Questions regarding the Scanning solution:

**Client:**

* What are the requirements for the local client?
  + 2 core CPU at least
* Which Operating systems are supported?
  + WinXP, Win7, Win8
* What has to be installed on the local client?
  + Net. Framework 4
* Has Citrix been tested?
  + Yes. Scanner application works well on Citrix. Camera application is not tested yet.
* Is a pure 64-bit OS supported (e.g Windows 8 or 10)?
  + Not tested but as long as this is NET. application it shouldn’t be a problem
* How will the application be distributed and updated?
  + It’s distributed by simple folder copy operation. It’s self-updated. There is functionality in application that downloads and overrides application files by clicking a button.

**Server:**

* What are the requirements on the server side?
  + 4 core CPU at least
  + Windows 2012 File Server
  + Windows Web Server
* What has to be installed on the server?
  + Net. Framework 4
  + Web Server role
  + File Server role
* How many servers are required in the overall concept including external access to the files?
  + One Web server
  + Two Web server and File servers.

See Figure 1

* Which Operating system is required on the server?
  + Windows 2012 Server
* Is high availability required? How is that guaranteed? During which time?
  + Yes. Both server machines run same software. In case of a server failure second server is switched to cover both server roles and take the whole load.
* What happens if the server is down?
  + Second server is set to cover both server roles. Clients are redirected to it.
* How long can the server be down?
  + During working hours it should not stop, but it could be stopped as long as needed.
* Where will the 2 files be stored?
  + They all are stored in encrypted archive in folder hierarchy. Files might be 1, 2, 3 or many. Number of files depends on country and company requirements, additional attachments. Operators also can add files to voucher archive.
* Where is the link to the files stored?
  + PTF\_Images database. Database will be free of images now. The other information still remain with it. The expected database file size is about 5-10GB.

**Data volume and handling:**

* How large are the 2 files? My understanding is that we have 2 files – one with hidden credit card information and one with the credit card number – correct?
  + There is a folder hierarchy model. The hierarchy is YEAR -> COUNTRY\_ID -> RETAILER\_ID -> VOUCHER\_ID.
  + The most internal folder (Voucher folder) contains an encrypted archive.
  + Archive contains 1 image file at least (voucher image). But it could contain many files depending on country requirements. It could contain more pages of voucher image, additional attachments, extracted barcode images, extracted credit card images, signed documents, office documents and enc.
  + The size of archive should not be greater than 500KB.System’s buffers have size of 1MB so bigger file than that couldn’t pass and would fail.
* Where will the full credit card number be stored? What are the PCI requirements for these files? Do we have to encrypt these files?
  + We don’t extract the exact CC number. We may extract image having CC number on it. All stay in encrypted archive file inside the folder.
* How long do we have to store the files?
  + Files in short term file storage stay for 1 year.
  + Files in long term file storage stay 1-10 years. Depending on country legal requirements.
* What happens with the files when they reach the end of their life cycle?
  + File server runs a service that deletes those.
* If 50 persons scan each 1voucher at the same time, this has an impact on the local network. How do you guarantee that this doesn’t affect the rest of the business?
  + Client does not send the images on one go. It sends them on portions of 16384 bytes (16kB).
  + The send operation is also buffered. In order to optimize and speed up operation it uses tcp protocol.
  + There is only one sending process per machine at the moment.
  + Tcp connections are hands shake connection. So it could be limited on server side in such a way that server will not be able to receive more bytes than its capacity. Means the clients will not able to send more bytes than that.
  + I’m going to add bandwidth limit for WCF server.
* Who will check the local bandwidth before you go live in a country? PTF Germany had until a half year ago only a bandwidth of 1 (!) Mbit.
  + Country IT team will look after the performance of system. If they decide the system loads the network much we will switch it to overnight sending mode or lower categories of vouchers we scan and send.
* If a voucher is fully processed and paid, what happens with the file? Can it be compressed? How fast should it be decompressed if a customer needs access to that file?
  + All images are stored in jpeg format. That’s compressed image format. Any further compression is useless. We don’t reallocate files until end of the year.
* How many voucher lookups from customers and partners are expected?
  + Not so many. We are going to send images instead of paper vouchers. According to country legacy we need to keep signed images for certain period.
* Can the customer and partner download these pictures? How many of these pictures can be downloaded from one customer in on session?
  + They can download up to 20 images.
  + From 10-100 vouchers they will be able to schedule sending email.
  + For 100 and greater they will be able to subscribe for posting with CD, receiving file on company FTP directory, receiving file on business drop-box, or google drive.
* In 2017 we are talking about ~ 10 Mio vouchers – that’s based on 250 working days 40’000 vouchers per day, which equals a data volume of 20 GB per day, which have to be transferred via the network to the datacentre. As we have 2 sites that could be 40 GB per day, to any additional daily traffic? Has this been considered?
  + The data transfer will be split between day and night. The biggest amount of images will be collected locally during the day and will be sent to server overnight.
  + We are not going to collect all vouchers initially. The plan is to start with high value goods first. We are going to add more categories one by one till we decide it affects whole network performance then we’ll stop.
  + The uploading clients will restrict vouchers by date. We are not going to upload vouchers older that month.
* Do you have a backup concept?
  + Yes. We are going to organize image store as two image stores (long term and short term). Long term store will be a 20TB/40TB drive. Short term store will be two drives 2TB /4TB each. We are going to add/update/delete files to short term image store. Once a year they will be transferred to long term image store. Long term store will be cleaned from older vouchers and then we are going to archive it. In case of failure of any device of short image store we are going to restore it from the other drive. Long term store is recoverable from the backup.
* Do the local authorities allow the storage of these files outside their country?
  + Yes, for some of the countries they do. We are not going to collect image for the rest.
* Has cloud storage been considered? Who approved it? How do you guarantee PCI compliance for the pictures with the credit card information?
  + Clouds are expensive. Price goes from £6000 up to £12000 annually. System is more complex and less protected of failures.
  + Been in image store data are PCI compliant. They stay in Tire 1 network. Data are encrypted. Access is restricted.
* As initially outlined is the voucher added to the Dbase and if so what is the staging process for write down to slower mass storage or cloud archival.
  + We changed the initial strategy. We are not going to insert image to the database. Only indexes and ids. Simple and lightweight data. Database file should not grow more than 5-10GB.
* If in the Dbase how long will the File remain in the Dbase until this process is completed?
  + There won’t be images in database any longer.
* What replication Strategy will be employed to remove Single Point of Failure.
  + Network team will decide that
* Will this replication be Synchronous or Asynchronous?
  + It could be any.

