Borneo Technical (Thailand) Limited

Business Continuity Plan
&
Disaster Recovery Plan

For

Computer Systems

Information Technology
Version : 2.8

Version Control

Version	Date	Author	Change Reference
1.0	12 August 2010	Thanyaphon Detsereephanit	Initial Document Creation
1.1	17 January 2011	Thanyaphon Detsereephanit	Updated Document
2.0	30 June 2012	Thanyaphon Detsereephanit	Updated New ERP & Payroll
2.1	13 July 2012	Thanyaphon Detsereephanit	Add Branches & Sales Office
2.2	3 October 2012	Thanyaphon Detsereephanit	Add Branches
2.3	14 June 2014	Thanyaphon Detsereephanit	Change HSGC to BORNEO
2.4	9 August 2015	Thanyaphon Detsereephanit	Update new DR Site
2.5	20 July 2017	Thanyaphon Detsereephanit	Update Team & Network Diagram
2.6	18 July 2018	Thanyaphon Detsereephanit	Update Team, HRM & Diagram
2.7	4 August 2019	Thanyaphon Detsereephanit	New Servers & Moved to DC
2.8	14 July 2020	Thanyaphon Detsereephanit	Add a Server & Upgrade Links

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1. BCP Objective

- Develop the plan to protect any interruption to BORNEO business due to IT system failure.
- Proceed sufficient testing on the core systems and related equipment.
- Review any disaster recovery plan to ensure updated plan and reduce business loss from unexpected interruption.

2. Background of BCP for Computer Systems

As our group requires the **Business Continuity Plan (BCP)** in order to protect any interruption to our business. Therefore, we have updated the Disaster Recovery Plan (DRP) which including details of hardware, software and network configuration of all computer systems of Borneo Technical (Thailand) Limited at Head Office, Laksi (HQ-Site), Data Center (DC-Site) and related information of other branches and sales offices. In summary, we have 5 major computer systems, Microsoft Dynamics AX2009, Borneo Mobile Sales, Sales Information Module, HRM and Microsoft Exchange E-Mail. Meanwhile we also provide communication gateway services which it is located at Data Center (CW Tower, 4th Floor) to Laksi Head Office (HQ), other branches and sales offices of BORNEO group in Thailand. So we need to recover the core systems and communication gateway as soon as possible to minimize business loss from any events of disaster.

3. BCP Scope

The purpose of the Business Continuity Plan (BCP) will focus on all core computer systems of BORNEO Group (Thailand):-

- Microsoft Dynamics AX2009 System
- Borneo Mobile Sales
- Sales Information Module
- Microsoft Exchange 2013, E-Mail System
- HRM System (Handle by HR and TigerSoft)
- Core Infrastructure and Internet Gateway

This plan will provide for individual responsibilities and procedures necessary to restore the systems from total disaster situation (fire, earthquake or flood which it will impact to colocation rack servers of Borneo at Data Center), or partial failures on databases, application systems, servers, network, power supply and related equipment.

4. Assumptions and Constrains

Short term solution for Disaster Recovery Plan :

- We assume that there are backup servers (Microsoft Dynamics AX2009, Borneo Mobile Sales, Backup Servers and Mail Server) in place which have at least 30% processing power (in term of CPU, Memory) of the production servers.
- Backup servers always have the same applications and SQL database version exist.
- In a disaster situation at DC-Site and replacement of database servers are required, it will take around 24 hours to install software and hardware settings at HQ-Site or DR-Site.

- In a disaster on fire or earthquake or flood, it will be required another 24 hours to network settings for a hot site (The site might be Laksi (HQ-Site) or Laemchabang Branch (DR-Site)).

Long term solution for Disaster Recovery Plan :
- We assume that there are new servers (Microsoft Dynamics AX2009, Borneo Mobile Sales, AD Servers and Mail Server) arrival and IT will increase support and service from 30% to full support for all branches and sales offices operation.
- In a disaster situation and replacement of database servers are required, it will take around two weeks to install software and hardware settings at new Data Center or Laksi's computer room.
- In a disaster on fire or earthquake or flood, it will be required 4 weeks to install servers, network equipment, PCs and printers after the machine arrival to new Data Center.

5. Failure Scenario's and Impact Analysis

Failure Scenario	Impact	Acceptable Recovery Time	Remark / Actions
MS Dynamics AX	High	Within 3 hours.	Refer to ERP Recovery Procedure
Exchange Mail Server	High	Within 3 hours.	Refer to Microsoft Exchange Mail Server Recovery Procedure
HRM System	Medium	Within 12 hours.	Refer to HRM Server Recovery Procedure
Power Supply	High	Within 30 min.	The UPS can be support in case of power failure around 30 minutes. If the power failure more than 3 hours on working hours, we should consider power generator or DR Site.
Network	Medium	Within 4 hours	Refer to Communication Recovery Procedures
MPLS Link or Corp. AIS	Medium	Within 4 hours	Refer to MPLS Recovery Procedures
FTTx or ADSL Link	Low	Within 1 Day	Refer to Sales Office Recovery Procedures
FortiGate 300E (DC-Site) or 300D (HQ-Site)	High	Within 4 hours	A main FortiGate will be replaced with small model and limited connection will be established.
FortiGate 90D or 60E	High	Within 2 hours	Aim to protect failure, the FortiGate must be shutdown properly after power failure more than 10 minutes.
Servers	Medium	Within 4 hours	Backup server will be used.
UPS	Medium	Within 4 hours	There are N+1 UPS at Data Center, which able to back up for each other.
Air Conditioner	High	Within 4 hours	There are N+1 air conditioner will be used in case of a unit failure.
Site disaster	High	Within 2 Days	Disaster Recovery site at HQ-Site (Laksi) or DR-Site (Laemchabang) will be used to recover all systems during disaster period.

Note: a.) The recovery procedures for the above failures had been summarized in following of this document.

b.) The recovery time are not including service maintenance or shutdown plan.

c.) The above mention is mostly covered at Data Center and Laksi head office.

6. Teams and Responsibilities

This section defines the teams involved in the Business Recovery teams and their associated responsibilities. The activities are broken down into categories of before, during and after the disaster event.

6.1 Business Recovery Management Team

Position	Name	Office Tel.	Home Tel.	Mobile
Team Leader	Atsushi Nomura President	66-2081 4988		06-5986-3258
Alternate Team Leader	Ratta Urusopone Managing Director	66-2081 4903		08-2005-1001
Team Member 1	Thanyaphon Detsereephanit IT Division Manager	66-2081 4910	66-2508-2044	08-2005-1020
Team Member 2	Prayad Woramanakul Assistant GM (SCM)	66-2081 4906		08-2005-1221
Team Member 3	Thapanee Seesod Assistant GM (F&A)	66-2081 4905		08-2005-1212
Team Member 4	Benjamas Immak HR & Adm. Manager	66-2081 4907		09-1889-6428

Pre-Disaster Responsibilities
1. Be knowledgeable of procedure for Borneo Technical's BCP Plan (this document).
2. Ensure hardware vendor has standby Servers that could be on loan within 48 hours. (MA contract)
3. Know and understand disaster criteria.
4. Understand the entire Business Recovery Plan.

Disaster Responsibilities
1. Inform Business Recovery Management Team.
2. Establish command post with communications.
3. Provide for well managing of recovery personnel.
4. Provide overall leadership to recovery teams.
5. Ensure teams are carrying out responsibilities.
6. Contact hardware vendor for delivery of replacement hardware and make sure they are delivered on time (according to service contract)
7. Hire temporary personnel as required.
8. Study and assess extent of damage in each area of responsibility.
9. Communicate recommendation to Business Recovery Management Team.

Post-Disaster Responsibilities
1. Assess overall performance of teams during the recovery process
2. Assess overall effectiveness of the Business Recovery Plan
3. Assess overall performance of Hardware vendor
4. Assess overall disaster assessment and performance during recovery process

6.2 Applications Team

Position	Name	Office Telephone	Home Telephone	Mobile Phone
Team Leader	Thanyaphon Detsereephanit IT Division Manager	66-2081 4910	66-2508-2044	08-2005-1020
Alternate Team Leader	Ratta Urusopone Managing Director	66-2081 4903		08-2005-1001
Team Member 1 (AX2009 & BI)	Piyapong Seibudta Assistant IT Manager	66-2081 4900 ext.2304		08-2993-9849
Team Member 2 (AX2009)	Wanpen Kobkittisuk Senior Business System Analyst	66-2081 4900 ext.2301		08-2993-9850 08-1850-7511
Team Member 3 (AX2009)	Paisan Sunhapojananon Business System Analyst	66-2081 4900 ext.2302		08-2993-9848 08-9117-4884
Team Member 4 (Network & Systems)	Aphichart Rattanabanjoedkul System / Network / DBA	66-2081 4900 ext.2303		08-2993-9847 08-9166-5484
Team Member 5 (IT Support)	Chainarong Ngamkham IT Support - Laemchabang	038-060111		08-3856-5608

Pre-Disaster Responsibilities
1. Ensure applications backup procedures
2. Regularly test the procedures at least once a year.

Disaster Responsibilities
1. Identify the cause of problem and the best fit of recovery procedure.
2. Inform Business Recovery Management Team
3. Processing the recovery procedure.
4. Local team will coordinate with regional team to perform the application recovery procedures.
5. Keep a problem report log.
6. Provide help desk assistance
7. Coordinate with key users for testing the applications.

Post-Disaster Responsibilities
1. Assess effectiveness of application and the system software backup/recovery procedures and make required changes for improvement

6.3 Infrastructure Team

Position	Name	Office Telephone	Home Telephone	Mobile Phone
Team Leader	Thanyaphon Detsereephanit IT Division Manager	66-2081 4910	66-2508-2044	08-2005-1020
Alternate Team Leader	Benjamas Immak HR & Administration Manager	66-2081 4907		09-1889-6428
Team Member 1	Aphichart Rattanabanjoedkul Network & System Engineer	66-2686-6888 ext.6979		08-2993-9847
Team Member 2	Piyapong Seibudta Assistant IT Manager	66-2081 4900 ext.2304		08-2993-9849
CSL's Team Leader	CSL : Thitima Janchol	66-2263-8000		08-4774-9141
CSL's Team Leader	CSL : Sorasak	66-2263-8000		08-2332-8729

Pre-Disaster Responsibilities

1. Maintain system operating procedures documentation
2. Be knowledgeable of Backup and Recovery Procedures
3. Make changes to the system and applications backup procedures as required
4. Supervise systems configuration and databases backup procedures.
5. Establish the operating system requirements for patches, utilities and database of all systems.
6. Develop and understand the procedures necessary to retrieve the back-up tapes, supplies and other material from the Offsite Storage location.
7. Regularly test the procedures at least once a year.

