Installation	http://help.elliemae.com/DocumentationLibrary/360/Encompass360Setup.pdf			**IT**
Performance Troubleshooting Basics	http://help.elliemae.com/DocumentationLibrary/360/PerformanceTroubleshootingBasics.pdf			**IT/Encompass Admin**
Printing Troubleshooting	Knowledge Base Article 4741 – Printing Troubleshooting Guide			**IT/Encompass Admin**
General Troubleshooting	Knowledge Base Article 8113 - List of Performance & Latency Troubleshooting Articles			**IT/Encompass Admins**

Solution Architecture
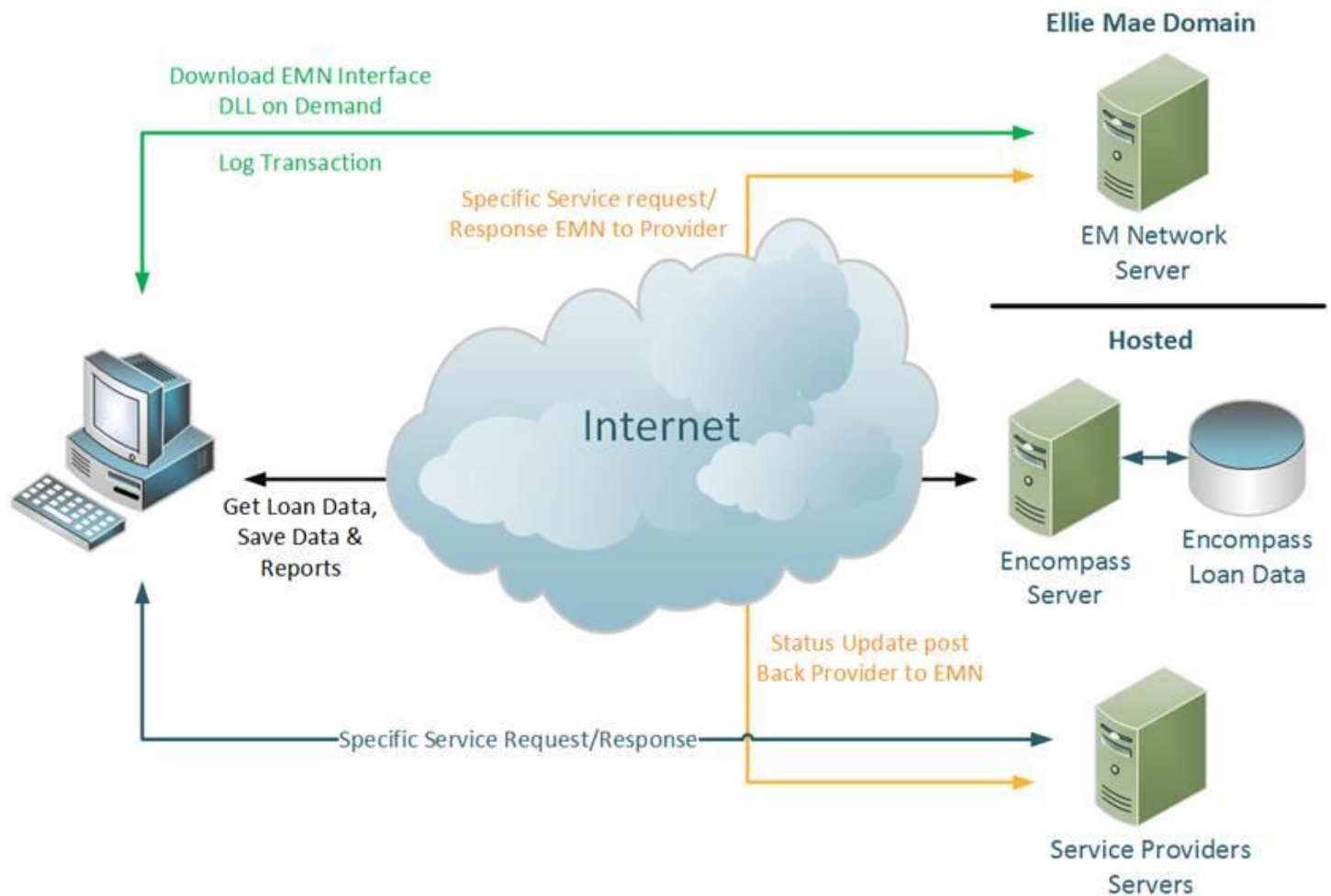
Where is each function handled?