**Switching and Routing:**

* What file type transport is to be used and what if any QoS rules have been identified.
  + It uses net.tcp protocol. I guess it uses tcp internally. Net.tcp is the fastest communication protocol for WCF services and most suitable for sending blobs.
* Will this require a separate VLAN and Routing topology to reduce the collision domain in case of traffic flooding.
  + It will require VLAN connection between file servers and web server. See Figure1.
* In Citrix environment running Net-scalar NLB the peripheral camera device will have to be an Open path route this will increase Datacentre bandwidth utilisation has this been considered.
  + Camera is the last part of the project. We might decide to take shoots of all vouchers or only those having high value goods. In case we decide we are going to use camera, camera stream should not be redirected to Citrix server. Camera app and camera should be running locally on client machine. Once client take the picture, picture should be sent to the server. That would consume less network resources.
* Disk type and model will have to be Write or Read intensive? Slower disk types will increase the packet queuing on the switching and Dbase writes, what is the preferred strategy and what tests have taken place to date.
  + The disks of file servers need to be quick. The disks of file stores might be normal speed.

**Security:**

* Who will have direct access to image store?
  + Network team will decide that.
* Who defines access rights?
  + System uses TRS users. The TRS system admin will define those roles.
* Is audit access for outside authorities required?
  + Yes. They will access image files via Internet Web site and WCF services.
* Do we require an audit trail – showing who accessed which file when and from where? Is this implemented in the application?
  + Yes we do. Yes, there is logging functionality showing who user do what operation on which files.

**Application:**

* Which programming language is used?
  + C#, C++ CLI
* Where is the source code?
  + Company TFS
* Who else can maintain, develop and fix the application?
  + [I](mailto:Rosen.rusev@fintrax.com) develop it for now. We are going to employ one more developer once system gets certified for Spain (at the beginning of following year).
* Do you have dependencies to other applications (TRS, Dynamics AX, Web browser versions, …)
  + It depends on TRS services
  + TRS database
* Web browser versions
  + Any greater than IE5
  + All other browsers.

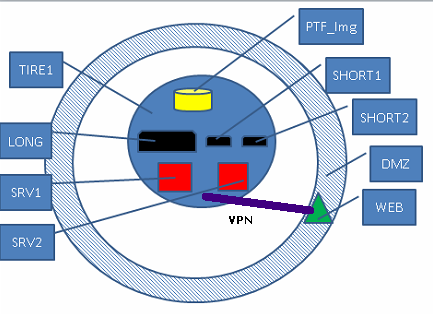


Figure 1

LONG – Long term file store

SHORT1 – Short term file store

SHORT2 – Short term file store

SRV1 – File server 1

SRV2 – File server 2

WEB – Web server

TIRE1 – Internal network 53

PTF\_Img – PTF\_Images database

DMZ – demilitarized zone