Disaster Responsibilities

1. Ensure operations documentation & system manuals are available
2. Ensure disaster recovery procedures are available.
3. Inform Business Recovery Management Team
4. Processing the recovery procedures.
5. Keep a problem report log.
6. Provide help desk assistance.
7. Recover operating system and data for each system on new Database servers.
8. Recover all infrastructure and Gateway system.
9. Test each systems and ensure they are working properly.
10. Coordinate for interfacing systems recovery with regional team.
11. Set-up a small group of PC clients for emergency operation.
12. Order new machines and set-up them to support core business as soon as possible.

Post-Disaster Responsibilities

1. Assess effectiveness of operating information, procedures and hardware information in the Business Recovery Plan and make required changes for improvement
2. Assess effectiveness of offsite storage information and procedures in the Business Recovery Plan and make required changes for improvement

6.4 Users Coordination Team

Position	Name	Office Telephone	Home Telephone	Mobile Phone
Team Leader	Thanyaphon Detsereephanit IT Division Manager	66-2081 4910	66-2508-2044	08-2005-1020
Alternate Team Leader	Benjamas Immak HR & Administration Manager	66-2081 4907		09-1889-6428
Team Member 1	Ratta Urusopone Managing Director	66-2081 4903		08-2005-1001
Team Member 2	Thapanee Seesod Assistant GM (F&A)	66-2081 4905		08-2005-1212
Team Member 3	Narong Luangtaweesub General Manager (AAD)	66-2081 4909		08-2005-1100
Team Member 4	Malin Jitrochanarak Assistant GM (ISD)	66-2081 4908		08-2005-1122
Team Member 5	Chaiwin Phungpha Division Manager (IS)	66-2081 4929		09-5365-8881
Team Member 6	Amon Kiastsiriluk Department Manager (AAD)	66-2081 4917		08-2005-1112
Team Member 7	Prayad Woramanakul Assistant GM (SCM)	66-2081 4906		08-2005-1221

Pre-Disaster Responsibilities
1. Knowledge of vital business functions and critical applications that are required for continued operations during a disaster

Disaster Responsibilities
1. Validate system security.
2. Coordinate with their team to verify application access
3. Verify results of online and batch outputs
4. Coordinate with principals/customers and inform them regarding the disaster event.
5. Provide help desk assistance

Post-Disaster Responsibilities
1. Assess availability of system for critical user applications
2. Assess effectiveness of user coordination information and procedures in the Business Recovery Plan and make required changes for improvement
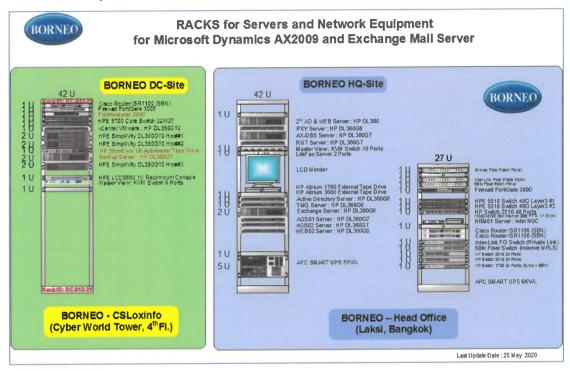
6.5 Team Matrix
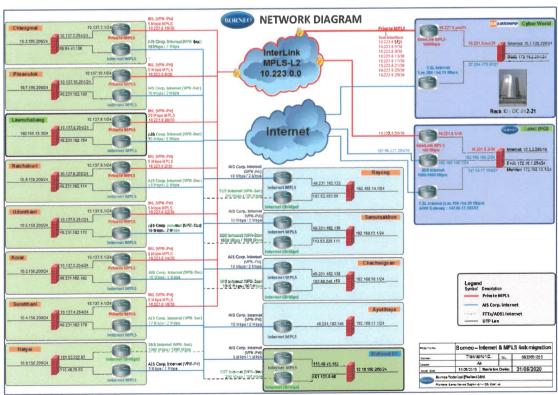
Team Member	Position	Mgmt. Team	App. Team	Infra. Team	User Coord. Team
Atsushi Nomura	President	Y			
Ratta Urusopone	MD	Y			Y
Narong Luangtaweesub	GM-AAD	Y			Y
Thapanee Seesod	AGM-F&A	Y			Y
Malin Jitrochanarak	AGM-ISD	Y			Y
Chaiwin Phungpha	Div.MGR	Y			Y
Amon Kiastsiriluk	MGR	Y			Y
Suchai Lersbuncha	Div.MGR	Y			Y
Prayad Woramanakul	AGM (SC/BR)	Y			Y
Benjamas Immak	HRM	Y		Y	Y
Thanyaphon Detsereephanit	Div.MGR-IT	Y	Y	Y	Y
Piyapong Seibudta	AIT		Y		
Wanpen Kobkittisuk	Senior BSA		Y		
Paisan Sunhapojananon	BSA		Y	Y	
Aphichart Rattanabanjoedkul	SN		Y	Y	
Chainarong Ngamkham	IT Support			Y	

7. Hardware and Software Specifics

7.1 Servers specification

7.2 Borneo Network Diagram

7.3 Software specification

7.3.1 Microsoft Dynamics AX2009 Server Software

- MS Dynamics AX2009: 125 Concurrent User (Finance, Trade, Service, Intercompany, Advance WMS-II, X++ Source code

- Jet Report Intelligence Tools (6 Designer, 5 Viewers)

- SQL Server Enterprise Core 2017

- Windows Server DC Core 2019

- Windows Server Standard 2012 R2

- Citrix XenDesktop Enterprise Edition 145 Users/Device License

7.3.2 Mobile Sales and BI (Business Intelligent) Server

- SQL Server Standard Core 2017

- Windows Server DC Core 2019

7.3.3 Veritas Backup Exec Software

- BACKUP EXEC SERVER 20 WIN SERVER (3 Servers)

- BACKUP EXEC 20 AGENT FOR APPLICATIONS AND DBS WIN PER SERVER (3 Servers)

- BACKUP EXEC 20 AGENT FOR VMWARE AND HYPER-V WIN 1 HOST SERVER

- BACKUP EXEC 20 AGENT FOR WIN SERVER (5 Servers)

7.3.4 Microsoft and Servers Software

- Windows Servers DC Core 2019 16Lic x 6, 2Lic x 6 (3 servers, THDCESX01, THDCESX02 and THDCESX03)

- Windows Servers Standard 2012R2 (vCenter VMware)

- SQL Server Enterprise 2017 x 10 Core (THDCDBS01 SQL Server)

- SQL Server Standard 2017 x 10 Core (THDCBIS01 SQL Server)

- SQL Server Standard 2017 x 3 (3 servers, THLSDBS01, THLSBIS01 and THDRDBS02)

- Windows Servers for Application Object Servers (4 servers)

    1) THDCAOS01, Windows Server 2012R2

    2) THDCAOS02, Windows Server 2019 Standard

    3) THDCRMT01 (Citrix server for branch users)

    4) THDCRMT02 (Citrix server for HQ users)

- SQL CAL 2008R2 (125 clients)

- Windows Remote Desktop for Server CAL 2008 (45 users)
- Citrix Virtual Apps and Desktops Advance Edition User/Device License x 45
- Windows Remote Desktop Service CAL 2019 x 100
- Citrix Virtual Apps and Desktops Advance Edition User/Device License x 100

7.3.5 Exchange Mail Server Software

- Exchange Server 2019 Enterprise x 3
- Exchange Standard 2019 USRCAL x 444
- Exchange Standard 2013 USRCAL x 141
- ForeFrontTMG Standard Anti-Virus Protection

7.3.6 Software Licenses for DR-Servers at DR Site

- Windows Servers 2012R2 Standard Edition (4 Licenses)

  (A Windows Servers 2012R2 included Hyper-V (Virtual Machine) and provide 2 guests (e.g. License of Windows Server 2008R2 x 2))
- Windows Servers 2008R2 Enterprise Edition
- Exchange Server 2013 Enterprise
- SQL Server Standard 2017

7.3.7 HRM System
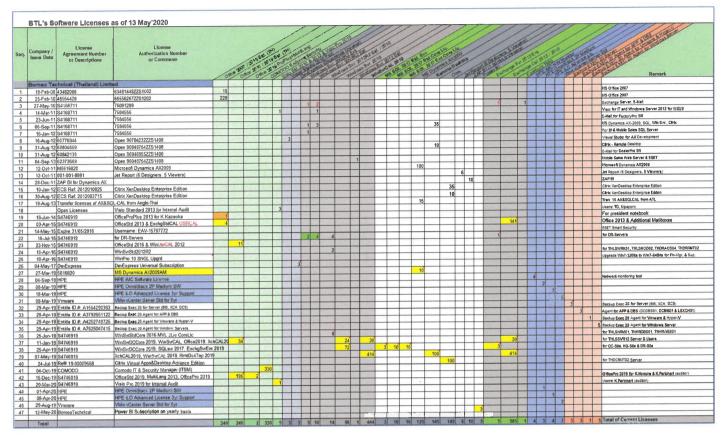
- Windows Server 2012 R2
- SQL Express 2008 R2 Database

7.3.8 PC or Notebook Clients Software

- Windows 10, Windows 8.1 Pro or Windows 7 (plan to replace with Windows 10 within Sep'2020)
- MS Office 2016/2019 or MS Office 2007 (plan to upgrade to MS Office 2016/2019 within Dec'2020)
- MS Outlook 2016 or higher (Outlook 2013 for old computers)
- Microsoft .Net Framework 3.5 for AX2009
- Microsoft .Net Framework 4.0 and Excel 2013 64bits for Jet Reports Tool
- Internet Explorer 11.0 or Higher
- Comodo Endpoint Security Protection

