

DAB-GRGBANKING INTEGRATED SELF-SERVICE IMPLEMENTATION PROPOSAL

March 2014

NOTICE

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Revision History

No&Name	Ver	Date	Modify Comment	Participants
Dong A Bank Upgrade Solution	V1.0	2014-3-21	Create	Written By: Gong MingHui Checked By: Approved By:

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1 DAB Bank Card Business Overview and Plan

1.1 DAB Background Introduction

DAB is one of biggest commercial bank in Vietnam who own and manage up to now nearly 1500+ ATMs start from 2003 on and Link to it's own ATM network with FEEL Switch as the ATM Switching Software. Within few year's development, the service to bank customer base on cards improved day by day.

Card Product from DAB Bank

- DAB Debit Cards issued by TICIS

1.1.1 Card Business Scope by ATM Network

The current acquire card media type accepted by the ATM is listed below:

- Accept On-us DAB Debit Cards through own Network
- Accept Off-us Domestic VNBC Cards through VNBC Network
- Accept Off-us International Visa Cards through Visa Network
- Accept Off-us International CUP Cards through CUP Network
- Accept Off-us International JCB Cards through JCB Network

The current issue card media type accepted by the off-us ATM is listed below:

- Accept On-us DAB Debit Cards from off-us ATM through VNBC Network

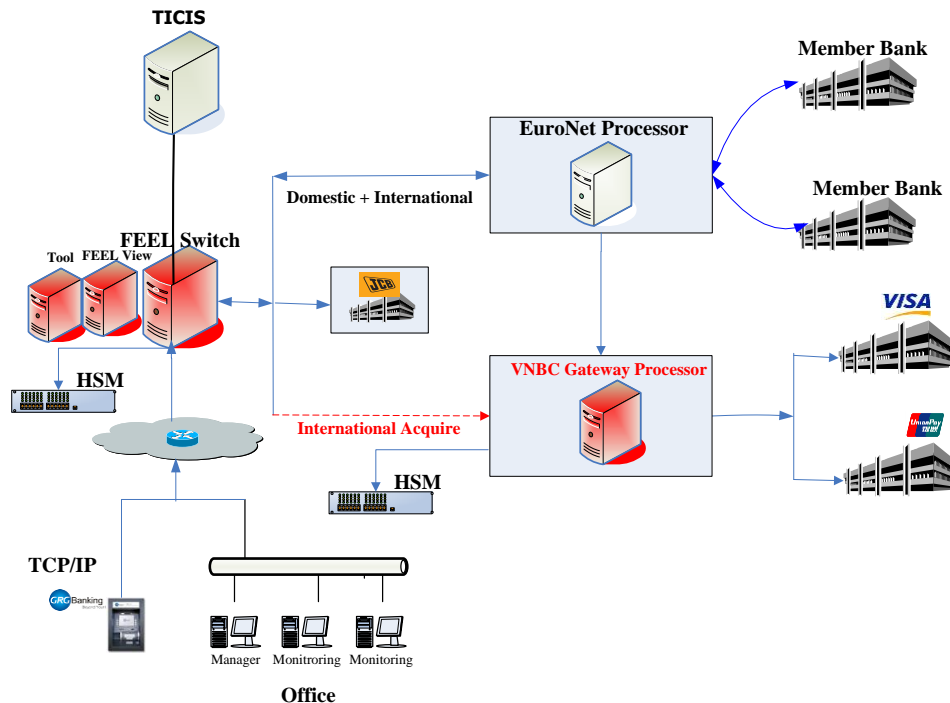
Transaction List Table for DAB

	No	Transaction Type	DAB On-us			Domestic[1]		International[2]	
	No		DAB Cards	VISA	MCI	Acq	Iss	Acq	Iss
A T M	1	Balance Inquiry	✓	N/A	N/A	✓	✓	✓	✗
	2	Cash Withdraw	✓	N/A	N/A	✓	✓	✓	✗
	3	PIN Change	✓	N/A	N/A	✓	✓	N/A	✗
	4	Funds Transfer	✓	N/A	N/A	✓	✗	N/A	✗
	5	Cash Deposit	✗	N/A	N/A	N/A	✗	N/A	✗
	6	Envelop Deposit	✓	N/A	N/A	N/A	✗	N/A	✗
	7	Mini Statement	✓	N/A	N/A	✓	✗	N/A	✗
	8	Prepaid Card	✓	N/A	N/A	N/A	✗	N/A	✗
	9	Bill Payment	✓	N/A	N/A	✓	✗	N/A	N/A
	10	Reversal	✓	N/A	N/A	✓	✓	✓	✗

[1] Right now to DAB there is 1 payment network, one is VNBC

[2] Right now to DAB only acquirer of international cards, there is 3 payment network, visa & CUP cards will go to network through VNBC and JCB cards will go to JCB network directly.

1.1.2 IT Network Structure



Up to today, the key points of DAB ATM Network is listed below

- ATM Switch to manage 1500+ ATMs online transaction
- Link VNBC network through EuroNet Processor
- Link JCB network directly
- Link VISA&CUP network through VNBC gateway
- ATM Monitoring with old version
- Independent application for distribution
- Security PCI-DSS not certified yet

What can be improved in 2014:

- 1, Complex transaction message routing and application deployment
- 2, Many tool need to be installed and data is not integrated and high cost on maintenance
- 3, Application not update in last 7 years and can not meet business development and security requirement
- 4, Time to plan and do well technical prepare job for next 5 years or long time

1.1.3 Requirement from DAB for 2014

The requirement from DAB Bank is upgrade ATM Switching Software from FEEL Switch 3.0 to 3.1 and make sure keep old function as before:

Requirement from Bank and Response from Vendor

Role	No	Requirement	Feedback from Vendor	Status
End User	1.	Upgrade to FEEL Switch 3.1	Already help MHB upgrade in 2013, platform using Linux 6.2 - 64Bit.	Accepted
	2.	<ul style="list-style-type: none"> Fix Bug on FEEL View 4.0 Distribution Application 	The current version is 7 years ago and difficult to maintenance. There is one version name FEEL View Plus, include both monitoring and distribution function	Accepted
	3.	PCI DSS Review and Change	There is many small change around PCI, GRG already almost passed the PCI Certification base on FEEL Switch 3.1 Platform, but still need review all necessary change base on the project and PCI review list.	Accepted
	4.	ATM EMV Acquiring	To meet Vietnam requirement on EMV acquiring before 2015	Accepted
	5.	Daily Process >1 Million Transactions	The solution for this need to be included into the proposal of this upgrade. The application use trace No to manage the transaction, and right now the trace No is only 6 digits so the maximum transaction can be managed in 1 day is 999,999 which include the network transaction.	Accepted
Vendor	6.	ATM Remote Key Loading	This is one solution to automatically download the ATM master key from the server. It's useful to manage big network like DAB.	Accepted
	7.	Application Backup & Disaster Recovery	To avoid the disaster what happened at 2012, need consider more on the application backup	Accepted
	8.	Link 3rd Local Payment Network like + BankNet	The FEEL Switch 3.1 already include both local BankNet and SmartLink Network, allow enable and disable.	Accepted
	9.	Inter-transfer with on-us or off-us cards	It's IBFT function, already implemented for MHB and SGB before.	Accepted

2 Solution Proposal from GRGBanking

2.1 What's the Change in 2014

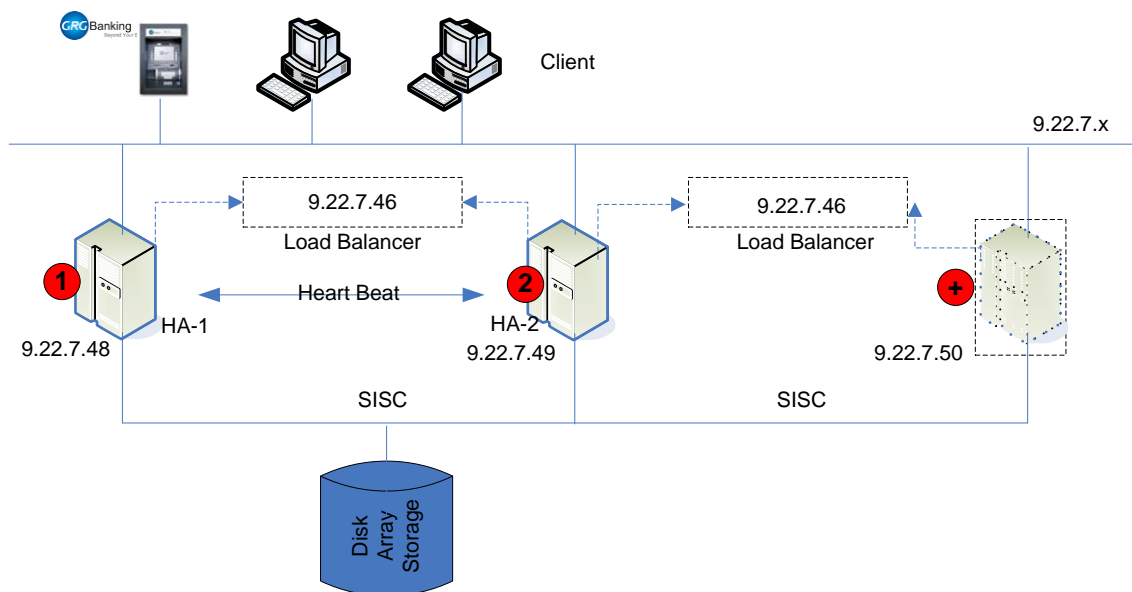
To meet the development requirement from DAB and what GRG can do will be listed as below, base on both bank's requirement and GRG's experience from some other bank customer.

Requirement from Bank and Response from Vendor

Role	No	Task	Comments	Status
End User	1.	Upgrade to FEEL Switch 3.1	There is following will be upgraded: 1, Create Web Console to Manage 2, Replace BOAS Tool by Console 3, Installation over 10 Banks 4, Replace OS Share Memory DB by Independent Memory DB 5, Pass PA-DSS Certification	Planning
	2.	Upgrade to FEEL View Plus 1.0	There is following will be changed: 1, Improve ATM Monitoring 2, Increase Status Accurateness 3, Integration Files Distribution 4, Integration EJ Files 5, Multiple Brand	Planning
	3.	PCI DSS Review and Change	Almost passed the certification: 1, PA-DSS Review and Scan 2, Review by Trustwave 3, Certify by PCI-DSS and Release at the Website	Planning
	4.	ATM EMV Acquiring	It's project EMV acquiring testing to allow accept EMV cards from ATM, but need do the certify testing one by one network: 1, International Visa/JCB/CUP 2, Domestic VNBC/BankNet/SmartLink	Planning
	5.	Daily Process > 1 Million Transaction	Solution is internal discuss and reach: 1, Increase Trace No Scope 2, Control Trace No Usage	Planning
Vendor	6.	Remote Key Loading	This is the solution to automatically download the terminal master key into ATM.	Planning
	7.	Application Backup & Disaster Recovery	It's the solution to make sure the application is down or process slow:	Planning

Role	No	Task	Comments	Status
	8.	Link 3rd Local Payment Network like + BankNet	It's the experience from some other local banks: 1, As BankNet Acquire & Issuer 2, As SmartLink Acquire & Issuer	Pending
	9.	Inter-transfer with on-us or off-us cards	It's IBFT function to enable transfer between banks instead inside bank: 1, IBFT Account Inquiry 2, IBFT Funds Transfer (on-us or off-us) 3, Reversal	Pending

