Technology required for AMDCN and Its operation on GISC Tokyo
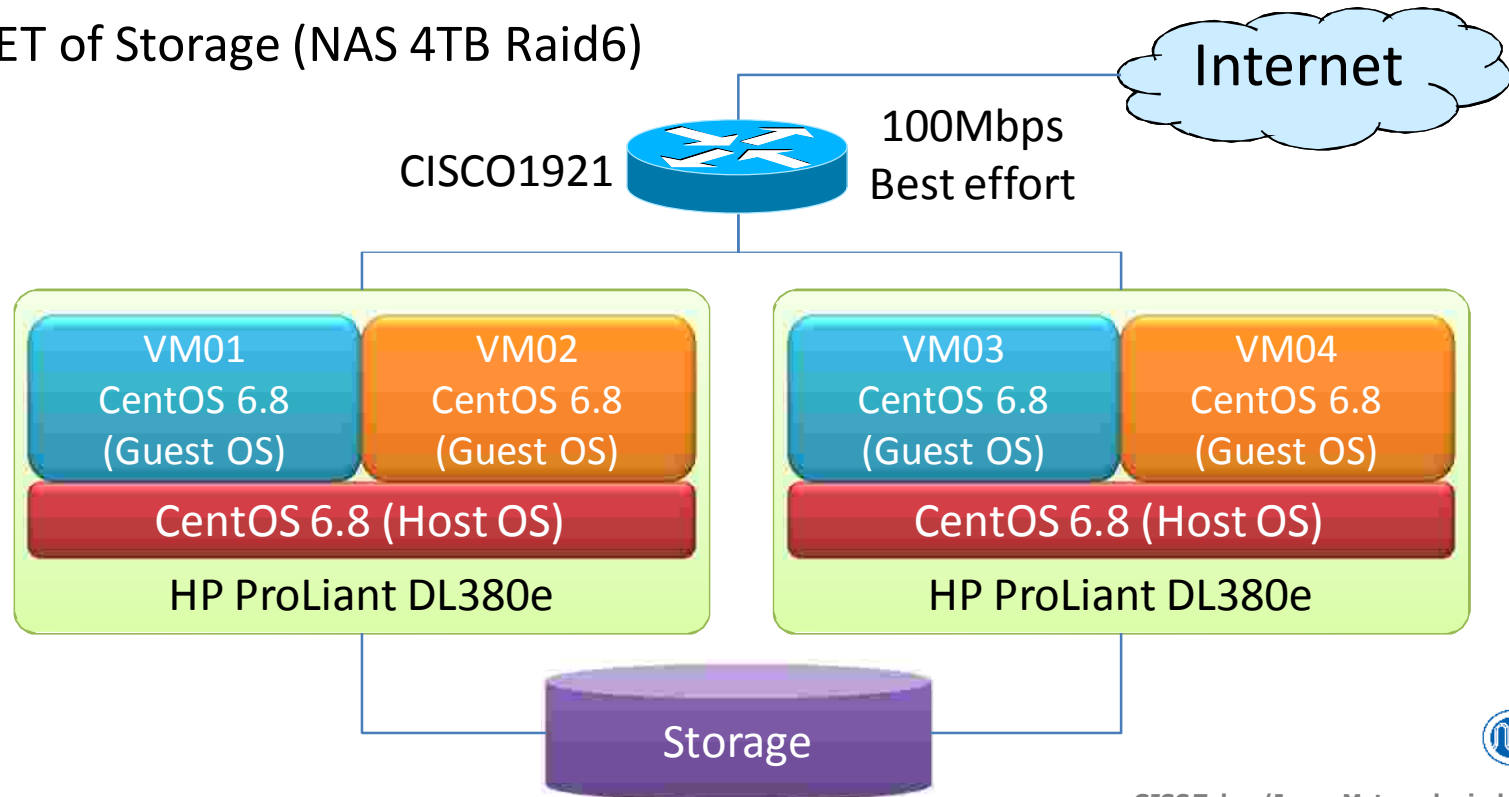
Yoritsugi OHNO