- Acrobat Reader DC 2020 or Higher

7.4 Borneo's Software Licenses Summary

BTL's Software Licenses as of 13 May'2020

Borneo Technical (Thailand) Limited

Seq.	Company / Issue Date	License Agreement Number or Descriptions	License Authorization Number or Comments	Remark
1	19-Feb-08	43482006	63491448ZZS1002	MS Office 2007
2	25-Feb-10	46564428	66556267ZZS1202	MS Office 2007
3	27-May-10	S4168711	76091289	Exchange Server, E-Mail
4	14-Mar-11	S4168711	7584556	Visio for IT and Windows Server 2012 for WSUS
5	23-Jun-11	S4168711	7584556	E-Mail for FactoryPro SR
6	06-Sep-11	S4168711	7584556	MS Dynamics AX-2009, SQL, Win Svr., Citrix
7	16-Jan-12	S4168711	7584556	For BI & Mobile Sales SQL Server
8	16-Aug-12	60776944	Open 90784232ZZS1408	Visual Studio for AX Development
9	31-Aug-12	60804659	Open 90848754ZZS1408	Citrix - Remote Desktop
10	31-Aug-12	60842139	Open 90846955ZZS1408	E-Mail for DealerPro SR
11	04-Sep-13	62373669	Open 90848754ZZS1408	Mobile Sales Web Server & ESET
12	12-Oct-11	M5616820	Microsoft Dynamics AX2009	Microsoft Dynamics AX2009
13	12-Oct-11	001-001-8991	Jet Report (6 Designers, 5 Viewers)	Jet Report (6 Designers, 5 Viewers)
14	28-Dec-11	ZAP BI for Dynamics AX		ZAP BI
15	10-Jan-12	ECS Ref. 2012010825	Citrix XenDesktop Enterprise Edition	Citrix XenDesktop Enterprise Edition
16	30-Aug-12	ECS Ref. 2012083715	Citrix XenDesktop Enterprise Edition	Citrix XenDesktop Enterprise Edition
17	19-Aug-13	Transfer licenses of AX&SQL-CAL from Anglo-Thai		Tran. 15 AX&SQLCAL from ATL
18		Open Licenses	Visio Standard 2013 for Internal Audit	Users: TD, Nipaporn
19	18-Jun-14	S4746919	OfficeProPlus 2013 for K.Kazeoka	For president notebook
20	03-Apr-15	S4746919	OfficeStd 2013 & ExchgStdCAL USRCAL	Office 2013 & Additional Mailboxes
21	14-May-15	Expire 31/05/2016	Username: EAV-15767772	ESET Smart Security
22	16-Jul-15	S4746919	for DR-Servers	for DR-Servers
23	23-Nov-15	S4746919	OfficeStd 2016 & WinUerCAL 2012	for THLSWRK01, THLSNOD02, THDRAOS04, THDRRMT02
24	10-Apr-16	S4746919	WinSwStd2012R2	Upgrade Win7-32Bits to Win7-64Bits for Fin-Mgr. & Sup.
25	10-Apr-16	S4746919	WinPro 10 SNGL Upgrd	
26	04-May-17	DevExpress	DevExpress Universal Subscription	
27	27-Mar-19	5816820	MS Dynamics AX2009AM	
28	04-Sep-19	HPE	HPE iMC Software License	Network monitoring tool
29	08-Mar-19	HPE	HPE OmniStack 2P Medium SW	
30	18-Mar-19	HPE	HPE iLO Advanced License 3yr Support	
31	08-Mar-19	Vmware	VMwrvCenter Server Std for 5yr	
32	29-Apr-19	Entitle ID #: A1554290363	Backup Exec 20 for Server (BIS, XCH, DCS)	Backup Exec 20 for Server (BIS, XCH, DCS)
33	29-Apr-19	Entitle ID #: A3792651122	Backup Exec 20 Agent for APP & DBS	Agent for APP & DBS (DCDBS01, DCDBS01 & LSXCH01)
34	29-Apr-19	Entitle ID #: A4252749725	Backup Exec 20 Agent for Vmware & Hyper-V	Backup Exec 20 Agent for Vmware & Hyper-V
35	29-Apr-19	Entitle ID #: A7625047415	Backup Exec 20 Agent for Windows Servers	Backup Exec 23 Agent for Windows Server
36	25-Jun-18	S4746919	WinSwStdCore 2016 MVL 2Lie CoreLic	for THLSHRM01, THHRDBS01, THHRIVE801
37	11-Jan-19	S4746919	WinSwDCCore 2019, WinSvrCAL, Office2019, XchCAL20	for THLSSVR12 Server & Users
38	25-Apr-19	S4746919	WinSwDCCore 2019, SQLsvr 2017, ExchgSvrEnt 2019	for DC-Site, HQ-Site & DR-Site
39	07-May-19	S4746919	XchCAL2019, WinSvrCAL 2019, RmtDskTop 2019	for THDCRMT02 Server
40	24-Jul-19	Refif 19-00009568	Citrix Virtual Apps&Desktop Advance Edition	
41	04-Oct-19	COMODO	Comodo IT & Security Manager (ITSM)	
42	16-Dec-19	S4746919	OfficeStd 2019, MultiLang 2013, OfficsPro 2019	Office Pro 2019 for K.Nomura & K.Parichart (auditor)
43	20-Mar-20	S4746919	Visio Pro 2019 for Internal Audit	Users: K.Parichart (auditor)
44	01-Apr-20	HPE	HPE OmniStack 2P Medium SW	
45	08-Apr-20	HPE	HPE iLO Advanced License 3yr Support	
46	29-Apr-19	Vmware	VMwrvCenter Server Std for 5yr	
47	12-May-20	BorneoTechnical	Power BI Subscription on yearly basis	
	Total			Total of Current Licenses

7.5 Minimum PC Hardware Requirement

- Intel Core i5 Processor or higher
- Memory 4 GB or more
- Disk space free at least 250 GB (HDD size 250 GB or more)
- Ethernet Network card speed 100/1000 Mbps

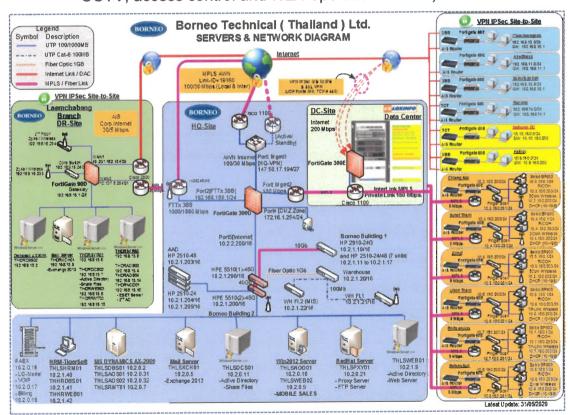## 7.6 Dot Matrix printers for pre-printed forms

- Seiko Precision BP-9000 or BP-9000 Plus
- AUI BP-9000E or AUI BP-9000 Plus

7.7 Network equipment at H.Q. and branches.

- Cisco routers (1100, 1841, 2800).
- Network switch (e.g. HP switch 24 or 48 ports)
- Firewall (FortiGate 300E, 300D, 90D, 60E, 60D or 50B)
- Cisco, HP Aruba, TP-Link, ZyXel or 3com Wireless

7.8 Colocation at Data Center (half rack, 21U)

- Cisco router (1100), InterLink Private MPLS 150 Mbps.

- Internet Link 200 Mbps. (local=200 Mbps, inter=11 Mbps)

- FortiGate Firewall 300E

- Forti_Analyzer Log 200D

- HPE 5700 Core switch 32 ports x 2 units.

- HPE Simplivity DL380 gen 10 x 3 units (Hyperconverge)

- HPE DL360 gen 10, vCenter VMware server

- HPE DL380 gen 7, Backup Server

- HPE Autoloader Tape Backup 1/8 slots, LTO5.

- HPE KVM Console G3, 8 ports.

- Tier-III Facilities (Generator, Air condition, Fire suppression system CCTV, access control and 7x24 operation service)

Borneo Technical (Thailand) Ltd.
SERVERS & NETWORK DIAGRAM

7.9 Servers and equipment list at Data Center (DC-Site)

Borneo : Servers & Equipment List at Data Center
as of Jul2020

Location	Seq.	Host	Type	Server Name	Description	OS	IP	Serial Number	Processor #Core	Memory (GB)	SSD (GB)	HDD (GB)
DC	1.1	Host#1	ESX	THDCESX01	HPE 380G10 SimpliVity #01	HPE SimpliVity	10.1.150.221	SGH910WH57	36	768GB	1.92TB x 9	
DC	1.2	Host#2	ESX	THDCESX02	HPE 380G10 SimpliVity #02	HPE SimpliVity	10.1.150.222	SGH910XJWK	36	768GB	1.92TB x 9	
DC	1.3	Host#3	ESX	THDCESX03	HPE 380G10 SimpliVity #03	HPE SimpliVity	10.1.150.223	SGH014X707	36	768GB	1.92TB x 9	
DC	1.4	Host#4	Server	THDCVCT01	HPE 360G10 vCenter - Vmware	WinSvr2012 R2	10.1.150.8	SGH910WH52	8	32		300 x 2
DC	1.5	Host#5	Server	THLSBIS01	HP ProLiant DL380G7 - Backup Server	WinSvr2012 R2	10.1.150.4	SGH149X65A	24	220GB		300GBx16
DC	1.6		Tape		HP 1/8 G2 LTO-5 Ultrium 3000 SAS Tape Autoloader		-	MXA309Z35U				
DC	1.7		FGT	FGT300E-DC	FortiGate 300E		10.1.120.208	FG3H0E5E19906160				
DC	1.8		FAZ	FAZ200D-DC	FortiAnalyzer 200D (Computer LOG)		10.1.120.202	FL200D3A16001491				
DC	2.1	Host#2	VM	THDCTMG01	TMG Server	WinSvr2008 R2	172.16.2.1	DMZ Zone	6	12	200	
DC	2.2	Host#3	VM	THDCXCH01	Exchange 2013 #1	WinSvr 2012 R2	10.1.110.4		16	32	1,716	
DC	2.3	Host#1	VM	THDCXCH02	Exchange 2013 #2	WinSvr2012 R2	10.1.110.5		16	32	1,716	
DC	2.4	Host#3	VM	THDCDCS01	Active Directory #2 & Backup Server	WinSvr2012 R2	10.1.110.11		4	8	1,080	
DC	2.5	Host#2	VM	THDCWEB01	Active Directory #1 / Web Server #1	WinSvr2019	10.1.110.12		4	8	2,128	
DC	2.6	Host#2	VM	THDCWEB02	Mobile Sales Web Server #02	WinSvr2019	10.1.110.42		4	16	280	
DC	2.7	Host#2	VM	THDCWEB03	Web Server for POD	WinSvr2019	10.1.110.46		2	8	280	
DC	2.8	Host#3	VM	THDCWEB04	Web Server for Warranty	WinSvr2019	10.1.110.47		2	8	280	
DC	2.9	Host#3	VM	THDCDBS01	Database Server for MS Dynamics AX	WinSvr2019	10.1.110.2		10	220	1,800	
DC	2.10	Host#3	VM	THDCAOS01	Application Server #01	WinSvr2012 R2	10.1.110.31		4	32	360	
DC	2.11	Host#1	VM	THDCAOS02	Application Server #02	WinSvr2019	10.1.110.32		8	32	360	
DC	2.12	Host#1	VM	THDCRMT01	Remote Clients Server #1	WinSvr2008 R2	10.1.110.45		4	32	280	
DC	2.13	Host#3	VM	THDCRMT02	Remote Clients Server #2	WinSvr2008 Ent.	10.1.110.35		4	64	280	
DC	2.14	Host#3	VM	THDCSVC01	Mobile Sales Web Service (API)	WinSvr2008 R2	10.1.110.48		2	8	180	
DC	2.15	Host#3	VM	THDCBIS01	Business Intelligent Server for Mobile Sales	WinSvr2019	10.1.110.37		8	160	580	
DC	2.16	Host#3	VM	THDCRDS03	Windows Server Update Service (WSUS)	WinSvr2019	10.1.110.36		4	8	230	
								Total	98	680	11,750	
								VM Host Spec.	36x2x3	768GB/Host	20.27TB/Svr	