2.2 Deployment Improve and Upgrade



Application Deployment Check List

No	Name	Application Description	Num
1	FEEL Switch 3.1 - Online	There is at least 2 server to install this application, one for primary and one for backup, and in case use cluster solution, can be more server to install and cluster process to improve transaction process performance	2+
2	FEEL Switch 3.1 - Console	There is at least 2 server to install this application, one for primary and one for backup, and in case use cluster solution, can be more server to install and cluster process to improve web	2+

		page access performance	
3	FEEL View Plus 1.0 - Server	<p>There is at least 2 server to install this application, one for primary and one for backup, and in case use cluster solution, can be more server to install and cluster process to improve web page access performance</p> <p><u>Note: can consider install both console and View Plus into one server</u></p>	2+
4	FEEL View Plus 1.0 - Agent	This one is installed at ATM Terminal	N+
5	Oracle Database 11g	This one is independent DB, make sure backup	2+

2.3 Online Transaction Process Application

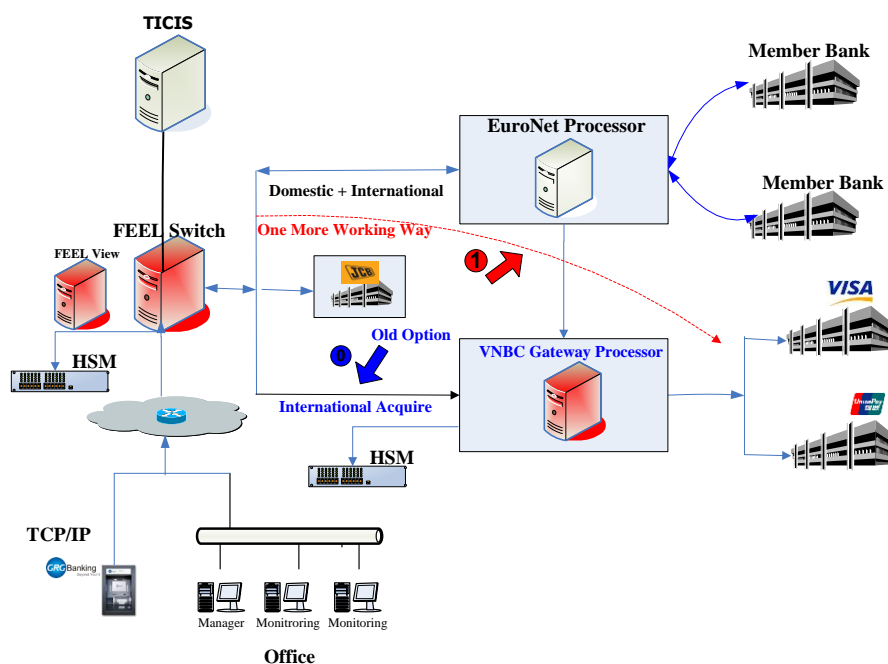
The current acquire card media type accepted by the ATM is listed below:

- Accept On-us DAB Debit Cards through own Network
- Accept Off-us Domestic VNBC Cards through VNBC Network
- Accept Off-us International Visa Cards through Visa Network
- Accept Off-us International CUP Cards through CUP Network
- Accept Off-us International JCB Cards through JCB Network

The current issue card media type accepted by the off-us ATM is listed below:

- Accept On-us DAB Debit Cards from off-us ATM through VNBC Network

2.3.1 Online Process Picture



The key change points list as below:

- ATM Switch upgrade from 3.0 to 3.1 including management console
- Keep more option to link ATM Switch to VISA & CUP directly
- ATM Monitoring upgrade covering from monitoring to distribution and remote control
- PCI-DSS Compliance and Certified
- EMV Acquiring Compliance
- Automatically remote key loading instead manually entry master key into ATM
- Disaster Recovery Consideration

1, Access points is unified from access person to link device, easy to control

2, Business function integration base on scenario, easy to use

3, Application internal improvement on both function, UI and security

2.3.2 Online Transaction Review

Transaction List Table for DAB

	No	Transaction Type	DAB On-us			Domestic		Intenational	
	No		DAB Cards	VISA	MCI	Acq	Iss	Acq	Iss
A T M	1	Balance Inquiry	✓	N/A	N/A	✓	✓	✓	✗
	2	Cash Withdraw	✓	N/A	N/A	✓	✓	✓	✗
	3	PIN Change	✓	N/A	N/A	✓	✓	N/A	✗
	4	Funds Transfer	✓	N/A	N/A	✓	✗	N/A	✗
	5	Cash Deposit[1]	✓	N/A	N/A	N/A	✗	N/A	✗
	6	Envelop Deposit	✓	N/A	N/A	N/A	✗	N/A	✗
	7	Mini Statement	✓	N/A	N/A	✓	✗	N/A	✗

8	Prepaid Card	✓	N/A	N/A	N/A	×	N/A	×
9	Bill Payment	✓	N/A	N/A	✓	×	N/A	N/A
10	Reversal	✓	N/A	N/A	✓	✓	✓	×
11	IBFT- Acc Inquiry	✓	N/A	N/A	✓	✓	N/A	N/A
12	IBFT[2]	✓	N/A	N/A	✓	✓	N/A	N/A
13	IBFT Reversal	✓	N/A	N/A	✓	✓	N/A	N/A

[1] Cash deposit from ATM, with cards and without cards

[2] IBFT include transfer between on-us cards and off-us cards, follow the BankNet transaction flow, get reference <Spec v1.5_Final.pdf> Page 29 ~ Page 37

2.3.3 Large Transaction Volume Process

2.3.3.1 Transaction Volume Predict for Future

Messages Processed Predict

No	ATM Unites	ATM Network Messages			1 Unit ATM Card Messages			Total Processed Messages
		Time Cycle	Unit Daily	Total	Time Cycle	Unite Daily	Total	
1.	1500	5 Minutes	300	450,000	2 Minutes	600	<u>900,000</u>	<u>1,350,000</u>
2.	1500	1 Minutes	1500	2,250,000	2 Minutes	600	<u>900,000</u>	<u>3,150,000</u>
3.	2000	5 Minutes	300	600,000	2 Minutes	600	<u>1,200,000</u>	<u>1,800,000</u>
4.	2000	1 Minutes	1500	3,000,000	2 Minutes	600	<u>1,200,000</u>	<u>4,200,000</u>
5.	3000	5 Minutes	300	<u>900,000</u>	2 Minutes	600	<u>1,800,000</u>	<u>2,700,000</u>
6.	3000	1 Minutes	1500	4,500,000	2 Minutes	600	<u>1,800,000</u>	<u>2,700,000</u>

Conclusion: This is normal scenario caculation exclude reversal counting, 1500 ATM is the limited and 6 number digits (maximum is 999,999) can not meet the messages requirement, urgently need one solution to resolve this high volume problem.

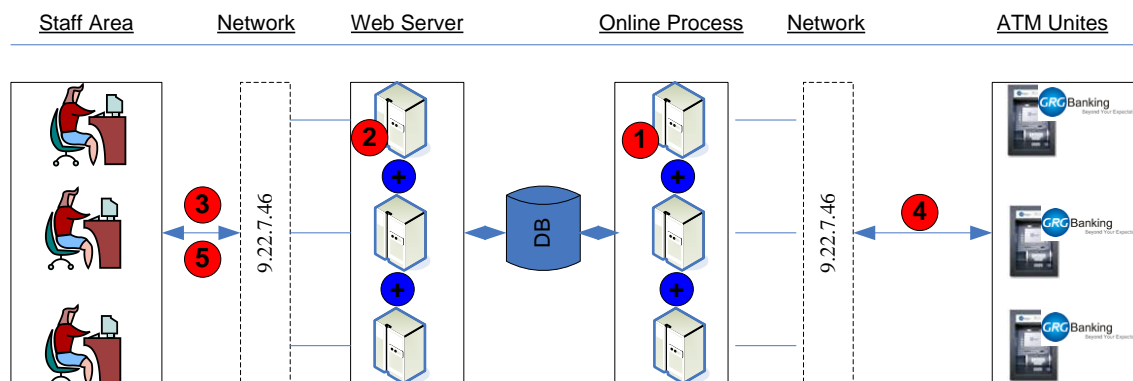
2.3.3.2 Scenario Consideration

High Volume Process Normal Scenario and Solution

Role	No	Scenario	Solution	Status
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Role	No	Scenario	Solution	Status
End User	7.	Trace No Extension	The current version support 6 digits and can not meet business requirement. It's not product version, and need customization to meet the trace No management	Enable
	8.	Independent Service Channel	Make sure difference channel keep independent and in case change something from one channel and there is no effect to another channel, channel cover from ATM, CMS, VISA, CUP, JCB, VNBC, ...	Enable
	9.	Enable DB Memory	Compare with 3.0, this version fully support memory DB to meet both application's fast process and data backup and multiple access	Enable
	10.	Cluster Process Enable	Since data is independent and can be cluster process by multiple server	Enable
	11.	Scan Tool to Review History Data	It's one tool reviewed by PCI-DSS and use to review history data and to convert and meet PA-DSS requirements	Enable
	12.	Message Format Review Tool	It's one tool to review all history log to give warning on some error format <i><u>Note: before this one cause application down and create big trouble</u></i>	Enable

2.3.3.3 Scenario Process View



2.3.4 IBFT - 3rd Change or Cooperate List

There is few interface will be upgrade on both the ATM and CMS-TICIS base on BankNet Spec:

ATM online Transactions

- IBFT-Acc Inquiry
- IBFT
- IBFT - Reversal
- Cash Deposit
- Cash Deposit Confirmation

CMS Online Transactions

- IBFT-Acc Inquiry
- Cash Deposit
- Cash Deposit Confirmation

2.4 FEEL Switch Console Application

2.4.1 Scenario Process

In order to facilitate user remotely access system, easy to maintenance and management, FEEL Switch Office adopt B/S structure. FEEL Switch Office adopt J2EE architecture and the application of advanced J2EE design patterns, as well as more mature technologies, which includes international language support, Tomcat technology, Web Service technology and JSP technology.