WIS Workshop in 2016
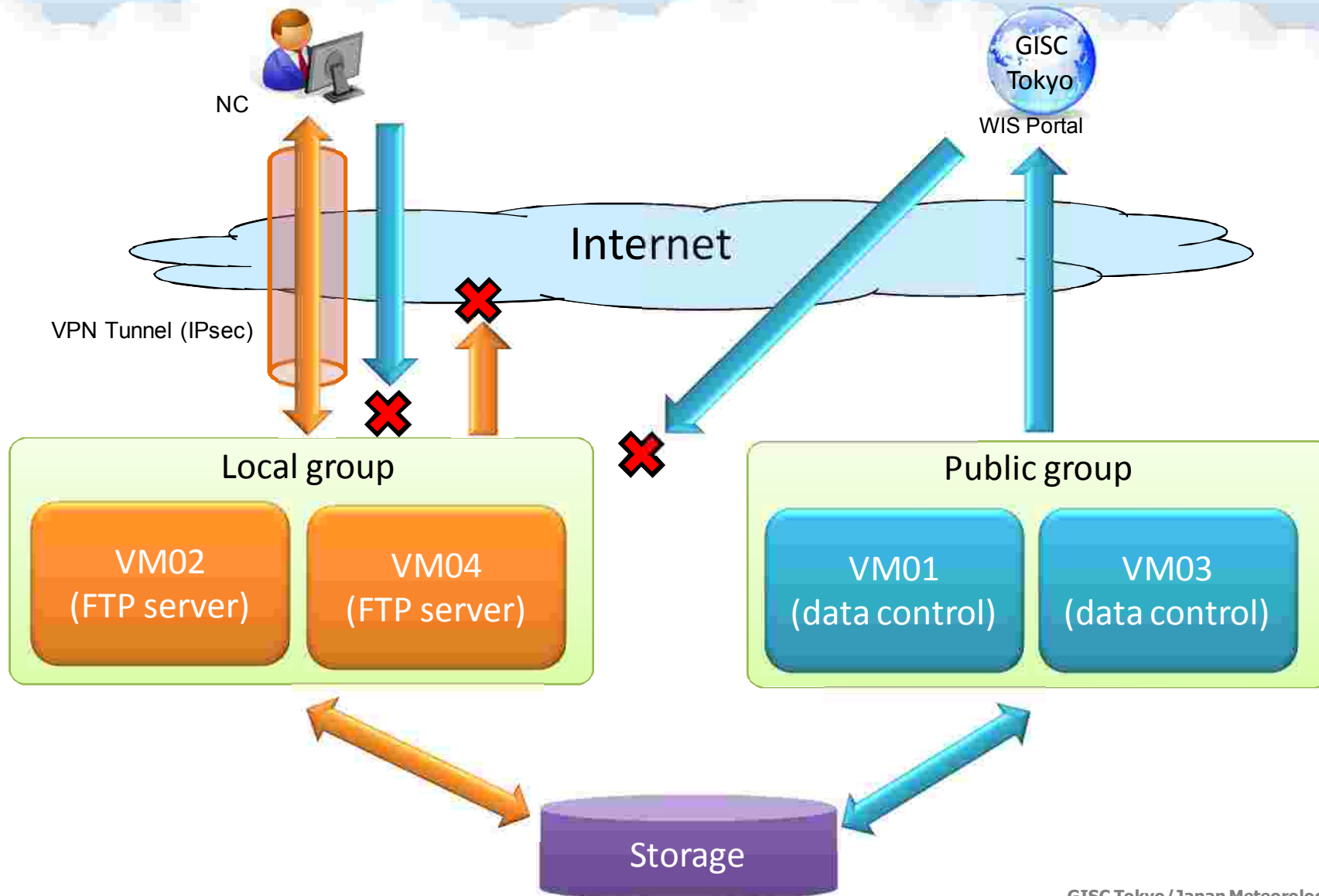## 6th-8th Dec. 2016 in JMA HQ

Prototype FTP server for AMDCN

- Configurations
  - 2 SET of Hewlett Packard ProLiant DL380e
  - 6 SET of CentOS version 6.8 (Open source Linux)
    - Kernel-based Virtual Machine (KVM)
  - 2 SET of CISCO 1921/K9 (Active and Standby)
  - 1 SET of Storage (NAS 4TB Raid6)