7.10 Other equipment at H.Q., Laksi (HQ-Site) computer room

- Air conditioner in computer room (60,000 BTU x 2 and a spare 24,000 BTU)
- APC UPS 6KVA and APC UPS 5KVA.
- One server rack and a network rack in Computer Room.
- Office furniture (Working area, Table, chair, direct telephone line)
- Power supply
- Firewall and Network Switches

8. Backup Procedures

The purpose of this section is to identify the backup procedures to recover critical applications from a disaster. The procedures are broken down by the following areas:

- Application software and data
- Vital Records Storage

8.1 Application software and Data Backup Procedures

The purpose of this section is to identify the procedures by which the BORNEO Group captures vital electronic DATA. The DATA backup (typically stored on magnetic tape media) are broken down into data capture time frames, as follows:

- Daily
- Weekly
- Monthly

8.1.1 DAILY Data Backup Procedures

The purpose of this section is to identify the data that is backup on a DAILY basis. Daily Backup onto local disk, other disk or magnetic tape will be performed for Database Server. The day end DB backup will be stored onto LTO Magnetic tape. Four versions of daily backup will be kept for two locations.

8.1.2 WEEKLY Data Backup Procedures

The purpose of this section is to identify the data that is backup on a Weekly basis. The objects being backed up are the same as those done in the Daily backup procedure for production machines. Also all system files and all data will be backed up to LTO magnetic tapes and kept in two locations.

8.1.3 MONTHLY Data Backup Procedures

The purpose of this section is to identify the data that is backed up on a Monthly basis. The objects libraries and databases will be backed up to magnetic tapes. At least five year versions of monthly backup will be kept in two locations.

8.2 Documents Backup

Two copies of these following documents are kept at HQ-Site (Laksi Head Office) and DR-Site (Laemchabang Branch).

8.2.1 Business Continuity Plan, this document.

8.2.2 System Manuals and Operation Manuals in soft copy (CD or external disk).

8.2.3 System Maintenance Agreement and Software Licenses.

8.2.4 Standard Forms in soft copy (CD), external disk or hard copy

8.2.5 IT's web intranet, which there are included all training documents, forms and related IT's manuals in CD format.

8.3 Equipment Backup/Spare

8.3.1 Tape backup server with LTO tape drive and Autoloader tape.

8.3.2 Spare servers – DR servers are existing for Exchange mail server, AX Database server, AOS servers, remote users, AD server and others virtual servers available at Laemchabang branch.

8.3.3 Spare routers – Cisco 1100 (HQ-Site), Cisco 2800 (DR-Site) and Cisco 1841 (BR) routers are available.

8.3.4 Spare network switches :–

1) HP Procurve Switch 2810-24G

2) HP Procurve Switch 2510G-48 ports

3) TrendNET Switch 24 ports speed 10/100/1000 Mbps

8.4 Communication backup

8.4.1 All sites have two links, main link and backup link from two vendors.

8.4.2 When a MPLS Private Link between Data Center and InterLink failure, then the Fortigate Firewall will automatic switch all traffic to use another MPLS link or FTTx link instead.

8.4.3 When there is any failure on VPN link at Data Center, All remote sites will able to switch to use a link at H.Q., Laksi.

8.5 Tape Backup medias

8.5.1 LTO5 Tape medias for New ERP servers and users mailbox.

8.5.2 LTO4 Tape medias for public shared folders and Users Data.

8.6 Standard Backup Procedures (New ERP Servers)

8.6.1 Daily backup

- There are daily ERP backup procedure as following:-
  - ➤ Copy BORNEO database and application objects to disk in to directory

    [\\THDCWEB01\Backup\ Backup to Disk\](\\THDCWEB01\Backup\ Backup to Disk\) at DC-Site.

  - ➤ Backup DB from the backup directory to magnetic tape media.

- There are 2 sets for daily backup (LTO tape) and each set will cover Monday – Thursday. Meanwhile sets no. 1-4 will be stored at Laksi, HQ-Site and soft copy should be kept at a server in "\\THDCWEB01\Backup" directory at DC-Site until next week.

- The daily tape medias will be reused on cycle due date.

8.6.2 Weekly backup (full backup type)

- There are 2 copied medias on Friday and Saturday at DC-Site. First copy will be stored at Borneo, Laksi (HQ-Site) location in the safety cabinet and secondary copy will be stored at Laemchabang (DR-Site).

- The ERP tapes will be kept for 1 year at least.

8.6.3 Monthly backup

- There are Monthly ERP backup procedure as following :-
  - ➤ Copy to disk in to directory "Backup to Disk".

> ➢ Backup DB in "Backup to Disk" directory to LTO tape media.

- All of monthly tape will be kept in two locations Head Office, Laksi (HQ-Site) and Laemchabang (DR-Site).
- The tapes will be kept for 5 years at least.

Note: The last completed Daily/Weekly/Monthly backup tape medias must be kept in Chubb cabinet safe at Finance division.

8.7 Standard Backup Procedures (Windows Servers)

8.7.1 Daily backup

- There are 2 sets (LTO tape) and each set will cover Monday to Thursday.
- The tape medias will be reused on cycle due date.

8.7.2 Weekly backup (full backup type)

- There are 2 copied medias. First copy will be stored at Borneo, Laksi location (HQ-Site) in the safety cabinet and secondary copy will be stored at Laemchabang (DR-Site).
- Weekly backup will be done on Friday and Saturday night.
- The tapes will be kept for 2 months at least.

8.7.3 Monthly backup

- For Email and User data there are two sets of monthly backup tape which they will be stored at HQ-Site, Laksi location and another copy will be stored at Laemchabang DR-Site.
- The tapes will be kept for 5 years at least.

Note: The last completed Daily/Weekly/Monthly backup tape medias must be kept in Chubb cabinet safe at Finance division.

8.8 Log Shipping Online Backup (AX Database Servers)

8.8.1 At Data Center, AX BORNEO Database will be generated backup transactions every 5 minutes.

8.8.2 The transactions will be replicated from DC-Site to database server at DR-Site (Laemchabang Branch) and HQ-Site via DFS (Distributed File System Management) as soon as possible.

8.8.3 All transactions from Data Center (DC-Site) will be restored to DR database server at DR-Site and HQ-Site every 3 minutes.

8.8.4 All DR database server will be sitting as Stand-by/Read-Only mode.

8.9 Log Shipping Online Backup (Mobile Sales Database Servers)

    8.9.1 At Data Center, Mobile Sales Database will generate backup transactions every 5 minutes.

    8.9.2 The transactions will be replicated to database server at DR-Site (Laemchabang Branch) and HQ-Site via DFS (Distributed File System Management) as soon as possible.

    8.9.3 All transactions from Data Center (DC-Site) will be restored to DR database server at DR-Site and HQ database server at HQ-Site every 3 minutes.

    8.9.4 DR and HQ Mobile Sales database server will be sitting as Stand-by / Read-Only mode.

8.10   Exchange Mail Clustering / High Availability (H.A.)

    8.10.1 All Exchange Mail messages from Data Center (DC-Site) will be replicated to HQ-Mail Server at HQ-Site and DR-Mail Server at DR-Site (Laemchabang Branch) as soon as possible.

    8.10.2 DR and HQ Mail server will be used as Stand-by/Healthy mode.

Note: a.) The Quality of Service (QoS) or priority of data transfer between Data Center to Head Office and DR Site had been implemented. e.g. AX must be highest priority.
b.) The HRM database should be copied to HR folder in Backup server every day then the database will be saved to LTO tape under topic 8.7 too.

9. ERP Recovery Procedures

In the event that the issue is other than hardware oriented or is only a partial hardware issue – then please consider the correct point in the chain of events to commence your recovery.

Server Name : THDCDBS01 ; HPE SimpliVity 380G10
Estimated Recovery Time : 24 Hours
Warranty/MA : 7 Days, 24 Hours Maintenance by HP and Metro Systems
Hardware Support : Mon – Sat 8:00 – 17:00 Tel. (662) 353-9199 (HP)
Non Business hours Tel. 08-5917-1532 K.Apirath

9.1 Recovery of a New Database Server

Recovery on a new database server is accomplished by performing the following steps. The system software recovery procedures are listed in order of execution. Each activity is to be performed following the successful completion of the prior task.

Option-1 : Using Backup Database Server
ASSUMPTIONS
- Only an ERP database server (THDCDBS01) failure.
- DC Backup Server (HPE SimpliVity #2 or #3) is ready.
The following tasks must be completed for a Backup server failing over.

a) Do VMware vSphere 6.7 vMotion from HPE SimpliVity #1 to #2 or #3
b) Stop/Restart THDCAOS01 and THDCAOS02
c) Verify

Option-2 : Using DR Database Server
ASSUMPTIONS
- Only an ERP database server (THDCDBS01) failure.
- DR Database Server (THLSDBS01) is ready.
- AX Database Log Shipping transactions are restored to DR Database Server up to before failure time and Application objects are uptodate.

The following tasks must be completed for a DR database server failing over.

a) Synchronizing all of the DR database with the primary database, if possible.
b) Copy any uncopied backup transaction files from primary database backup folder to DR database copy folder.
c) Apply any unapplied transaction log backups in sequence to DR database server.
d) If the primary database is not damaged, backup the tail of transaction log of the primary database using WITH NORECOVERY.

e) After the DR database server are synchronized, we can fail over to DR database server and redirecting clients to DR database server instance.

Option-3 : Using Tape Backup/Restore
ASSUMPTIONS
- Only a ERP database server failure.
- Current Up-To-Date Backups exist of the DB, System files and Application objects.
- Backup LTO media is ready.
- LTO Backup server is ready.