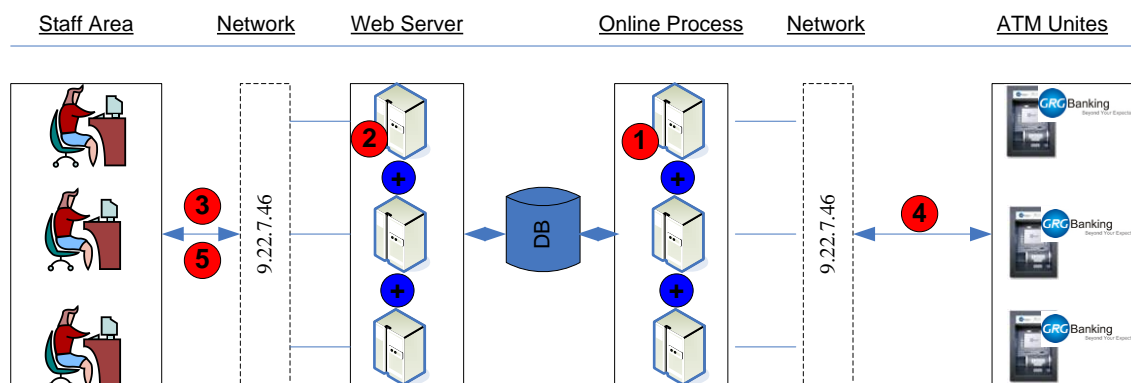


Figure 1 FEEL Switch Console

Portfolio Application Criteria

Phase	Step	Procedures	Time	Requirement
Initialization	1.	Setup Online Application	0.5 Days	N/A
Initialization	2.	Setup Web Application	0.5 Day	N/A
Initialization	3.	Import or Setup Related Parameter	1 Month	N/A
Lifecycle	4.	Go Live and Transaction from ATM	2 ~3 Weeks	ATM follow up specification
Lifecycle	5.	Go Live and Control	N/A	Done

2.4.2 Scenario List

FEEL Switch Console Normal Scenario

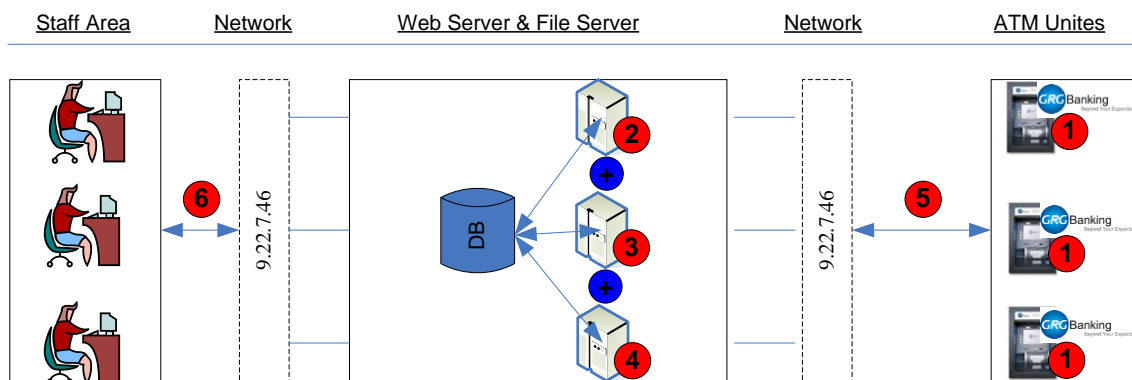
Role	No	Scenario	Job to do (How to do)	Status
End User	1.	System Monitoring	This scenario enable user easily monitoring from UI: 1, Transaction Status List Monitoring 2, Application Version Information View 3, Network Connection Status Monitoring 4, Database Connection Status Monitoring 5, OS Resource Status Monitoring	Enable
	2.	Parameter Configuration	This scenario enable user easily setup or view all the parameter used by application: 1, Balance ID 2, State and City Code 3, Card BIN Table 4, Zone Verification Key 5, Transaction Code 6, Transaction Fee Policy 7, Merchant Code Catalog 8, Transaction Code Catalog 9, POS Fee Policy 10, Utility Account Bind	Enable

Role	No	Scenario	Job to do (How to do)	Status
			11, Card Type Design (Optional) 12, Customer Class Design (Optional) 13, Card Group Design (Optional) 14, Card Products Design (Optional) 15, Card Verification Key (Optional) 16, PIN Verification Key (Optional) 17, Response Code List 18, Country Code List 19, Currency Exchange Rate 20, Reason Code List	
	3.	Ticket Management	This scenario enable user easily manage all the trouble from transaction process: 1, Ticket Event Generation 2, Ticket Event Notification 3, Ticket Lifecycle Control, trace, process, summary	Enable
	4.	Payment Network BOAS	This scenario enable user easily manage all the operation from 3rd payment network: 1, Network Management, Sign in, Sign off, Echo test, Sign on advice retrieval, Sign off advice retrieval, Dynamic key exchange 2, Integrate VISA/JCB/CUP independent operation function	Enable
	5.	Helpful Tool	This scenario enable technical people easily trouble shooting from these tool: 1, Transaction Log Research and Capture 2, Telnet and Remote Command	
	6.	Statistics & Reporting	This scenario enable user easily get all related report from ATM network: 1, Transaction Success Rate 2, Transaction Day statics 3, Transaction Month Statics 4, Network Connect Rate 5, Online Transaction Report 6, Question Transaction Report 7, High Frequency Transaction Report 8, High Single Transaction Report 9, ATM Reconciliation Inquiry	Enable
	7.	Merchant Management	N/A	Disable

Role	No	Scenario	Job to do (How to do)	Status
	8.	Debit Card Management	N/A	Disable

2.5 ATM Monitoring Application FEEL View Plus

2.5.1 Scenario Process



Portfolio Application Criteria

Phase	Step	Procedures	Time	Requirement
Initialization	1.	Setup ATM Agent	0.5 Days	ATM Need Meet: 1, XFS ... 2, ...
Initialization	2.	Setup FEEL View Plus Monitoring Server	0.5 Day	???
Initialization	3.	Setup FEEL View Plus Files Server	0.5 Day	???
Initialization	4.	Setup FEEL View Plus Related Server + Task Server + Gateway Server	0.5 Day	???
Lifecycle	5.	Go Live and Transaction from ATM	N/A	
Lifecycle	6.	Go Live and Monitoring ATM	N/A	

2.5.2 ATM Agent Installation and Requirement

In case upgrade to FEEL View Plus, need install one agent into ATM and this agent will follow XFS specification to access the status from ATM Hardware Modular, and then upload or report to the View server. There is some change need to be on the ATM Terminal. Here will summary the change list of GRG ATM.

ATM Upgrade Summary List

No	Brand	Num	ATM Application	Comments from Vendor	Status
9.	H38	131	CatalystR2b46		Enable
10.	E300L	1	CatalystR2b46		Enable
11.	H38L	111	CatalystR2b46		Enable
12.	H38N	2	CatalystR2b46		Enable
13.	G21L	481	CatalystR2b46		Enable
14.	F16/F16A	34	CatalystR2b46		
15.	F34	150	CatalystR2b46		
16.	H35	4	CatalystR2b46		
17.	K16	1	CatalystR2b46		
18.	F12B	73	CatalystR2b46		
19.	F12	16	CatalystR2b46		
20.	...				

2.5.3 Scenario List

View Plus Normal Scenario

Role	Step	Scenario	Job to do (How to do)	Status
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Role	Step	Scenario	Job to do (How to do)	Status
End User	1.	ATM Monitoring	This scenario enable user easily monitoring from UI: 1, ATM Network Monitoring Navigation, Summary, Trend, Top List, Average Statistics 2, Detail ATM Status Monitoring 3, Detail Transaction Monitoring 4, Detail Card Captured Monitoring	Enable
	2.	Ticket Management	This scenario enable user easily manage all the trouble from ATM: 1, Ticket Generation 2, Ticket Notification 3, Ticket Lifecycle Control, trace, process, summary	Enable
	3.	Remote File Distribution	This scenario enable user easily manage all the package or file to or from ATM: 1, ATM Application Package Control, including Advertisement, ATM Application, ATM Agent 2, Remote Control, Upload Journal in Schedule, Reset or restart or shutdown ATM Application, Upload & Download & Delete Files, Setup Agent Parameter and OS Parameter 3, Remote Diagnosis, Screen shortcut, Line Test, File Directory Check, ATM Agent Parameter Confirm, OS Parameter Confirm 4, Parameter Drive Setup	Enable
	4.	EJ Log Upload & Download	This scenario enable user easily manage all the EJ Log from ATM: 1, Upload Control, Upload EJ, Integrity Check, Exception Report, EJ View 2, EJ Log Process 3, EJ Log Storage	Enable
	5.	Reporting on Detail and Summary	This scenario enable user easily get all related report from ATM network: 1, Auto Task Execute Summary List 2, ATM Out of Service Event Detail List 3, ATM Out of Service Event Summary Report 4, ATM Trouble Detail List 5, ATM Cash Loading Detail and Summary 6, ATM Cassette Clean up Detail and Summary 7, ATM In Service Time Rate Statistics 8, ATM Brand Rate Statistics	Enable

2.6 PCI-DSS Product Certification and Project Review

2.6.1 Product PA-DSS Certification

Note: This chapter have nothing with customer, it's certified on product level by application vendor

Trust Confirm From



FEEL Switch 3.1 Application

Portfolio Certification Criteria

Responsibility	Step	Procedures	Time	Status
GRG&Trustwave	6.	<u>Pre-Kickoff</u> All projects start with the signing of the SoW. Once stamped by legal, the project is entered into Trustwave's order system and will be ready for assignment to an assessor. The assignment usually happens as soon as it is visible. Once assigned, the assessor will send a kick-off meeting request. In almost every case projects can be kicked off immediately.	2 Days	Done
GRG&Trustwave	7.	<u>Kick-Off</u> The Kick-off is the first critical component to an	1 Day	Done

Responsibility	Step	Procedures	Time	Status
		<p>engagement and is used for introductions and to set expectations with the client. It starts off with the kick-off call. The kick-off call serves the following purposes:</p> <ul style="list-style-type: none"> • Introduction for assessor and vendor development/product team • Explain Trustwave's PA-DSS Assessment Methodology • Overview of Trustwave's deliverables • Tentatively schedule testing and reoccurring status calls • Discuss client deadlines 		
GRG	8.	Review base on pa-dss.pdf	1 Month	Done
GRG&Trustwave	9.	<p>Information Gathering</p> <p>The Information Gathering Phase is usually contained within the time between the Kick-Off call and Application Testing Phase. During this period, the following will occur:</p> <ul style="list-style-type: none"> • Executive Summary Call - A fairly long call, up to 2 hours, to show serve as a deep-dive into almost all aspect on how the application works. • Documentation Gathering – Trustwave will obtain all documentation for the installation, development and support of the application. • Regular Status Calls – Usually weekly or whenever is convenient for the client. • Application Test Scoping/Preparation – Decide on the location of testing: on-site or in Trustwave's ActiveLab. If on0site, lab requirements will be laid out 	2 ~3 Weeks	Done
GRG&Trustwave	10.	<p>Application Testing</p> <p>The Application Phase includes the installation and testing of the application followed by a</p>	1 ~ 2 Weeks	Done

Responsibility	Step	Procedures	Time	Status
		<p>forensic review of the application to ensure it is handling cardholder data in a compliant manner. This phase includes the following:</p> <ul style="list-style-type: none"> • Test system preparation – Ensure lab environment meets PA-DSS Appendix B. • Application installation – According to PA-DSS Implementation Guide • Perform supported transactions – Credit/debit, card present/not present • Forensic image acquisition – Using Encase • Forensic analysis – Using Encase 		
Trustwave&SSC	11.	<p>Reporting</p> <p>Depending on whether the application is compliant or non-compliant, the Reporting Phase will generate a Gap Analysis or PA-DSS Report on Validation RoV:</p> <p>Gap Analysis Doc – A documents that lists all the areas an application has been found to be non compliant. It will also contain remediation suggestions.</p> <p>PA-DSS RoV – Final Document sent to QA for finalization and subsequently to the PCI-SSC for acceptance</p>	1 Week	Done
Trustwave&SSC	12.	<p>QA</p> <p>After the RoV has been completed is submitted to Trustwave's Quality Assurance group. A robust QA program has been required by the PCI-SSC since version 1.2 of the standard. QA is performed in two stages:</p> <p>Stage 1 - Basic grammar and formatting.</p> <p>Stage 2 - Technical analysis and sanity check.</p> <p>Once out of Stage 2, the RoV is sent to the client for review. Once accepted by the client, the report will be submitted to the PCI-SSC</p>	1 ~ 2 Weeks	On-going
Trustwave&SSC	13.	<p>PCI-SSC Submission</p> <p>Submission to the PCI-SSC is performed by Trustwave's QA group through the SSC's submission portal. The SCC will review the RoV</p>	2 ~ 3 Weeks	Pending