Internet

CISCO1921   100Mbps
             Best effort

| VM01 CentOS 6.8 (Guest OS) | VM02 CentOS 6.8 (Guest OS) |
| VM03 CentOS 6.8 (Guest OS) | VM04 CentOS 6.8 (Guest OS) |

CentOS 6.8 (Host OS)   CentOS 6.8 (Host OS)

HP ProLiant DL380e   HP ProLiant DL380e

Storage

Prototype FTP server for AMDCN

Example for Necessary Equipment and Software

- For connecting to GISC Tokyo
  - Dedicated circuit or MPLS
    - CISCO router or CISCO compatible
    - PC server
    - Communication software (MSS) and FTP server (e.g. VSFTPD)
  - Internet-VPN (IPsec tunnel)
    - CISCO router (IPsec support)
    - PC server
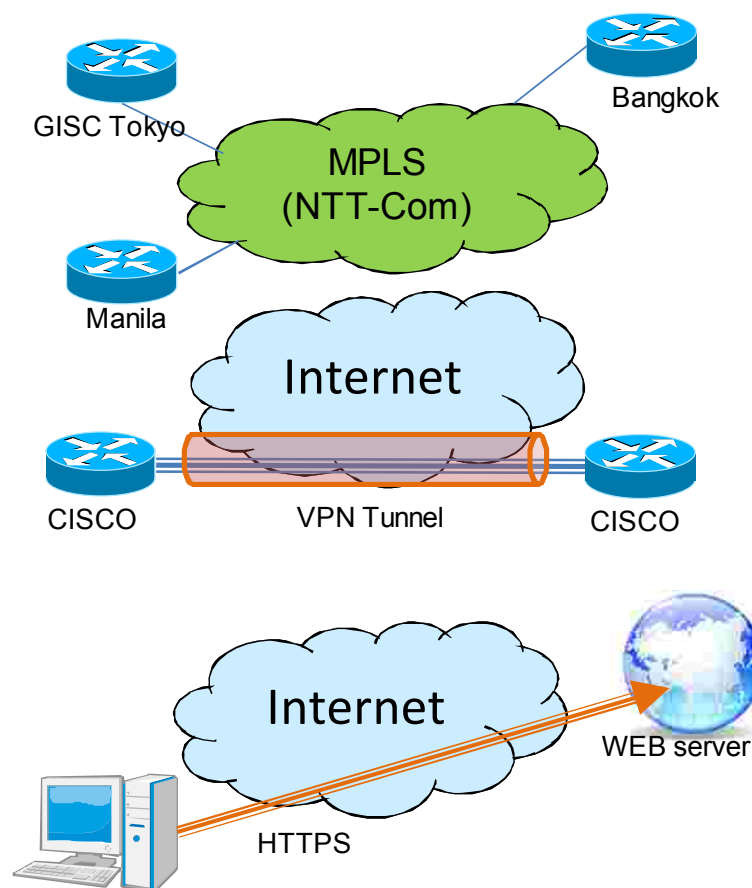   - Communication software (MSS) and FTP server (e.g. VSFTPD)
  - Internet-VPN (HTTPS)
    - PC
    - Line command tool for HTTPS (e.g. cURL)
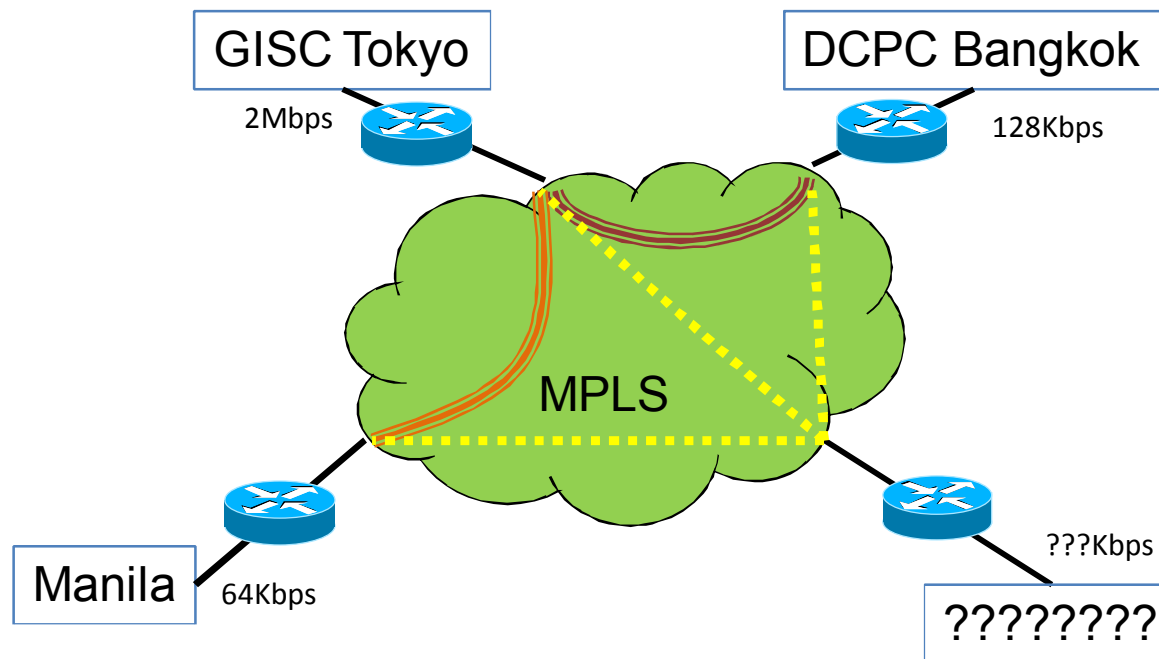   - Downloading tool (e.g. cURL, wget)