The following tasks must be completed for a new database server restore.

a) Install hard disk drives and configuring RAID.
b) Install Windows 2019 Server and restore system files from tape backup.
c) Setup network connectivity – LAN
d) Install SQL 2017 Enterprise Core License
e) Install Microsoft Dynamics AX2009 Application
f) Restore Microsoft Dynamics AX2009 and objects libraries
g) Restore Database from backup tapes or from disk backup directory.
h) Inform User team to do the recovery process
i) Users to check the latest transaction on database, re-create (re-input) loss transactions.

10. Microsoft Exchange Mail Server Recovery Procedure

Server Name : THDCXCH01 ; HPE SimpliVity 380G10
Estimated Recovery Time : 8 Hours
Warranty/MA : 7 Days, 24 Hours Maintenance by HP and Metro Systems
Hardware Support : Mon – Sat 8:00 – 17:00 Tel. (662) 353-9199 (HP)
Non Business hours Tel. 08-5917-1532 K.Apirath

Option-1 : An Exchange Server failure
Assumption of the event
➢ An Exchange Clustering Server failure (THDCXCH01).
➢ There is a spare server (THDCXCH02) available.
Procedure

1. Investigate for the Exchange Server failure (If a hard disk RAID failure system can continue work)
2. Inform IT Center Khun Aphichart Tel. 0-2081-4900 ext.2304
3. Call J-Group Technology Co.,Ltd., K.Lertrit (06-2594-5914)
4. Switch to use another Exchange Server (THDCXCH02)
5. Move all mail database from THDCXCH01 to THDCXCH02
6. Fixing the failure Exchange Server
7. Install Microsoft Windows Server 2012 R2 Edition

8. Install Microsoft Exchange 2013 Enterprise server.
9. Start all Exchange Services
10. Resynchronize with Active Exchange Server.
11. Test send/receive e-mail message to internet mail and external email

Option-2 : All current exchange servers failure.
Assumption of the event
➤ An Exchange Clustering Server failure.
➤ There are no spare servers available.
Procedure

1. Investigate for the Exchange Server failure (If a hard disk RAID failure system can continue work)

2. Inform IT Center Khun Aphichart Tel. 0-2081-4900 ext.2304

3. Call J-Group Technology Co.,Ltd., K.Lertrit (06-2594-5914)
4. Switch to use another Exchange Server (THDCXCH02)
5. Fixing the failure Exchange Server
6. Install Microsoft Windows Server 2012 R2 Edition
7. Install Microsoft Exchange 2013 Enterprise server.
8. Install Veritas Backup EXEC 20.6
9. Restore EXCHANGE Tape from last daily tape.
10. Restore DATA Tape from last weekly and daily tapes.
11. Start all Exchange Services
12. Resynchronize with Active Exchange Server.
13. Test send/receive e-mail message to internet mail and external email

11. HRM Server Recovery Procedure

Server Name   : THLSHRM01 (TigerSoft HRM)
Estimated Recovery Time : 24 Hours
Warranty/MA   : 5 Days, 8 Hours Maintenance by Tiger Soft
Hardware Support   : Mon – Fri 8:00 – 17:00 Tel. 66-2347-0373

Assumption of the event
➤ HRM Server failure.
➤ There is a spare server available.
Procedure

1. Investigate for the HRM Server failure

2. Inform IT Center Khun Aphichart Tel. 0-2081-4900 ext.2304

3. Call Tiger Soft, Tel. 66-2347-0373
4. Switch to use another HRM Server
5. Fixing the failure HRM Server
6. Install Windows Server 2012 R2
7. Install HRM server.
8. Restore HRM Database Server and Web Server from last daily backup set.
9. Start all HRM Services

12. Communication Recovery Procedures

Network Equipment

- FortiGate Firewall
- FortiAnalyzer
- Routers
- Switching
- MPLS Lines
- FTTx Fixed IP (Fiber to Internet Link)

A.) FortiGate Firewall

The FortiGate Firewall had been installed at every sites.

Estimated Recovery Time	: 24 Hours
Warranty/MA	: 7 Days, 24 Hours Maintenance by CSLoxinfo
Hardware Support	: CSL Call Center 24*7, Tel. 02-2637117
	CSL Network Mgt., K.Sorasak M.08-2332-8729
	CSL K.Thitima Mobile 08-4774-9141

Option-1 : FortiGate FG300E at Data Center

Assumption of the event

➢ The FortiGate FG300E Firewall failure.

Procedure

1. After detect the FortiGate FG300E Firewall failure
2. Inform IT Centre and switch to use backup VPN Client.
3. Inform CSL Call Center
4. Replace a new Hardware box or using spare box FG310B
5. Connect to the FortiGate box with console port and upload the latest backup configuration file.
6. The configuration backup file saved at
   \\thlsdcs01\IT-Data\BCP-Books\Network\Fortigate\CFG\
7. Plug in all cables
8. Reboot the FortiGate FG310B
9. Inform IT team and CSL Network team to switch back to FortiGate FG300E.
10. Use PING command to test link
    PING   192.168.15.1   ; Laemchabang's Firewall
    PING   192.168.15.5   ; Laemchabang's Mail Server

Option-2 : FortiGate FG300D at Laksi, HQ-Site

Assumption of the event

➢ The FortiGate FG300D Firewall failure.

Procedure

1. After detect the FortiGate FG300D Firewall failure
2. Inform IT Centre and switch to use backup VPN Client.

3. Inform CSL Call Center
4. Replace a new Hardware box or using spare box FG310B
5. Connect to the FortiGate box with console port and upload the latest backup configuration file.
6. The configuration backup file saved at
    i. \\thlsdcs01\IT-Data\BCP-Books\Network\Fortigate\CFG\
7. Plug in all cables
8. Reboot the FortiGate FG310B
9. Inform IT team and CSL Network team to switch back to FortiGate FG300D.
10. Use PING command to test link
    i. PING 192.168.15.1   ; Laemchabang's Firewall
    ii. PING 192.168.15.5   ; Laemchabang's Mail Server

B.) Routers
Cisco Router 1100 or 1841

The router has been installed at Laksi & Branch.
Estimated Recovery Time　　: 3 Hours
Warranty/MA　　　　　　　: 7 Days, 24 Hours Maintenance by CSLoxinfo
Hardware Support　　　　　: CSL Call Center 24*7, Tel. 02-2637117
　　　　　　　　　　　　　　CSL Network Mgt., K.Sorasak M.08-2332-8729
　　　　　　　　　　　　　　CSL K.Thitima Mobile 08-4774-9141

Assumption of the event

➤ The Cisco router 1100/1841/2800 failure.
➤ There is a spare Cisco router 1100/1841/2800 available.
➤ Every sites have a spare router with the same model and same configuration.

Procedure

1. After detect the Cisco 1100/1841/2800 router failure
2. Inform CSL Call Center.
3. Switch to spare router (Cisco 1100/1841/2800)
4. Replace a new Router from CSL.
5. Install all Modules
6. Upload the router configuration file with the PC connect to the router with serial port as a console.
7. The configuration backup file saved at
    \\thlsdcs01\IT-data\BCP-Books\Network\Router\CFG\
8. Reboot the router
9. Use PING command to test link
    PING　　192.168.15.1   ; Laemchabang's Firewall
    PING　　192.168.15.5   ; Laemchabang's Mail Server

C.) Network Switching
HP Switching installed at Data Center (DC-Site)
Usage Time　　　　　　: 1 hr.
Assumption of the event

➤ A Core Switch HPE 5700 32XGT failures.

➢ There is a spare HPE 5700 32XGT (Active/Active).

HP Switching installed at HQ-Site, Laksi
Usage Time   : 1 hr.
Assumption of the event

➢ A Core Switch HPE 5510 48G 4SFP+ failures.
➢ There is a spare HPE 5510 48G 4SFP+ available (Active/Active).

Switch details.

- HPE 5700 32XGT 8XG 2QSPF+   2 Units   5 years warranty
  S/N   CN91GN502J, CN91GN5049
- HPE 5510 Hi Switch 48G 4SFP+   2 Units   Life Time warranty
  P/N   JH146A
  S/N   CN81H0Z00T, CN81H0Z05Y
- HP Procurve Switch 2910al-24G   1 Unit   Life Time warranty
  P/N   J9145A
  S/N   SG009IP086
- HP Procurve Switch2510G-48   1 Unit   Life Time warranty
  P/N   J9280A
  S/N   CN139DG2DG
- HP Procurve Switch 2510-48   1 Unit   Life Time warranty
  P/N   J9020A
  S/N   CN140YV0FW
- HP Procurve Switch 2510-24G   1 Unit   Life Time warranty
  P/N   J9279A
  S/N   CN836DE3BT
- HP Procurve Switch 2510-24   7 Units   Life Time warranty
  P/N   J9119A
  S/N   CN632WX3KV, CN633WX1EI
          CN633WX371, CN633WX2N5
          CN818FW1FI, CN818FW1CE, CN818FW06I

Procedure
In case the switch failure

1. Call HP Customer Service or SDC Service
   HP Thailand Ltd.   Tel. 02 353-9000
   SDC   Tel. 02 744-1600
2. Data Center replace backup Switch
   HPE 5700 Switch   Replace with Switch 5700
3. IT Center replace backup Switch
   HPE 5510 Switch (BD2)   Replace with Switch 5510
   HP Switch 2910al-24G (BD1)   Replace with Switch 2810-24G
   HP Switch 2510G-48 (BD2)   Replace with Switch 2510-48
   HP Switch 2510-48 (BD2)   Replace with Switch 2510-48
   HP Switch 2510-24 (BD2)   Replace with Switch 2510-24
   HP Switch 2510-24G (BD1)   Replace with Switch 2510-24
4. Request new Switch to replace (urgent)
5. Reconfigure Swtich (IP Address, Subnet mask , Gateway and Ports)
   HPE Switch 5510-48G (BD2)   10.2.1.200   255.255.0.0
   HP Switch 2510-48 (BD2)   10.2.1.203   255.255.0.0
   HP Switch 2510-24 (BD2)   10.2.1.2xx   255.255.0.0
   HP Switch 2910al-24G (BD1)   10.2.1.10   255.255.0.0
6. Restart
7. Link test

D.) MPLS Private Link or Internet Link at Data Center
Borneo colocation rack at Data Center has MPLS Private Link 150 Mbps and Internet Link 100 Mbps. These links are responsible by CSL.

Provider   : CSL / InterLink
Warranty/MA   : 7 Days, 24 Hours Maintenance by CSLoxinfo
Hardware Support   : CSL Call Center 24*7, Tel. 02-2637117
                          CSL Network Mgt., K.Sorasak M.08-2332-8729
                          CSL K.Thitima Mobile 08-4774-9141

E.) MPLS/Internet Links at Laksi, HQ-Site.
Borneo Technical (Thailand) Ltd. has MPLS Private Link 100 Mbps, MPLS Internet Link 100/30 Mbps and FTTx 3BB 1000/1000 Mbps.