Responsibility	Step	Procedures	Time	Status
		soon after it is submitted to make sure the Application described in the RoV is in-scope for PA-DSS. They call this process the "Performa Review". Once accepted as an in-scope RoV, it will enter the queue for review. Once accepted, Trustwave and the client will be notified. In addition to notification, the client will receive an invoice for listing		
End User	14.	Login Website Confirm: https://www.pcisecuritystandards.org/approved_companies_providers/validated_payment_applications.php?agree=true	2 Years	N/A

Note:

This step have nothing with customer, it's product certification, finally confirm from:

https://www.pcisecuritystandards.org/approved_companies_providers/validated_payment_applications.php?agree=true

Example

Alaric Systems Ltd

Alaric Payment Suite, consisting of Authentic and Fractals

Version #: v3-0_00

App Type: Payment Middleware

Target Market: Financial institutions, TPPs, and retail merchants

Reference #: 11-02.00469.001

Tested Platforms/Operating Systems:

Red Hat Enterprise

Service Pack/Build/Version:

RedHat Linux Enterprise Edition 5 Validated According to PA-DSS

(PA-DSS v1.2) Acceptable for New Deployments 1 Jun 2013 28 Oct 2013 Trustwave

ProClassic/Enterprise - Retail Banking Solution Suite

Version #: 2.3

App Type: Payment Middleware

Target Market: Retail banks / Retailer, Independent Service Operator,

ATM and POS Service Provider, Acquiring Processors

Reference #: 11-02.00511.005

Tested Platforms/Operating Systems:

Windows XP, Red Hat Enterprise

Service Pack/Build/Version:

SP3; 4.0 Validated According to PA-DSS

(PA-DSS v2.0) Acceptable for New Deployments 13 Apr 2012 28 Oct 2016 usd AG

2.6.2 Project PA-DSS Review List

Note: This chapter is the Job need to be consider during project implementation

Job List

No	Application	Description	Resource
1	Review List	PA-DSS Change List - FEEL Switch 3.1.doc	GRG R&D
2	History Data Process Tool	There is one tool to automatically process history data inside database to make sure it meet PCI DSS	GRG R&D
3	Review Process	Review base on pa-dss.pdf	GRG ISD&DAB
4			

PA-DSS Review List

Scope	No	Key Item	Review Description	DAB Enable
Host Security Process	1	Password Setup Strategy		YES
	2	User and Group Setup		YES
	3	User Lock Strategy		YES
	4	User Audit Enable		YES
	5	Virus Tool be Installed		YES
	6	Firewall Setup Required		YES
Online Transaction Security Process	7	Remove Redundancy Log Print		YES
	8	Security Information shielded		YES
	9	Audit Log Process		YES
	10	DB Password Encrypted		YES
	11	Log & Data Clean up		YES
	12	Log File Remove Tool		YES
	13	DB Audit Remove Tool		YES
Web Console	14	SQL Impregnation Prevent		YES
	15	Session Attack Prevention		YES
	16	Attack across Site Attack Prevention		YES

	17	Check Value Enable		YES
	18	User Access Limited		YES
	19	Tomcat User & Password be Encrypted		YES
	20	HTTPS Configuration		YES
	21	Web Log File Process		YES
CMS Security Process	22	Card PIN encrypted by HSM 3DES		NO
	23	Card Number Encrypted by Software of 3DES		NO
	24	Card Number Convert Tool		NO
	25	Card PIN Convert Tool		NO
	26	Card Online Transaction Process		NO

Note: Get more from process manual to meeting these change requirement.

2.7 ATM EMV Acquiring

2.7.1 DAB EMV Upgrade Target

The EMV product from GRG Banking has been developed to support processing for both ICC and magnetic stripe transactions from a single terminal. This proposal enable DAB to accept services payment through the GRG ATM using both magnetic stripe cards and ICC (EMV) cards.

2.7.2 Acquire Card Media Supported for this Target

The current acquire card media type accepted by the ATM is listed below:

- Accept off-us VISA international magnetic cards
- Accept off-us CUP international magnetic cards
- Accept off-us JCB international magnetic cards
- Accept off-us VNBC domestic magnetic cards
- Accept on-us magnetic cards

While EMV upgrade is completely finished, besides the old acquire service, the target will be added more by the ATM as:

- Accept off-us VISA international ICC(EMV) cards
- Accept off-us CUP international ICC(EMV) cards
- Accept off-us JCB international ICC(EMV) cards
- Accept off-us VNBC domestic ICC(EMV) cards

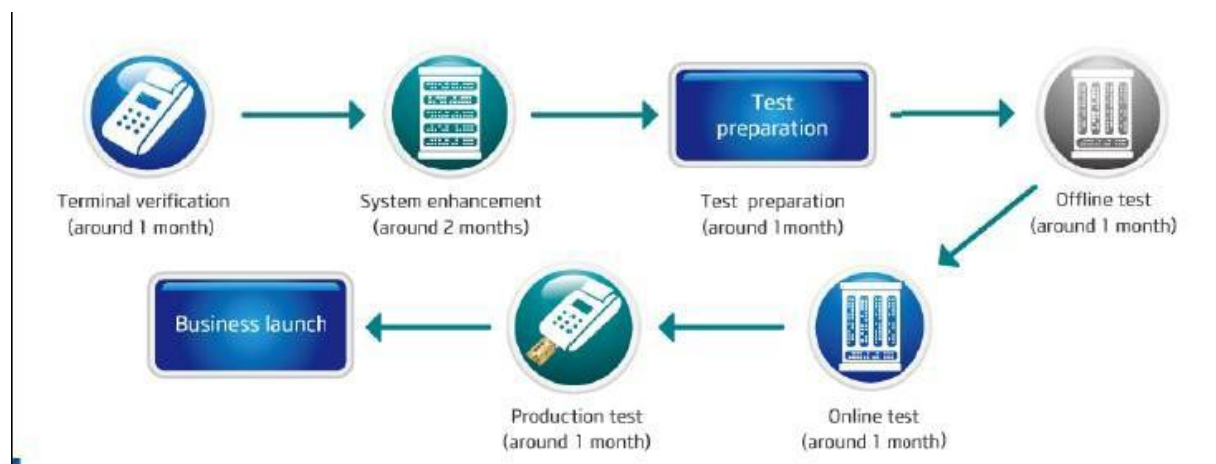
- Accept on-us ICC(EMV) cards

2.7.3 Transaction Supported for this Target

EMV Capable Terminal?	Card Details Read from Chip or Magnetic Stripe?	Chip Data Elements Included?	Switching Application Processing Requirements
No	Magnetic stripe	No	Traditional Standard processing
Yes	Magnetic stripe	No	Add EMV Status token indicating EMV-capable terminal, but not a chip-read transaction.
Yes	Microprocessor chip	No	Add EMV Status token indicating EMV-capable terminal and a chip-read transaction.
Yes	Microprocessor chip	Yes, included in transaction message	Add EMV Status token indicating EMV-capable terminal and a chipread transaction. Also add one or more tokens containing the chip data elements. EMV tokens are described in the message

2.7.4 EMV Migration or Certification Procedure

Reference copy from China Union Pay



Portfolio Certification Criteria

Responsibility	Step	Procedures	Time	Status
GRG	1.	Terminal Verification This step is only try to make sure the device install	1 Month	Pending

Responsibility	Step	Procedures	Time	Status
		on the terminal is EMV compatible, so here need more confirm with terminal vendor on the EMV certification.		
GRG	2.	System Enhancement This step is some change on the system including both terminal's application and switch host application	1 Month	Pending
DAB&GRG	3.	Testing Preparation This step just make sure the testing environment is ready, for example: 1, The terminal of ATM and POS 2, The EMV parameter request and download into terminal 3, The Simulator environment 4, The testing EMV cards request from payment network	1 Month	Pending
DAB&GRG	4.	Offline Testing This step is only focus on offline testing, test from terminal to Simulator. To each payment network there is around 50 cards need to be passed on this testing and make sure it's ready for online testing	1 Month	Pending
DAB&GRG	5.	Online Testing This step is only focus on online testing, test from terminal to real 3rd party's testing environment. To each payment network there is around 50 cards need to be passed on this testing and make sure it's ready for online testing	1 Month	Pending
DAB	6.	Production Go Live This step already finish all and just monitoring	N/A	Pending

2.7.5 Online Message Process Modification

There is few interface documentation for reference:

2.7.6 Message Modification Requirement

Transaction List Table for SGB

	No		SGB On-us[0]		Domestic[1]		International[2]	
	No	Transaction Type	Mag Stripe	EMV IC	Mag Stripe	EMV IC	Mag Stripe	EMV IC
A T M & P O S		ATM - Single Message						
	1	Balance Inquiry	✓	✗	✓	✗	✓	✗→✓
	2	Cash Withdraw	✓	✗	✓	✗	✓	✗→✓
	3	PIN Change	✓	✗	N/A	N/A	N/A	N/A
	4	Funds Transfer	✓	✗	✗	✗	N/A	N/A
	5	Cash Deposit	✗	✗	✗	✗	N/A	N/A
	6	Envelop Deposit	✓	✗	✗	✗	N/A	N/A
	7	Mini Statement	✓	✗	✓	✗	N/A	N/A
	8	Prepaid Card	✓	✗	N/A	N/A	N/A	N/A
	9	Bill Payment	✓	N/A	N/A	N/A	N/A	N/A
	10	Curr Exchange[7]	✓	N/A	N/A	N/A	N/A	N/A
	11	Reversal	✓	✗	✓	✗	✓	✗→✓

[0] DAB Bank issue out the mag-stripe card only up to now

[1] VNBC&BankNet not yet EMV compatible on both acquire and issue

[2] EMV acquire certification with international payment network like MasterCard, Visa, CUP ...etc, but need one round certification testing one by one, ATM and POS can be certified at the same time with payment network.

[3] This is single message, right now DAB Bank not yet using it

2.7.6.1 Field 55 - Key Chip Card Information Field

- Field 55

- TLV format : Tag, Length, Value

- Basic Information Subfields vs. Optional Information Subfields

- Basic Information Subfields : General information subfields attend the calculation of ARQC

- Optional Information Subfields : Based on business requirements

Basic information of sub-field list:

Sub-field name	Sub-field abbreviation	Sub-field tag	Tag value (byte)	Sub-field attribute
Application Cryptogram	AC	9F26	8	B
Cryptogram Information Data	—	9F27	1	B
Issuer Application Data	IAD	9F10	Up to 32	B

Unpredictable Number	—	9F37	4	B
Application Transaction Counter	ATC	9F36	2	B
Terminal Verificaion Result	TVR	95	5	B
Transaction Date	—	9A	3	CN (includes 6 bit valid number, YYMMDD)
Transaction Type	—	9C	1	CN(includes 2 bit valid number) authorization amount
Transaction Amount or Amount Authorized	—	9F02	6	CN(includes 12 bit valid number) Transaction Currency Code — 5F2A 2 CN(includes 3 bit valid number)
Application Interchange Profile	—	82	2	B
Terminal Country Code	—	9F1A	2	CN(includes 2 bit valid number)
Amount Other	—	9F03	6	CN(includes 12 bit valid number)
Terminal Capabilities	—	9F33	3	B

Optional information of sub-field list:

Sub-field name	Sub-field abbreviation	Sub-field tag	Tag value (byte)	Sub-field attribute
Cardholder Verification Method Results	CVM	9F34	3	B
Terminal Type	—	9F35	1	CN(2 bit valid number)
Interface Device Serial Number	IFD	9F1E	8	AN
Dedicated File Name	DF	84	5~16	B
Terminal Application Version Number	—	9F09	2	B
Transaction Sequence Counter	—	9F41	2~4	CN (includes 4-8 bit valid number)
Issuer Authentication Data	—	91	8~16	B
Issuer Script Template 1	—	71	var. up to 128	B
Issuer Script Template 2	—	72	var. up to 128	B
Issuer Script Results	—	DF31	var. up to 21	B