Practical Example (1)

- ## MPLS (NTT Communications)
  - ➤ Bangkok (Thailand)
  - ➤ Manila (Philippines)
- ## Internet-VPN (IPsec Tunnel)
  - ➤ Bangkok (Thailand)
  - ➤ Nay Pyi Taw (Myanmar)
- ## Internet-VPN (HTTPS)
  - ➤ Hanoi (Viet Nam)

GISC Tokyo

Bangkok

MPLS (NTT-Com)

Manila

Internet

CISCO

VPN Tunnel

CISCO

Internet

WEB server

HTTPS

Practical Example (2)

- MPLS (NTT Communications)
  - Bangkok (Thailand)
  - Manila (Philippines)

GISC Tokyo

DCPC Bangkok

2Mbps

128Kbps

MPLS

Manila

64Kbps

???Kbps

???????

Practical Example (3)

- Internet-VPN (IPsec Tunnel)
  - ➤ Bangkok (Thailand)
  - ➤ Nay Pyi Taw (Myanmar)

Data exchange is under discussion.

DCPC Bangkok

CISCO

VPN Tunnel

Internet

Data exchange has started from Nov. 2016.

GISC Tokyo

VPN Tunnel

Nay Pyi Taw

CISCO

CISCO

VPN Tunnel

CISCO

????????