Provider   : CSL / InterLink / 3BB
Warranty/MA   : 7 Days, 24 Hours Maintenance by CSLoxinfo
Hardware Support   : CSL Call Center 24*7, Tel. 02-2637117
                          CSL Network Mgt., K.Sorasak M.08-2332-8729
                          CSL K.Thitima Mobile 08-4774-9141

Procedure

Case I   MPLS Private link of HQ-Site down (effect to connection of All HQ users)
1. Inform IT Center
   Tel.   : 0-2081-4900 ext. 2303
   Contact   : K.Aphichart or K.Paisan
2. IT Center Inform CSL Call Center.
3. Router will automatic switch to MPLS Internet Link 100/30 Mbps.
4. Use PING command to do link test.

        PING   192.168.15.1   ; Laemchabang's Firewall

        PING   192.168.15.5   ; Laemchabang's Mail Server

5. CSL/InterLink fix the line then router will auto recovery the link

Case II   MPLS Internet link down (effect to internet usage)

    1. Inform IT Center

       Tel.   : 0-2081-4900 ext. 2303

    2.   Contact   : K.Aphichart or K.Paisan

    3.   IT Center Inform CSL Call Center.

    4.   The system will auto switch to Backup Link (3BB FTTx 1000/1000 Mbps)

    5.   CSL/InterLink fix the line.

    6.   CSL will switch remote sites back to the MPLS Internet Link.

F.) Branches Network

MPLS Private link at Branches (LB, CM, KR, SR, UD, PL and RB)

For each branch has a MPLS private link to Data Center (DC-Site), and a MPLS Internet link for backup.

Provider	: CSL / InterLink
Warranty/MA	: 7 Days, 24 Hours Maintenance by CSLoxinfo
Hardware Support	: CSL Call Center 24*7, Tel. 02-2637117
	CSL Network Mgt., K.Sorasak M.08-2332-8729
	CSL K.Thitima Mobile 08-4774-9141

Procedure

Case I   MPLS Private link down   (effect connection to Data Center, DC-Site)

    1.   Inform IT Center

       Tel.   : 0-2081-4900 ext. 2303

       Contact   : K.Aphichart or K.Paisan

    2.   IT Center Inform CSL Call Center.

    3.   Router will automatic switch to MPLS Internet backup link.

    4.   Use PING command to link test.

    5.   CSL/InterLink fix the line then router will auto enable link.

       PING   10.1.120.208   ; DC-Site's FortiGate Firewall

       PING   10.1.110.11   ; DC-Site's AD Server

Case II   FTTx Internet link down (effect to internet connection)

    1.   Inform IT Center

       Tel.   : 0-2081-4900 ext. 2303

       Contact   : K.Aphichart or K.Paisan

    2.   IT Center Inform CSL Call Center/3BB/TOT.

    3.   CSL/3BB/TOT fix the line then the internet connection will be resumed.

Case III   FortiGate Firewall 60E failure but MPLS is still working well (effect both connection to Data Center, DC-Site and Internet link)

    1.   Inform IT Center

       Tel.   : 0-2081-4900 ext. 2303

       Contact   : K.Aphichart or K.Paisan

    2.   IT Center Inform CSL Call Center.

3. CSL will do :-
   a) Switch to backup firewall (FG60D/FG50B)
   b) setup bypass FortiGate Firewall and use MPLS direct connection to Data Center, DC-Site.
4. Use PING command to link test.
   PING 10.1.120.208 ; DC-Site's FortiGate Firewall
   PING 10.1.110.11   ; DC-Site's AD Server
5. CSL fix the FortiGate box and replacement then the network will be resumed to normal link.

G.) Sub Branches and Sales Offices Network
FTTx Internet link at Sub Branches and Sales Offices (National DC, HY, AY, RY, SK and CS)

For each branch has a MPLS private link to Data Center (DC-Site), and a MPLS Internet link for backup.

Provider　　　　　　　　　　: CSL / 3BB / TOT
Warranty/MA　　　　　　　　: 7 Days, 24 Hours Maintenance by CSLoxinfo
Hardware Support　　　　　　: CSL Call Center 24*7, Tel. 02-2637117
　　　　　　　　　　　　　　　 CSL Network Mgt., K.Sorasak M.08-2332-8729
　　　　　　　　　　　　　　　 CSL K.Thitima Mobile 08-4774-9141

Procedure

Case I　An Internet link down (effect connection to Data Center, DC-Site)
1. Inform IT Center
   Tel.　　　　: 0-2081-4900 ext. 2303
   Contact　　: K.Aphichart or K.Paisan
2. IT Center Inform CSL Call Center.
3. Router will automatic switch to another Internet link.
4. Use PING command to link test.
5. CSL/3BB/TOT fix the line then router will auto enable link.
   PING 10.1.120.208 ; DC-Site's FortiGate Firewall
   PING 10.1.110.11   ; DC-Site's AD Server

Case II　FortiGate Firewall 60E failure but Internet Link is still working well (effect both connection to Data Center, DC-Site and Internet link)
6. Inform IT Center
   Tel.　　　　: 0-2081-4900 ext. 2303
   Contact　　: K.Aphichart or K.Paisan
7. IT Center Inform CSL Call Center.
8. CSL will do :-
   c) Switch to backup firewall (FG60D/FG50B)
   d) setup bypass FortiGate Firewall and use MPLS direct connection to Data Center, DC-Site.
9. Use PING command to link test.
   PING 10.1.120.208 ; DC-Site's FortiGate Firewall
   PING 10.1.110.11   ; DC-Site's AD Server
10. CSL fix the FortiGate box and replacement then the network will be resumed to normal link.

Power Supply Backup and Recovery at Branches.

Backup :
a) Each branch install a UPS to
   - Support power failure for 30 minutes
   - Support at least all network equipment, 2 PCs, 1 printer and 2 fans.
b) Each branch identify hot site backup for emergency operation
   - VPN client should able to support 2 PCs.

Recovery:

Case I   Power failure but still less than 10 minutes
   1. Utilize the working PC and Printer (under UPS supporting)
   2. Back to normal if power is resumed within 10 minutes.
Case II   Power failure and more than 10 minutes.
   1. Inform IT Center
      Tel.   : 0-2081-4900 ext. 2303
      Contact   : K.Aphichart or K.Paisan
   3. Shutdown Fortigate 60E
   4. Inform Provincial Electricity Authority
   5. Waiting until power is resumed
   6. Router will be resumed to normal link.

Note: a.) Branch to make decision to use hot site for urgent operation

TOTAL SYSTEM DISASTER AND RECOVERY PLAN

The purpose of this section is to identify the details plan for initiating and executing the previously defined disaster recovery procedures.

ASSUMPTIONS

- The main host at Data Center might be disastrous and cannot provide services.
- Backup site is ready for set-up hot site.
- The contract vendor can move the backup equipment to hot site as committed time.
- All DR Servers at DR-Site (HQ-Site, Laksi or DR-Site, Laemchabang Branch) are ready.
- Current On-line transactions backup are committed and ready for switching.
- Current Up-To-Date Backup media exist.
- Installation CDs and Tape Drive are ready.
- Communication and power supply at backup site are no problems

12.1 Task Chart

The following is a listing of the tasks required to perform the recovery. Each task number is prefixed by two characters identifying the team or individual responsible for completing the task. Section two (2) identifies the personnel assigned to each team.

Task Key

Code	Individual/Team
XX	Any Microsoft Dynamics AX end users
BR	Business Recovery Management Team
MT	Management Team
FT	Infrastructure Team
VT	Vendor Team
AT	Application Team
UT	User Coordination Team

12.2 Initiate Notification Plan Tasks

Time Start	Time End	Task No.	Pre-req	Responsible Member	Task Description	Ref. Section
		XX00		End Users	Report potential system failure	
		AT01	XX00	IT Team	Perform Preliminary trouble shooting	
		AT02	AT01	IT Team	Report findings to Business Recovery Manager	
		AT03	AT02		Evaluate damage and estimate length of outage	
		BM01	AT03		Initiate the Disaster Recovery Log	
		BM02	BM01		Notify Management and BR Management Team	6.1
		BM04	BM03		Evaluate team findings and notify key Executives	6.1
		BM05	BM04		Declare a Disaster	6.1
		BM06	BM05		Notify and Activate BR Teams	6.1
		BM07	BM06		Establish Command Post with Communications	6.1
		BM08	BM07		Notify Remote Sites and Distribution offices of the disaster situation	6.1
		FT01	BM01		Notify hardware vendor – CSL/Metro Systems/SDC for Production Servers replacement – Refer to Appendix A for Service Call.	App.A
		FT02	FT01		Get latest tape backup medias from backup location.	
		FT03	FT02		Assure team responsibilities are being carried out	
		FT04	FT03		Verify tape medias are available as documented	
		FT05	FT04	IT Team	Execute ERP's servers recovery procedure	9
		FT06	FT03	IT Team	Execute Network Infrastructure recovery procedure	11
		FT10	FT06	IT Team	Execute Exchange Mail Server recovery procedure	10

Appendices

A Maintenance Services Contracts

A.1 QuickERP

- Microsoft Dynamics AX2009 : Ref. Contract Date 11/09/2019
  - Microsoft Dynamics AX2009
  - EP Period 01/10/2019 – 30/09/2020
  - Contact person Khun Sarut
  - Business hours contact Mon – Fri 9:00 – 17:00 Tel. 66-2048-0757
  - Non Business hours Tel. 668-4092-8938 K.Sarut

A.2 Bhatara Progress Co., Ltd.

- Microsoft Dynamics AX2009 : Ref. Contract Date 20/09/2017
  - Microsoft Dynamics AX2009, Jet Report, ZAP-BI
  - EP Period 26/09/2015 – 24/09/2018
  - Contact person Khun Chaiwichit
  - Business hours contact Mon – Fri 9:00 – 17:00 Tel. 66-2732-2090
  - Non Business hours Tel. 66-2717-1018

A.3 Metro Systems Corporation Public Co., Ltd.

- HPE SimpliVity 380 Gen10, HPE DL360 Gen10
- HPE Switch 5700
- vCenter VMware
- Tel.: 02-089-4600, dsgsupport@metrosystems.co.th
- K.Apirath M. 08-5917-1532, K.Sethasith M. 06-1945-9656

A.4 HP Thailand Co., Ltd.