| Encompass Component	Operations
Encompass Client	User Interface Business Logic / Rules Calculations Custom Calculations Vendor Services (EMN) EM Services (EDS, ECS, EPPS) Printing Report Generation Custom Form Creation / Display Email Generation Document Conversion
Encompass Server	Authentication Authorization / Access Control Data Access / Storage / Caching Session Management

Performance

- What are we measuring, how, and why?
  - > Encompass continuously logs the end-to-end transaction response time for many of the key functions or activities performed by the user which involve communications between the client and the Encompass application server.
  - > Transaction timings are initiated from the end user's workstation, and record the total duration of the activity execution from its initiation to the point of completion acknowledgement by the Encompass client. This is a true end-to-end response time.
  - > On a routine basis throughout the working session, as part of the Encompass client heartbeat and services validation process, this data is transmitted to Ellie Mae. The collection, internal caching, and transmittal process of this data has negligible overhead to the Encompass client, user's workstation, network layer, and Encompass server.
  - > This data is being utilized as part of our efforts toward understanding trends in product performance, and as a means of assisting clients in performance base-lining and troubleshooting.

EllieMae | | | |
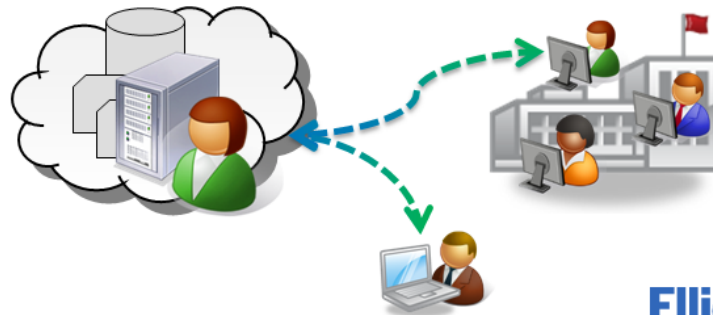
In order to achieve the Activity target times listed in the subsequent pages, your latency must be extremely low.

Here is an example of how network latency can affect Encompass operations:
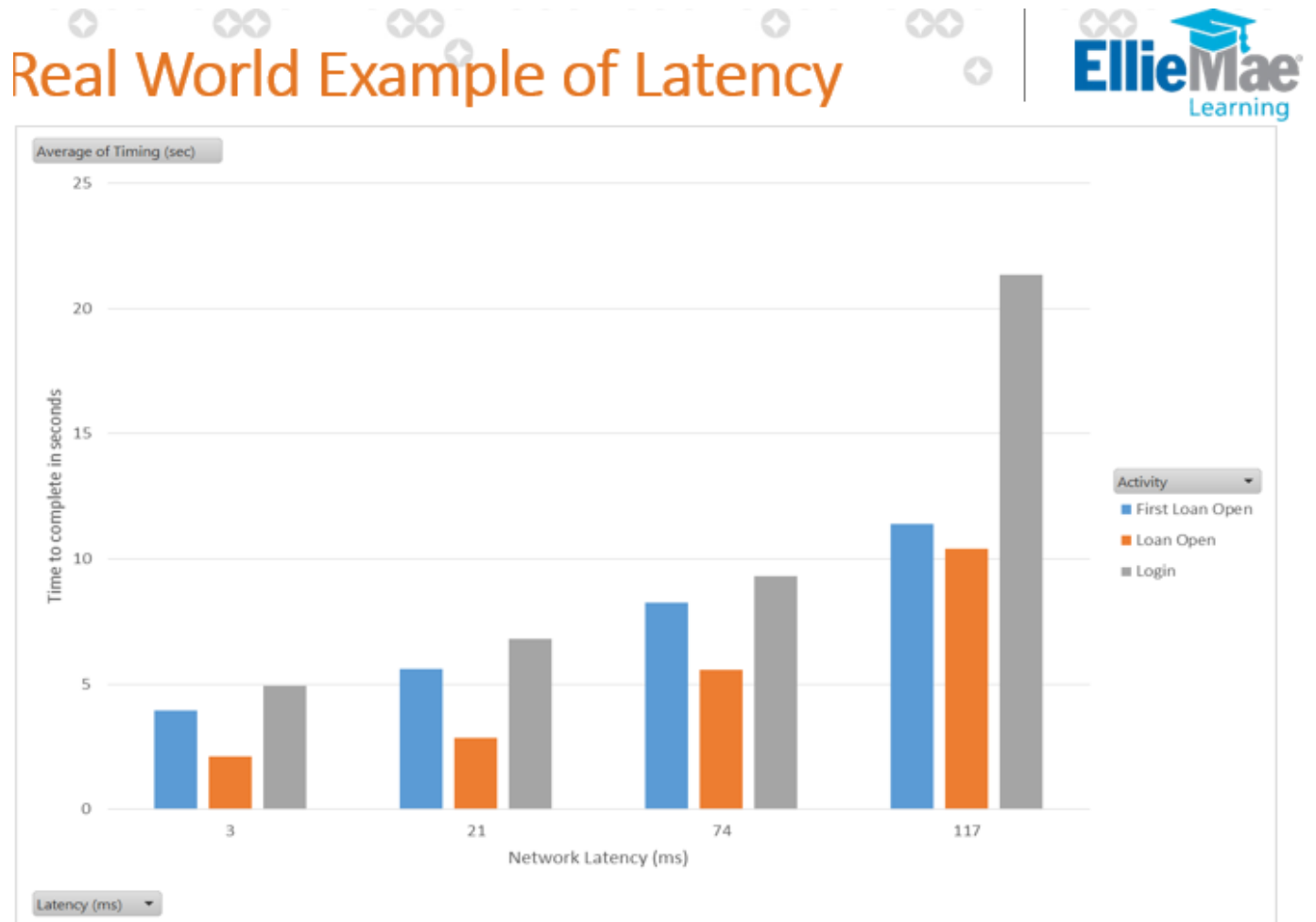
End-user Activity – Target Times