ECI Issuer Authorization Code	EC IAC	9F74	6	an
Card Product Identification	--	9F63	16	b

2.7.6.2 Field 23 - Auxiliary Chip Card Information Field

- Field 23
- Card Sequence Number : 3 numeric with fixed length
- Used for distinguishing between separate cards with same PAN

2.7.6.3 Field 22&60 - Card Media Information Field

- Card Media includes : Magnetic card, chip card, fallback card
- Decided by the combination of

Field 22 – Point of Service Entry Mode Code

Field 60.2.2 – Terminal Entry Capability

Field 60.2.3 - Chip Condition Code

Card Media	1st 2 digits of F22	F60.2.2	F60.2.3
Magnetic Card	02 or 90	2	Unrelated
Chip Card	05, 95, 07, 91, 96, 97, 98	5 or 6 (While First 2 digits of F22 are 05 or 95, F60.2.2 shall be 5, otherwise 6)	Unrelated
Fallback Card	02 or 90	5 or 6	1 or 2

2.7.7 Interface Specification Reference

Channel	ATM	VISA	CUP
F22			
F55			
F60.XX			

Get Reference from:

<Part I GRG FEEL Switch Device Online Interface.pdf>

2.7.8 File Process Modification

This part need get reference from related file specification and batch process it, consider more EM information

2.7.9 EMV Upgrade on GRG ATM

Base on the history record of archive, GRG would like provide the upgrade summary on the ATM hardware and software especially for EMV.

2.7.9.1 ATM Hardware Module Upgrade

The card readers models installed in DAB ATMs are Sanyko(0179 or 0188) or Omron and the card readers already support EMV Integrated Circuit Card.

The PIN PAD models install in DAB ATMs are EKP/NKP/EPP PIN PADs, the EKP and NKP PINPAD must be changed to EPP PIN PAD to support PCI-EPP flow.

List 1 ATM Upgrade Summary

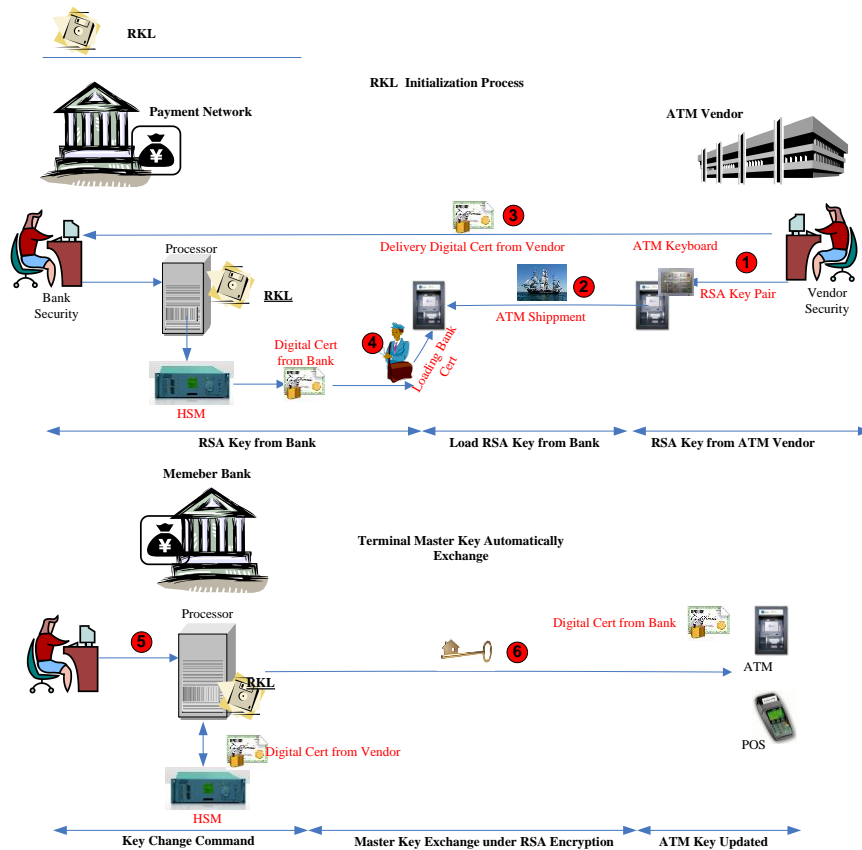
Model	Numbers	KEYBOARD	ATMC Version	MEMO
H38	131	EPP	CatalystR2b46	
E300L	1	EPP	CatalystR2b46	
H38L	111	EPP	CatalystR2b46	
H38N	2	EPP	CatalystR2b46	
G21L	481	EKP and EPP	CatalystR2b46	
F16/F16A	34	EKP	CatalystR2b46	
F34	150	NKP	CatalystR2b46	
H35	4	EKP	CatalystR2b46	
K16	1	EKP	CatalystR2b46	
F12B	73	EKP	CatalystR2b46	
F12	16	EKP	CatalystR2b46	
Total	1004			

2.7.9.2 ATM Software Application Upgrade

The GRG ATMC version in DAB is CatalystR2b46,it needs to be upgraded to Catalyst R4 version to support EMV transaction.

2.8 ATM Remote Key Loading (RKL)

2.8.1 Scenario Process



Portfolio Certification Criteria

Phase	Step	Procedures	Time	Requirement
Manufacture	1.	Load RSA Pair Key into EPP Keyboard	2 Days	
Shipment	2.	Ship ATM to Bank Customer	3 M	
Initialization	3.	1, Vendor Delivery Digital Cert-A to Bank Customer 2, Bank keep it by HSM	1 M	
Initialization	4.	1, Bank Generate own Digital Cert-B 2, Load Digital Cert-B from Bank	2 ~3 D	

Phase	Step	Procedures	Time	Requirement
Lifecycle	5.	Manually start exchange TMK Automatically start exchange TMK	1 ~ 2 D	
Lifecycle	6.	Automatically Exchange TMK Process	1 Minute	
Lifecycle	7.	Report Review	1 ~ 2 Minute	

2.8.2 ATM Hardware Module Upgrade

The PINPAD Models install in DAB ATMs are EKP/NKP/EPP PINPADs, the EKP and NKP PINPAD must be changed to EPP PINPAD to support PCI-EPP flow.

ATM Upgrade Summary List

No	Brand	Num	Keyboard	Comments from Vendor	Status
1.	H38	131	EPP		Enable
2.	E300L	1	EPP		Enable
3.	H38L	111	EPP		Enable
4.	H38N	2	EPP		Enable
5.	G21L	481	EPP or EKP		Enable
6.	F16/F16A	34	EKP		
7.	F34	150	NKP		
8.	H35	4	EKP		
9.	K16	1	EKP		
10.	F12B	73	EKP		
11.	F12	16	EKP		
12.	...				

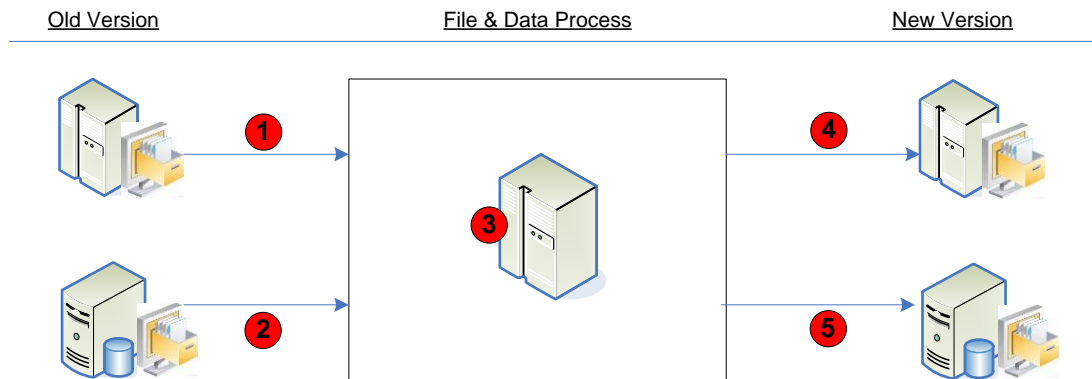
2.8.3 Scenario List

Remote Key Loading Normal Scenario

Role	No	Scenario	Job to do (How to do)	Status
End User	1.	Cert Management	This scenario enable user easily manage the digital cert from web UI: 1, Load or Export Cert 2, Cert Lifecycle Management 3, Turn on/off Cert 4, Detail Report Review	Enable
	2.	Task Control	This scenario enable user easily manage all the automatic task planned for remote key loading tomorrow: 1, New Schedule Task Create 2, Auto Task Execute Monitoring 3, Task Status Audit Report Review	Enable
	3.	Manually RKL	This scenario enable user easily manually start Remote Key Loading: 1, Manually RKL to One or Batch ATM 2, Task Execute Monitoring 3, Task Status Audit Report	Enable
	4.	Manually TMK	This scenario enable user keep using old way to load TMK into ATM: 1, Print Key Pair Envelope 2, Re-set TMK 3, Status of TMK	Enable
	5.	Reporting on Audit	This scenario enable user easily confirm all related Key Loading: 1, Auto Task Execute Summary List 2, ATM Trouble Detail List 3, Auto Task Audit Log	Enable

2.9 History Data Migration

2.9.1 Scenario Process



Data Migration Steps

Scope	Step	Procedures	Time	Status
Extract Files	1.	Key Parameter File Extract	1 Weeks	Pending
Extract Data	2.	Key DB Table Data Export	1 Week	Pending
Process	3.	Data Migration Process and Testing	1 Month	Pending
Import Files	4.	Key Parameter File Loading	1 Week	Pending
Import Data	5.	Key DB Table Data Import	1 Week	Pending

Note: This job will be done and manually confirmed testing

2.9.2 Scenario List

FEEL Switch 3.1 Application Data Migration Normal Scenario

No	Scenario	Job to do (How to do)	Storage Location	
			3.0	3.1

No	Scenario	Job to do (How to do)	Storage Location	
			3.0	3.1
1.	Card BIN	This table contains Card ID, Track Info ..., that used to identify a card		
2.	Location	- This table contains the branch information - This is important table in the relationship with User Account Table and Terminal Info Table		
3.	Terminal	- This table contains all information of ATM machines		
4.	Terminal Key			
5.	Access User	- This table contains all information about user accounts within the Management Console System		
6.	Transaction Type	- This table contains transaction ID, that used to identify an transaction		
7.	Trace No			
8.	Transaction Log			
9.				