- HP HW Support (Servers, Computers, HP Switches)
- IT Resource Center (ITRC) (662) 353-9199
- 8.30am – 5.30pm Mon-Fri, Tel.: 1800-441-4085, 02-118-6300
- HP Contract support 24*7, Tel.: 1800-441-4048, 02-118-6000

A.5 System Dot Com Co., Ltd.

- Agreement no. 62/379
  - HP DL380G7 (AX2009 Database Server of Borneo)
  - HP DL380G7 (ZAP BI and LTO Backup Server)
  - HP DL360G7 (AOS01, AOS02 and Citrix Servers)
  - HP LTO5 Ultrium 3000 SAS Ext Tape Drive
  - HP ProLiant DL380 G6 (Exchange 2010 Server)
  - HP ProLiant DL360 G6 (AD & Backup Server)
  - HP LTO4 Ultrium 1760 SAS Ext Tape Drive
  - HP ProLiant DL360 G6 (TMG Server)
  - HP ProLiant DL380 G4 (WSUS Server)
  - HP ProLiant DL120 G6 (Proxy Server)
  - HP LTO5 Ultrium 3000 SAS Tape Autoloader 1/8 G2

- o HP ProLiant DL360 G8 (Mobile Sales & Eset Server)
- o Effect Date 3/09/2019 – 02/09/2020
- Agreement no. 62/356
  - o APC UPS Model : SUA5000RM15U, Serial No. : JS1107008712
  - o APC UPS Model : SURT6000XL, Serial No. : QS1540170279
  - o APC UPS Model : SURTD5000XLI, Serial No. : QS1330272926
  - o Warranty Period : 6/09/2019 – 5/09/2020
- Contact person Khun Ganjira, Mobile +669-1889-8243, 66-2744-1600

A.6   CS Loxinfo Public Co.,Ltd.

- Agreement no. 61127 (NW Services & MPLS Links Contract) and 61164 (Data Center, Colocation Contract)
  - o Effective Date 1 June 2020 – 31 May 2021 (MPLS Links)
  - o Effective Date 22 July 2020 – 21 July 2021 (Colocation)
  - o Respond time : 7 days x 24 hours, within 4 hours
  - o CSL Call Center 24*7, Tel. 02-2637117
  - o CSL Network Mgt., K.Sorasak M.08-2332-8729
  - o CSL K.Thitima Mobile 08-4774-9141

A.7   J-Group Technology Co., Ltd.

- Agreement no. JGROUP 63/002 (Exchange Mail and AD Servers),
- Respond time : 5 days x 8 hours, within 8 hours
- Hotline service : Tel. +662 950-0078
- Effective Date 9 Apr 2020 – 9 Apr 2021
- Contact person Khun Lertrit Mobile +666-2602-6644

A.8   Comodo (Thailand) Co., Ltd.

- Respond time : 5 days x 8 hours, within 8 hours
- Hotline service : Tel. +662 610-3663
- Expire Date : 8 October 2020
- Contact person Khun Narongsak (Boy) Mobile +668-3068-6510

A.9   Konica Minolta Business Solution Co., Ltd.

- Leasing Agreement no. TOL19-1198 with Thai ORIX Leasing Co.,Ltd.
  - o Konica Minolta Copier Machine, model BH-C558-CPS x 1 unit S/N : A79K041006299
  - o Konica Minolta Copier Machine, model BH-C250i-CPS x 5 units, S/N : AA2M041002535, AA2M041002527, AA2M041002488, AA2M041002485, AA2M041002519
  - o Effective Date 1 Dec 2019 – 30 Nov 2023 (48 months)
- Service Agreement no. 01D19240094
  - o Konica Minolta BH-C558-CPS x 1 unit, S/N : A79K041006299
  - o BH-C250i-CPS x 5 units
  - o S/N : AA2M041002535, AA2M041002527, AA2M041002488, AA2M041002485, AA2M041002519
  - o Effective Date 15 Oct 2019 – 14 Oct 2023
- Respond time : 5 days x 8 hours, within 2 hours
- Hotline service : Tel. +662 029 7000

- Contact person Khun Orawan Mobile +668-2209-0445

A.10 Ricoh (Thailand) Ltd.

- Hotline service : Tel. +662 762-1621
- Contact person K. Kamol (Multifunction Copier) Mobile +668-6909-9444
- Contact person K. Anucha (PC/Notebook) Mobile +668-9969-2348

A.11 ShoppingPC DotNet Co.,Ltd.

- Hotline service : Tel. +662 933 0022
- Agreement no: MA-1 Feb 2562
- Effective Date 1 February 2019 – 31 January 2020

A.12 Tiger Soft (1998) Ltd.

- Hotline service : Tel. +662 347-0373 K.Wanida
- Payroll - Agreement no: MA-03-1906-023
- Effective Date 18 June 2019 – 17 June 2020
- HRM is under warranty period

B Project Charter : IT Core Systems DR Plan

Project Charter : IT Core Systems Disaster Recovery Plan

Project	IT Core Systems Disaster Recovery Plan		Project ID	IT-2015/01
Project Manager	Mr. Thanyaphon Detsereephanit		Sponsor	Khun Wasan Tanmanuradkul
Project Artifacts	h3nt.80C30\Public\82-IT-Shared\12-DR Project		Date Proposed	25-May-2015

Background	Before June 1st, 2014, under Hugsoon Thailand Group, Borneo Technical (Thailand), Anglo-Thai and United Motor Work (Siam) have agreement for computer system hot site backup (Disaster Recovery Plan, DRP). On the agreement three companies utilized mutual computer system backup site to each other by sharing portion of each IT facilities and operations without additional cost. After the acquisition by Toyota Tsusho Corporation, the DRP/hot site backup agreement was dissolved. Borneo Technical (Thailand) therefore need a new IT backup site for the DRP.
Business need and business benefits	As a Disaster Recovery Plan and IT Risk Management Policy, the core business systems, i.e. Microsoft Dynamics AX, Borneo Mobile Sales and E-Mail System, require to implement hot site backup. Benefits:- 1. Protect business interruption from IT system failure. 2. Reduce IT systems down time. 3. Provide off-site disk backup for core business systems. 4. Reduce transactions loss from IT system failure.
Objectives	Key Objectives:- 1. Protect any interruption to BORNEO business due to IT systems failure. (in case of fire/flood/power failure/earthquake) 2. Review any disaster recovery plan to ensure updated plan and reduce business loss from unexpected interruption. 3. Sufficient testing on the core systems (MS Dynamics AX, Mobile Sales, E-Mail System) and related equipment. 4. Protect security risk from serious virus attacks.

Scope	In Scope / 1st Priority	Out of Scope / 2nd Priority
	1. Support at least 25% of normal operation.	Full operation should be recovered by 4 weeks after the disaster event at HQ.
	2. Core business systems are including:- a.) Microsoft Dynamics AX b.) Borneo Mobile Sales c.) E-Mail System	Other systems, e.g. Sales Module, Shared Folders and ESET will be recovered after major systems complete.
	3. All branches can continue business operation in case of any IT disaster at head office within 24 hours. (Recovery Time Objective, RTO = 24 Hrs) 3.1 AD & Exchange Mail Server will be recovered within 8 hrs. 3.2 Microsoft Dynamics AX will be recovered within 24 hrs. 3.3 Mobile Sales will be recovered within 24 hrs.	Sales Office usage will be implemented after all branches. (within 48 hrs.)
	4. Minimize data loss. (less than 8 hrs, Recovery Point Objective, RPO=8hrs)	Some transactions might be lost, which these depended on the replication process and link speed between HQ and DR backup site.

Task/Deliverable	Deliverables	Due Date	
	1 - Project Charter	27-May-15	
	2 - Project Plan	01-Jun-15	
	3 - Project Organization Structure	01-Jun-15	
	4 - Project Budget (Estimated)	01-Jun-15	
	5 - Project Implementation (DRP)	31-Aug-15	

Key Considerations	Assumptions and Constraints	Risks	
	A1 - Have enough budget to support both HW and SW purchasing. A2 - No delay in mini PC's delivery.	Category	Risk Description
		Mini PC for backup servers	Need to get the PC's on time.
		Resource	Need full time job for installation and testing
		Testing	Need sufficient DRP testing

Success Criteria	
	1 - Right DRP (HW/SW/Network/SOP) design. 2 - Approved budget to support project. 3 - Efficient planning and implementation process. 4 - Enough resource for implementation. 5 - No major issues during test or rollout.

Steering Committee / Project Team	Name	Group	Roles and Responsibilities
	1. Khun Wasan Tanmanuradkul	SC	Project Sponsor
	2. Khun Gisana Mangnoi	SC	IT Consultant
	3. Khun Thanyaphon Detsereephanit	SC & PT	Project Manager
	4. Khun Loetri Kommuangpak	PT	Microsoft Tech. Consultant
	5. Khun Piyapong Seibudta	PT	Project Leader for SQL DB
	6. Khun Aphichart Rattanabanjerdkul	PT	Project Leader : Infrastructure
	7. Khun Panu Wiriyaruk	PT	Project Leader at DR Site
	8. Khun Wanpen Kobkitisuk	PT	Project Leader : DRP Testing

Budget Overview		
	1. Hardware (4 mini servers Intel Core i5 & Intel Core i7)	= 162 K.Baht
	2. Software : Windows Server Std 2012R2 x 4, Exchange Server Ent 2013, MS SQL Server 2014 Std.	= 191 K.Baht
	3. Implementation & Consultant Fee	= 65 K.Baht
	Total project cost (Depre. around THB 65K/year)	= 418 K.Baht

Signatures	Sponsor	Project Manager
		Thanyaphon D.
	Name	Name
	Date 25/5/15	Date 25/5/2015

B.1 User Acceptant Tested Result on 15/09/2015

โดยขั้นตอนการทดสอบจะทำดังนี้
1. ทาง IT เตรียม AX database ของสิ้นเดือนที่แล้ว ณ.วันที่ 29/08/2015 เพื่อใช้ทำการทดสอบ (UAT)
2. ให้แต่ละสาขาส่งรายชื่อผู้ที่จะเข้าทดสอบประมาณ 3 users ให้ทาง IT ก่อน
3. ช่วงก่อนการทดสอบ (7/9/2015 – 11/09/2015) ทาง IT (อภิชาติ/ภานุ) จะติดตั้งโปรแกรม และทดสอบ
เบื้องต้น เพื่อให้มั่นใจว่าทางสาขาสามารถเข้าระบบสำหรับการทดสอบได้
→ หรือจะทำเองก็ได้ (ควรทำเฉพาะเครื่องของผู้ที่เข้าร่วมการทดสอบเท่านั้น) โดย →
Copy folder "P:\52-IT-Shared\01-ERP (AX)\09-Utilities**DR Site (AX Icons)**" *past* to Desktop
[1] Borneo (Branch-DR)　　　　; ใช้เพื่อทำงานผ่าน Remote Citrix
　　　　　　　　　　　　　　　　(จะทำงานได้เร็วกว่าแบบ [2] & [3])
[2] BTL-DRAOS3 TEST　　　　; ใช้เพื่อเข้า AX-TEST เพื่อทำการทดสอบ
[3] BTL-DRAOS4 TEST　　　　; ใช้เพื่อเข้า AX-TEST เพื่อทำการทดสอบ