Nay Pyi Taw   Tokyo

FTP Server/Client
202.xxx.xxx.1

192.xxx.xxx.11

MSS1   VPN Link (IPsec)   MSS1

Server VIP   2Mbps   100 Mbps
192.xxx.xxx.10   Internet

CISCO1921   CISCO1921

Nay Pyi Taw   Tokyo

MSS2   MSS2

192.xxx.xxx.12   FTP Server/Client
                                            202.xxx.xxx.2
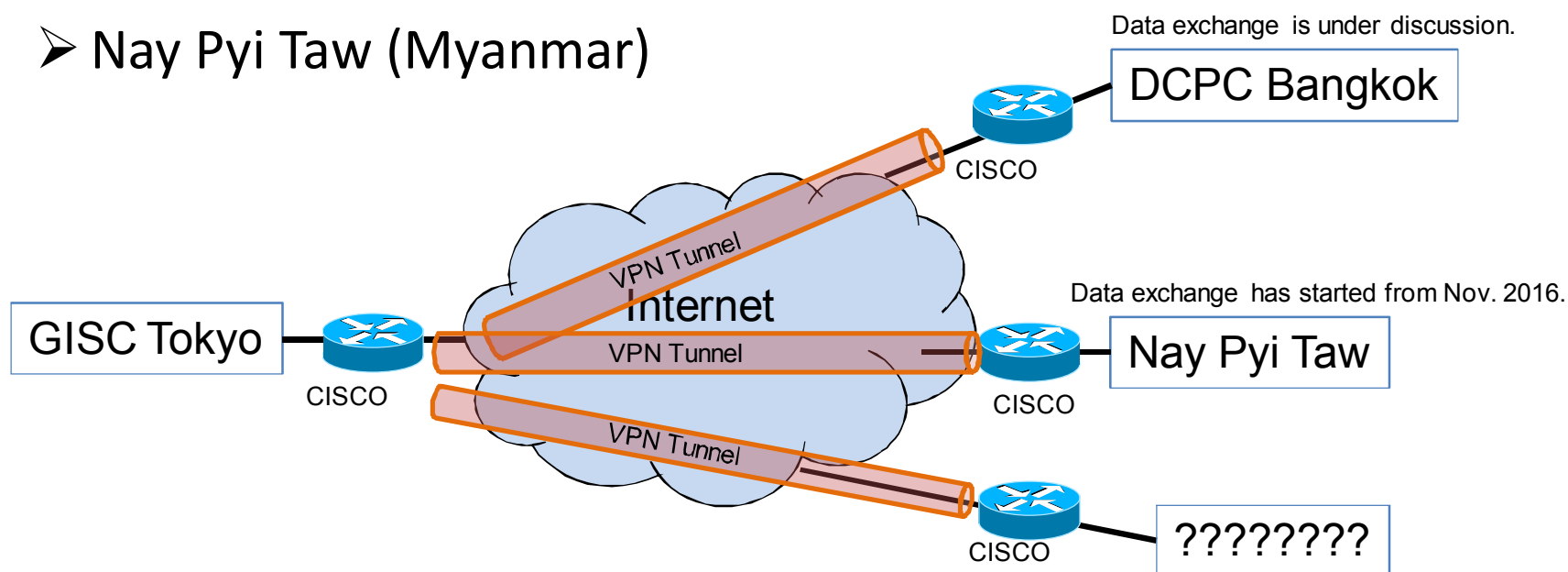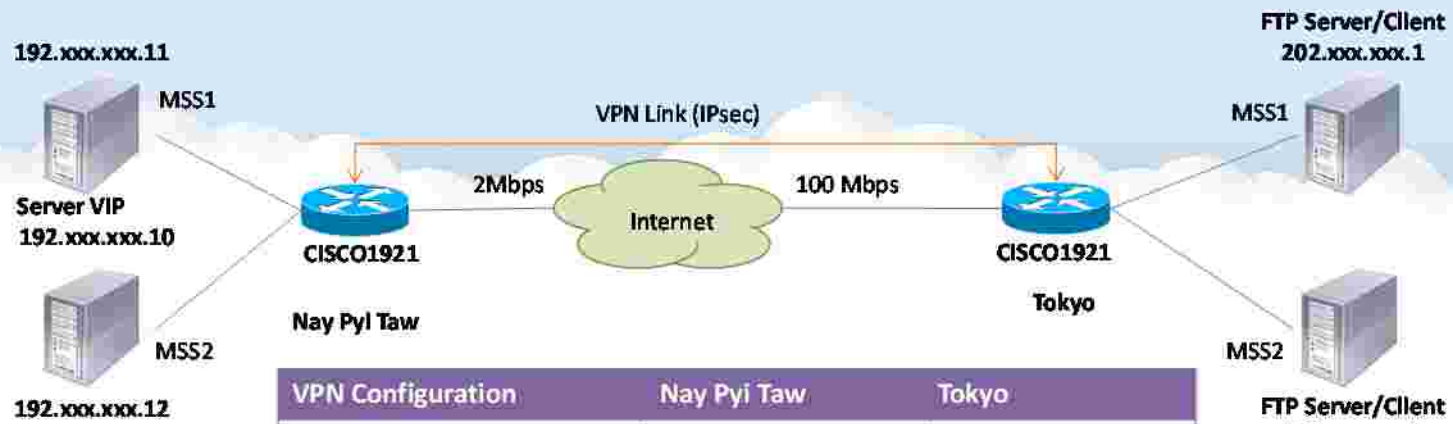
VPN Configuration	Nay Pyi Taw	Tokyo
Router	CISCO 1921	CISCO 1921
Router Address	203.xxx.xxx.18	202.xxx.xxx.138
Host Address	192.xxx.xxx.10 (VIP) 192.xxx.xxx.11 192.xxx.xxx.12	202.xxx.xxx.1 202.xxx.xxx.2
IKE:		
Encryption Algorithm	3DES	
Hash Algorithm	SHA256	
Diffie-Helman Group	MODP 1024 bit (Group 2)	
Lifetime	86400s	
IPsec:		
Mode	Tunnel Mode	
Service Protocol	-	
Protocol to Manage Keys	-	
Transform-set	esp-3des, esp-sha256-hmac	
pfs	group 2 (mode 1024)	
peer authentication	Pre-Shared-Key "********"	