Activity	Target Range Low End (seconds)	Target Range High End (seconds)	Definition	Components	Impacted By
Encompass Login	8	17	From point of click on Login to the point immediately prior to rendering of Homepage modules/user interface	• Validate client version and download updates • Validate user license • Download Module licenses • Validate and download current Services libraries (if not previously downloaded) • Download custom plugins • Authenticate Encompass user credentials • Authenticate ePass user credentials	• Network throughput (availability and bandwidth, internal and external)
Loan Open	1	8	From the point of double-clicking on a loan in the pipeline, to fully-rendered/loaded loan on screen	• Stream metadata for loan file being opened to the Encompass client • Create local cache copy of loan (temporary binary file on client workstation) • Download form views (input form UI) • Evaluate and apply business rules on loan file • Perform custom field calculations on loan file • Populate form and render results/loan data	• Network throughput (availability and bandwidth, internal and external) • Workstation performance and available resources (CPU, RAM, disk I/O) • Quantity, efficiency, and complexity of custom business rules and calculations
Loan Save	1	6	From the point of clicking on Save to "File Saved" dialog	• Evaluate and invoke triggers and custom field calculations for loan file • Upload loan data to Encompass server • Receive acknowledgement from Encompass following file write and database update • Display "File Saved" dialog	• Network throughput (availability and bandwidth, internal and external) • Workstation performance and available resources (CPU, RAM, disk I/O) • Quantity, efficiency, and complexity of business rules and custom calculations • Any workflow-generated or programmatic dialog requiring user-input affects transaction timing
Pipeline Load	3	10	From the point of clicking on the Pipeline tab to fully rendered and loaded pipeline	• Calculate personas and user groups associated with user ID • Stream business rules and custom field calculation meta data to the Encompass client • Execute SQL query to retrieve list of loan folders based on access rules/rights • Execute SQL query to retrieve pipeline loan data based on access rules/rights • Build folder structure in UI from query results • Build loan lists from query results • Construct pipeline view in UI and populate with data retrieved	• Network throughput (availability and bandwidth, internal and external) • Workstation performance and available resources (CPU, RAM, disk I/O) • Quantity of loan meta data (business rules and custom calculations) • Database performance and health of pipeline

Pipeline Refresh	1	5	From the point of clicking on the Pipeline Refresh button to fully re-loaded pipeline	• Execute SQL query to retrieve pipeline loan data based on access rules/rights • Build loan lists from query results • Construct pipeline view in UI and populate with data retrieved	• Execute SQL query to retrieve pipeline loan data based on access rules/rights • Build loan lists from query results • Construct pipeline view in UI and populate with data retrieved