4. **ข้อควรระวัง** ห้ามใช้ icons สำหรับการทดสอบทำ DR ไปใช้สำหรับงานจริงนะครับ
5. วิธีการทำการทดสอบ → เหมือนทำงานปกติโดยเริ่มพร้อมกันเวลา 10.00 น. ของวันอังคารที่ 15 กันยายน
2558 นี้ เพื่อดูว่าทุกสาขาปฏิบัติงานพร้อมกัน สามารถรับ Load ได้ขนาดไหนครับ
6. AA → ให้เลือก WO = 5 และ SO = 5 (หรือให้มีมากที่สุดที่ทำได้)
7. สำหรับเรื่องวันรับสินค้าของลูกค้า ให้สมมุติเป็นวันที่ 16/09/2015 ก็ได้ครับ
8. MIS → หลังจาก AA ปล่อย order แล้วดึง Picking ตามจำนวนที่ AA ปล่อย order ให้หมด
9. WH → ขั้นตอนนี้ให้ข้ามไป เพราะไม่ใช่ Invoice จริง จึงไม่ต้องไปหยิบของส่งให้ลูกค้า
10. WH → ทำกระบวนการรับของ
11. MIS ทำการ print Invoice (ใช้เพื่อทดสอบระบบเท่านั้น ห้ามนำไปใช้จริง)
12. จดบันทึกและรายงานปัญหาแต่ละส่วนส่งมาที่ BOM จะทำการสรุปปัญหาและตั้งคำถามไปทาง IT
Team เพื่อรับข้อมูลและแก้ไขปัญหาต่อไป

Testing Result
There are 28 users join the UAT from all braches and included head office. Therefore this meet the objective at 25%+ of maximum concurrent AX users. The users can create Sales Orders, update Web Orders from Mobile Sales, posted sales order, print picking slip and print invoices in to pre-printed forms as normal. They complain regarding system performance quite slow but they can do all operations as same as AX production system.

AX DR-Servers : Users Acceptant Test Result
Invoices from SO/WO and RMA

Date : 15 Sep 2015 10:00 - 12:00

Branches / WH Code	Order Type SO	WO	RO	Grand Total
04	4	4		8
05	1			1
61	9	2	1	12
62	5	5		10
63	11			11
64	12			12
65	7	5		12
66	6	5		11
67	4	5		9
Grand Total	59	26	1	86

Maximum Users join UAT

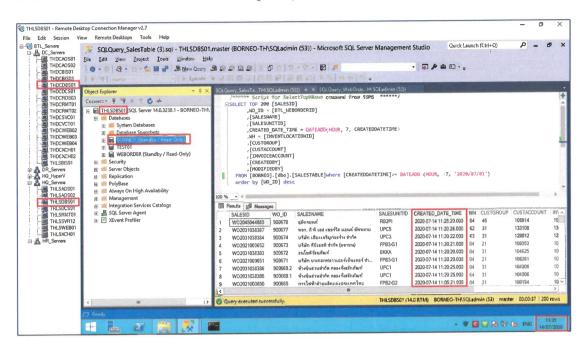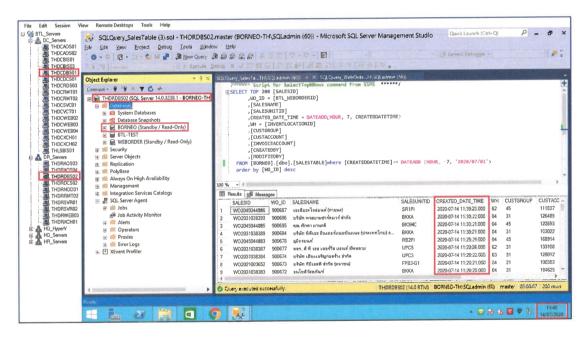## Remote Citrix Users and CPU peak at 57% during UAT
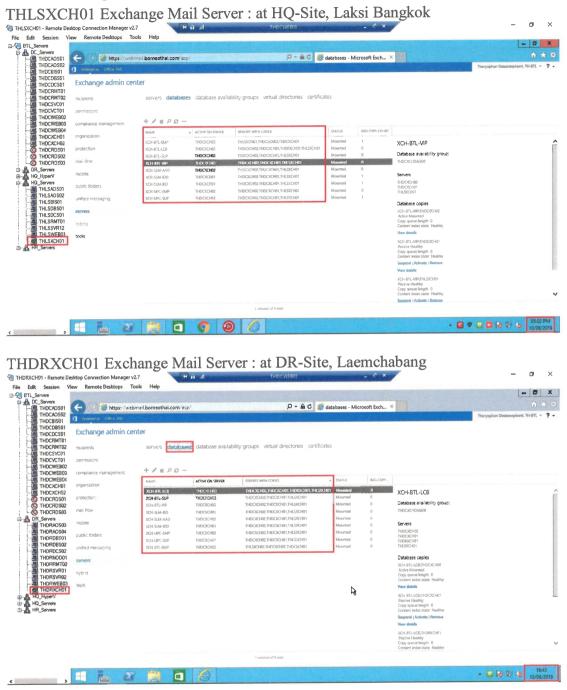
B.2 SQL Log Shipping and Database Server Performance

THLSDBS01 Database Server : at HQ-Site, Laksi
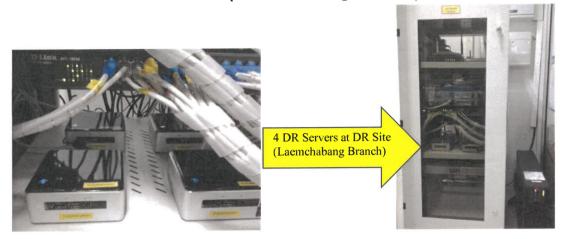
THDRDBS02 Database Server : at DR-Site, Laemchabang

B.3 Exchange Mail Clustering

THLSXCH01 Exchange Mail Server : at HQ-Site, Laksi Bangkok

THDRXCH01 Exchange Mail Server : at DR-Site, Laemchabang

B.4 DR Servers at DR-Site (Laemchabang Branch)

4 DR Servers at DR Site
(Laemchabang Branch)
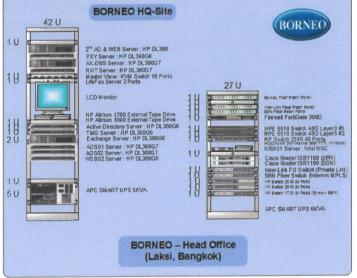
B.5 Data Center DC-Site Servers, HQ-Site Servers and equipment

**RACKS for Servers and Network Equipment
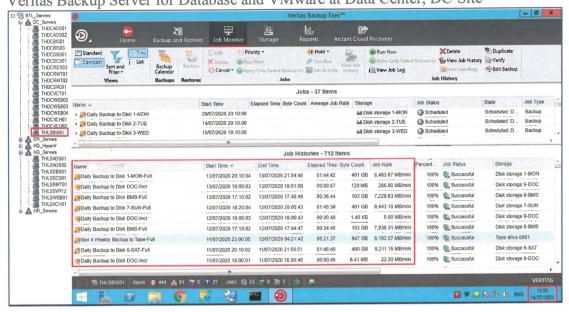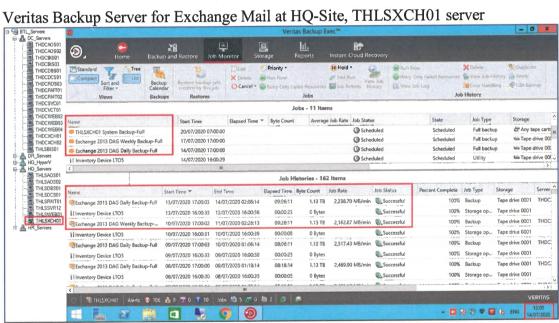for Microsoft Dynamics AX2009 and Exchange Mail Server**

Last Update Date : 25 May 2020
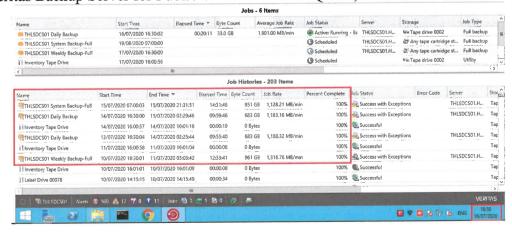
B.6 Backup Servers at DC-Site and HQ-Site

Veritas Backup Server for Database and VMware at Data Center, DC-Site

Veritas Backup Server for Exchange Mail at HQ-Site, THLSXCH01 server

Veritas Backup Server for Public Shared Files at HQ-Site, THLSDCS01 server

C Recovery Team Sign-off

Business Continuity Plan for Computer Systems
Borneo Technical (Thailand) Limited

Seq.	Name	Business Unit / Position	Signature / Date
1	Atsushi Nomura	Borneo Technical (Thailand) President	
2	Ratta Urusopone	Borneo Technical (Thailand) Managing Director	
3	Narong Luangtaweesub	Borneo Technical (Thailand) General Manager (AAD)	
4	Thapanee Seesod	Borneo Technical (Thailand) Assistant General Manager F&A Division	
5	Malin Jitrochanarak	Borneo Technical (Thailand) Assistant GM (ISD)	
6	Chaiwin Phungpha	Borneo Technical (Thailand) IS Division Manager	
7	Amon Kiastsiriluk	Borneo Technical (Thailand) Business Unit Manager	
8	Suchai Lersbuncha	Borneo Technical (Thailand) IS Marketing Div. Manager	
9	Prayad Woramanakul	Borneo Technical (Thailand) Assistant General Manager Supply Chain/Branches	
10	Benjamas Immak	Borneo Technical (Thailand) HR & Administration Manager	
11	Thanyaphon Detsereephanit	Borneo Technical (Thailand) IT Division Manager	
12	Paisan Sunhapojananon	Borneo Technical (Thailand) Business System Analyst	
13	Wanpen Kobkittisuk	Borneo Technical (Thailand) Business System Analyst	
14	Piyapong Seibudta	Borneo Technical (Thailand) Assistant IT Manager	
15	Aphichart Rattanabanjoedkul	Borneo Technical (Thailand) Network & System Engineer	