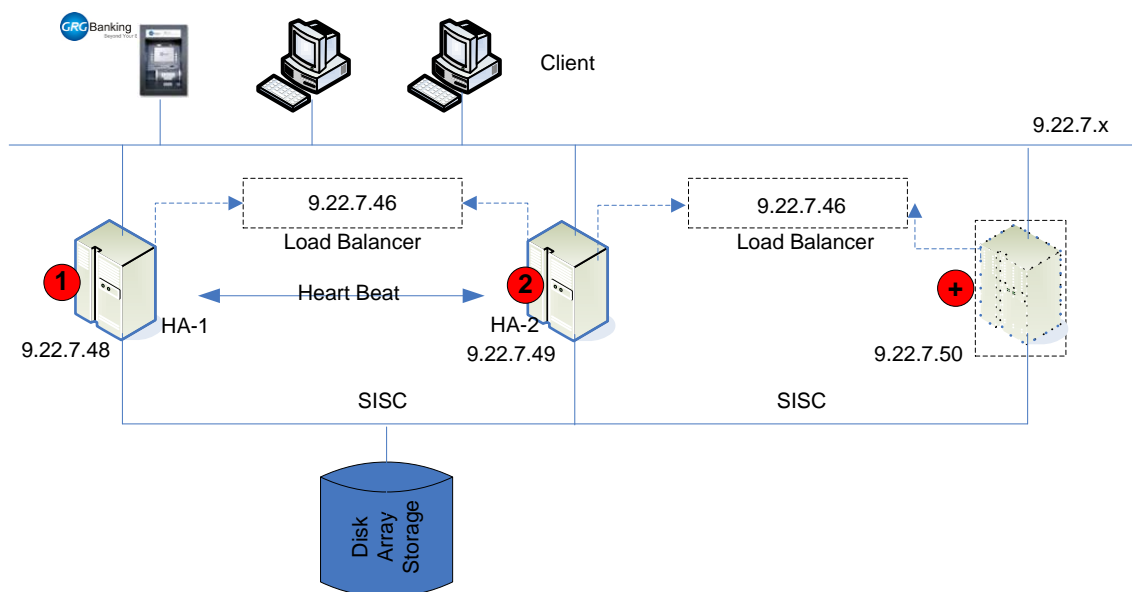
FEEL View Plus 1.0 Application Data Migration Normal Scenario

No	Scenario	Job to do (How to do)	Storage Location	
			4.0	Plus 1.0
1.	Terminal			
2.	Location			

No	Scenario	Job to do (How to do)	Storage Location	
			4.0	Plus 1.0
3.	Access User			
4.				

2.10 Application Backup and Disaster Recovery

2.10.1 Scenario Process



Related Application List

No	Application	Disaster Consideration	Num
1	FEEL Switch 3.1 - Online	Independent Server Installation and Backup: 1, HA Process 2, Cluster Process for Performance Extension 3, Status Monitoring	2+
2	FEEL Switch 3.1 - Console	Independent Server Installation and Backup: 1, HA Process	2+

		2, Cluster Process for Performance Extension 3, Status Monitoring	
3	FEEL View Plus 1.0	Independent Server Installation and Backup: 1, HA Process 2, Cluster Process for Performance Extension 3, Status Monitoring	2+

2.10.2 Scenario List

Here will list out most of possible trouble from real production and what's the solution to do in case trouble happen and finally the solution will cover what mentioned here.

Application Backup and Disaster Recovery Normal Scenario

Role	No	Scenario	Job to do (How to do)	Status
System Manager	1.	Web Page Process Slow	This scenario enable user know how to do in case access some web page is very slow: 1, Get problem report and Confirm 2, Plug-in a new site (Installation Ready in Advance) 3, Call technical Team health check 4, Fix Bug if any	Enable
	2.	Web Page Access Fail	This scenario enable user know how to do next in case the web page error happen and access fail: 1, Get problem report and Confirm 2, Plug-in a new site (Installation Ready in Advance) 3, Call technical Team health check 4, Fix Bug if any	Enable
	3.	Key Application Down	This scenario enable user easily manage all the trouble from ATM: 1, Get warning from monitoring 2, Switch to backup Server 3, Call technical Team health check 4, Fix Bug if any	Enable
	4.	Transaction Process Slow	This scenario enable user easily manage all the package or file to or from ATM: 1, Get warning from monitoring 2, Plug-in a new site (Installation Ready in Advance) 3, Call technical Team health check 4, Fix Bug if any	Enable

Role	No	Scenario	Job to do (How to do)	Status
	5.	Message Format Error	This scenario enable user easily locate message format error in big ATM network: 1, Batch Review all Message 2, Generate warning from Review 3, Call technical Team health check 4, Fix Bug if any	Enable

2.10.3 3rd Hardware and Software List

Item	Configuration	Num
HA Software	<i>Note: Please get more detail from < RHA_ClusterSuiteWPPDF.pdf ></i>	2+
Cluster	<i>Note: Please get more detail from < RHA_ClusterSuiteWPPDF.pdf ></i>	2+
Load Balancer	There is 2 option: 1, Choose F5 2, Choose Red Hat Enterprise Linux - Load Balancer <u><i>Note: Red Hat Load Balancer need to be fully testing, ever stop running when big stress testing</i></u>	1+

2.11 Software and Hardware List

Software List

Linux Platform for FEEL Switch:

Item	Reference
Operating System	Red Hat Enterprise Linux 6.2 – 64Bit
Database	Oracle 11g or higher version – 64 Bit
Software Platform	FEEL Switch 3.1 Package - 64 Bit

Window Platform for FEEL View Plus:

Item	Reference
Operating System	Windows 2008 Server R2 - 64Bit
Database	Oracle 11g or higher version – 64 Bit
Software Platform	FEEL View Plus 1.0 Package - 64 Bit

Hardware for 1500-3000 Terminal

Server	Usage	Model	Software	Configuration	Num
Storage (M)	Database's Data FEEL Switch's Data	IBM DS4700 Express	HA Software <ul style="list-style-type: none"> Heartbeat for Linux IBM PowerHA for AIX 	2 Gbps FC, 146 GB/10K E-DDM Fiber Cable 5m Multimode DS4700 Windows Host Kit DS4700 Mod 70 2-Storage Partitions Activation Field Integrate DS4700 Power Cord 250V/10A	1
DB Server (M)	Database	IBM P52A	Oracle 10g Enterprise	CPU: 4-core 1.65 GHz POWER5+ Memory: 16Gb-32G Disk SAS: 146G*4	1
Online App Server (M)	Realtime (Primary) Realtime (Backup)	IBM P52A	Linux AS 6.2 Linux - HA	CPU: 4-core 1.65 GHz POWER5+ Memory: 16G-32G Disk SAS: 146G*4	2
Office App Server (M)	1: Mgmt Console 2: Merchant Mgmt 3: Card Mgmt	IBM x3850 M2	Linux AS 6.2 JDK 1.6	CPU *2 Dual Core Intel Xeon Processor x7400 Memory: 16G Disk SAS: 146G*4	1
Office App Server (M)	1, View (Primary) 2, View (Backup) 3, File Server	IBM X3850 M2	Windows 2008 Server R2	IBM X3650 M2 CPU: Intel Xeon E5520 Memory: 8G HDD: 256G+	3
Client (M)	1: Configurator 2: IE Browser for Web	PC	Windows XP IE6.0	CPU: P4 2.0G or higher Hard Drive Disk: 80G Memory: 2G Pixel: 1024 * 768	N
Notes: 1, (O) mean optional and (M) mean mandatory, Storage is optional, if need HA it will become mandatory 2, DB Server the better be installed in different host from FEEL Switch Realtime 3, Office App Server the better be installed different host from FEEL Switch Realtime 4, Client is normal office PC					

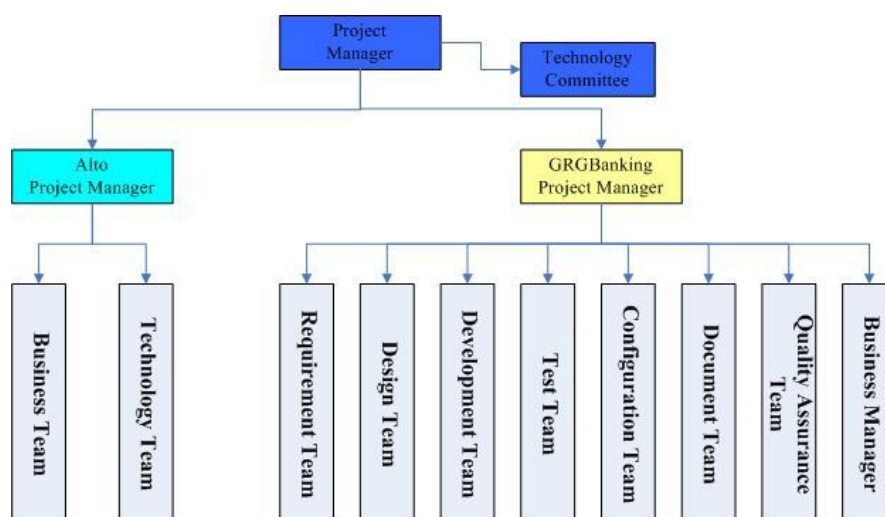
3 Project Implementation Proposal

3.1 Project Organizational Structure

3.1.1 General Architecture

To successfully implement the project, both GRGBanking and DAB should establish the respective Project Teams, and should also establish a Project Leadership Team formed by the project supervisors and experts committee of both parties to be responsible for the significant decision-makings in relation to the project and the monitoring of the progress.

Organizational structure of the Project Team is as shown in the following chart:



Project Manager has the most important role during the project implementation process. Both GRGBanking and DAB should designate the project personnels to fulfill such roles and responsibilities.

(1) The responsibilities of Project Manager of GRGBanking

The Project Manager of GRGBanking will be total in charge of the entire Project activities and is responsible for all liaison, work coordination with DAB, and reporting the project progress on a regular basis. He is responsible successful completion. He hands over before the UAT (User Acceptance Test) of the application system, and the hand-over of the successfully completed project to DAB, the Project Manager of GRGBanking should also act as the overall communication channel between GRG and the client.

(2) The responsibilities of Project Manager of DAB

The Project Manager of DAB should act as the communication channel between the DAB and GRGBanking. In accordance with the requirements of the Project Team, within the time frame agreed by both sides, the Project Manager should assist to collect and provide the business-related information and data, and accord approval and decision as need arises. In addition, the Project

Manager should also be in charge of the management of the project acceptance and take-over work.

1.1.1 Project Team from GRGBanking

All roles of the Project Team will be fulfilled by those full-time engineers with appropriate experience. The division of responsibility between different roles is as follows:

- (1) Project Director (1 person)
- (2) Technical Committee (Several Persons)
- (3) Project Manager (1 person)
- (4) Requirements Management Team (Several Persons)
- (5) Testing Team (Several Persons)
- (6) Project Documentation Team (Several Persons)
- (7) Commercial Manager (1 Person)

1.1.2 Project Team from DAB

GRGBanking suggests that DAB will constitute a full-time Project Team to involve in the project to coordinate all activities. The Project Team should provide necessary information on the business processes to GRGBanking so as to develop an effective system which can be developed to cater to the needs of DAB. Collaboration will enable efficient knowledge transfer and the transition from development stage to operation stage smoothly. This can lower the maintenance risks after the system is put into operation.

GRGBanking recommends that the Project Team of DAB should consist of the following posts:

- (1) Project Manager (1 Person)

As the representative and liaison contact of DAB, the Project Manager should cooperate with the Project Manager of GRGBanking to resolve the issues occurring during the project implementation. He should establish a cordial working relationship between the staff of DAB and the Project Team of GRGBanking during the entire project implementation cycle,

- (2) Business Team (2-3 Persons)

The Business Team should provide a detailed requirement of the business needs. This will be the basis for the Requirements Specification document and the whole project design. The team should coordinate with GRG Project team during all the stages of the project to ensure the implementation of the system that would satisfy the needs of the business domain. Their functional and professional expertise will enable to design, develop and implement an efficient system which will meet the business needs of DAB.