Infrastructure

Ellie Mae Network Services	Action	Completed By	Completed Date	Target Audience
If you decide to use a Proxy filters or other devices/software that limits or requires authentication for outbound Internet (HTTP/HTTPS) connections will need to be configured to allow the Encompass client to create unauthenticated connections to a number of different external resources. These external resources consist of both Ellie Mae and external service providers.	Proxy whitelist setup Knowledge Base Article 2043			IT
There are three possible ways to setup proxy authentication in your environment. 1. Anonymous authentication 2. Proxy exceptions by name 3. IP ranges* 199.189.124.xxx 199.189.125.xxx 199.189.126.xxx 199.189.127.xxx 165.193.240.xxx You will select the one that best fits your network and security environment. *Caution: Ellie Mae can and does change IP ranges. If you have selected this option you may run into authentication issues.	What authentication method did you select? Knowledge Base Article 2043 Knowledge Base Article 1605			IT
Homepage modules to white list (if used): http://www.elliemae.idmanagedsolutions.com http://www.marketwatch.com http://www.nationalmortgagenews.com http://www.mortgagenewsdaily.com/channels				IT
Firewall/Security programs like Bit9, AVG may need to allow the creation and access of files.				IT
We recommend that you utilize a utility such as httpanalyzer to validate that your proxy settings have taken effect if you utilize a Proxy Server. This is intended to verify from different subnets, etc.				IT

Email		Completed By	Completed Date	Target Audience
You can configure Encompass to use Outlook, SMTP or enable both Outlook and SMTP. If you enable both, the end user can select which one is used for mail merges and campaigns.	To setup email: 1. Encompass Settings 2. Contact Setup 3. Email Server Settings			IT

		Completed By	Completed Date	Target Audience
You should base your selection on your understanding of the company's email environment. There are technical reasons that you would select one over the other based on how your email system is setup.				
Encompass does not work with gmail	Knowledge Base Article 1482			**IT**
Setup for email triggers	Ensure SMTP traffic is allowed to/from Ellie Mae domains.			**IT**
SPAM filter	Verify that your SPAM filter is allowing emails from elliemae.com, 209.167.231.81 & 209.167.231.211			**IT**

Network/Bandwidth		Completed By	Completed Date	Target Audience
Bandwidth requirements will vary by business practice. There are several factors that affect performance such as file uploads, generating disclosures and/or closing docs. You need to consider and factor in other network or internet intensive applications. Voice over IP phone system (VOIP), file sharing, media streaming (for example, internet radio, gaming and videos).				IT
An upload and download bandwidth test should be performed at each location to ensure good performance.	For example, speakeasy.net. Both the upload and download speeds are important when utilizing Encompass. The speeds should meet or exceed the recommended minimum standards. Knowledge Base Article 4285 The performance can vary as the upload/download speeds change based on where the hosted environment is located.			IT

For each location it is recommended to run a tracert to your hosted server, for example:
 	
    tracert BE<your-clientID>.ea.elliemae.net
 	
    e.g.
 	
    tracert BE1234567.ea.elliemae.net
	This information is your baseline of the numbers of hops and amount of time it takes at each hop. Few hops and less time at each hop is one of the indicators of performance and stability.
	
	How many hops and time at each hop?
	
	Latency seems to be the #1 indicator of how Encompass will perform with all other things held constant. If you have latency showing of more than 50ms going to our server your performance may suffer. Speak to your ISP to see if this can be improved.
				IT

Do you have a shared network with other companies in your building? This also applies to any of your branches.	If yes, then you need to consider getting your own dedicated network otherwise bandwidth could be unpredictable based on usage of the other companies.			IT
If you have a firewall or router that does packet inspecting, there should be a QoS rule that gives traffic going to / from Ellie Mae a pass-through. Otherwise, it could add significant latency. If the router that does this of the "cable modem" class (and possibly underpowered), it could be even worse.				
Do you use Web Filtering (such as Web Sense or zScaler)? If so, have it give Encompass traffic (going to / from your Encompass server) a pass-through, or it could significantly impact performance.				