GISC Tokyo/Japan Meteorological Agency

Nay Pyi Taw   Tokyo
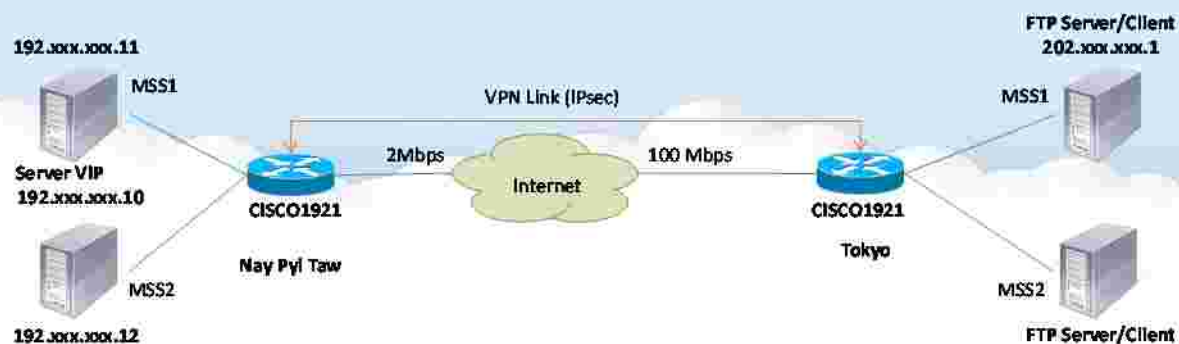
2016/11/14

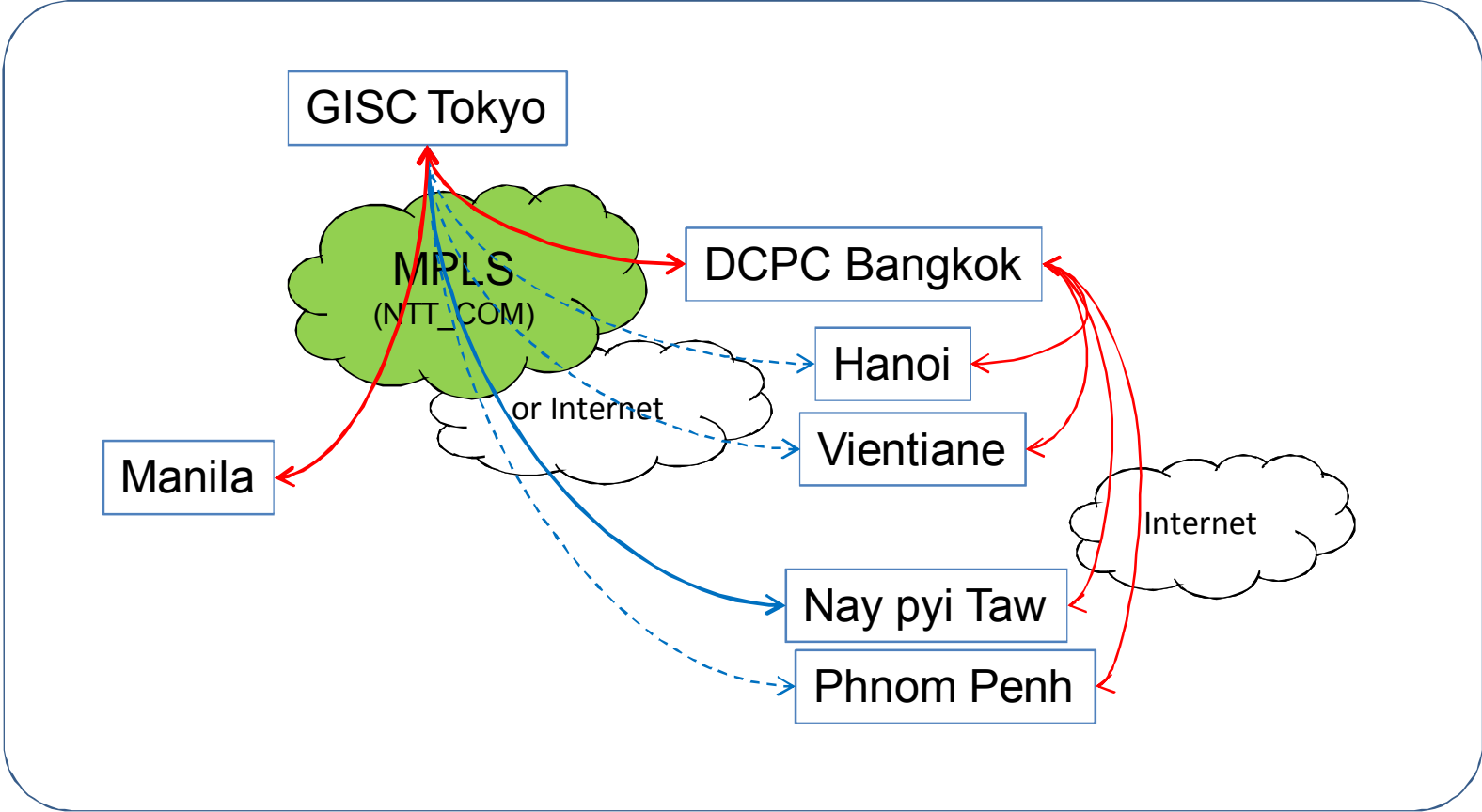| Num	Test Item	DMH	JMA	Results	Remarks
1	Confirmation of establishment of VPN link between NayPyiTaw and Tokyo	# Ping to JMA's router # show crypto session		OK	
			# Ping to DMH's router # show crypto session	OK	
2	Confirmation of FTP login with ID/Password	$> ftp "202.xxx.xxx.1"		OK	
		$> cd From_DMH		OK	
			$> ftp "192.xxx.xxx.10"	OK	
			$> cd From_JMA	OK	
3	Confirmation of exchanging some test message (manually)	$> ftp "202.xxx.xxs.1" $> cd From_DMH $> put file file.tmp $> rename file.tmp VBRRxxxxxxxx.b		OK	
			$> ftp "192.xxx.xxx.10" $> cd From_JMA $> put file file.tmp $> rename file.tmp RJTDxxxxxxxx.b	OK	
4	Confirmation of exchanging some message (Auto program)	To JMA		OK	
			To DMH	OK	

Practical Example (4)

- Internet-VPN (HTTPS)
  - Hanoi (Viet Nam)