- (3) Technical Team (Several Persons)

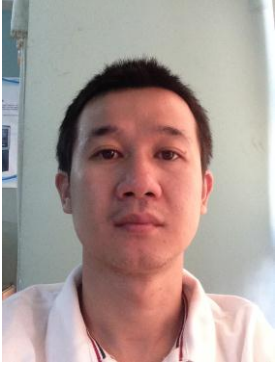


The Project Manager of the DAB should constitute a Technical Team which will be taking over the system after successful completion of project implementation. The Technical Team should participate with the Project Team during entire implementation period. They would be imparted technical training on the system. They will be responsible for day-to-day operation and maintenance of the system after

the implementation.

1.1.3 Project CV List from GRG Banking

Project Team Member CV List from GRG Banking

Step	Name & Photo	Project Experience	Responsibility
1.	 Gong Ming Hui	Key Project Experience	Project Manager
2.	 Nguyen Hai Trieu	Key Project Experience	Deputy Project Manager Java Senior Engineer
3.	 Nguyen Tien Phuc	Key Project Experience	Java Senior Engineer

Step	Name & Photo	Project Experience	Responsibility
4.	 Le Nguyen Quang Vinh		C++ Senior Engineer
5.	 Nguyen Tan Duy	Key Project Experience	C++ Senior Engineer
6.	 Truong Phi Son	Key Project Experience	C++ Senior Engineer

1.2 Project Implementation Schedule

The FEEL Switch is proven quality products from GRGBanking and it is a product of our long standing experience and R&D efforts.



GRGBanking will implement the new system in three (3) steps as shown in the flow chart. GRGBanking will spare all efforts to install this system which will enable DAB to switch over to new system from its legacy system in the shortest time. And DAB can derive the benefit of the new system in the shortest period.

Portfolio Project Implementation Milestone

Responsibility	Step	Procedures	Time	Status
DAB&GRG	1.	Pre-Kickoff	1 Week	Done
DAB&GRG	2.	Kick-Off	1 Day	Done
GRG	3.	Proposal and GRG Internal Review	1 Month	On-going
DAB&GRG	4.	Information Gathering and Proposal	1 Month	Pending
GRG	5.	Lab Development and Simulate Testing	2 Month	Pending
DAB&GRG	6.	Onsite Inside DAB Certification and Testing	1 Month	Pending
DAB&GRG	7.	Data Migration & Disaster Recovery & Review	2 Month	Pending
DAB&GRG	8.	UAT & Go Live Testing	2 Month	Pending

4 Project Implementation Plan (Job List)

Party A: DongA Bank Party B: GRGBanking

No	Time	Task	Description on Job List	Time
1	T-60 2014 -03	Proposal and Requirement Review	1) Party A need work on: <ul style="list-style-type: none"> Review the change list for 2014 on ATM network Approve from management Requirement update 2) Party B need work on: <ul style="list-style-type: none"> Generate out proposal and pass internal review Software application build up and testing Arrange project team and be familiar with software application 	2W + 1M
2	T-30	Project Plan and Project Prepare	1) Party A need work on: <ul style="list-style-type: none"> Review proposal and any requirement if have 	1M

	2014-04		<ul style="list-style-type: none"> ● Communication and any update on proposal ● Approve on final proposal from bank technical ● Assign final responsible people <p>2) Party B need work on:</p> <ul style="list-style-type: none"> ● Revise proposal base on bank's requirement ● Software application prepare, including FEEL Switch 3.1 & FEEL View Plus ● Review and finalize the project plan ● Review and finalize the project testing case 	
3	T+0 2014-05 & 2014-06	Internal Development and Simulator Testing	<p>1) Party A need work on:</p> <ul style="list-style-type: none"> ● Hardware and software prepare, like the server and OS&DB ● Ready on testing environment, like SmartLink Network and BankNet Network and VNBC Network ● Ready on one testing ATM for testing ● Ready on one HSM for testing <p>2) Party B need work on:</p> <ul style="list-style-type: none"> ● LAB FEEL Switch upgrade develop and test with ATM and DAB TICIS ● Finish the connection between ATM and FEEL Switch 3.1 and DAB TICIS System ● Finish the connection between FEEL Switch 3.1 and SmartLink as both Acq&Iss ● Finish the connection between FEEL Switch 3.1 and BankNet as both Acq&Iss ● Finish the connection between FEEL Switch 3.1 and VNBC as both Acq&Iss ● Finish the connection between FEEL Switch 3.1 and VTS (VISA Testing Simulator) as Acq ● Finish the connection between FEEL Switch 3.1 and CUP Simulator as Acq ● Finish the connection between FEEL Switch 3.1 and JCB Simulator as Acq ● LAB FEEL View Plus upgrade develop and test with ATM and DAB FEEL Switch 3.1 ● Finish the connection between ATM and FEEL View Plus and FEEL Switch 3.1 	2M

			<ul style="list-style-type: none"> ● Generate out the Testing Log File ● Generate and review out Testing Case 	
4	T+60 2014 -07	On-site Testing Environment Setup	1) Party A need work on: <ul style="list-style-type: none"> ● Make sure all the hardware and software for testing is ready in step 1 ● Discuss with party B about the requirement 2) Party B need work on: <ul style="list-style-type: none"> ● Install the software environment inside DAB ● Finish the connection between ATM and FEEL Switch 3.1 and DAB TICIS System ● Finish the connection between FEEL Switch 3.1 and SmartLink as both Acq&Iss ● Finish the connection between FEEL Switch 3.1 and BankNet as both Acq&Iss ● Finish the connection between FEEL Switch 3.1 and VNBC as both Acq&Iss ● Finish the connection between FEEL Switch 3.1 and VTS (VISA Testing Simulator) as Acq ● Finish the connection between FEEL Switch 3.1 and CUP Simulator as Acq ● Finish the connection between FEEL Switch 3.1 and JCB Simulator as Acq ● LAB FEEL View Plus upgrade develop and test with ATM and DAB FEEL Switch 3.1 ● Finish the connection between ATM and FEEL View Plus and FEEL Switch 3.1 ● UAT on all the card business from ATM ● Bug Fix or Report if any ● Weekly Report 	1M
5	T+120 2014 -08& 2014 -09	Data Migration and Disaster Recovery Process	1) Party A need work on: <ul style="list-style-type: none"> ● Ready on Stress Testing Environment ● Ready on backup solution ● Ready on F5 the Load Balancer ● Ready on the installation of related software 2) Party B need work on: <ul style="list-style-type: none"> ● Finish data migration job and internal testing ● Finish Disaster Recovery Integration and Internal 	2M

			testing <ul style="list-style-type: none"> ● Finish EMV Acquire Compliance Review ● Finish PA-DSS Project Review ● Bug Fix or Report if any ● Weekly Report 	
6	T+150 2014 -10& 2014 -11	Integration & UAT Testing	1) Party A need work on: <ul style="list-style-type: none"> ● Review Testing Plan ● Join Integration Testing and any requirement ● UAT Testing and any requirement if have ● Review Go Live Plan from 3.0 to 3.1, from 4.0 to View Plus ● Testing Go Live Procedures ● Ready on Production Environment 2) Party B need work on: <ul style="list-style-type: none"> ● Build up testing environment ● Generate out PA-DSS Review Check List ● Generate out final Testing Case ● Integration Testing base on Testing Case ● Bug Fix or Report if any ● Weekly Report 	2M
7	T+210 2014 -12& 2015 -01	Launch and Live And User Training	1) Party A need work on: <ul style="list-style-type: none"> ● Ready on all for Go Live ● 2nd Review Go Live and 2nd Testing, especially in case Fail ● Book time to Go Live 2) Party B need work on: <ul style="list-style-type: none"> ● Technical support & Monitoring ● Cooperate on Go Live ● UAT on live ● Bug Fix or Report if any 	2M

5 Hardware and Software Function List

5.1 Project Delivery List

The following table will have list on what GRG delivery to DAB on this upgrade project

No	Item	Description	Time * Man Power
Application Software			
1	FEEL Switch 3.1 - Online	This is the Online Transaction Processing	Ready
2	FEEL Switch 3.1 - Console	This is Web Console used to Control FEEL Switch Application	Ready
3	FEEL View Plus 1.0 - Server	This is Web Server used to Monitoring and Storage all Monitoring Data and Lifecycle Process Management	Ready
4	FEEL View Plus 1.0 - Agent	This is the Agent Application Running on ATM Terminal, each ATM need Install this application to connect to View Plus Server	Ready
Technical Interface Specification			
1	Part I GRG FEEL Switch Device Online Interface	This is the Message Interface Specification between ATM Terminal and FEEL Switch	Ready
2	Part III GRG FEEL Switch CMS Online Interface	This is the Message Interface Specification between CMS Host and FEEL Switch	Ready
3	Part VI GRG FEEL Switch File Interface	This is the File Interface Specification between FEEL Switch and 3rd Application	Ready
4	PA-DSS Change Review List	This is the Change List for PA-DSS base on PCI-DSS official Check List	Ready
5	FEEL View Plus Agent Interface	This is the Interface Specification between Agent and ATM Driver Level. As Bank Customer Required for 3rd Party to Follow this Specification to Connect to FEEL View Server	Confirming
User Manual Set			
1	FEEL Switch 3.1 User Manual +User Manual-Device Management and Monitoring +User Manual-System Configuration +User Manual-Back Office Management +User Manual-3rd Payment Network BOAS +User Manual-Online Service	User Manual Set	Enable
2	FEEL Switch 3.1 Technical Manual +FEEL Switch 3.1 Installation Manual +FEEL Switch 3.1 Maintenance Manual +FEEL Switch 3.1 Backup and Recovery Guide	Technical User Manual	Enable

3	FEEL View Plus 1.0 User Manual	This is the User Manual Guide End User how to use this application	Confirming
4	FEEL View Plus 1.0 Technical Manual	Technical User Manual for Installation, Technical Maintenance and Troubleshooting	Confirming
Implementation Service			
1	Requirement and Solution Confirm	Requirement summary and Proposal and Suggestion to Bank Customer.	2 Month * 1
2	Office Integration Service and Testing	GRG Internal Team Job working at Office base on the Requirement from Bank Customer	3 Month * 3
3	On-site Integration Service	End User side Integrate Testing with Bank Customer and Phase Confirm by Bank	3 Month * 3
4	EMV Certification Testing Service	It's Independent Testing Service with Each Payment Network	2 Month * 1
5	Remote Support Service and Document Improvement	Remote support during user accept testing, Related Documentation Improvement	2 Month * 3
4	Warranty Service	Warranty make sure for long term	1 Month * 3

5.2 Product License and Service Scope

5.2.1 Application Upgrade

A. Upgrade old Module: Visa/JCB/CUP **ATM Acquire Service (Online Transaction) - 3 Month**

1, Upgrade to FEEL Switch 3.1 Platform

- (1) Private Local on-us CMS
- (2) Domestic Payment Network
- (3) International Payment Network

2, Upgrade to FEEL View Plus 1.0 Platform

- 3, Integrate ATM Remote Key Loading
- 4, PCI-DSS Certification Project Review
- 5, Online Transaction

- (1) Balance Inquiry
- (2) Cash Withdraw
- (3) Reversal

6, Application Backup & Recovery Solution Compliance

7, License for TPS = 200 on the channel

8, Certification Service [2]

5.2.2 EMV Acquiring [1]

A. Upgrade old Module: ATM/Visa/JCB/CUP **ATM** Acquire Service (Online Transaction) - 3

Month

- 1, Visa/JCB/CUP Host Connection as Client
- 2, Zone Key Management
- 3, 3DES and HSM Support
- 4, EMV and Fallback Support**
- 5, Online Transaction

- (1) Balance Inquiry
- (2) Cash Withdraw
- (3) Reversal

- 6, License for TPS = 10 on the channel
- 7, Certification Service [2]