Application Considerations		Completed By	Completed Date	Target Audience
Reporting database	Encompass contains an internal reporting database that you can leverage. Please refer to the "reporting database" setup and configuration document. For example, there are a recommended 2500 maximum number of fields. Adding fields beyond this limit can result in significant performance degradation. The system will warn you when you are going to exceed the recommended number of fields but will allow you to continue if you choose to do so. Do you do business in North Carolina? Then you will have to install the NC NMLS fields otherwise avoid installing this as it will be an extra 1400+ fields added to the Reporting DB. Knowledge Base Article 1560			**IT**
Audit Fields	For best performance, 200 or less is optimal. The higher the number the longer the loan save.			**Encompass Admin**
Custom Fields	For best performance, 1500 or less is optimal. The higher the number, the slower the loan saves.			**Encompass Admin**
Custom Calculations	For best performance, less than 500 is optimal. The higher the number, the slower the loan open.			**Encompass Admin**
Business Rules *(Banker Edition)*	1. Transfer of information from your project manager on your business rules 2. Document your business rules 3. Training – The Resource Center contains various training courses and documentation. 4. Advance Coding Options Knowledge Base Article 5027			**Encompass Admin**

Home Page modules
  - "All Folders"
  - "All Folders but Archive and Trash"
"Loans with Alerts"
	These cause very high load for the server.			**Encompass Admin**

Use Archive Folders	Keeps alerts down as firing unnecessary alert reduces load on the server and enables quicker searches for active loans and quicker pipeline refresh.			**Encompass Admin**
Automatic Pipeline Refresh	Do not use this for best performance as it leads to greater load on the server.			**Encompass Admin**
Enabling Diagnostic Mode for Encompass				**Encompass Admin**
SDK	The Encompass Software Development Kit (SDK) provides your organization the ability to integrate your existing back office applications with your Encompass system. By using the Application Programming Interface (API) included with the SDK, software developers can write custom code to move data between applications, create processes for updating or reporting on your loans, or write their own, stand-alone user interfaces. Knowledge Base article 5093 Knowledge Base article 6274 Knowledge Base article 6373 Knowledge Base article 4746 **Notes:			**IT/Encompass Admin**

	1. Be aware of the potential impact of deploying SDK customizations that may affect overall user performance. 2. Limit degree of parallelism, especially during production hours 3. Limit "heavy" API calls as these calls require more resources on the server (such as logins, Loan.Open, Loan.Save, Pipeline queries and Reports) 4. Always consider supportability of your SDK customization (e.g. – SDK standalone application, plugin or codebase assembly) by effective use of trace logging. Consider SDK available logging interface ApplicationLog class.			

Workstation

Microsoft Office (workstation)		Completed By	Completed Date	Target Audience
Microsoft Office: 1. Encompass does not support Office 2013 Click to Run Edition 2. Encompass does not support Home and Student edition	Knowledge base article 1717			IT
Excel will be used for reporting				IT/Encompass Admin

SmartClient Installation - preparing each end user PC		Completed By	Completed Date	Target Audience
Screen Resolution	1024 x 768 or greater			IT
Encompass can be installed via an exe or MSI	If via exe, Admin rights are required during installation. If via MSI, you can install via active directory GPO.			IT *SmartClient.exe is prefer method
Do the end user's workstations meet or exceed the recommended specs?	In consideration of the specifications, account for all applications the end user will be utilizing. If no, then there will be parts of the install that will not happen correctly. For example, the end user will not be able to print from the eFolder.			IT
Do the users have admin rights?	Encompass needs either Local Admin rights to install SmartClient or elevated permissions. Encompass does not need local admin rights to run on a daily basis. Depending on your internal security policies, users should have read\write access to the Encompass Folders, subfolders and Encompass registry settings, 'authenticated users' rights should suffice, below represents Windows 7. • C:\SmartClientCache\ • C:\Users\<USER>\Application Data\Encompass • C:\Users\<USER>\Application Data\EllieMae • C:\Users\<USER>\Local Settings\Application Data\Encompass Installation • C:\Users\<USER>\Local Settings\Temp\Encompass • C:\Users\<USER>\Local Settings\Temp\Ellie Mae			IT