HTTPS

Internet

Web Server
GISC Tokyo

GTS

Hanoi

WIS Technical Specifications
Uploading of data and products;
Downloading files (Subscription)
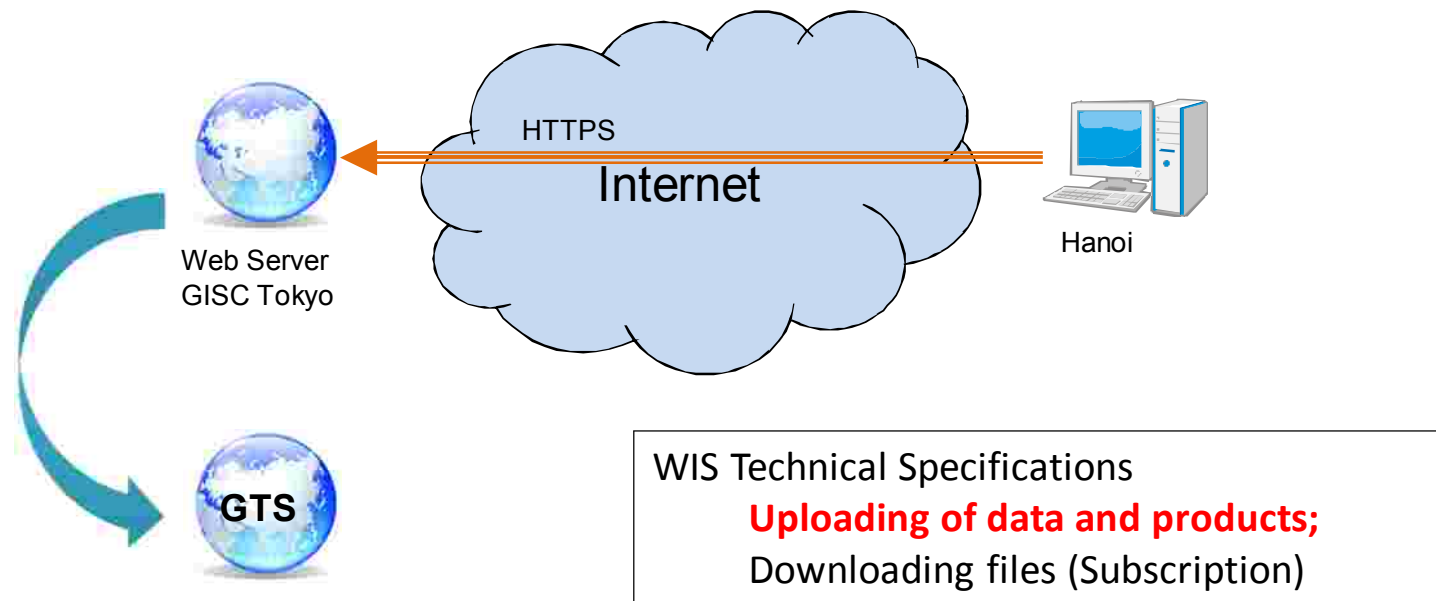
Current status of AMDCN on GISC Tokyo

Operation of AMDCN
on GISC Tokyo

Review : Option for AMDCN of GISC Tokyo

GISC Tokyo

1: Dedicated Circuit

JMA needs to get budget.

Dedicated Circuit (Bilateral)

FTP server (GTS)

2: IPVPN (MPLS)

MPLS (NTT-Com)

VPN Tunnel

Prototype FTP server (for Internet)

CISCO1921

Internet

CISCO

3: Internet-VPN (IPsec Tunnel)

4: Internet-VPN (HTTPS)

HTTPS Upload

Internet

Web system (for Internet)

Subscription

5: Himawari Cast

Satellite data

Himawari8/9

GISC Tokyo/Japan Meteorological Agency

Operation/Support on GISC Tokyo

Connection Types	Network	Hardware	Application (MSS)
Dedicated Circuit	24/7	24/7	24/7
IP-VPN (MPLS)	24/7	24/7	24/7
Internet VPN (IPsec Tunnel) (Prototype)	Business hours	Business hours	Business hours
Internet VPN (HTTPS Upload) (Subscription)	24/7	24/7	Business hours

At this time, this is prototype system. In 2018, this system will be in 24/7 service.

Revision of Manual on the GTS (WMO No. 386)

Revision of Attachment II-15

- WMO Expert Team (ET-CTS) had decided to remove "TCP sockets-based data exchange" from Attachment II-15 on the Manual on the GTS.

- CBS-16 (Nov. 2016) recommends this to EC.

- This decision does not mean it can not use "TCP socket" in the future.

- Aftertime, WMO recommend to use following protocols for data exchange:

  ➢ FTP: File Transfer Protocol

  ➢ SFTP: SSH File Transfer Protocol

  ➢ FTPS: File Transfer Protocol over SSL/TLS

Replacement of GISC Tokyo

FYI: Draft Schedule of Replacement of GISC Tokyo (WIS Part-B Internet system)

	2017 –	1st quarter 2018	2nd quarter 2018
Current system			
New system	Developing	Pre-operational	In operation

In this point, our ISP might be changed to new telecom company depending on result of bid processing.
If so, our public IP addresses will be changed and we will have to announce to relevant centres in order to request to modify our IP addresses before pre-operational stage.

What do I do?

- Share the specification for Tokyo's new system
- Connectivity test
- Re-establish the VPN link to Tokyo's new system
- Test for data exchange

Thank you!