5.3 FEEL Switch 3.1 Package to DAB

I. Software		
SN	Product	Functional Module
1	FEEL Switch - Platform	Runtime and Container <ul style="list-style-type: none"> - Encapsulated System Resource Management - In-Memory Financial Transaction Management - Routing Controlling and SAF Management - Concurrent processing - Load Balance and Fail Tolerance Common Library <ul style="list-style-type: none"> - Communication Management - Message Processing and Security Management - Common and Reusable Function Library - Toolkits for Technical Engineers including Simulators
2	FEEL Switch - ATM Handler	Common Module <ul style="list-style-type: none"> - ATM Connection Support (NDC+) - Key Management - Multi-Institutional Acquirers Support - 3DES and HSM Support - ATM Connection Template for NCR - HSM Connection Template for Safenet, Racal, Atalla ATM Terminal Online Transaction <ul style="list-style-type: none"> - Balance Inquiry, Withdrawal, PIN Change, Transafer, Deposit, Reversal - Utility Payment

		EOD Processing connection - 2000 units ATM connection license
3	FEEL Switch - ATM Acquiring Management Module	Common Module - Base System Configuration - ATM Terminal Management - Customer Service Queries - Monitoring System Health - SMS and Message Notification Online Customer Services - Transaction Inquiry - SMS and Notification Management - Transaction Reconciliation Risk Management - Hot Card Management - Transaction Limitation Management - Abnormal Transaction Monitoring and Confirmation Reporting - Transaction Statistical Report - Terminal Settlement Report
4	FEEL Switch - 3rd Host Interface	Connection Interface with Card Issuing Banks - TICIS
5	FEEL Switch - Acquiring Gateway	Common Acquiring Gateway for Domestic & International Payment Network - Domestic - SmartLink - Domestic - BankNet - Domestic - VNBC - International - VISA - International - CUP - International - JCB - International - MasterCard
6	FEEL Switch - Issuing Gateway	Common Issuing Gateway for Domestic & International Payment Network - Domestic - SmartLink - Domestic - BankNet - Domestic - VNBC

II. Optional Module		
SN	Product	Functional Module
7	FEEL Switch - Settlement	Settlement process and fee calculation - File Generation - Settlement Adjustment - Flexible file format and integration
8	FEEL Switch - Dispute Management	Dispute management - Dispute case management - Claims management - Dispute processing
9	FEEL Switch - HA	High Availability and Disaster Recovery - Cold backup
10	FEEL Switch - Cluster	High Availability and Cluster Process - Standard Compliance
III. Implementation		
1	Implementation	Site-Implementation - Customization - SIT & UAT - Operational Training & System Maintenance Training
2	Other	Transportation charges & Local Accommodation charges of GRG implementation engineers
IV. OS / DataBase / Hardware		
1	Application Server	Server for FEEL Switch Platform, ATM and ATM Acquiring Management System - IBM System x3650 / IBM System x3850 M2 (proposed for <500 ATM) - Red Hat Enterprise Server AS 6.2 installed
2	Database Server	Server for Database - IBM System x3650 / IBM System x3850 M2 (proposed) - Oracle 11g Standard Edition
3	HSM	HSM - Safenet / Racal / Atalla / 3rd Party HSM
4	Other	Other Physical Infrastructure
V. Maintenance after warranty		
- Annually maintenance cost by GRGBanking		
- Transportation & accommodation charges for GRGBanking engineers		

5.4 FEEL View Plus 1.0 Package to DAB

I. Software

SN	Product	Functional Module
1	FEEL View Plus - Platform	Platform and Container <ul style="list-style-type: none"> - Unified Device Status and Transaction Data Gathering - Unified Database Access Control - Flexible Parameter Management - Load Balance and Fail Tolerance Common Library <ul style="list-style-type: none"> - Agent Communication Management - Security Management - Audit Log & Report - Toolkits for Technical Engineers including Simulators
2	FEEL View - ATM Monitoring	ATM Monitoring <ul style="list-style-type: none"> - ATM Network Monitoring Navigation, Summary, Trend, Top List, Average Statistics - Detail ATM Status Monitoring - Detail Transaction Monitoring - Detail Card Captured Monitoring Ticket & Notification Management <ul style="list-style-type: none"> - Ticket & Notification Generation - Ticket & Notification Delivery - Ticket Lifecycle Control, Tracing, Process, Summary Reporting <ul style="list-style-type: none"> - ATM Out of Service Event Detail List - ATM Out of Service Event Summary Report - ATM Trouble Detail List - ATM Cash Loading Detail and Summary - ATM Cassette Clean up Detail and Summary - ATM In Service Time Rate Statistics - ATM Brand Rate Statistics

3	FEEL View - Distribution Module	Remote Control <ul style="list-style-type: none"> - Upload Journal in Schedule - Reset or restart or shutdown ATM Application - Upload & Download & Delete Files - Setup Agent Parameter and OS Parameter - Remote Diagnosis, Screen shortcut, Line Test Remote Distribution <ul style="list-style-type: none"> - ATM Application Package Control - ATM Advertisement Management - ATM Agent and Parameter Management - Remote Monitoring System Health EJ Log Upload & Download <ul style="list-style-type: none"> - Upload Control, Upload EJ, Integrity Check, Exception Report, EJ View - EJ Log Process - EJ Log Storage Reporting <ul style="list-style-type: none"> - Auto Task Execute Summary List - Terminal Settlement Report
4	FEEL View - 3rd Terminal Interface	Connection Interface with ATM <ul style="list-style-type: none"> - Agent base on XFS

II. Optional Module

SN	Product	Functional Module
5	FEEL RKL	Cert Management <ul style="list-style-type: none"> - Load or Export Cert - Cert Lifecycle Management - Turn on/off Cert - Detail Report Review Task Control <ul style="list-style-type: none"> - New Schedule Task Create - Auto Task Execute Monitoring - Task Status Audit Report Review Manually RKL <ul style="list-style-type: none"> - Manually RKL to One or Batch ATM - Task Execute Monitoring - Task Status Audit Report Manually TMK <ul style="list-style-type: none"> - Print Key Pair Envelope

		<ul style="list-style-type: none"> - Re-set TMK - Status of TMK Reporting on Audit <ul style="list-style-type: none"> - Auto Task Execute Summary List - ATM Trouble Detail List - Auto Task Audit Log
6	FEEL Switch - HA	High Availability and Disaster Recovery - Standard Compliance
7	FEEL Switch - Cluster	High Availability and Cluster Process - Standard Compliance
III. Implementation		
1	Implementation	Site-Implementation <ul style="list-style-type: none"> - Customization - SIT & UAT - Operational Training & System Maintenance Training
2	Other	Transportation charges & Local Accommodation charges of GRG implementation engineers
IV. OS / DataBase / Hardware		
1	Application Server	Server for FEEL Switch Platform, ATM and ATM Acquiring Management System <ul style="list-style-type: none"> - IBM System x3650 / IBM System x3850 M2 (proposed for <500 ATM) - Window 2008 R2 Installed
2	Database Server	Server for Database <ul style="list-style-type: none"> - IBM System x3650 / IBM System x3850 M2 (proposed) - Oracle 11g Standard Edition
3	HSM	HSM (Optional in case RKL need) <ul style="list-style-type: none"> - Safenet / Racal / Atalla / 3rd Party HSM
4	Other	Other Physical Infrastructure
V. Maintenance after warranty		
<ul style="list-style-type: none"> - Annually maintenance cost by GRGBanking 		
<ul style="list-style-type: none"> - Transportation & accommodation charges for GRGBanking engineers 		

6 Customer Prerequisites Request List

The following table will have list on what we request DongA Bank need to prepare for this project:

No	Item	Description	Time
----	------	-------------	------

			Request
【International Acquire Certification】 Application Software Request			
1	Visa Simulator – Mag-stripe (ATM&POS)	Simulate Visa and authorize magstripe transactions	June 2014
2	Visa Simulator - EMV (ATM&POS)	Simulate Visa and authorize EMV transactions	Oct 2014
3	Visa Testing Case (ATM&POS)	Testing case to follow and generate log file	June 2014
4	CUP Simulator – Mag-stripe (ATM&POS)	Simulate CUP and authorize magstripe transactions	June 2014
5	CUP Simulator - EMV (POS)	Simulate CUP and authorize EMV transactions, only use for POS	Pending
6	CUP Testing Case (ATM&POS)	Testing case to follow and generate log file	Pending
7	JCB Simulator – Mag-stripe (ATM&POS)	Simulate JCB and authorize magstripe transactions	June 2014
8	JCB Simulator - EMV (POS)	Simulate JCB and authorize EMV transactions, only use for POS	Pending
9	JCB Testing Case (ATM&POS)	Testing case to follow and generate log file	Pending
10	Any other if want		Pending
【Domestic Acquiring & Issuing Certification】 Application Software Request			
1	VNBC Testing Application (ATM)	Simulate VNBC and authorize magstripe transactions	June 2014
2	BankNet Testing Application or Simulator (ATM)	Simulate BankNet and authorize magstripe transactions	June 2014
3	SmartLink Testing Application or Simulator (ATM)	Simulate SmartLink and authorize magstripe transactions	June 2014
【Integration Certification】 Hardware Request			
1	1 PC to Install Simulator	Use to install the simulator	June 2014
2	1 PC to install on-us Core Banking	Use to authorize on-us transactions	June 2014
3	1 PC to install FEEL View Plus Server	Use to install ATM monitoring application + Application Server + Database Server + File Server & Gateway Server	June 2014
4	1 PC to install FEEL Switch 3.1 Server	Use to install ATM Switch application	June 2014
5	ATM – GRG or any others + Agent Install + Message Testing	Real ATM terminal use for testing + One GRG ATM + One 3rd Brand ATM	June 2014
6	HSM - SafeNet or the others	One real HSM use for integration and testing	June 2014
7	2 Server + Storage + HA	These hardware and software used to	Oct 2014

		test the High Availability Process	
8	Load Balancer F5 or Linux	This hardware or software used to test the load balance	Oct 2014
【EMV Acquire Certification】ATM EMV Acquiring Testing Parameter			
1	Visa – Magstripe Testing Cards	This is magstripe testing card	June 2014
2	Visa – EMV Testing Parameter & CA Public Key	Download and load into terminal	Oct 2014
3	Visa – EMV Testing Cards	This is the full set of EMV testing cards	Oct 2014
4	CUP – EMV Testing Parameter & CA Public Key	Download and load into terminal	June 2014
5	CUP – Magstripe Testing Cards	This is magstripe testing card	Oct 2014
6	CUP – EMV Testing Cards	This is the full set of EMV testing cards	Oct 2014
7	JCB – EMV Testing Parameter & CA Public Key	Download and load into terminal	June 2014
8	JCB – Magstripe Testing Cards	This is magstripe testing card	Oct 2014
9	JCB – EMV Testing Cards	This is the full set of EMV testing cards	Oct 2014
【Project 3rd Party Support】Implementation Service Request			
1	Technical service from HSM Vendor	In case HSM have some problems especially the RKL process	July 2014
2	Technical service from CMS	In case some integration problem happen	July 2014
3	Technical service from ATM	ATM can accept testing cards	July 2014
4	Technical service from Visa	Note: In case some technical issue need support, normally it's no need!	July 2014
5	Technical service from CUP	Note: In case some technical issue need support, normally it's no need!	July 2014
6	Technical service from JCB	Note: In case some technical issue need support, normally it's no need!	July 2014
7	Technical service from BankNet, SmartLink	Online certification support, around 1 Week	July 2014