		Completed By	Completed Date	Target Audience
	• C:\Users\\Local Settings\Temp\EncompassSC • C:\Users\\Local Settings\Apps\Ellie Mae • C:\Users\\Application Data\ePASS			
Test the install, utilizing a workstation with one of your standard PC configurations				IT
NOTE: If you need to log on to different Encompass environments, for example Broker and Banker environments, use the **Manage IDs** button to add, delete, or reorder the SmartClient IDs for the different Encompass environments that are available for selection from the drop-down list. Make sure you clear the **Auto Sign-On** check box so that the launcher displays each time you log on, allowing you to select the SmartClient ID for the appropriate environment.	1. Right-Click on the Encompass Icon and choose Properties. 2. From the Shortcut tab choose Find Target 3. A new window will appear. 4. Locate the RemoveUAC.exe file and double click to open. 5. Check the first and last check boxes and click Remove. 6. Close out of all Windows just opened and Launch Encompass. **Note**: You will be prompted to enter the new Client ID number and will be connected to the new company's server.			IT

Printing - preparing each end user workstation		Completed By	Completed Date	**Target Audience**
If you are using Adobe Reader X	Disable **Protected mode at Startup** 1. Open Reader, click the **Edit** menu, and then select **Preferences**. 2. Select **General**, and then clear the **Enable Protected Mode at Startup** check box.			IT
If you are running Windows XP	Add the following registry string: "AdobeAPI" and set the value to 1. • For 32-bit systems add to HKEY_LOCAL_MACHINE/Software/Ellie Mae/Encompass.			IT
Enabling printing from the eFolder – this port is configured during installation. If during the client install the end user does not have admin rights to system32 folder this may not get installed correctly.	Ensure configuration of printing ports for eFolder print driver. Reference Knowledge Base article 1410.			IT
Adobe does not recommend Reader and Acrobat installed on the same machine.	Check to see if there are multiple versions of Adobe installed. • To verify this, use the Add or Review Programs tool in Windows XP or Programs and Features in Windows Vista/7 from the system control panel. • Adobe recommends that you have only one version installed. If Acrobat Standard or Professional is installed with Reader, then uninstall Adobe Reader and leave Acrobat installed. **Note:** After removing Adobe Reader, run Detect and Repair in Acrobat Standard or Professional. To run Detect and Repair, launch Acrobat, click **Help,** and then select **Detect and Repair**. Make sure you are not logged into Encompass when you do this. Knowledge Base Article 1882			IT
Adobe provides regular updates to their software. They will also release updates that block security risks.	Ensure that you are managing your Adobe updates to end users in a controlled manner. If the end user selects to			IT

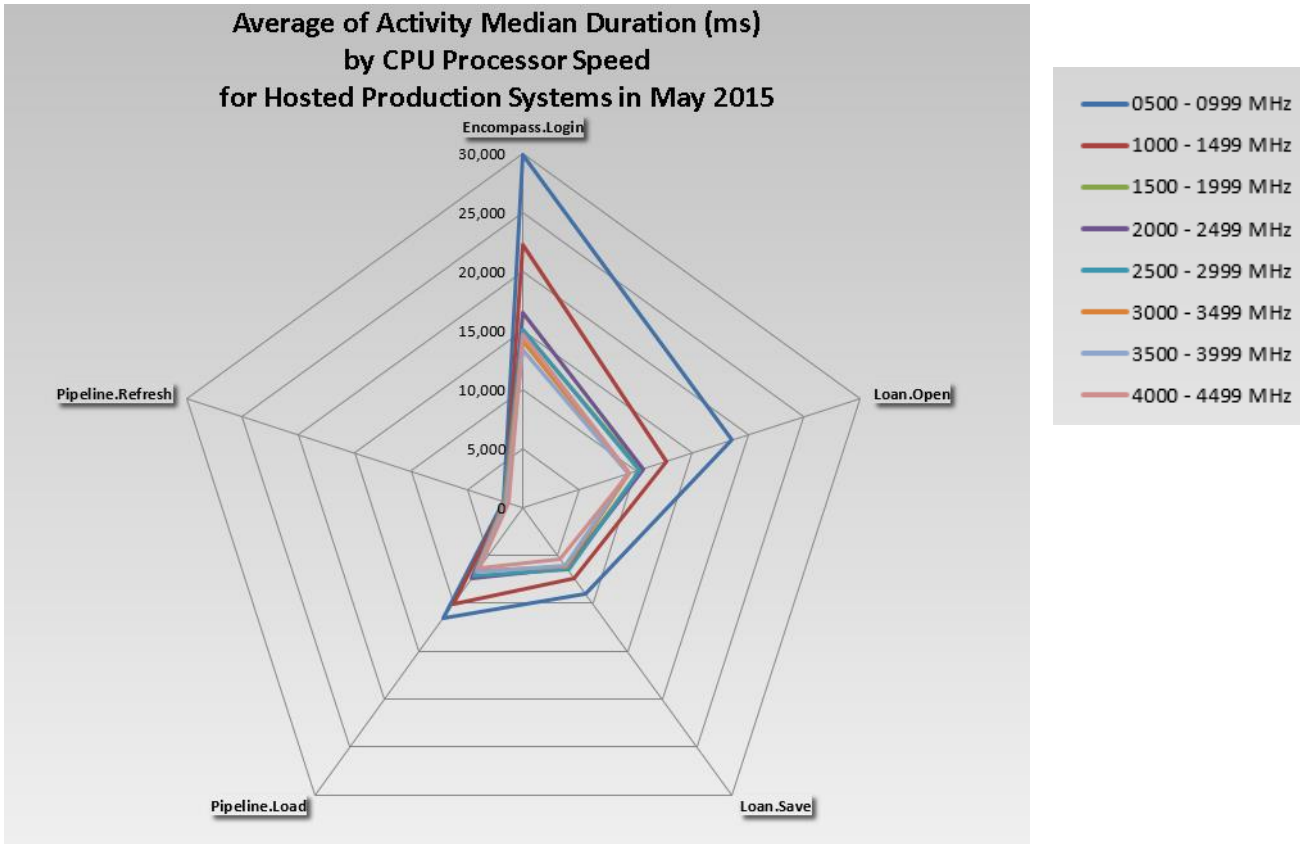|		Completed By	Completed Date	Target Audience

	update Adobe while using Encompass it may break printing and eFolder functionality.
	
	To Manage auto updates for Adobe.
	
	  1. Encompass interfaces with Adobe and if Adobe is updated while logged into Encompass then Adobe may become corrupted.
	  2. Always apply Adobe updates when logged out of Encompass.
	  3. To disable auto updates:
	    a. Open Adobe, and then click **Edit**, and then click **Preferences**.
	    b. Select **Updated,** and then click **Do not download or install updated automatically**.			

Printing in a terminal server environment		Completed By	Completed Date	Target Audience
Will you be installing the client in a Citrix/terminal server environment? Although Encompass can be made to work under Citrix or Terminal Servers, Ellie Mae does not test using these configurations and cannot provide advice/support on how clients should configure Citrix and/or Terminal Servers to work with Encompass. Technical Support uses commercially reasonable efforts to assist and provide direction, however, it is ultimately up to the client's IT group to make sure Encompass works with Citrix and/or Terminal Servers.	1. Server must be on install mode. 2. Install on console only. Do not install via RDP. 3. Always use "run as administrator" for all installation.			IT
Encompass Printer	Used for printing Custom Forms (Word documents)			IT/Encompass Admin
Encompass eFolder Document converter	Installed as a document conversion backup print driver. Software components are used for image conversion and / or PDF Viewer rendering if Document Conversion is disabled. **Note – Conversion occurs on the workstation, resulting in slightly longer upload times. However, eFolder viewing performance is greatly improved.			IT/Encompass Admin
Encompass eFolder Print Driver	Allow users to print from non-Encompass applications to the Encompass eFolder **Note - Should problems occur, there are workaround to upload the source file to eFolder using alternate methods in most cases.			IT/Encompass Admin

Scanning		Completed By	Completed Date	Target Audience
Must be in TIF format at a recommended 200 DPI	See SmartClient Help under "Scanned Document Uploader Service"			IT

End User Checklist – each end user to complete		Completed By	Completed Date	**Target Audience**
login				
View the Home Page				
Access the Resource Center				
Test eSign (ignore this step if you don't plan on utilizing this feature)				
Print				
Print eFolder				
Send/receive email				
Run reports				
How many License Users?				

Workstation performance impact on Encompass operations:

Average of Activity Median Duration (ms) by CPU Processor Speed for Hosted Production Systems in May 2015

Legend:
- 0500 - 0999 MHz
- 1000 - 1499 MHz
- 1500 - 1999 MHz
- 2000 - 2499 MHz
- 2500 - 2999 MHz
- 3000 - 3499 MHz
- 3500 - 3999 MHz
- 4000 - 4499 MHz

Also see **http://www.cpubenchmark.net/singleThread.html** to see comparative CPU performance (our minimum **i3@2.8** Ghz has a score of 1503). **Faster machines make a difference!**

Additional Notes: