## http://www.phopenix.net/pacnog2015.pdf

# APAN 41 Manila

January 25-29, 2016

#### Marriott Hotel Manila

No. 10 Newport Boulevard, Newport City Complex, Pasay City, Metro Manila

http://www.apan.net/meetings/Manila2016/

## Philippine Open Internet eXchange Updates

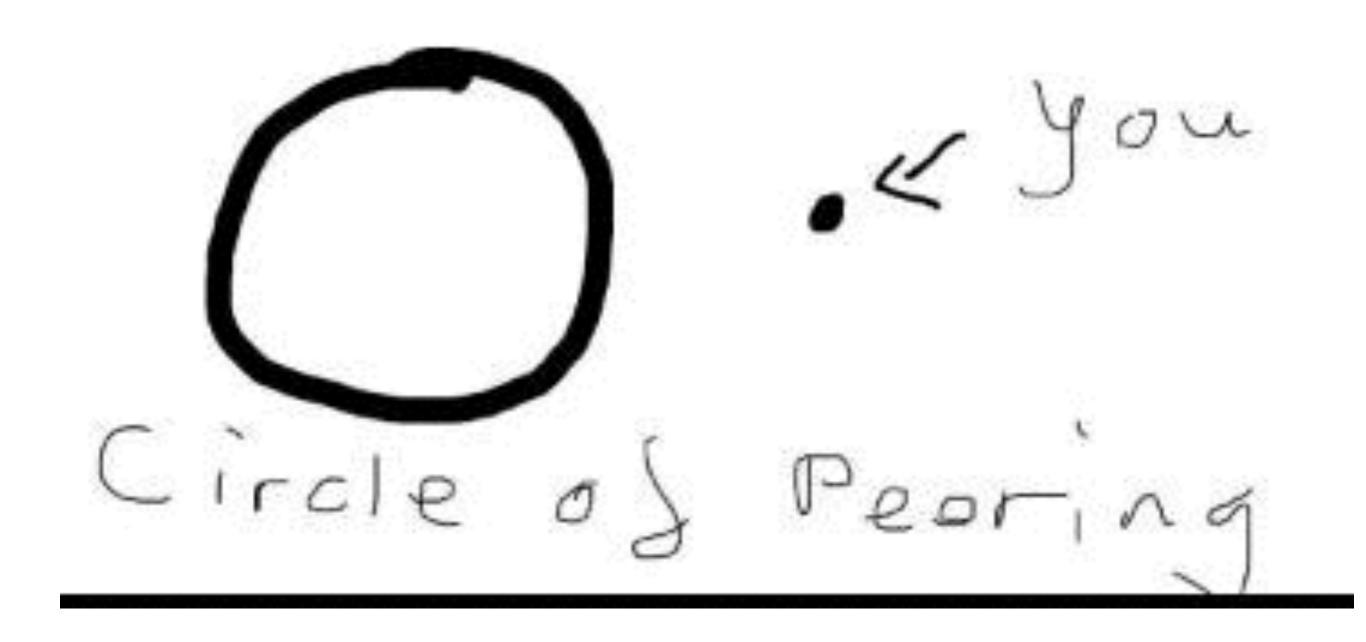
November 30, 2015 Hyatt Hotel PacNOG, Guam, USA

Bani Lara
Advanced Science and Technology Institute
Department of Science and Technology

#### Outline

- Benefits of peering
- How we started our IX
- How to promote the IX yourself
- How to get a big brother to help promote

## Benefit of peering



http://www.peeringforum.com

## Benefits of peering

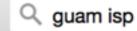
- Lower latency (delay) of traffic exchange to other peers
- Encourages CDNs to put servers near the peering fabric, if there is enough peers
- Good location to do as many bilateral peering sessions as possible at a fraction of a cost

## Benefits of peering

- It can "possibly" lower your transit (internet port) traffic, which is usually more expensive
- Its a good place to form a community :-D











#### TAMUNING, GU **BROADBAND STATS**

Guam is the 0 most connected state in the U.S.

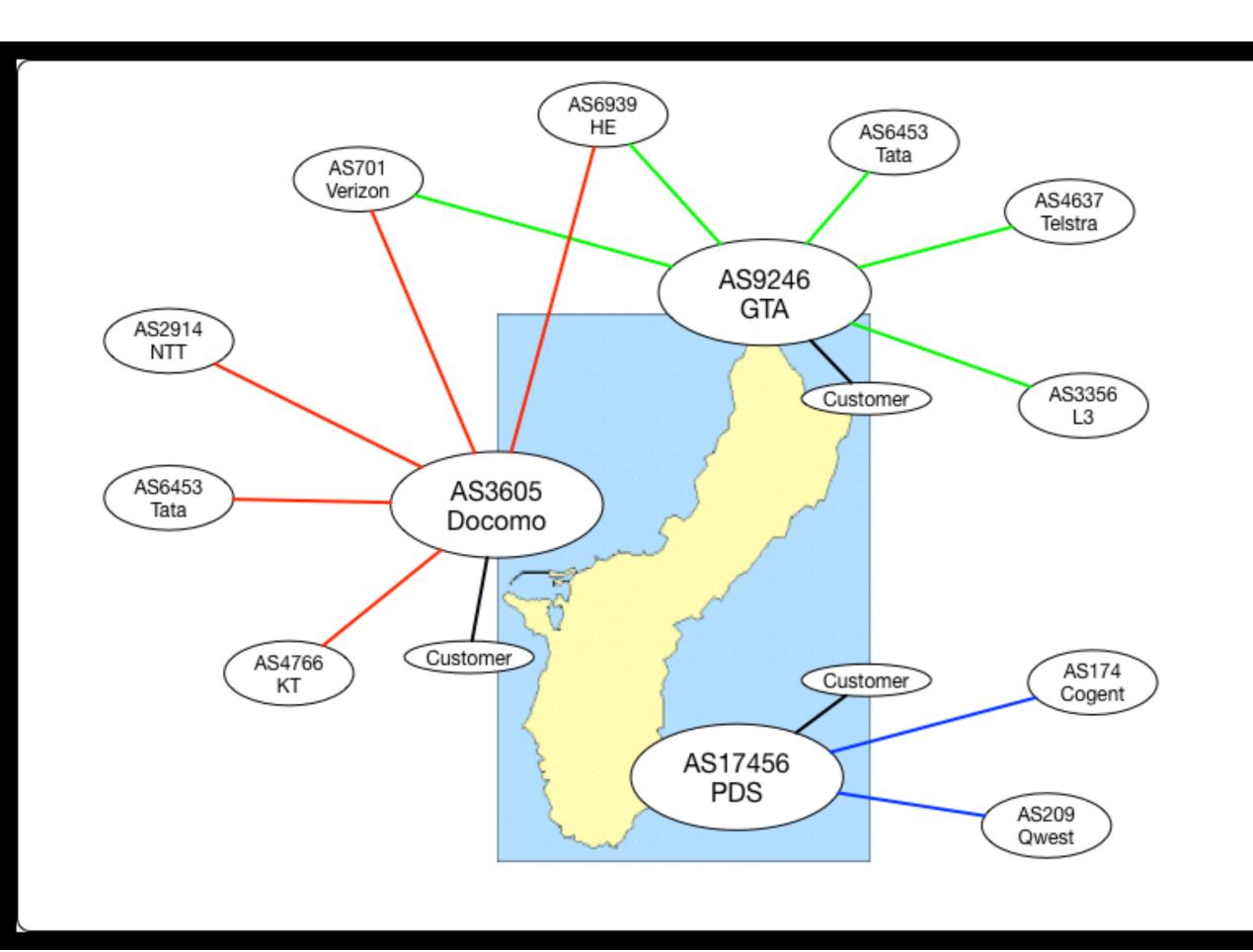
Approximately 2,000 people in Guam County don't have access to any wired internet.

Only 0.0% of Guamanians have access to 100mbps or faster broadband.

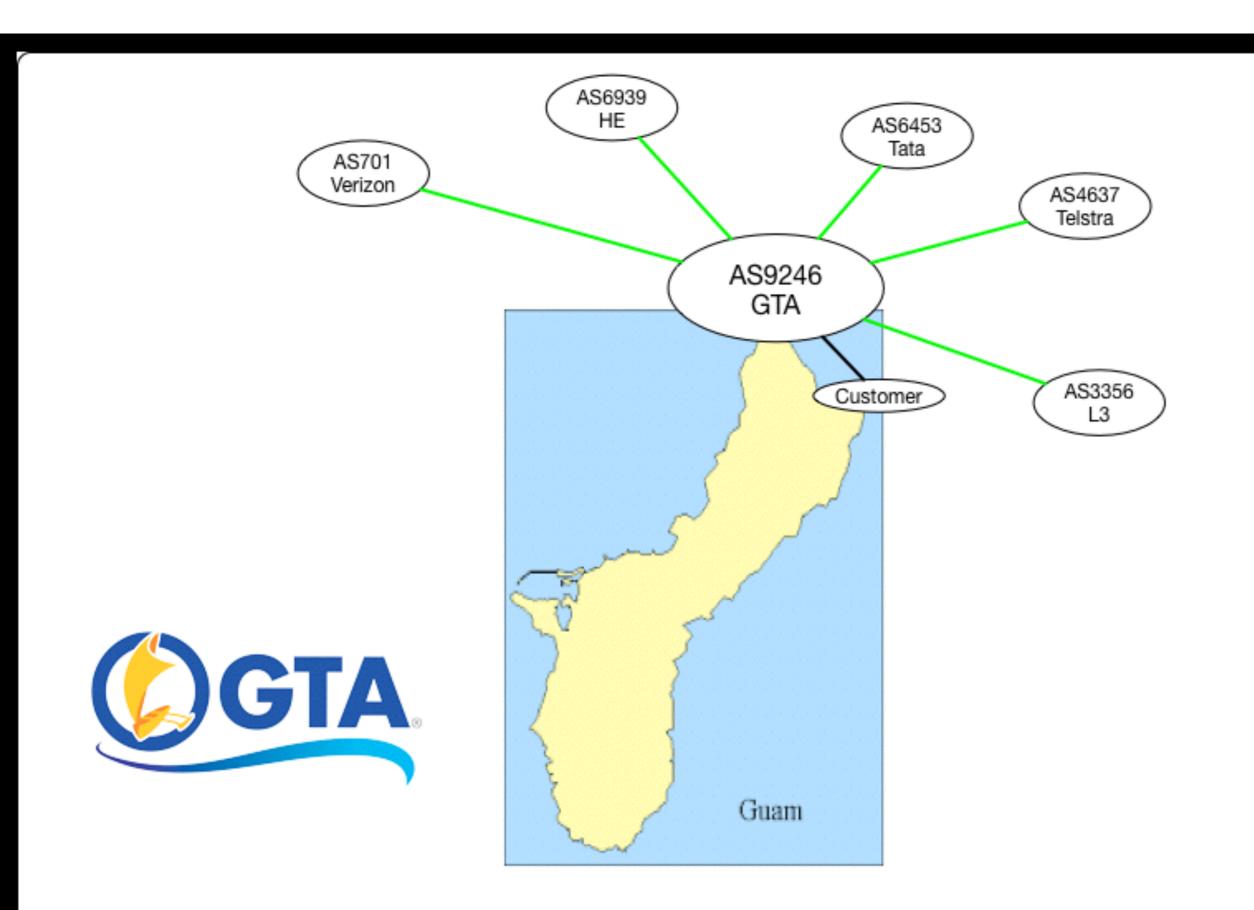
In Guam County, approximately 134,000

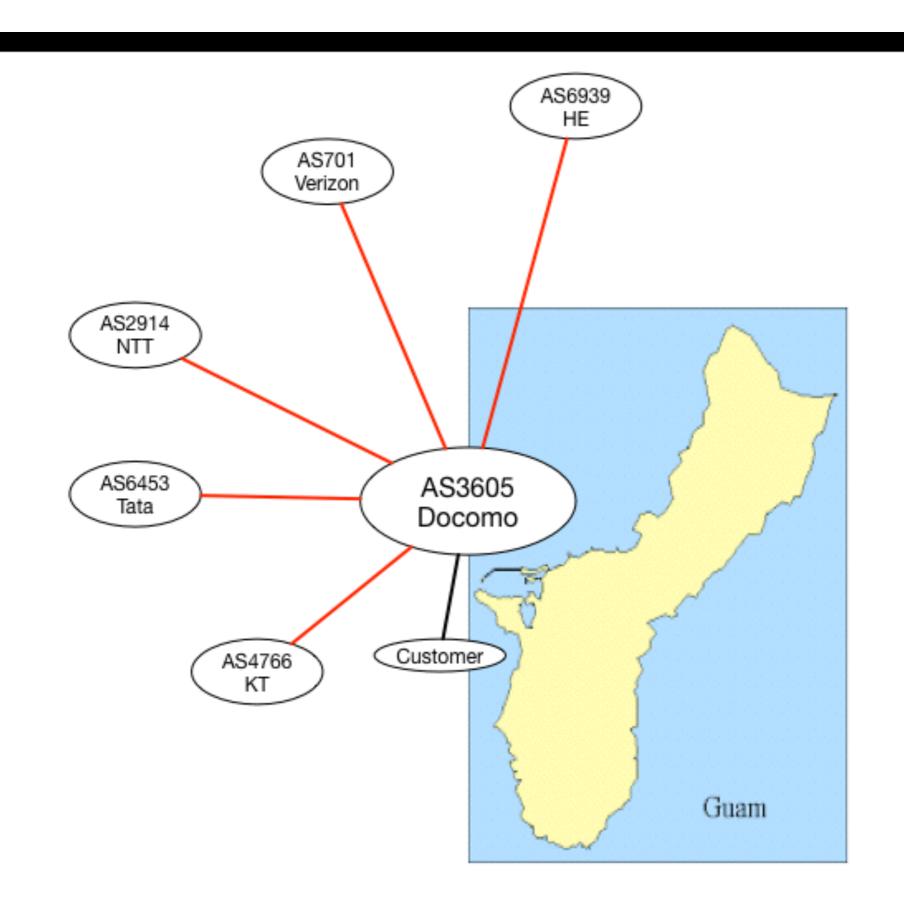
#### ADDITIONAL INTERNET SERVICE PROVIDERS

Provider	Availability	Rating	Speed	Pricing
DSL DSL		?		\$75.00 for 15mbps
docomo		?		
Pacific Data Systems		?		



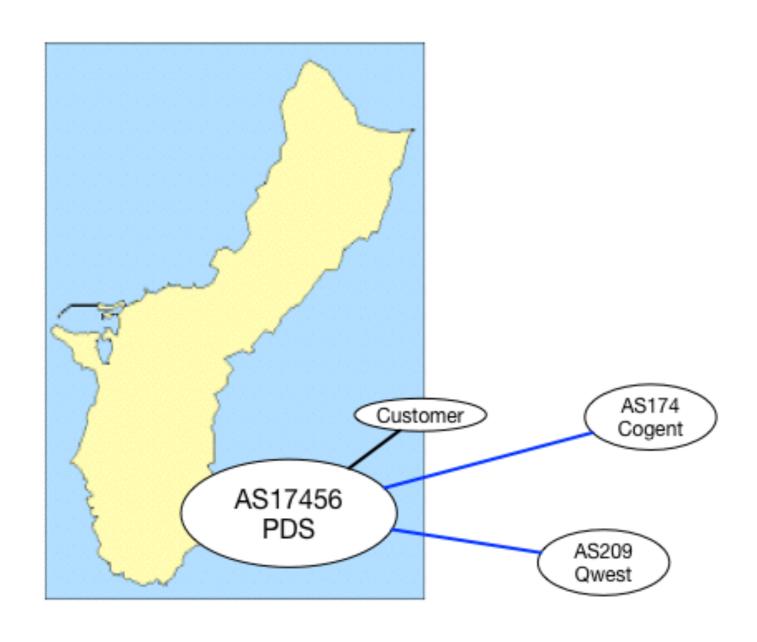
Based on http://bgp.he.net data

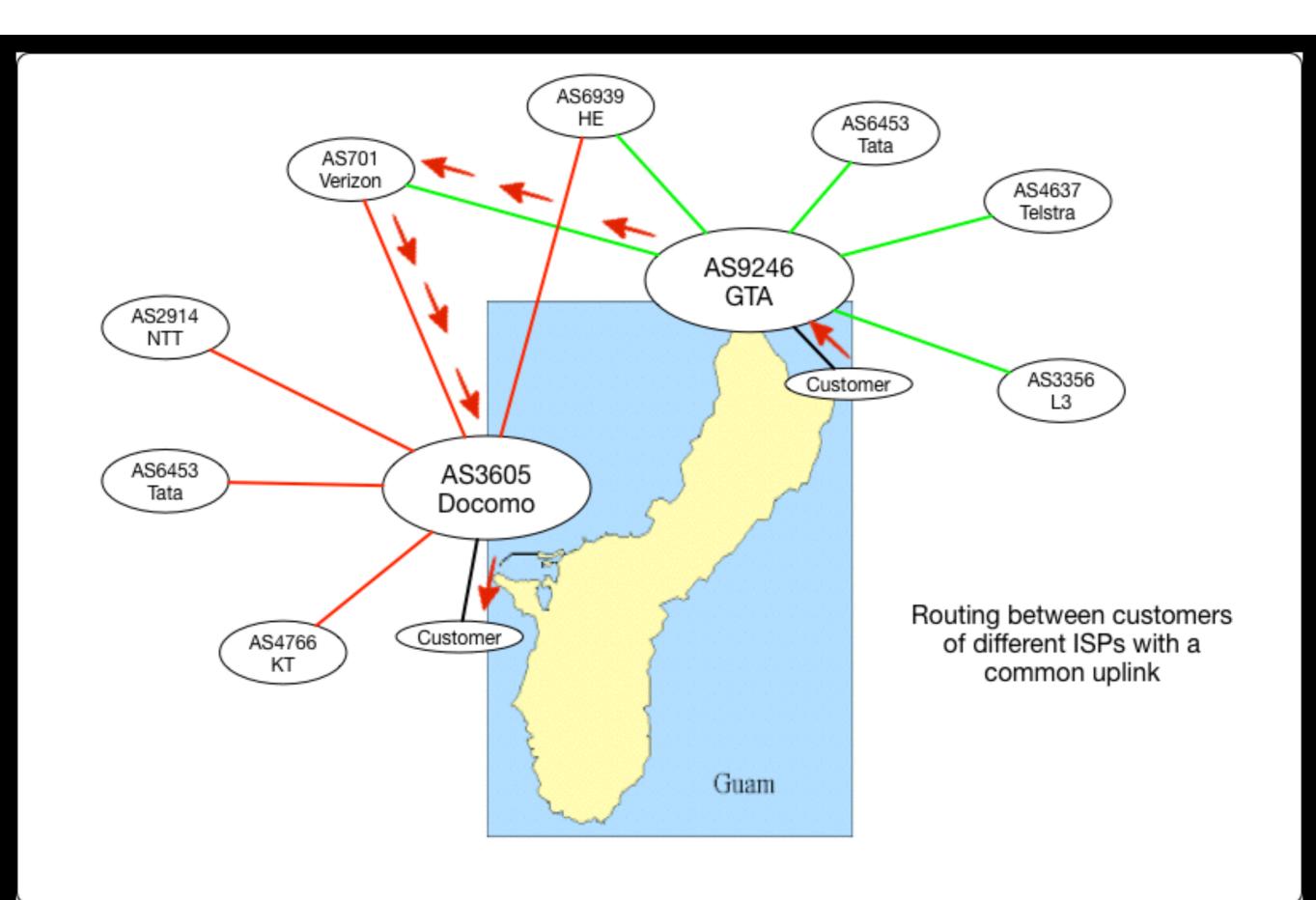


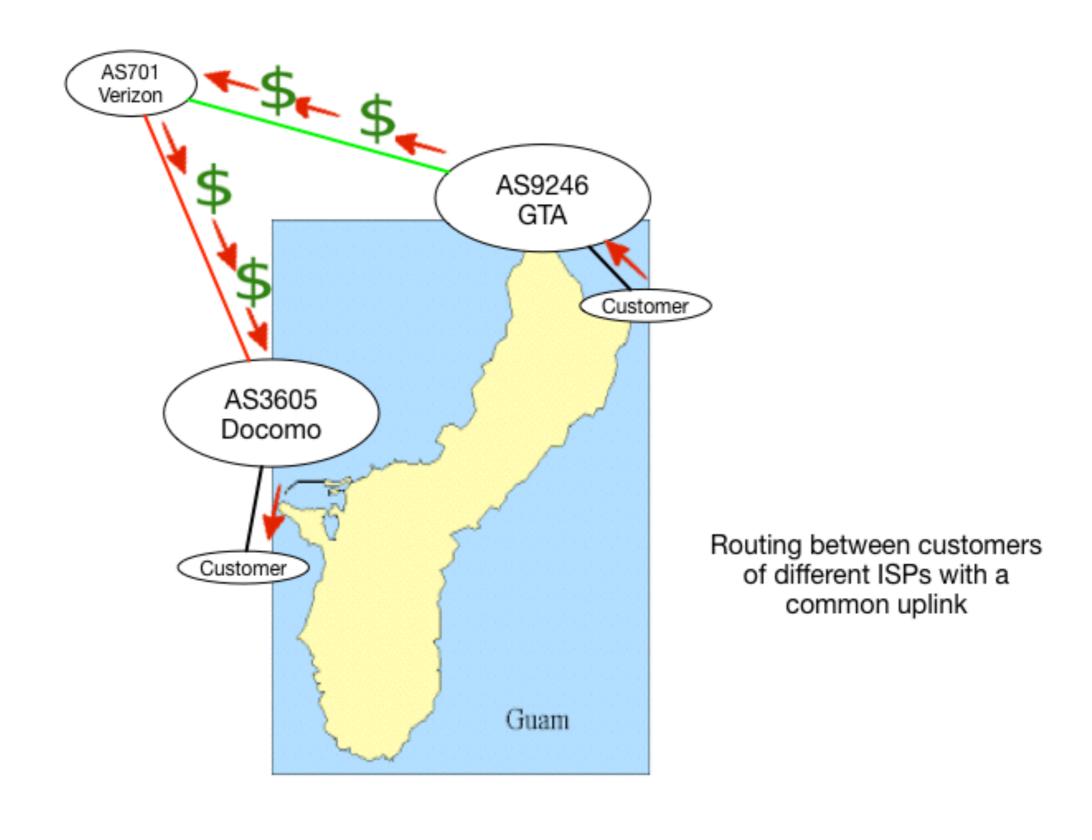


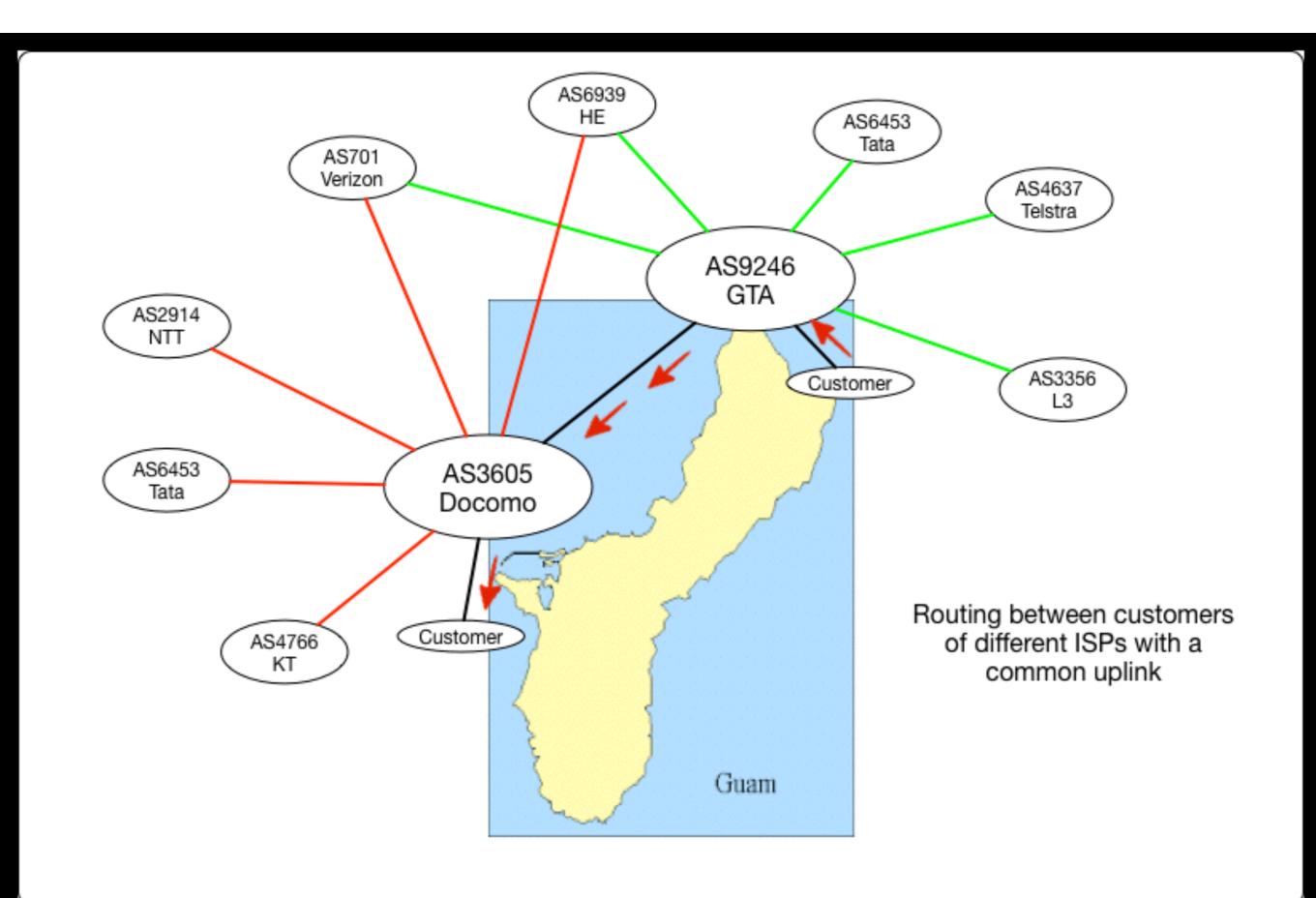


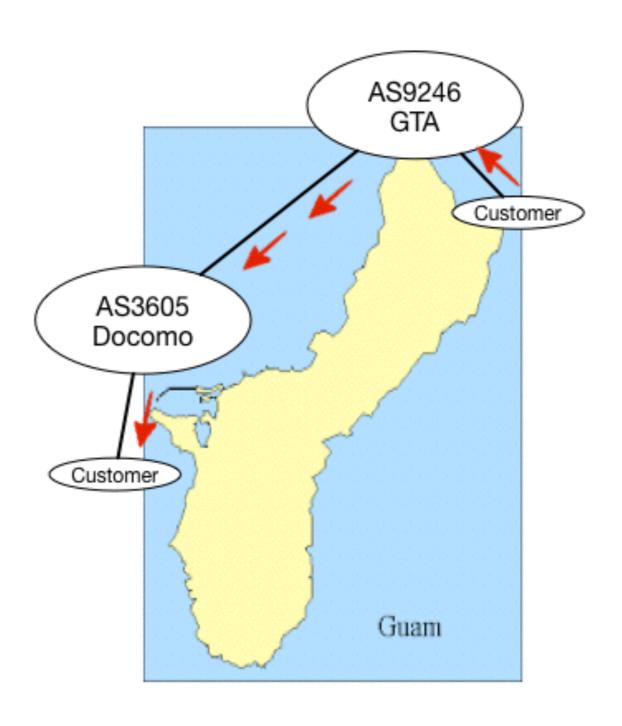


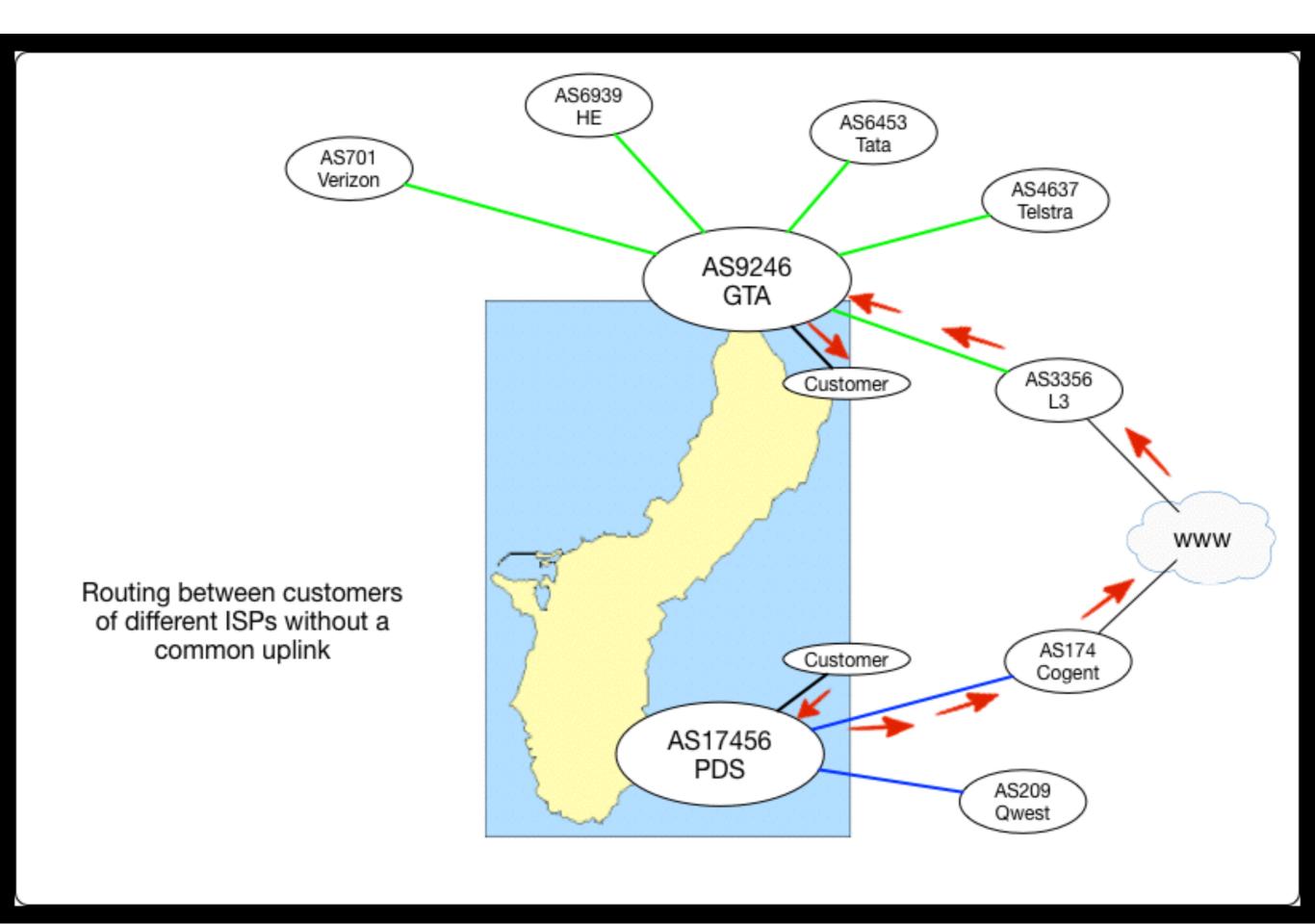




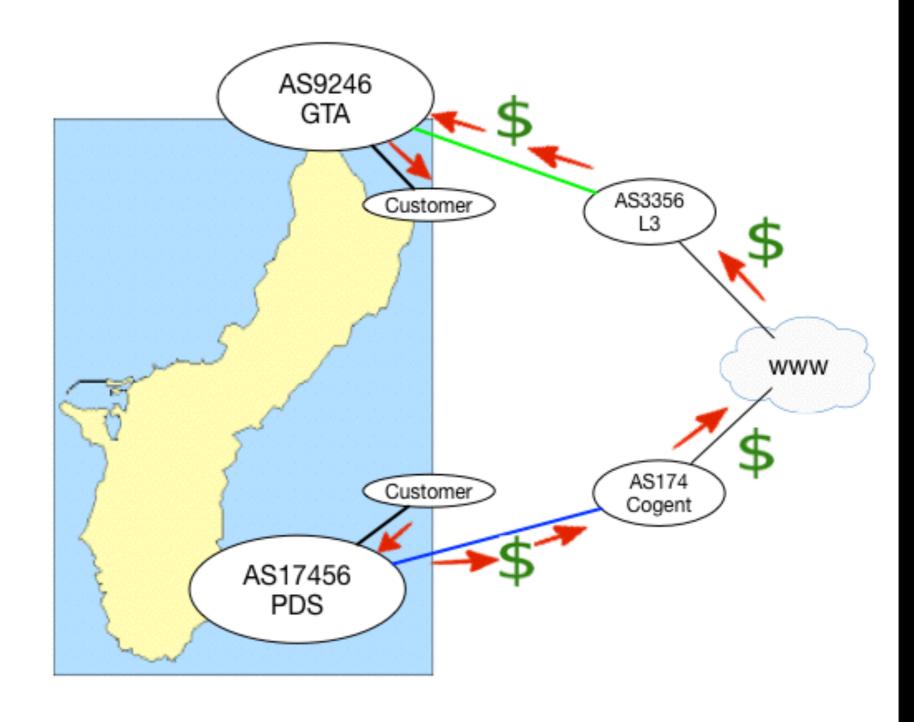


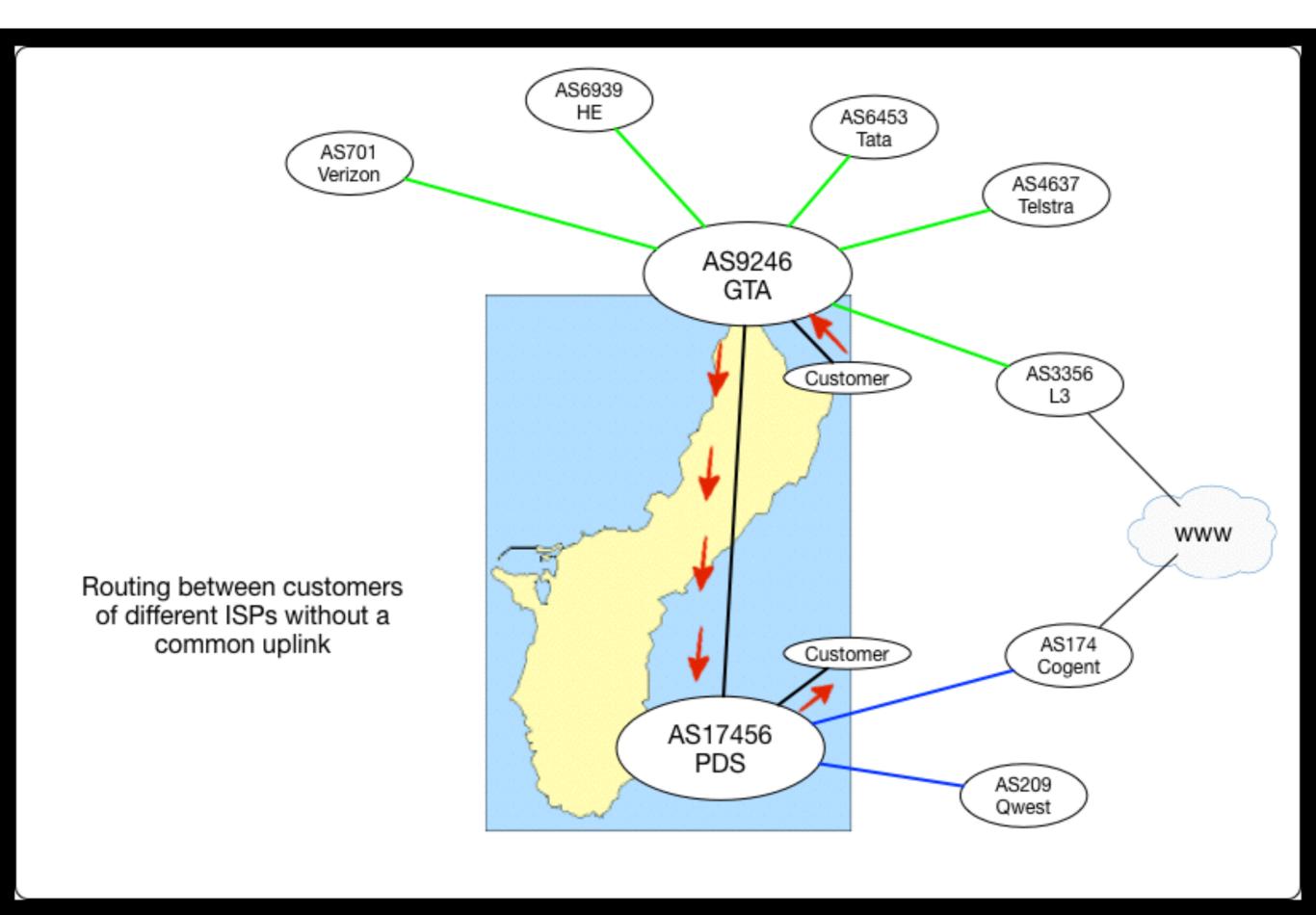


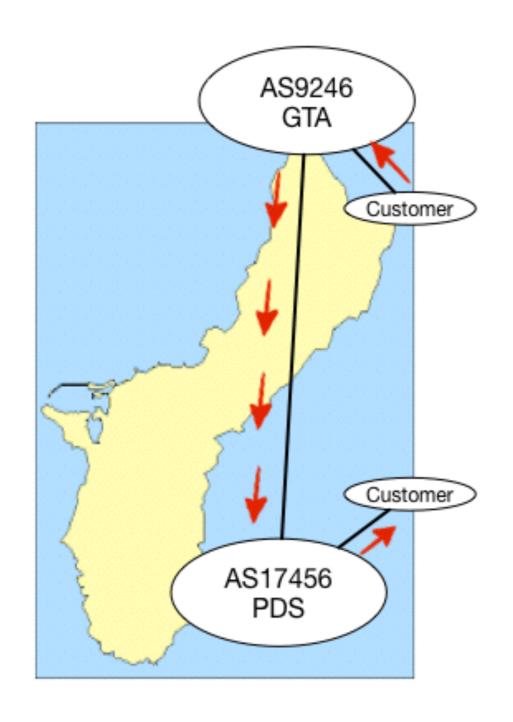


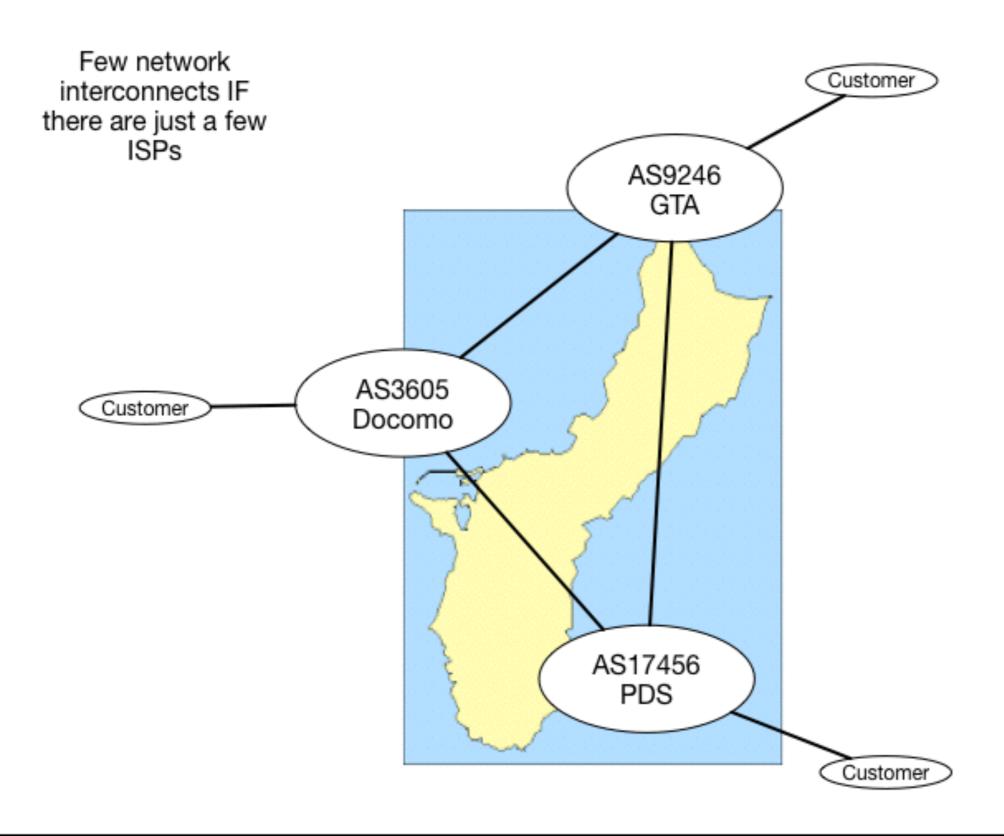


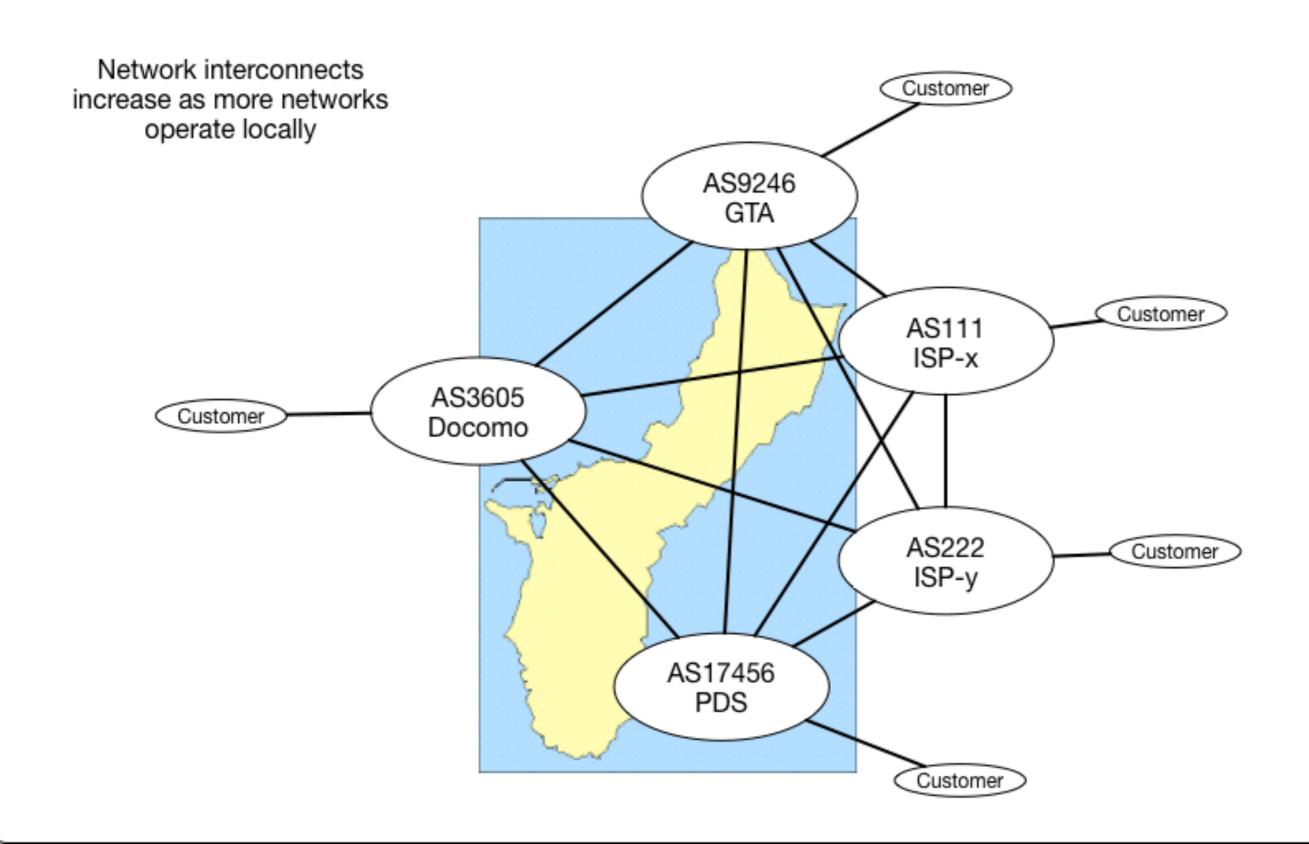
Routing between customers of different ISPs without a common uplink

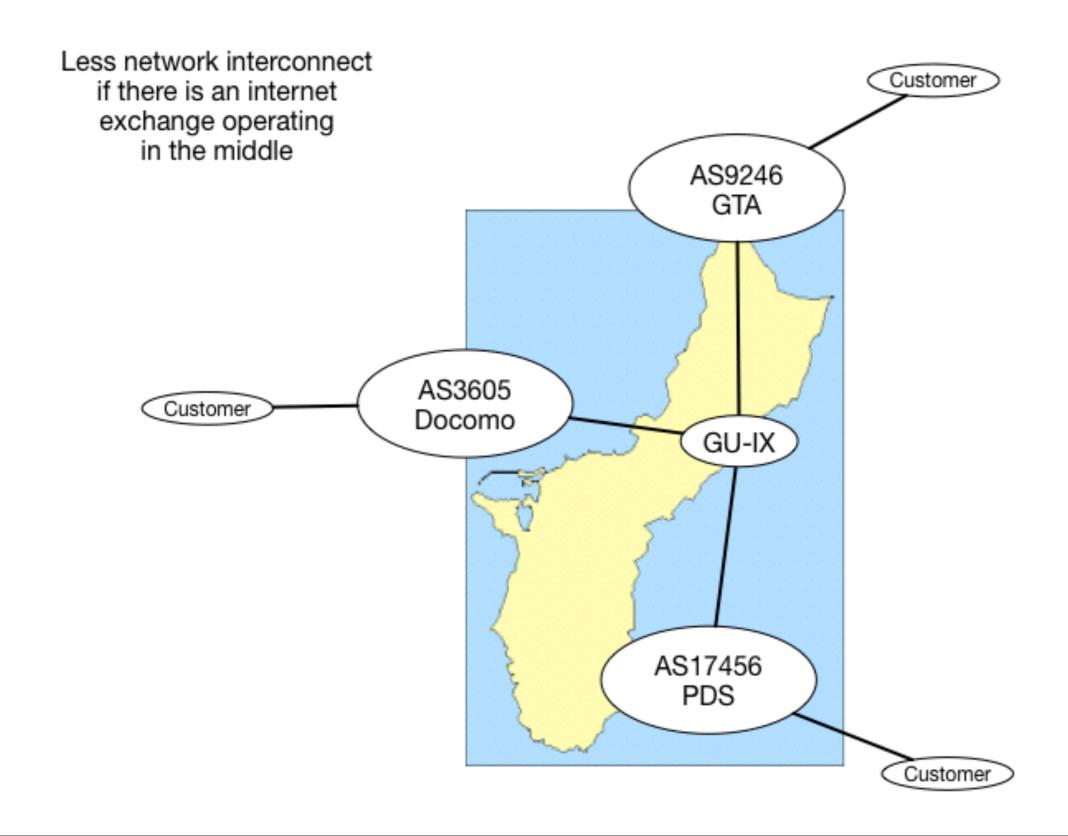


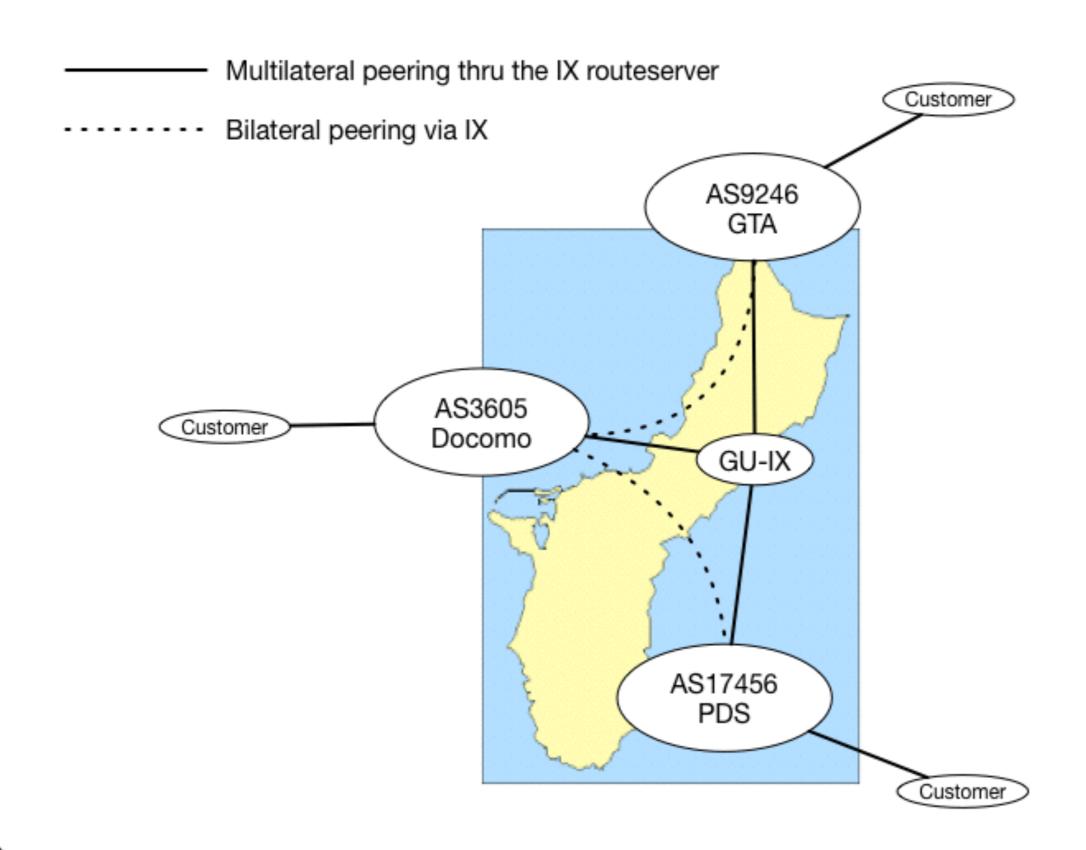


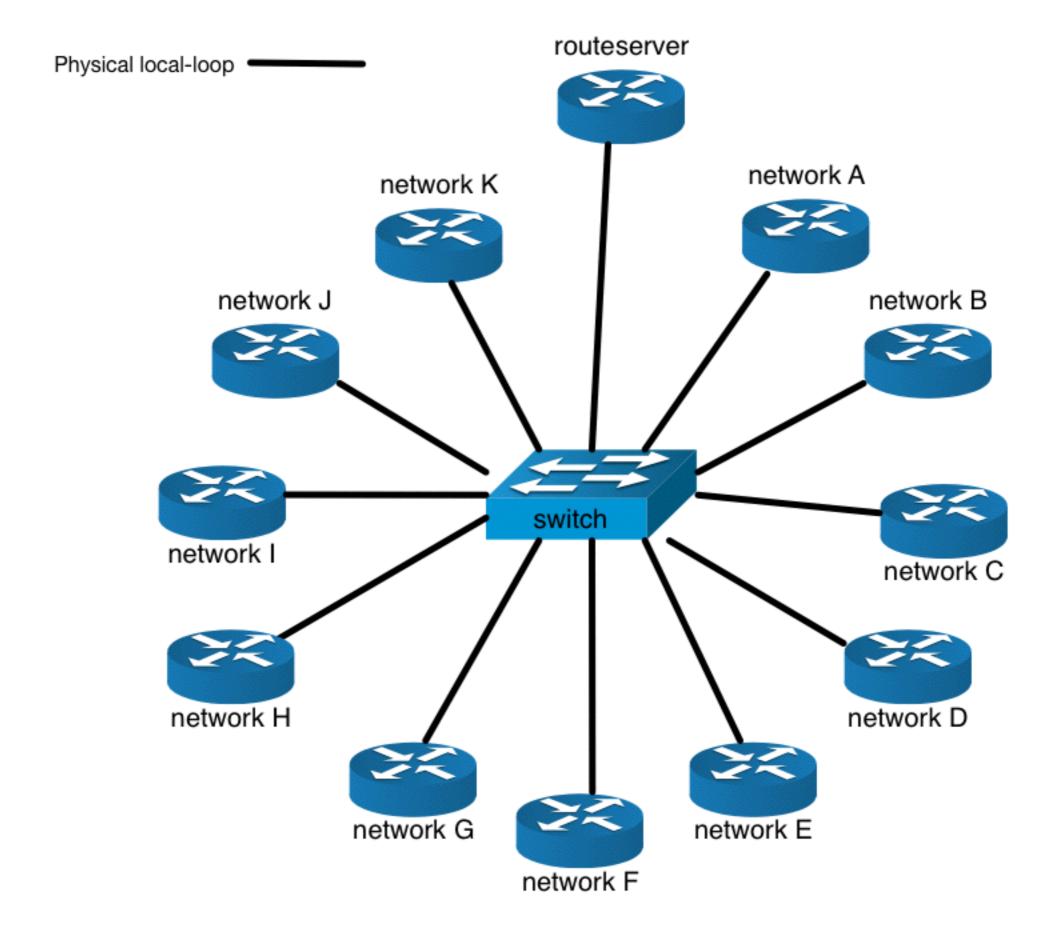




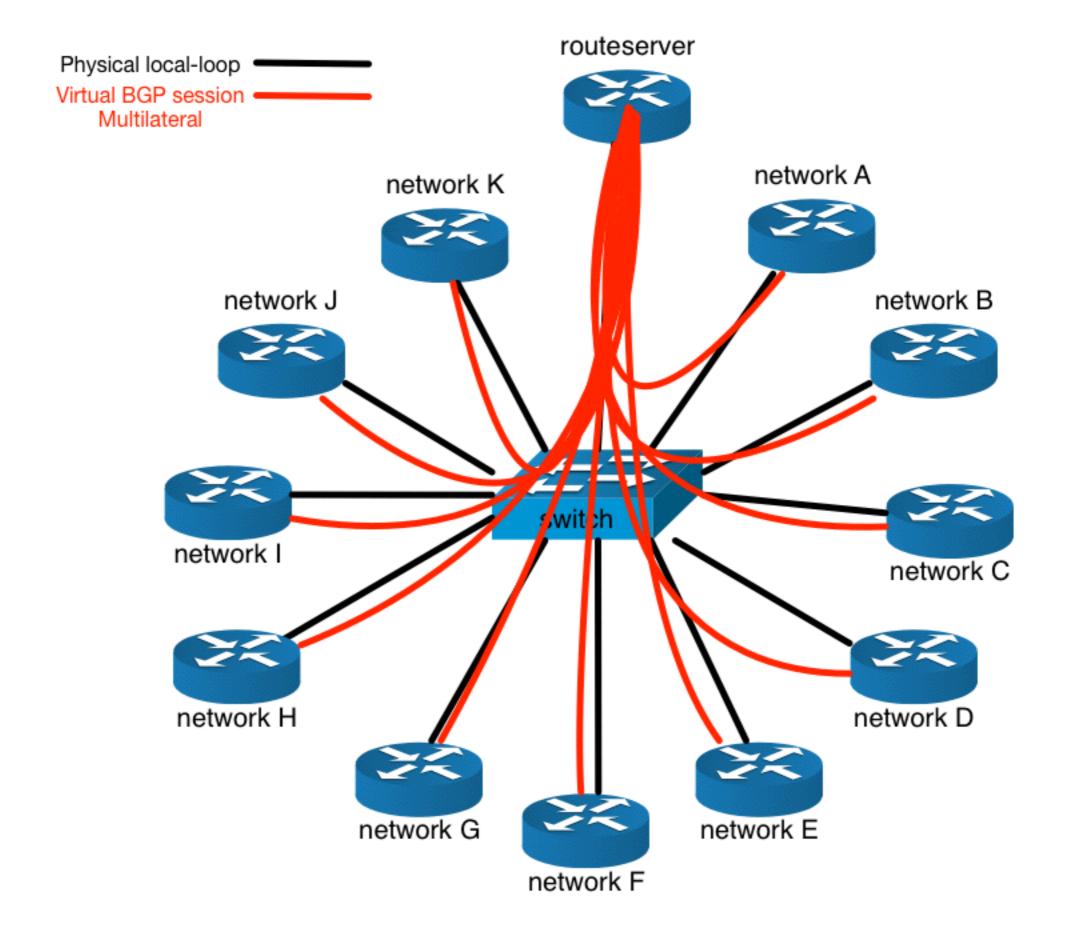




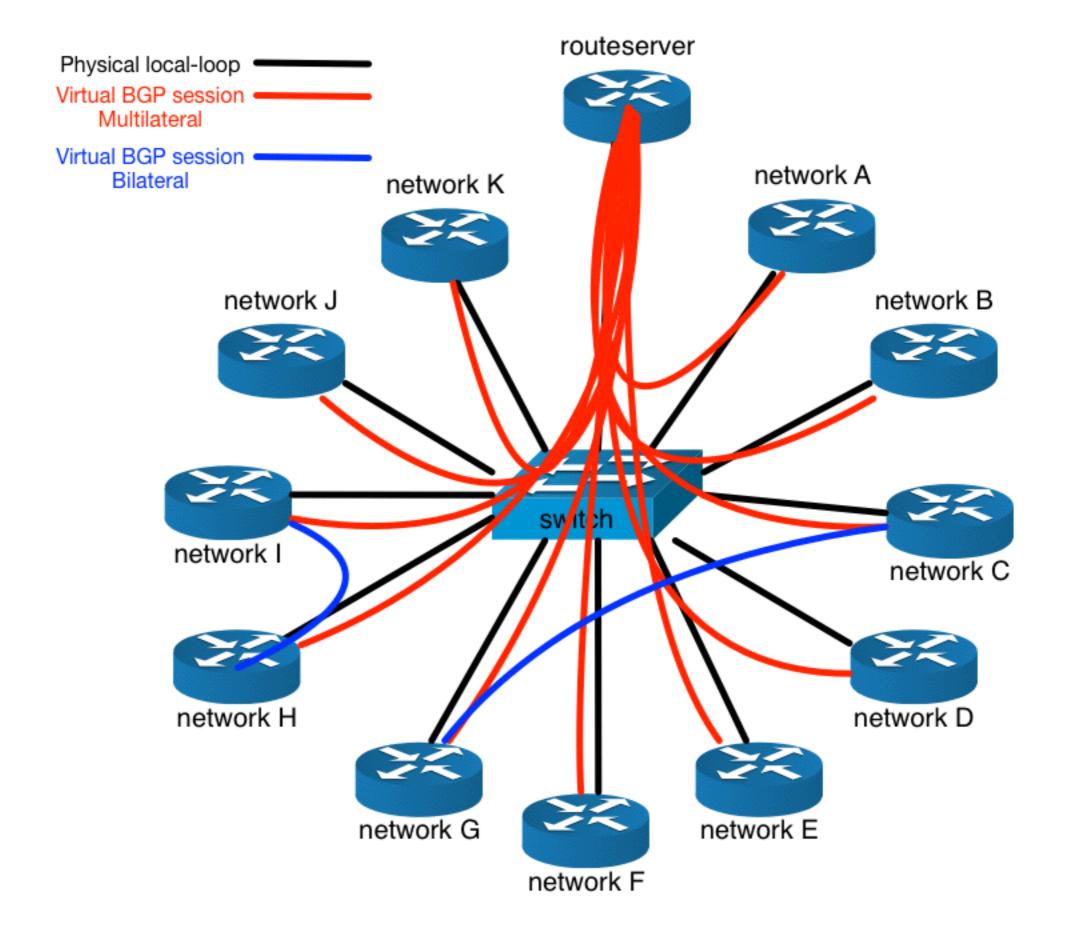




Internet Exchange



Multilateral peering thru a route server



Bilateral peering thru direct negotiations

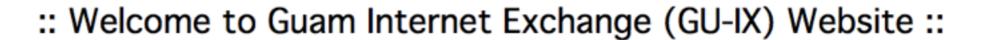
#### METCALFE'S LAW

value increases with n<sup>2</sup>









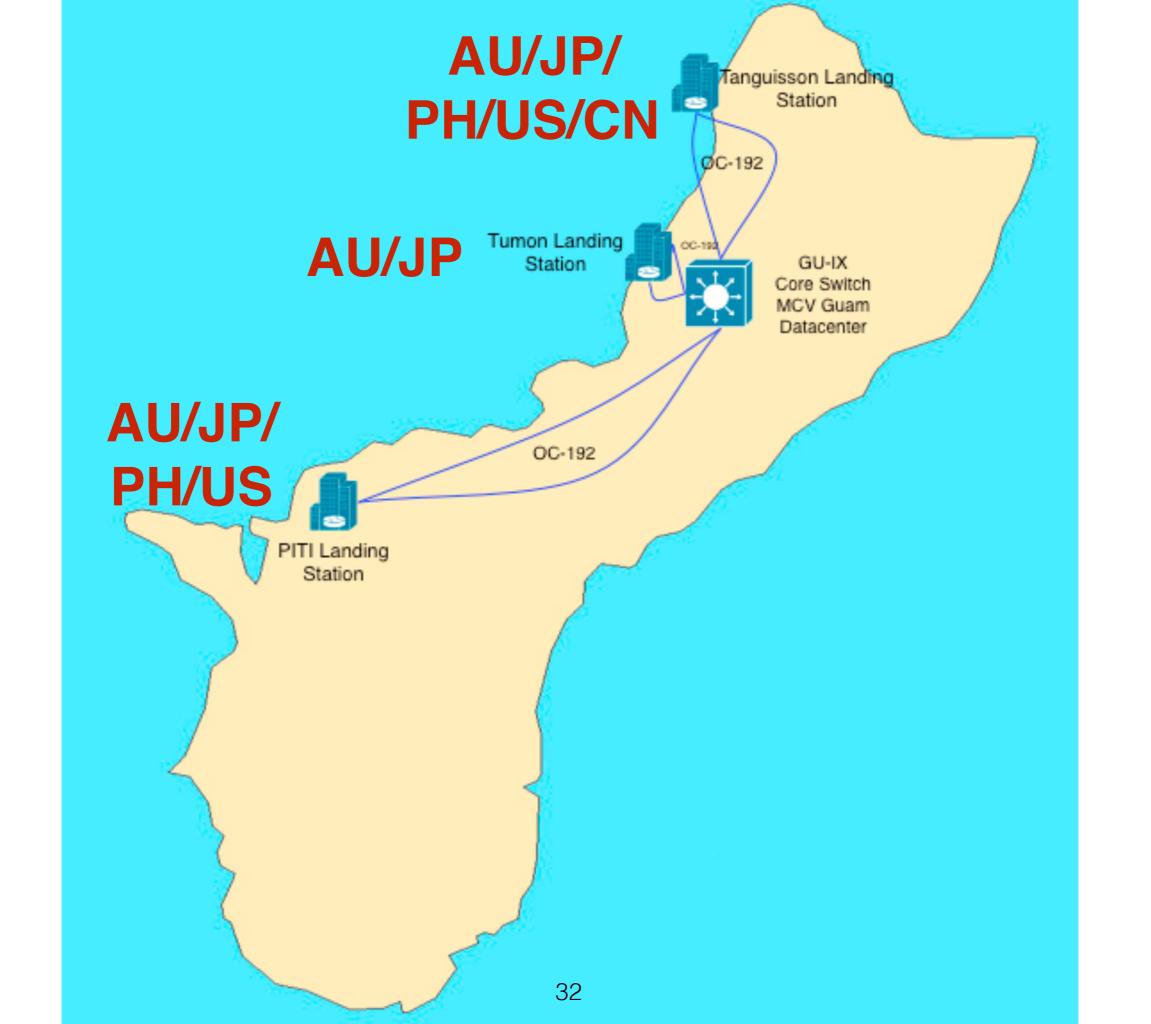
Main ::: About Us ::: Technical ::: Members ::: Locations ::: Contact

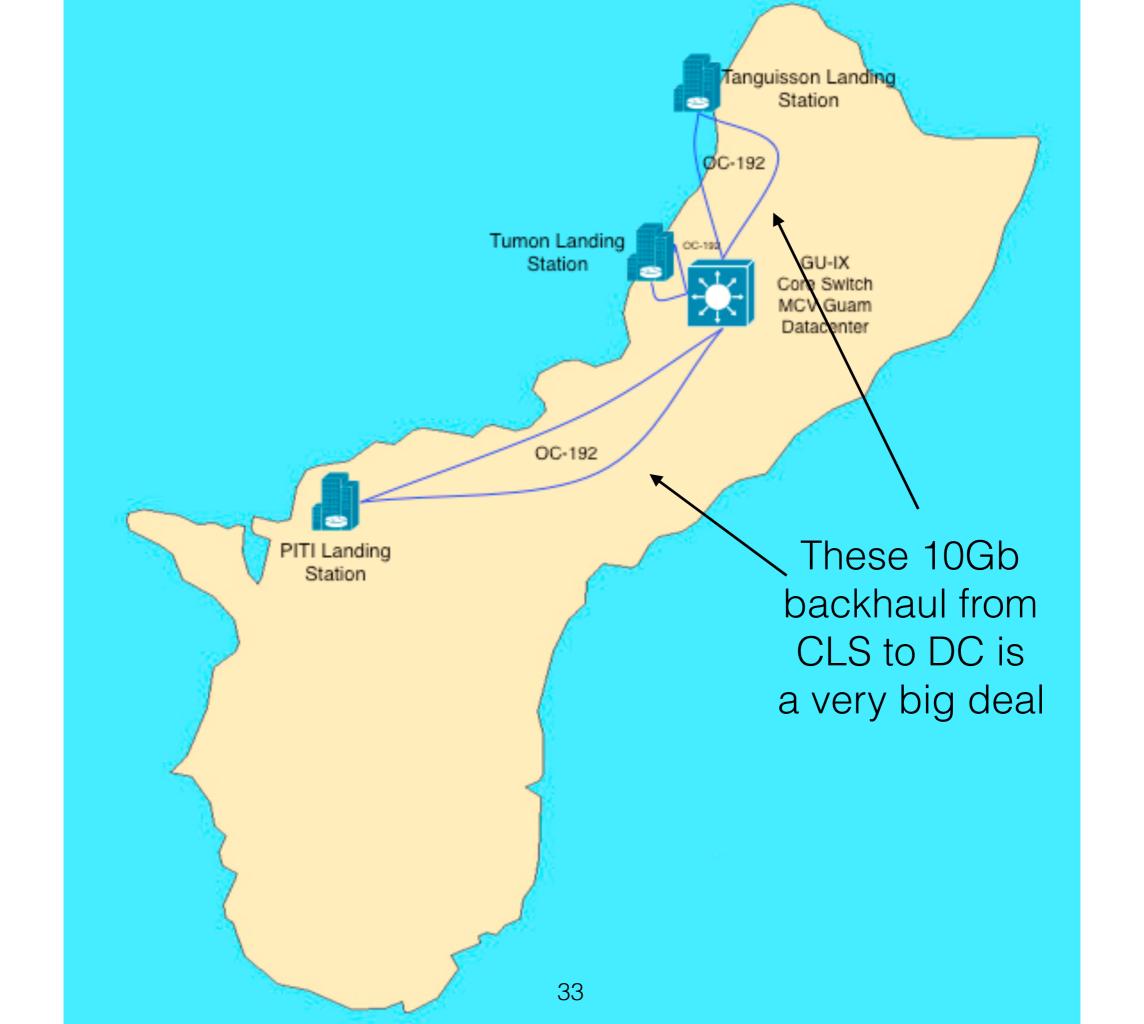
::: Members

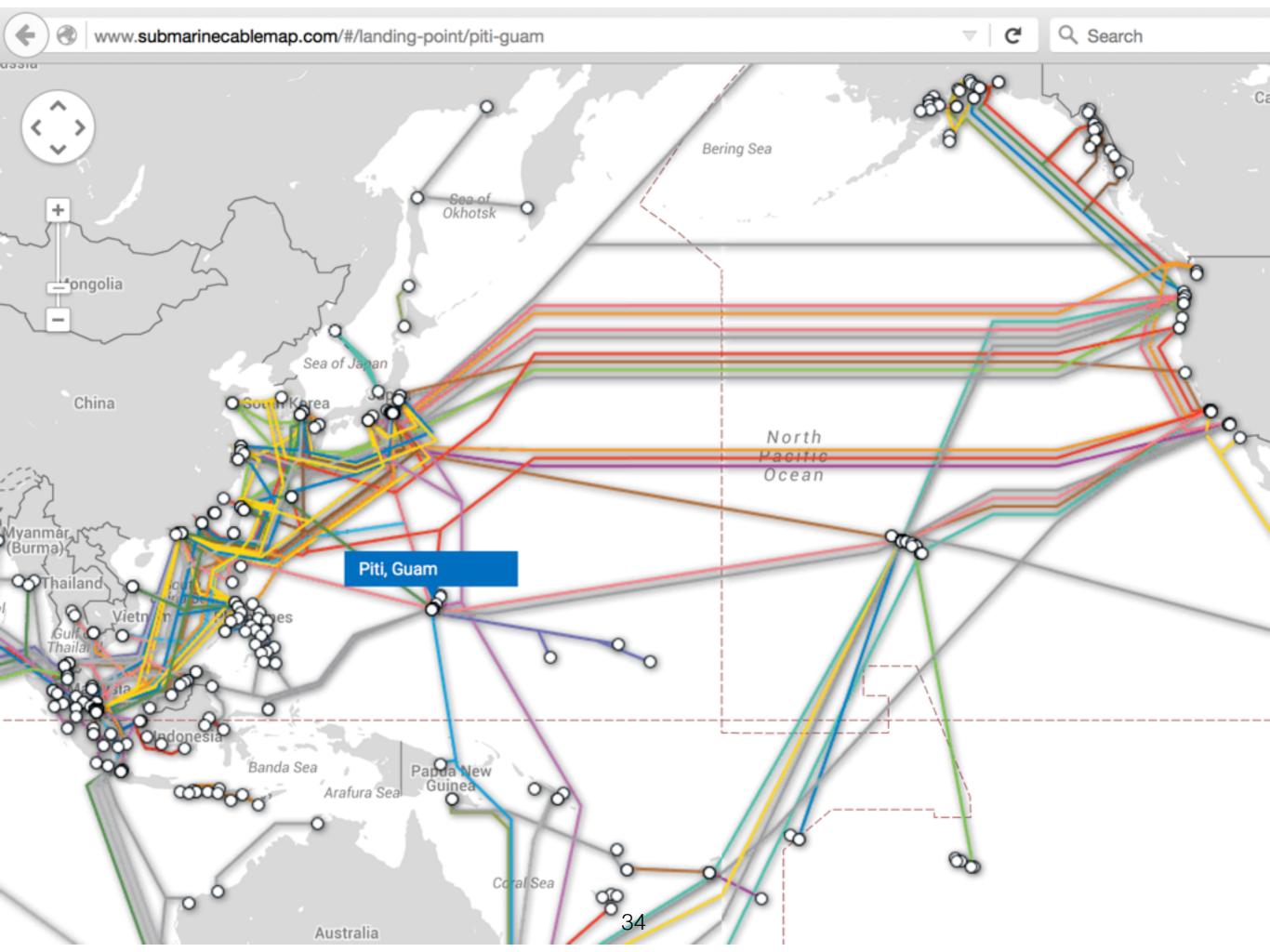
Company Name ( or DBA )	ASN	
Guam Cablevision / Kuentos Communications	AS3605	
FSM Telecom	AS10130	
ICANN / L.ROOT-SERVERS.NET	AS20144	

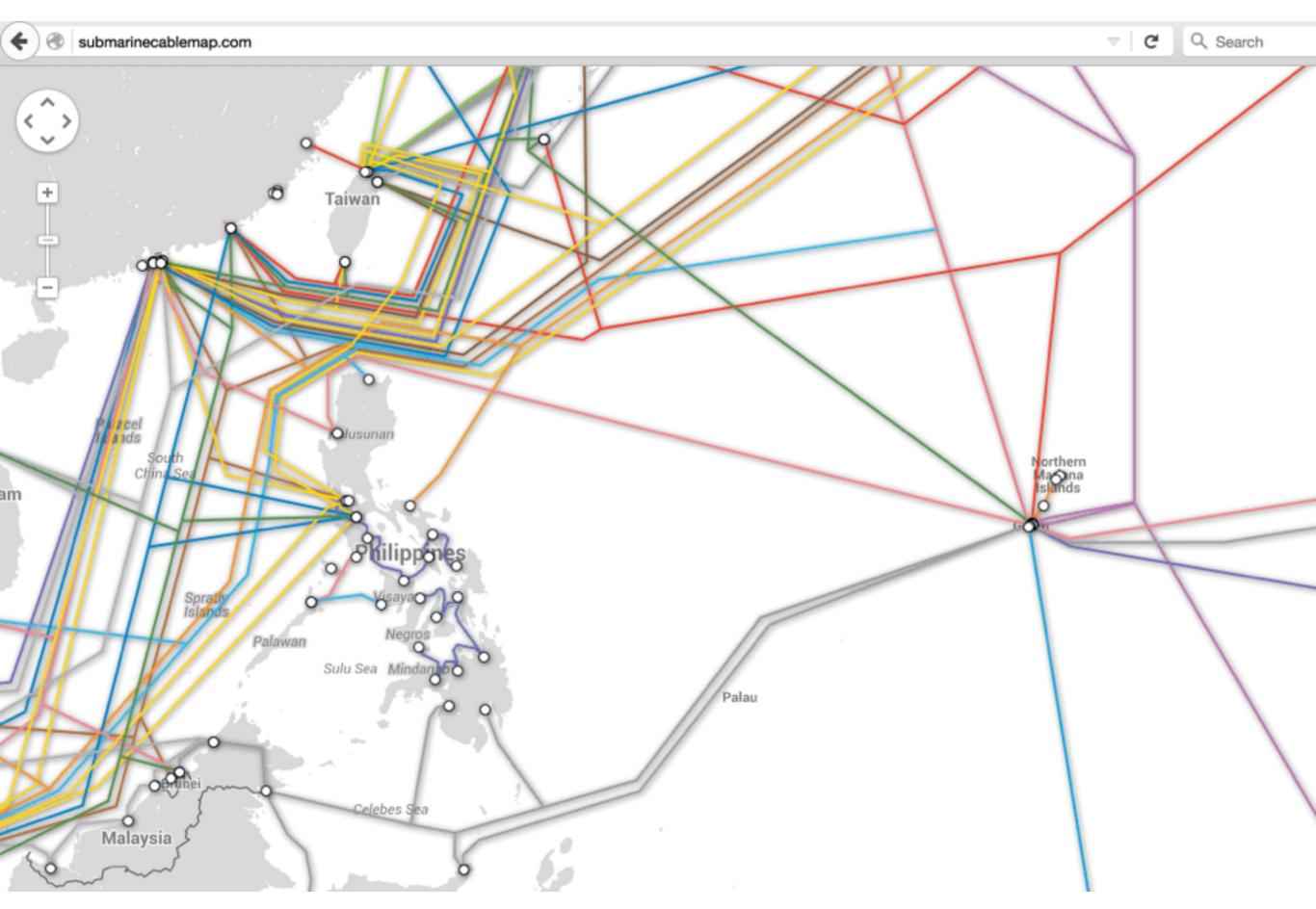
Copyright 2010 Guam Internet Exchange

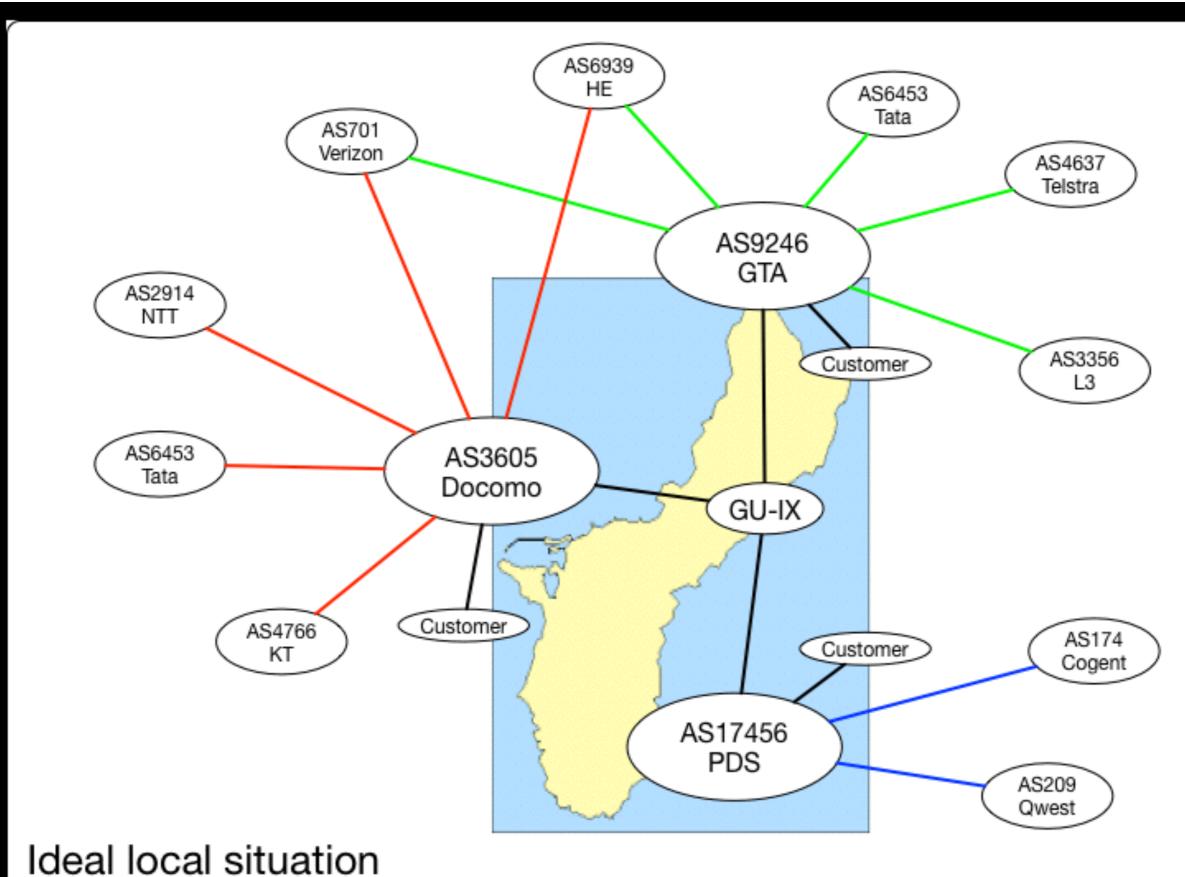


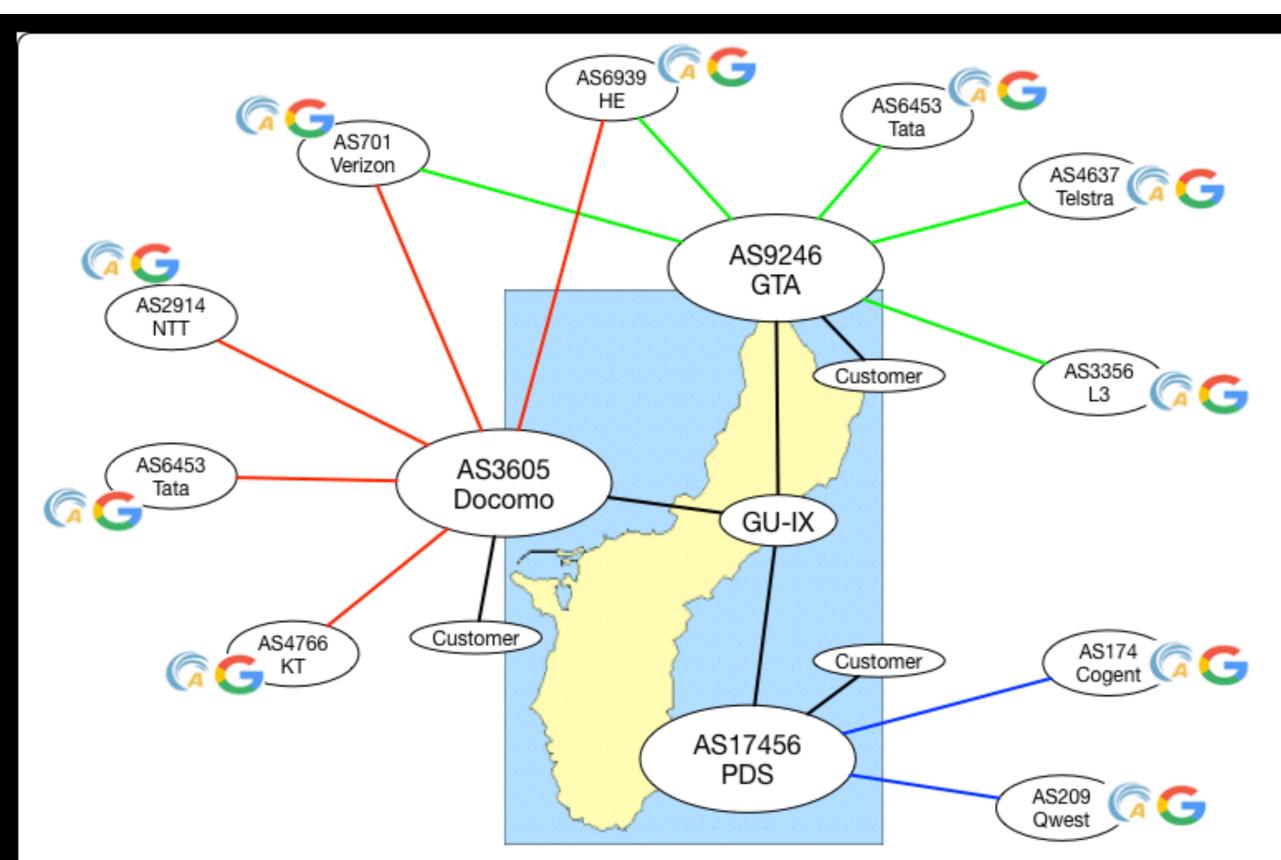




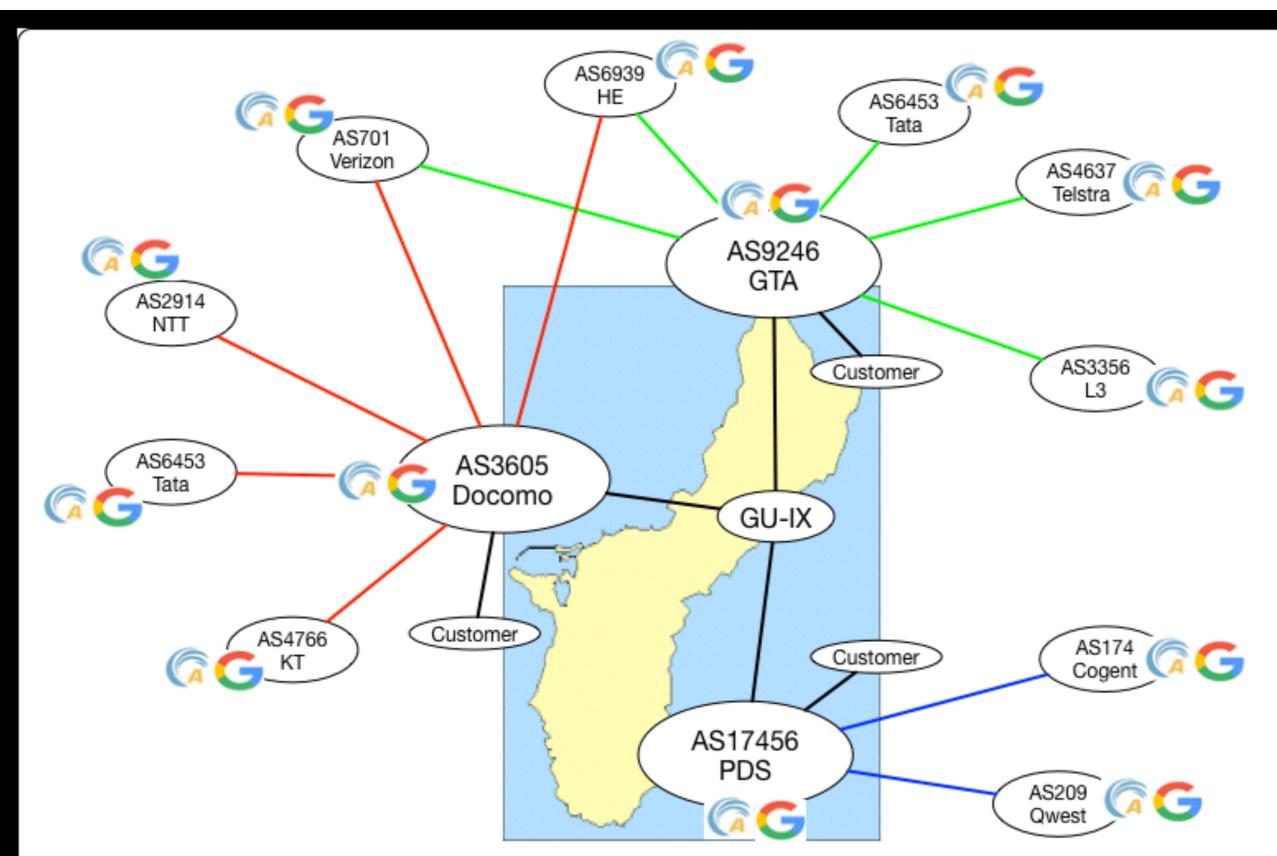




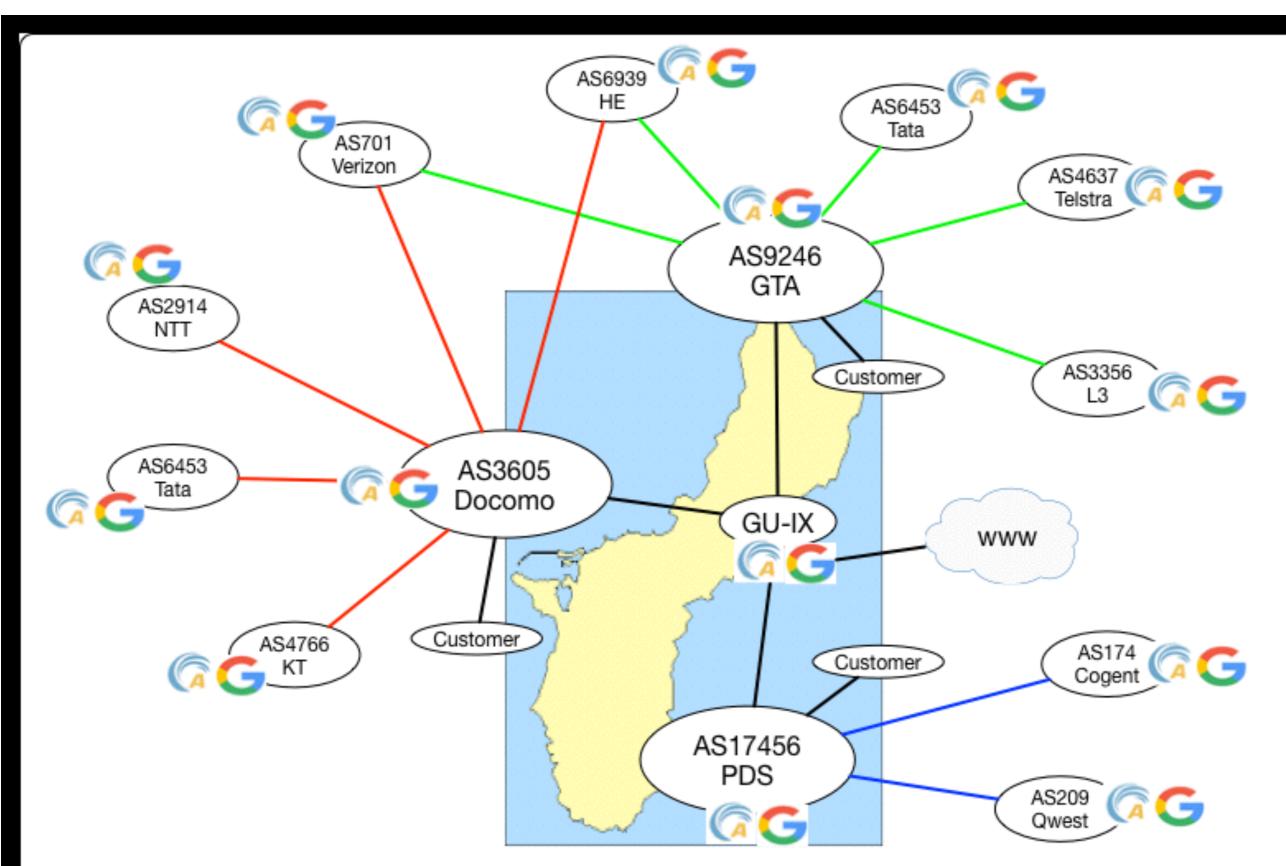




Uplinks would have CDNs



Local ISPs would probably have CDNs

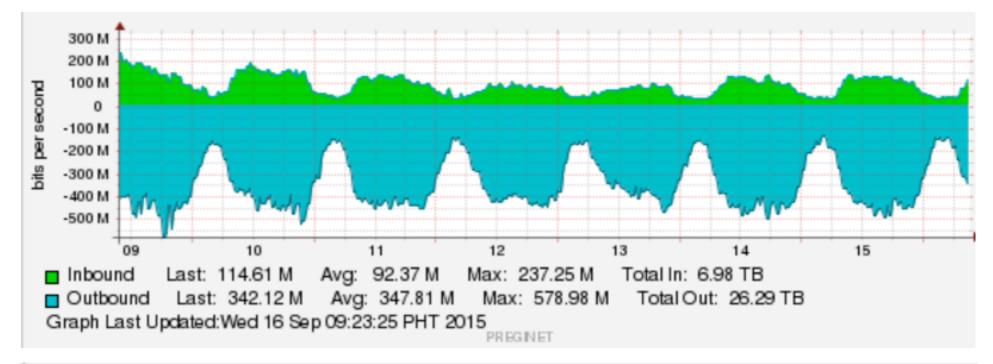


You can have a CDN at an IX, if somebody will provide an internet port for it to be able to sync up

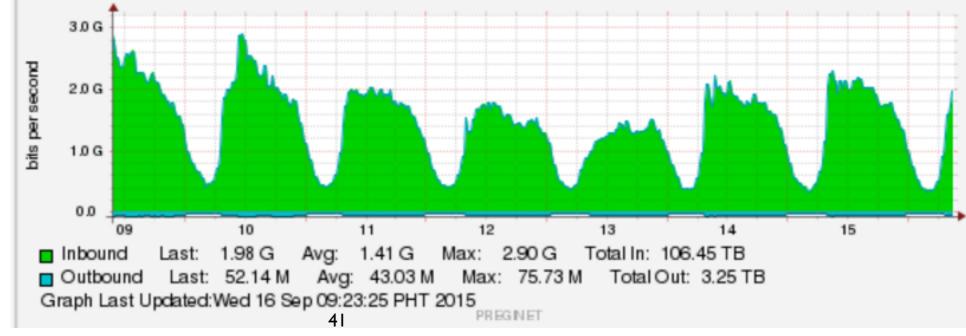
# Who pays for the internet port for the CDNs at the IX in the Philippines?



## Traffic IN from ASTI

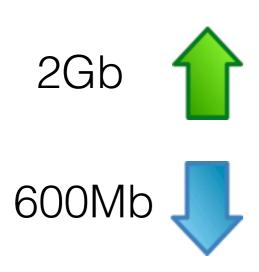


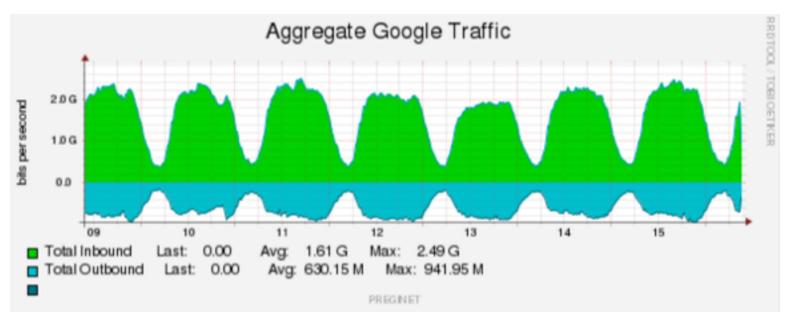
Traffic OUT onto PhOpenIX





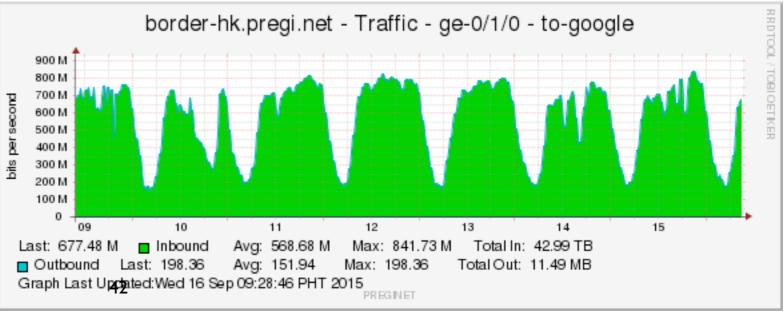
http://www.google.com/doodles/philippines-independence-day-2015





#### Your traffic levels qualify for Google Peering

Your network traffic could be better served through Google Peering



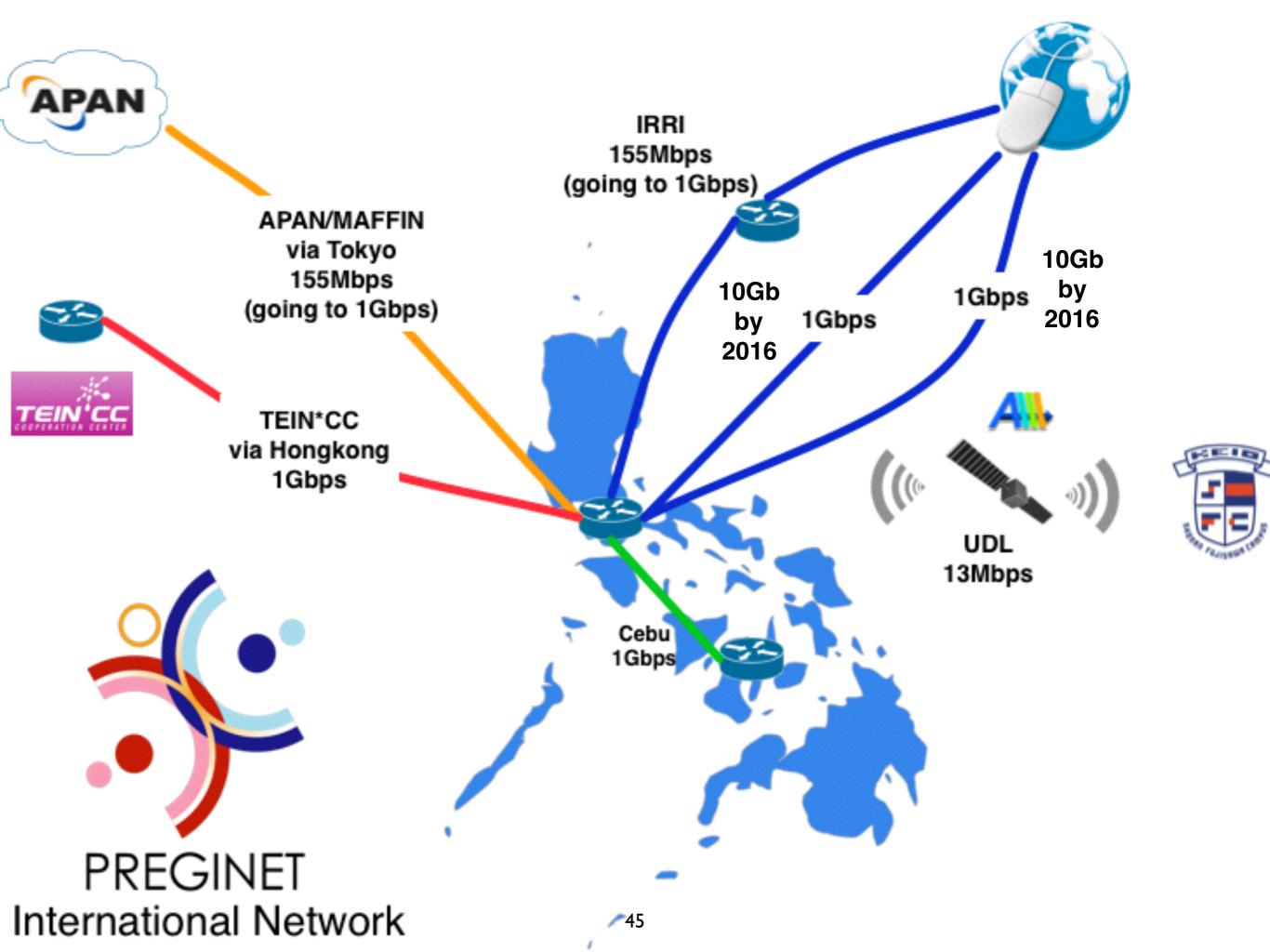
### Philippine Research, Education and Government nformation Network



#### PREGINET

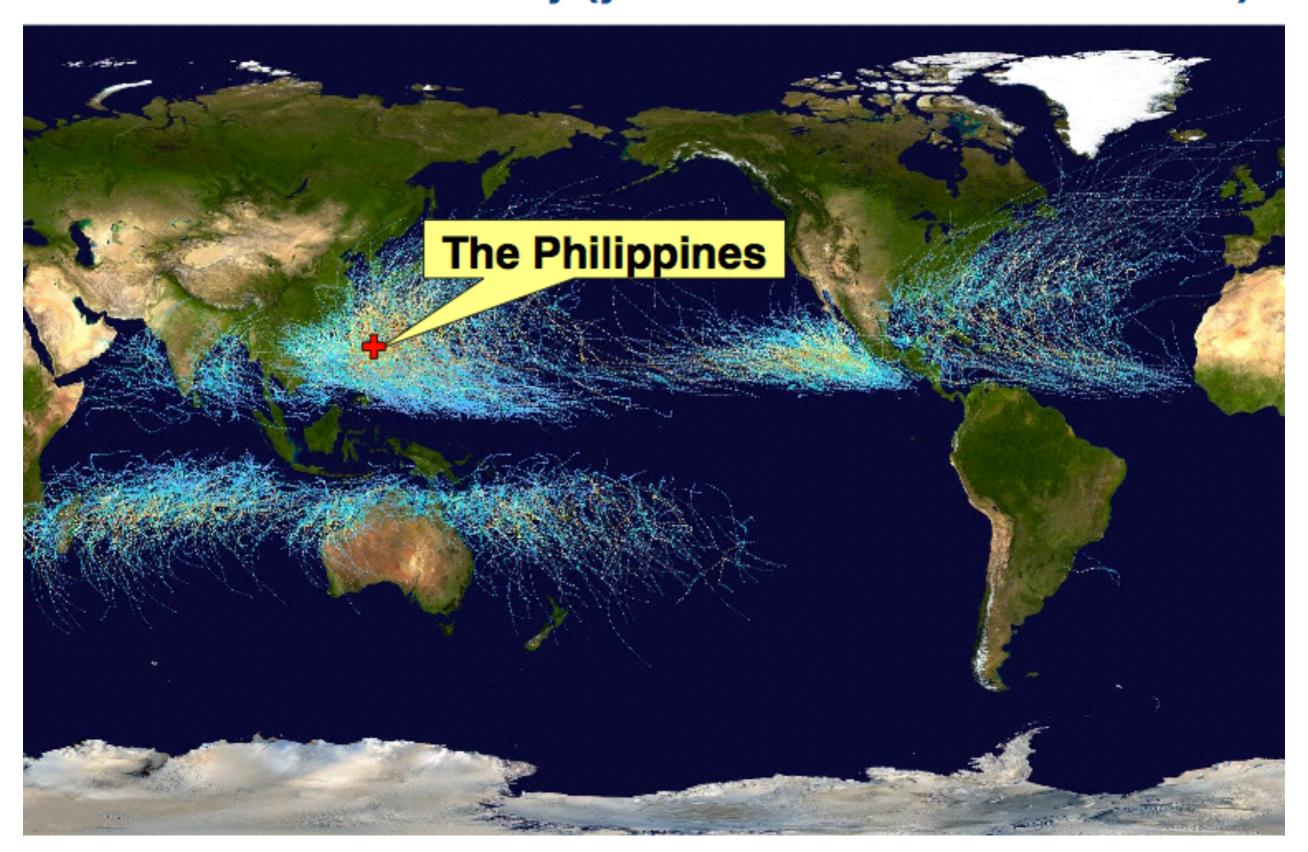
- Philippine Research, Education and Government Information Network
- Proposed as a DoST project around 1999
- Granted funding around 2000
- Has been running as the only research and education network of the Philippines for the past 14 years





#### Problems we address

#### Tracks of all Tropical Cyclones, 1985 to 2005. Colours indicate intensity (yellows to reds = most intense).



http://icfr2013.ex.ac.uk/papers/BI\_Duncan.pdf



Photo credit: onlinehome.us



http://s1.ibtimes.com/sites/www.ibtimes.com/files/styles/v2\_article\_large/public/2013/11/10/ typhoon-1.jpg



http://images.gmanews.tv/v3/webpics/ v3/2013/08/2013\_08\_21\_14\_36\_49.jpg



http://motioncars.inquirer.net/files/ 2014/07/620x413x20140716JB-18.jpg.pagespeed.ic\_.UEhJglAFKO.jpg

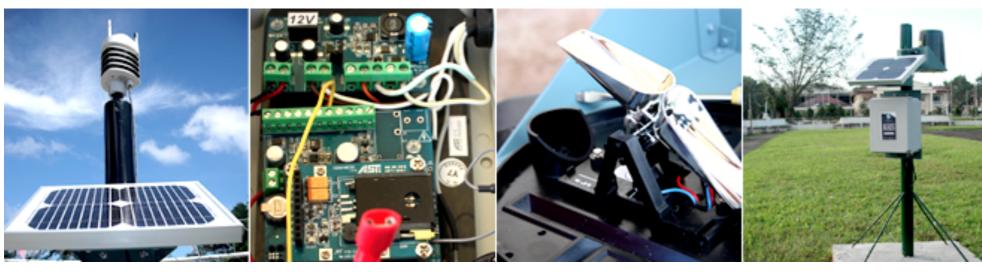


# Orchids Home Subidivision, Santiago, Iligan

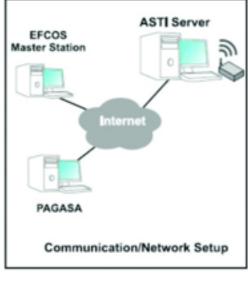
#### Initiatives

- Deployment and installation of hydrometeorological sensors
- Integration of doppler radar, ground stations, and satellite remotely-sensed data into forecast models
- HPC implementation of Numerical Weather Prediction (NWP) model systems
- Use of 3D LIDAR technology for generation of hazard maps and flood inundation models
- Establishment of a central data archiving facility

#### http://embedded.asti.dost.gov.ph/projects

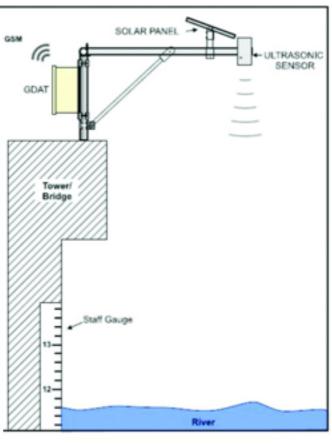






Installation of ASTI Water level Monitoring Apparatus



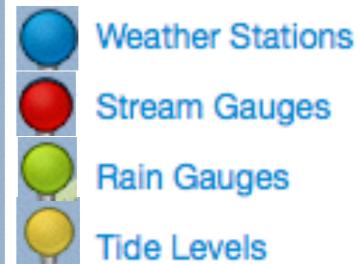


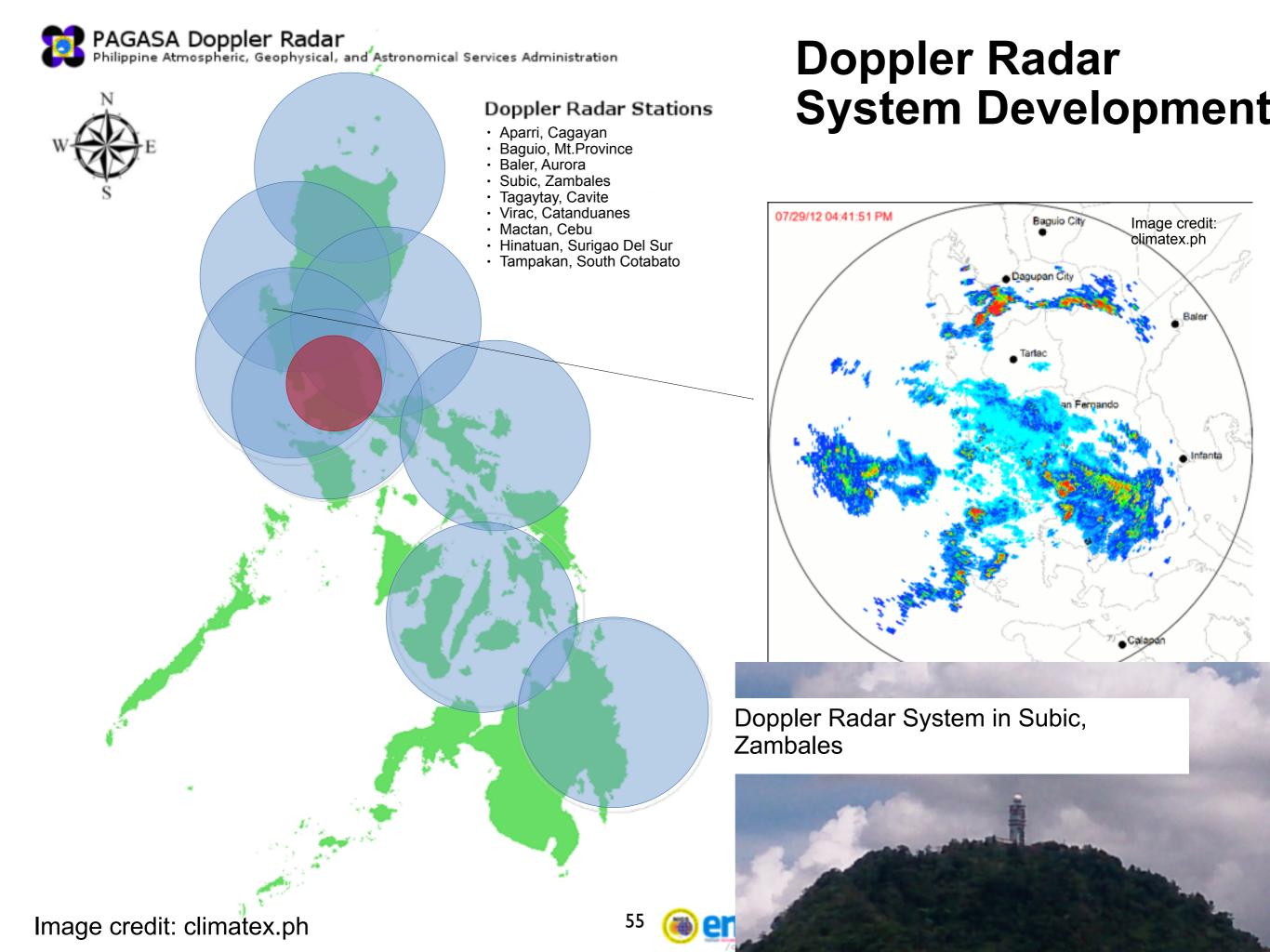


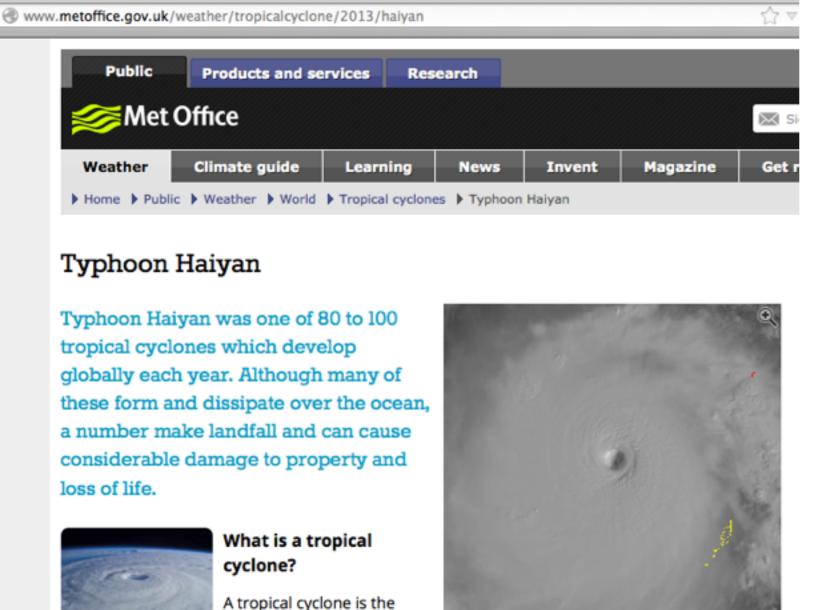
#### http://embedded.asti.dost.gov.ph/projects











generic term for a low

pressure system over tropical or sub-tropical

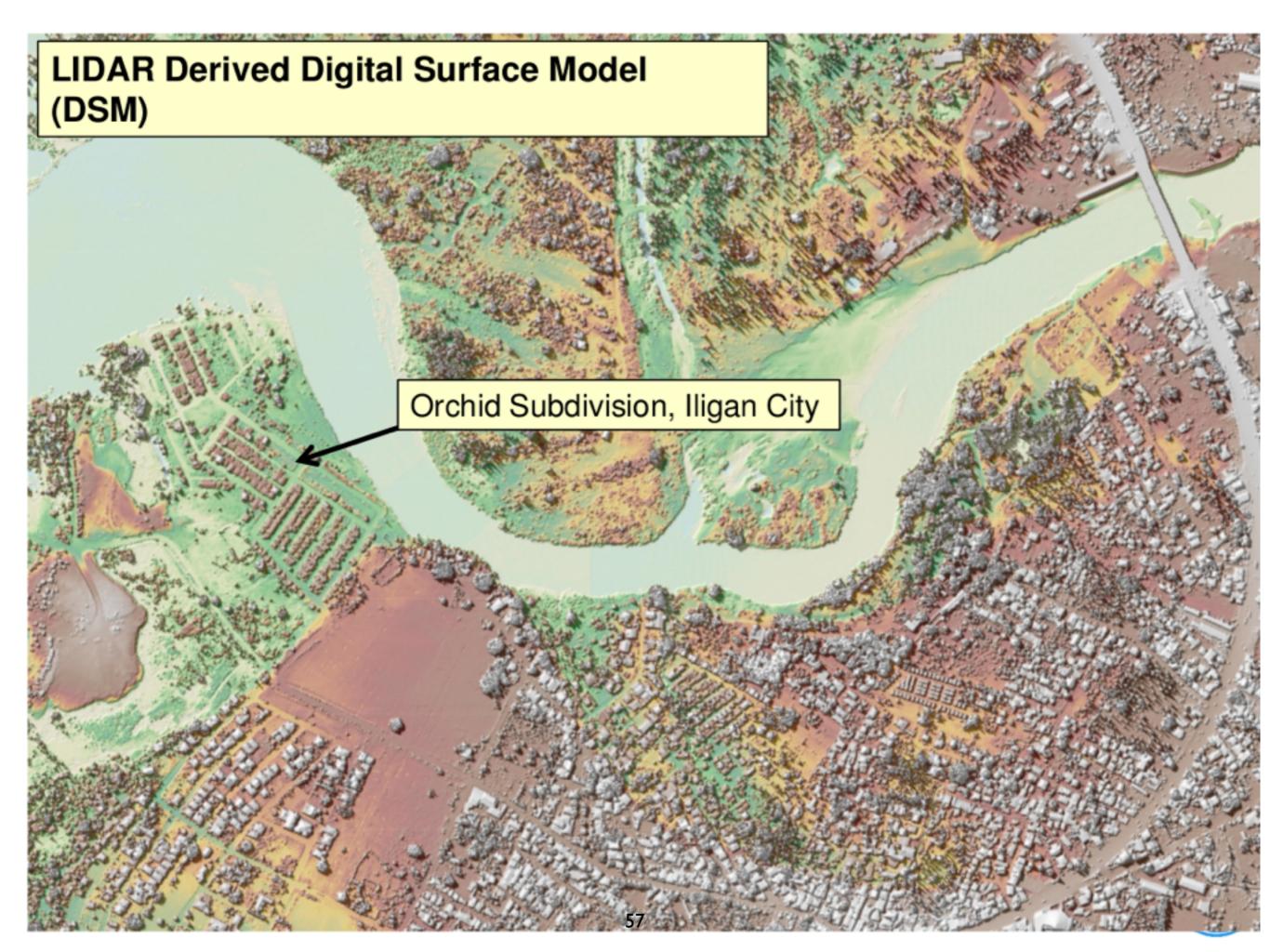


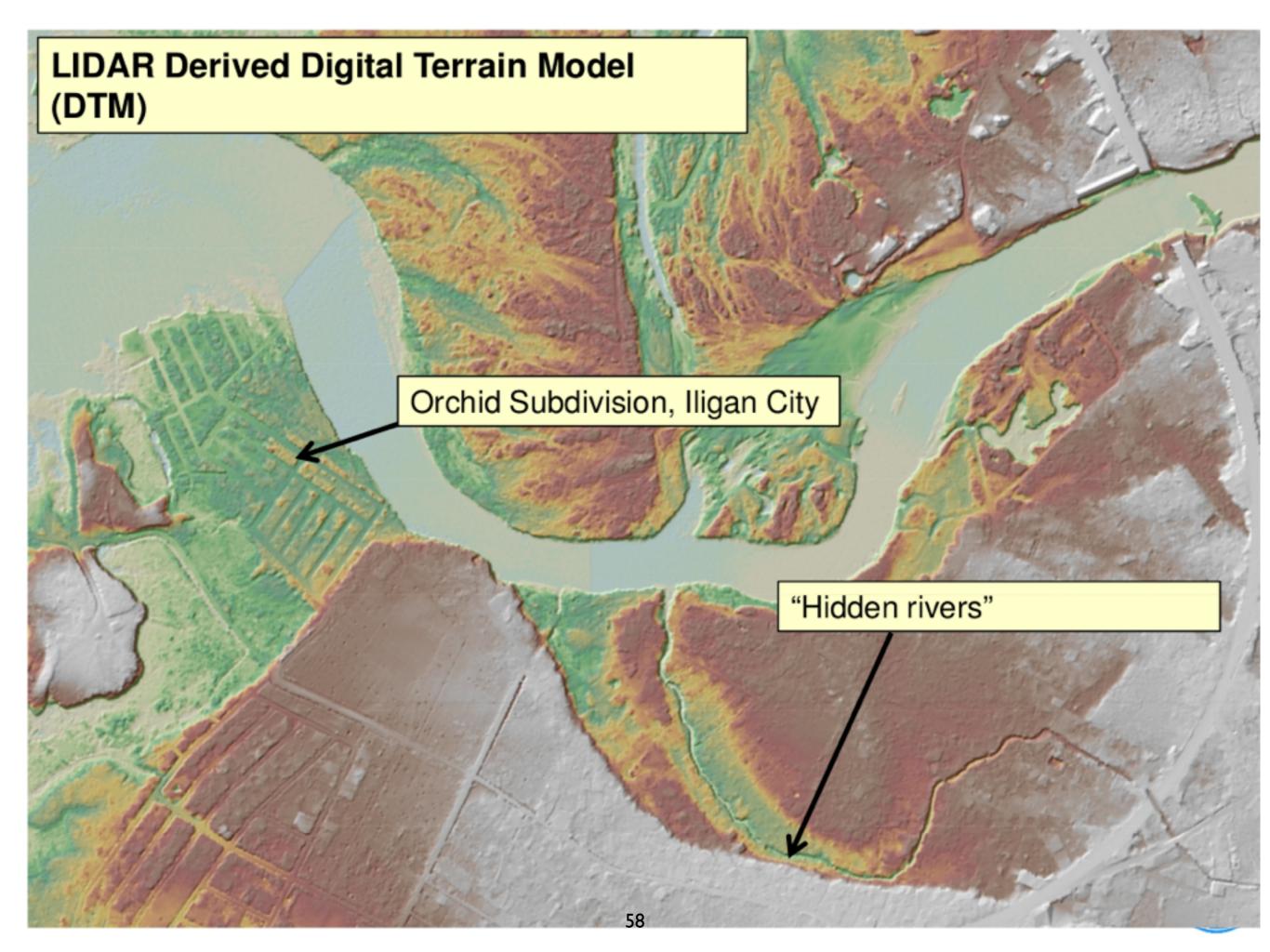
#### Transfer of data is done using TEIN-CC's digital SilkRoad

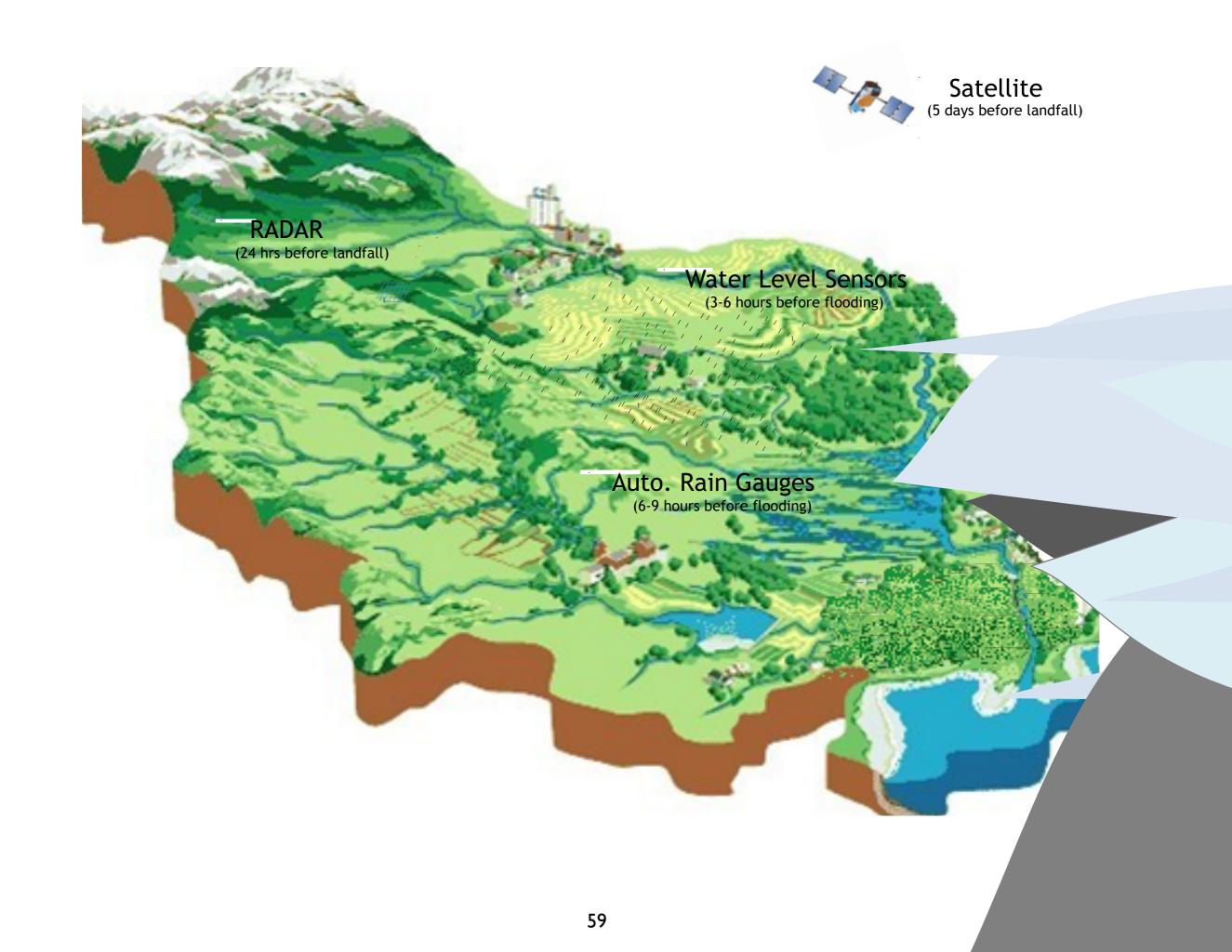


From Germany's weather bureau, we transfer around 15 files (14Mb each) of weather data twice a day

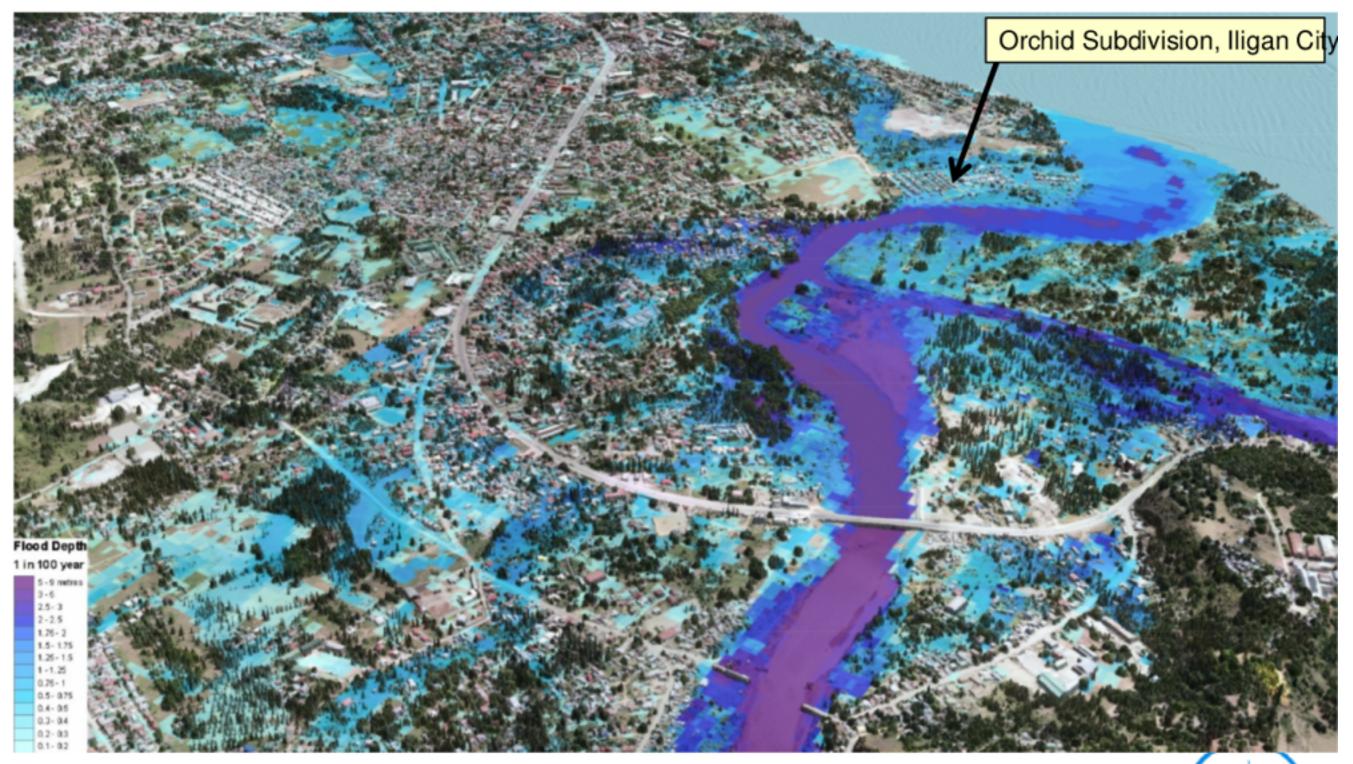
From the MET office of UK, we transfer 2 files (~200Mb each) of weather data, also twice a day







#### 3D Visualisation of the Flood Model derived using LIDAR data for the Mandulog River, Iligan City. 1 in 100 year event modelled, flood depth shown.

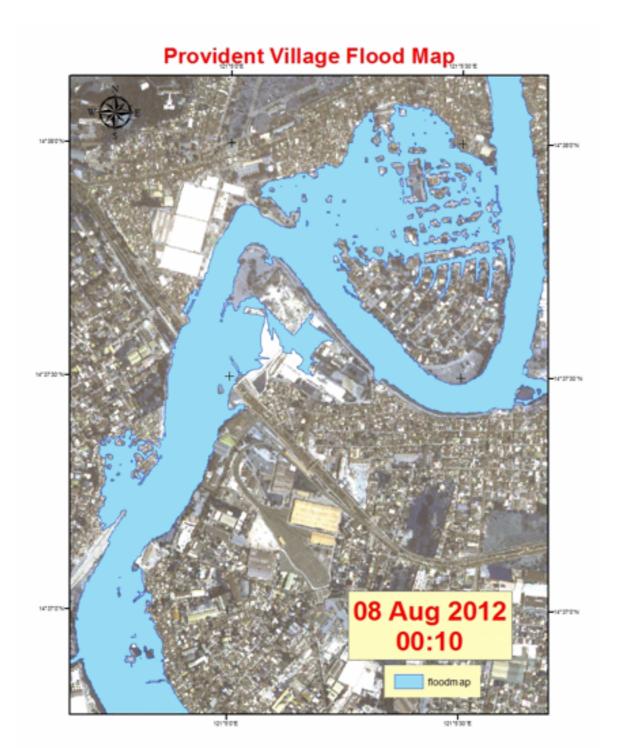




© Image from 1 in 100 year flood model produced by the DREAM-LIDAR component of Project NOAH. Modelled flood depth is shown overlain on the surveyed aerial photo and LIDAR Digital Surface Model.

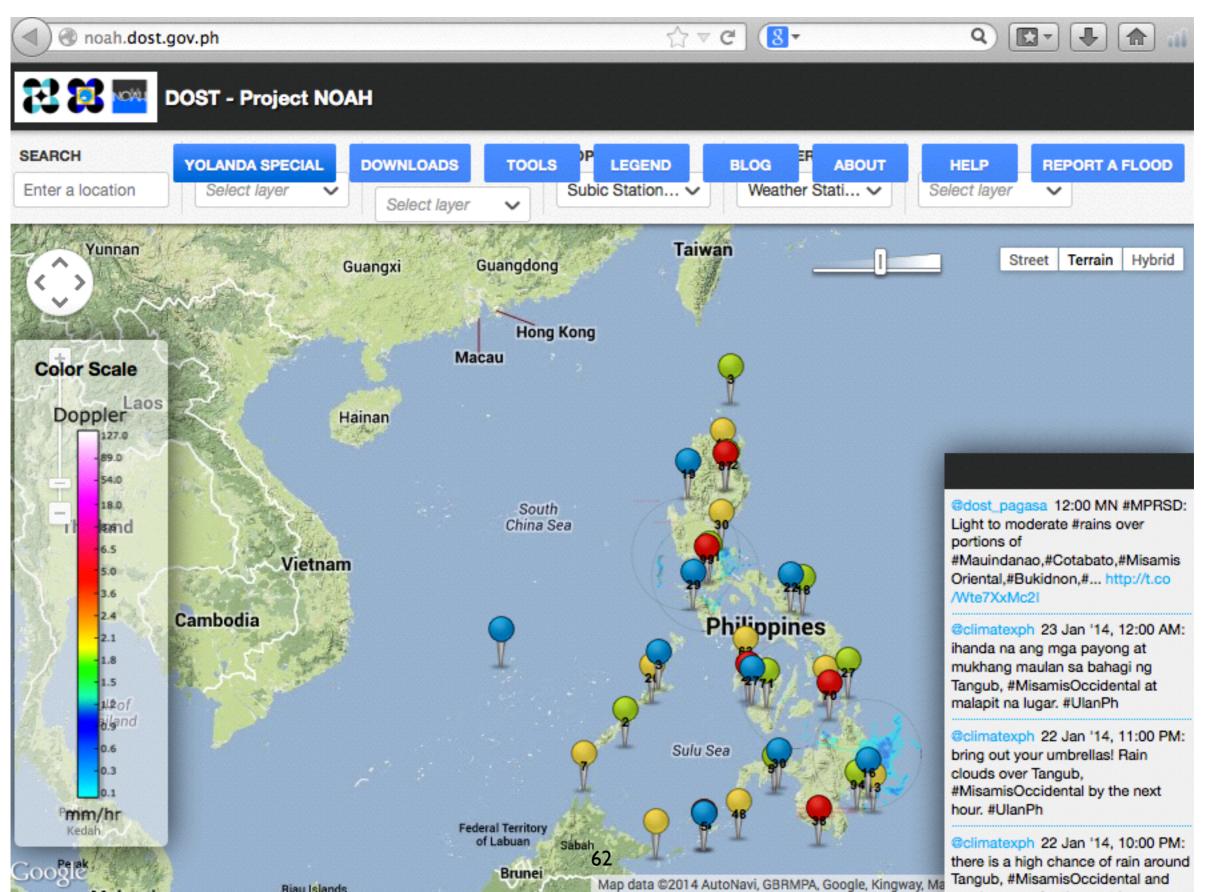
#### Rapid Flood Simulation for Flood Events



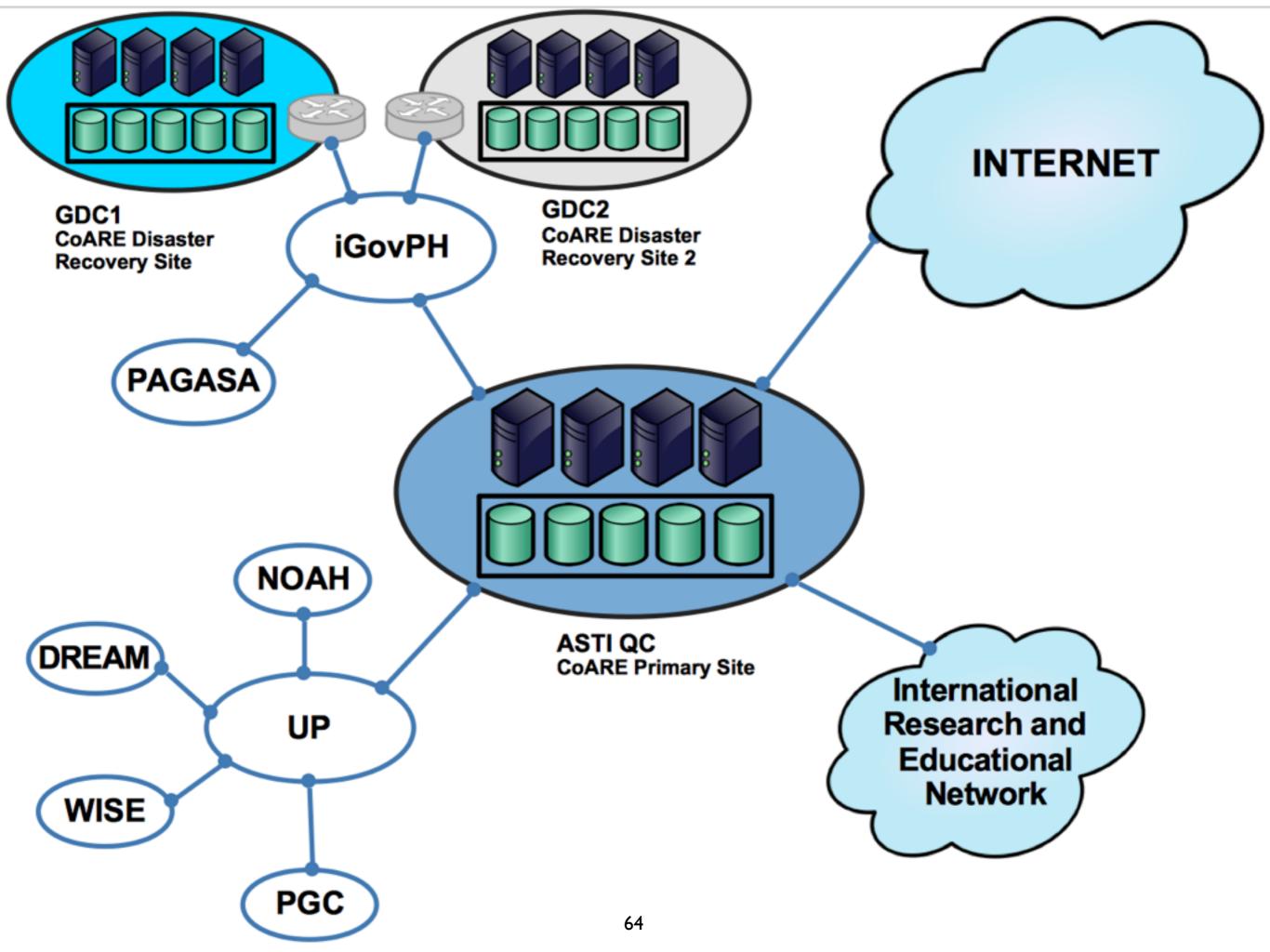


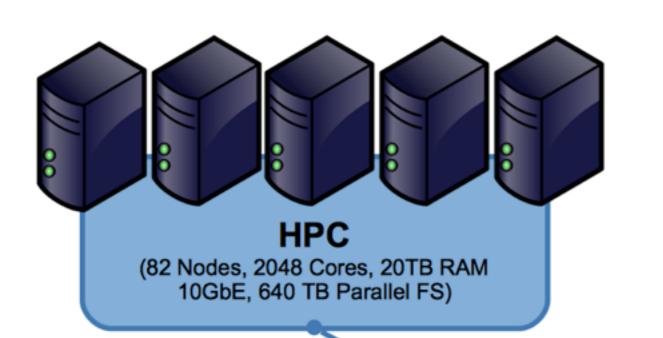


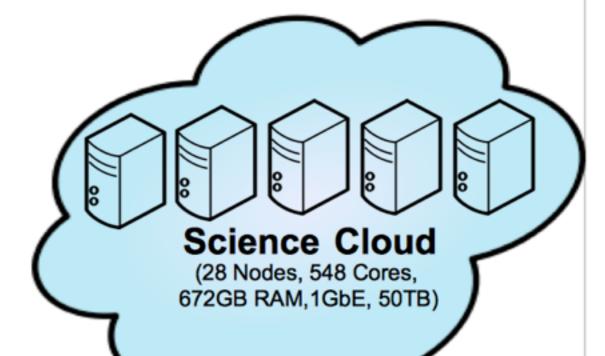
#### http://noah.dost.gov.ph



## High Performance Computing (HPC)







Computing and Archiving Environment (CoARE)

## Storage Facility (3 sites x 20 nodes, 1.5 PB, 10GbE)

#### 2015: WHERE WE ARE NOW

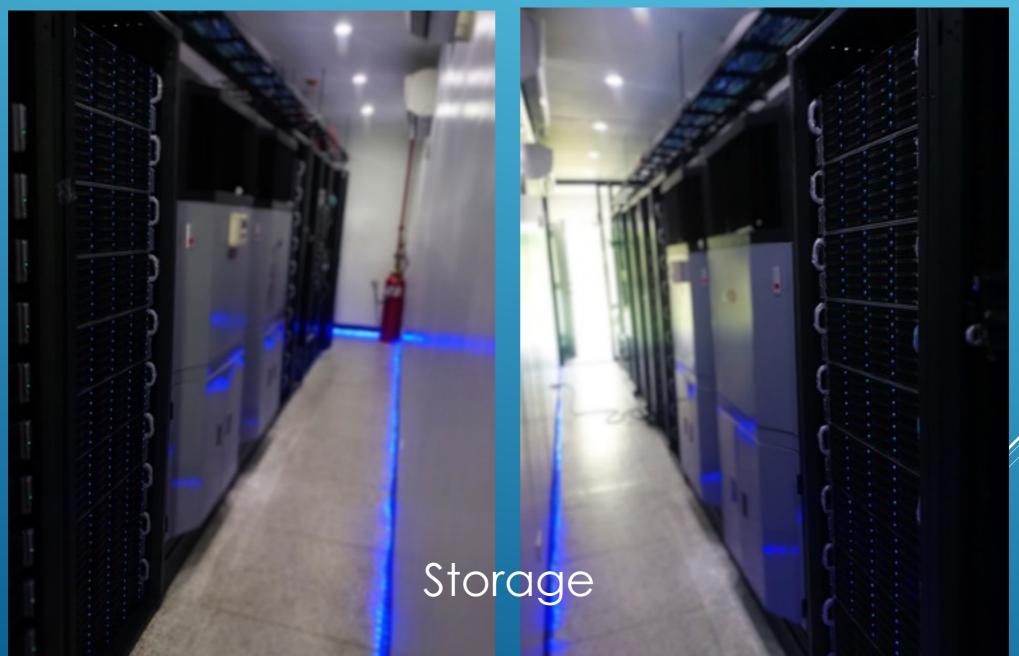
Computing and Archiving Research Environment (CoARE)

**Project** 



#### 2015: WHERE WE ARE NOW

Computing and Archiving Research Environment (CoARE)
 Project



#### 2015: WHERE WE ARE NOW

Computing and Archiving Research Environment (CoARE)
 Project



E □ □ C



#### Introducing Diwata, the first Philippine-made satellite

Diwata is one of two micro-satellites the Philippines hopes to launch in 2016 and 2017. It is expected to improve weather forecasting, disaster management, forest protection and other public services.



Pia Ranada

@piaranada

Published 12:11 PM, March 10, 2015

Updated 1:23 PM, March 10, 2015



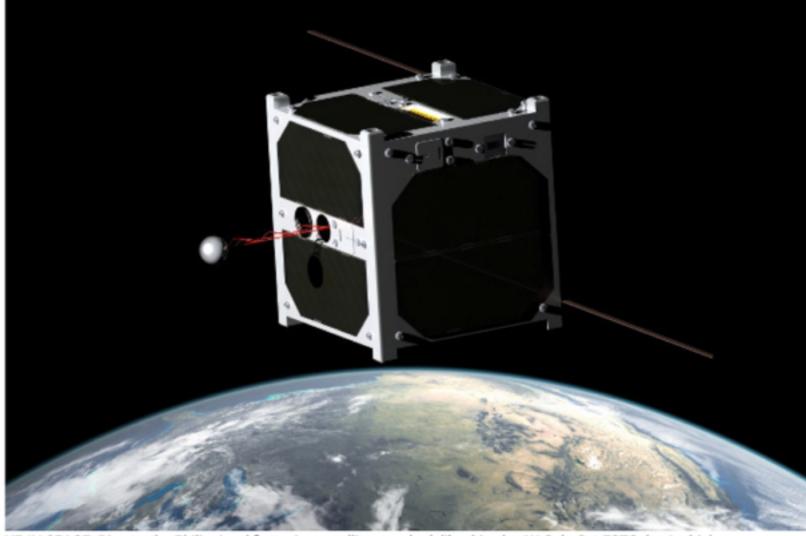












UP IN SPACE. Diwata, the Philippines' first microsatellite, may look like this, the 1U CubeSat ESTCube-1 which was developed by Estonia. Image from Wikipedia

MANILA, Philippines - The Philippines will launch its very own satellites into space in 2016 and 2017, the Department of Science and Technology (DOST) announced on Tuesday, March 10.

## Philippine Satellite Project

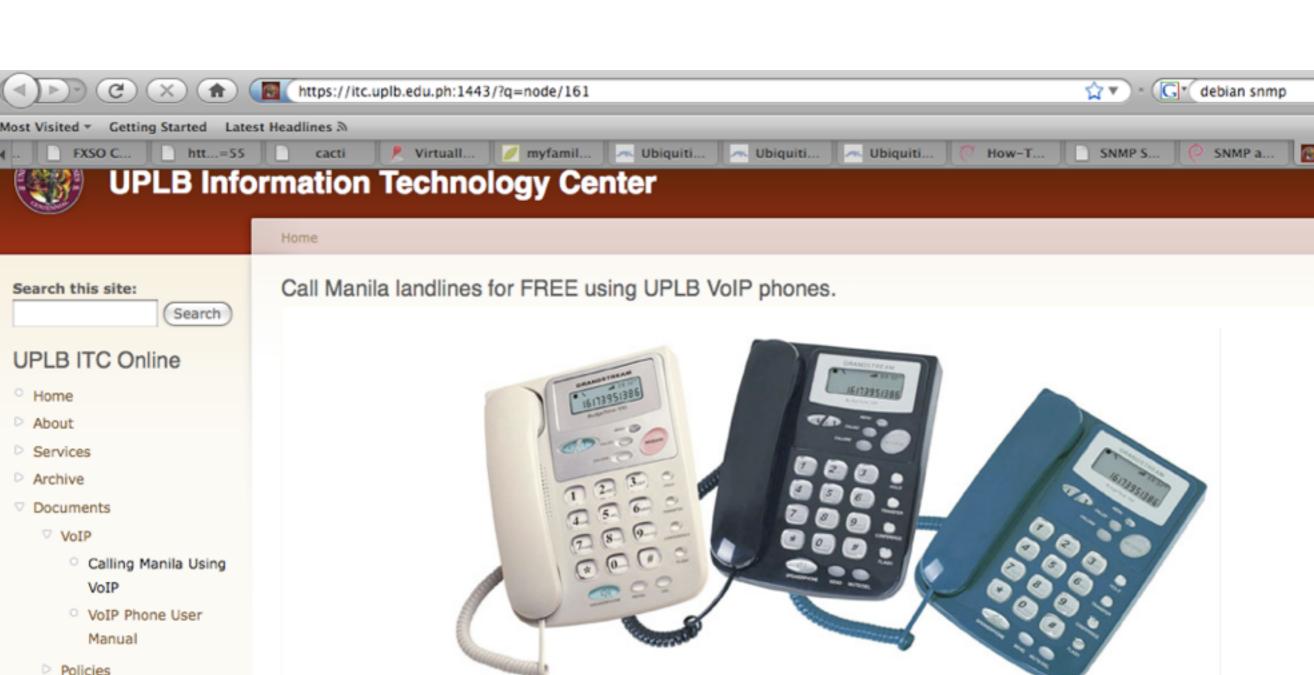
- A ground receiving station will be setup and it will be linked to PREGINET
- The Philippine NREN will be the primary storage facility of the data collected by this infrastructure



APAN 26th (NZ)







We can now make use of our VoIP phones to call Manila landlines with no additional costs. It is just like calling your neighbor. This was made possible by the generous action of IRRI of letting UP Los Banos share its direct fiber optic connection for non-commercial traffic; thus, creating a direct connection to UP Dilliman.

VoIP calls to Manila will not mean additional bandwidth consumption for UPLB. Instead of going through our leased lines (ISP), VoIP calls will pass through the IRRI-UPD link via PREGINET. This feature will save UPLB some money on its official call transactions on Manila area, specially with the UP Diliman campus.

Tutorials

Contact Us

Author Portal

UPLB VoIP Directory



#### Office of the President of the Philippines COMMISSION ON INFORMATION AND COMMUNICATIONS TECHNOLOGY

#### MEMORANDUM CIRCULAR No. \_01\_

Subject:

Implementing Rules and Regulations (IRR) of Executive Order

(E.O) No. 893 - Promoting the Deployment and Use of Internet

Protocol Version 6 (IPv6)

Whereas, pursuant to Section 24, Article II (Declaration of Principles and State Policies) of the 1987 Constitution states that, "The State shall recognize the vital role of communication and information in nation-building";

Whereas, advanced Internet services are now widely used and have become an enabler to social and economic development of all countries, as these services have increased worker productivity and connected local businesses to local and international markets;

### IPv6 Summit 2011





Video



2011 State of the Nation Address

#### Benigno S. Aquino III, Second State of the Nation Address, July 25, 2011

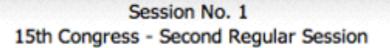
Senate President Juan Ponce Enrile; Speaker Feliciano Belmonte Jr.; Bise Presidente Jejomar Binay; mga dating Pangulong Fidel Valdez Ramos at Joseph Ejercito Estrada; Chief Justice Renato Corona at ang ating mga kagalang-galang na mahistrado ng Korte Suprema; mga kagalang-galang na kasapi ng diplomatic corps; mga butihing miyembro ng Kamara de Representante at ng Senado; mga Local Government officials; mga miyembro ng ating Gabinete; mga unipormadong kasapi ng militar at kapulisan; mga kapwa ko nagseserbisyo sa taumbayan;

At sa mga minamahal kong kababayan, ang aking butihing mga boss: Continue reading →

#### Benigno S. Aquino III, Second State of the Nation Address, July 25, 2011 (English translation)

Senate President Juan Ponce Enrile; Speaker Feliciano Belmonte Jr.; Vice President Jejomar

Legislative Documents Secretariat Senators Gallery About Committees Publications





Live Video Stream





#### SUPREME COURT OF THE PHILIPPINES

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OTHER COURTS

ATTACHED INSTITUTIONS

JURISPRUDENCE

ADMINISTRATIVE MATTERS

**BAR ADMISSIONS** 

ABOUT THE SC

PUBLIC INFORMATION



#### Features AASAA

#### 2011 BAR EXAMINATIONS

Preparing for Bar Examinations and Beyond Syllabus for 2011 Bar Examinations

#### SMALL CLAIMS

Amended Rule of Procedure for Small Claims Cases Downloadable Forms Small Claims Poster

#### RULE OF PROCEDURE FOR ENVIRONMENTAL CASES

A.M. No. 09-6-8-SC Annotation Rationale

MORE >>

SUPREME COURT NEWS

RECENT DECISIONS



# UPLB Graduation 2011 <a href="http://graduation.uplb.edu.ph/">http://graduation.uplb.edu.ph/</a>

- over 500++ simultaneous network connections!
- 30233 unique IPs connected
- ate up almost 100Mbps of outbound traffic

#### Network Time Protocol

ntp.phopenix.net



PAGASA's newly installed atomic clock



#### PHILIPPINE STANDARD TIME



#### www.pregi.net

This is the public mirror service of PREGINET.

Access to the software archives are available via <a href="http://example.com/html/>HTTP">HTTP</a> or <a href="http://example.com/html/>FTP</a>.

DISCLAIMER: The use of the facility is at your sole risk and comes with no implied warranty of any kind.

#### Index of /

<u>File Name</u> ↓	File Size ↓	<u>Date</u> ↓
CPAN/	-	2015-Nov-28 21:33
<u>Linux/</u>	-	2015-Nov-06 14:35
<u>R/</u>	-	2015-Nov-29 03:13
apache/	-	2015-Oct-28 01:14
<u>centos/</u>	-	2015-Nov-29 03:10
debian/	-	2015-Nov-29 12:23
<u>debian-cd/</u>	-	2015-Sep-09 22:16
epel/	-	2015-Nov-29 01:46
fedora/	-	2014-Nov-12 08:34
gnu/	-	2015-Oct-15 08:25
pub/	-	2015-Oct-28 14:58
rpmfusion/	-	2014-Jul-16 06:46
tex-archive/	-	2015-Nov-28 01:02
<u>ubuntu/</u>	-	2015-Nov-29 05:52
<u>ubuntu-releases/</u>	-	2015-Nov-28 00:40

Please send your comments and suggestions regarding this site by mail to ops-at-pregi-net.

# Back to internet exchanges

### How we started our IX

## Thank you



**Amante Alvaran**APNIC



Paul Wilson APNIC



**Bill Woodcock** PCH



**Gaurab Raj Upadhaya** PCH



Philip Smith Cisco



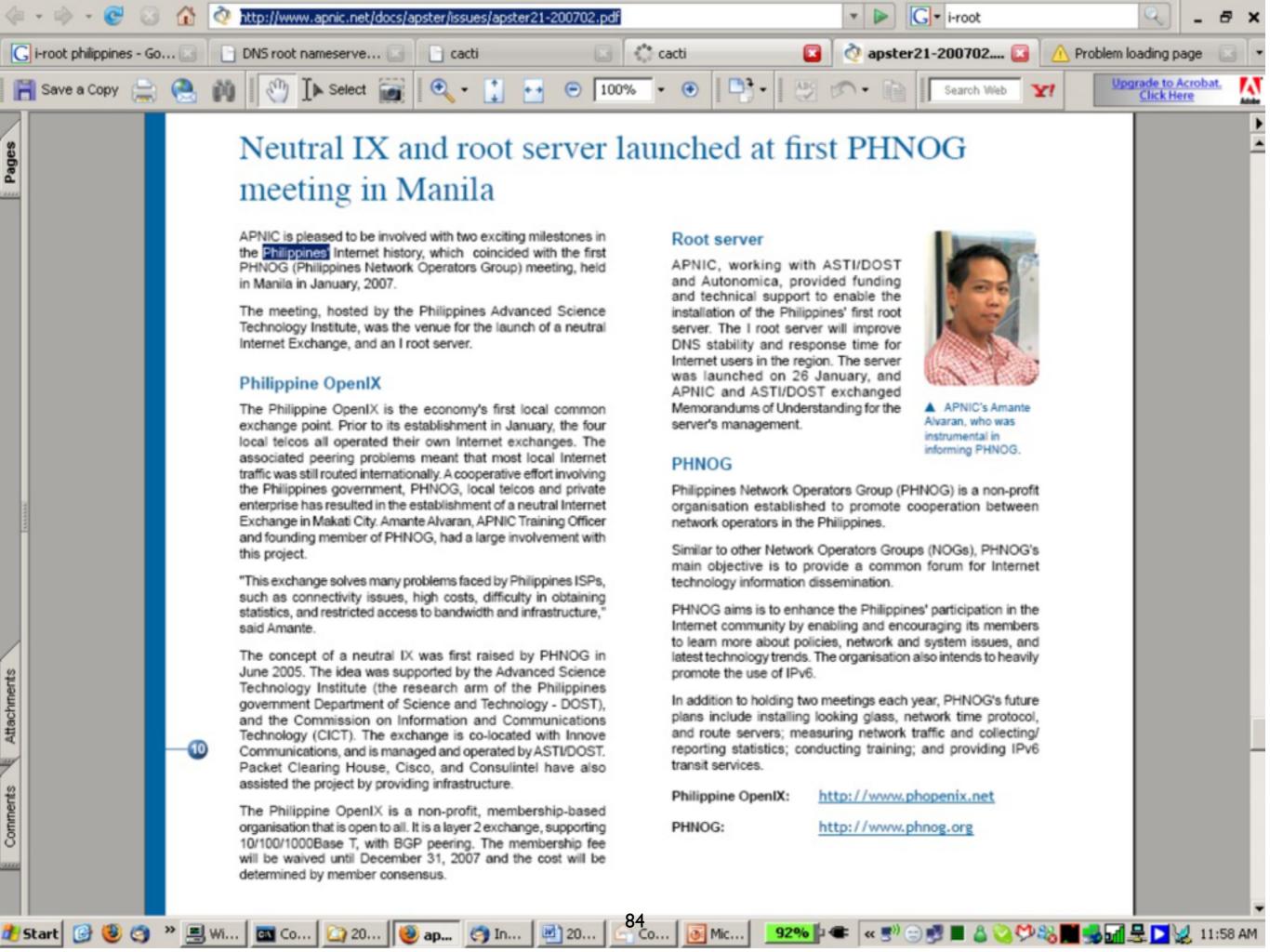
Kurt Lindqvist Netnod



Bill Manning USC ISI

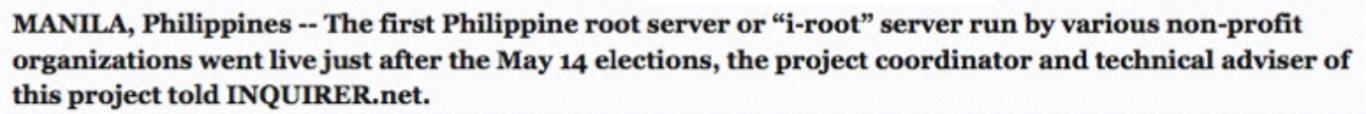


**Ceejay Dideles**ASTI-DOST



#### First RP 'root server' now live, improves local Net traffic

By Erwin Oliva INQUIRER.net Last updated 04:58pm (Mla time) 06/17/2007



Hoping to improve local Internet traffic in the Philippines, the Philippine "i-root" is now part of the Philippine Internet Open Exchange or PHOpenIX network which was launched in January 2007.

The i-root is currently operated by Autonomica from Stockholm, Sweden.

The PHOpenIX is a joint project managed by Advance Science Technology Institute of the Department of Science and Technology, the Philippine Network Operators Group, and the Asia Pacific Network Information Center, which awarded the hosting of the root server.

### First network to peer

# Wilson Chua: A single failure point for the Philippine Internet?

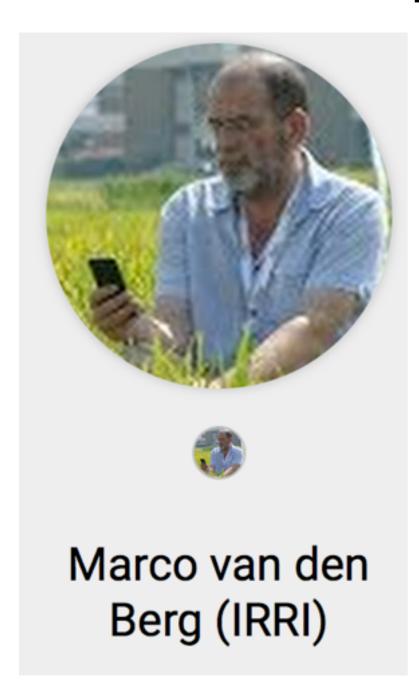
TAS Editor / 5 days ago

A single failure point for the Philippine Internet? by Wilson Chua The Asian Spectator 9 June 2015





# Helps us in bringing in equipment





## BGP Black Magic



### **BGP**

- Border Gateway Protocol
- The internet is a network of networks, and BGP is the protocol used to exchange bits and bytes between networks
- You need an AS number (we can help here)
- You need a minimum of 256 IPv4 addresses
- /24 IPv4 block

## Membership thru the years

2007 - 8

• 2012 - 0

2008 - I

2013 - I

42

2009 - 3

• 2014 - 11

"directly

• 2010 - 2

• 2015 - 16

peered"

• 20 | | - 0

**ASNs** 

http://www.phopenix.net/members

## How to promote the IX

## How to promote the IX

Network trainings





#### Advanced BGP Training

July 25, 2014

ASTI Bldg. UP Technopark Complex C.P. Garcia Ave. Diliman, Quezon City







## How to promote the IX

- Network trainings
- Network Operator Groups (NOG)









## How to promote the IX

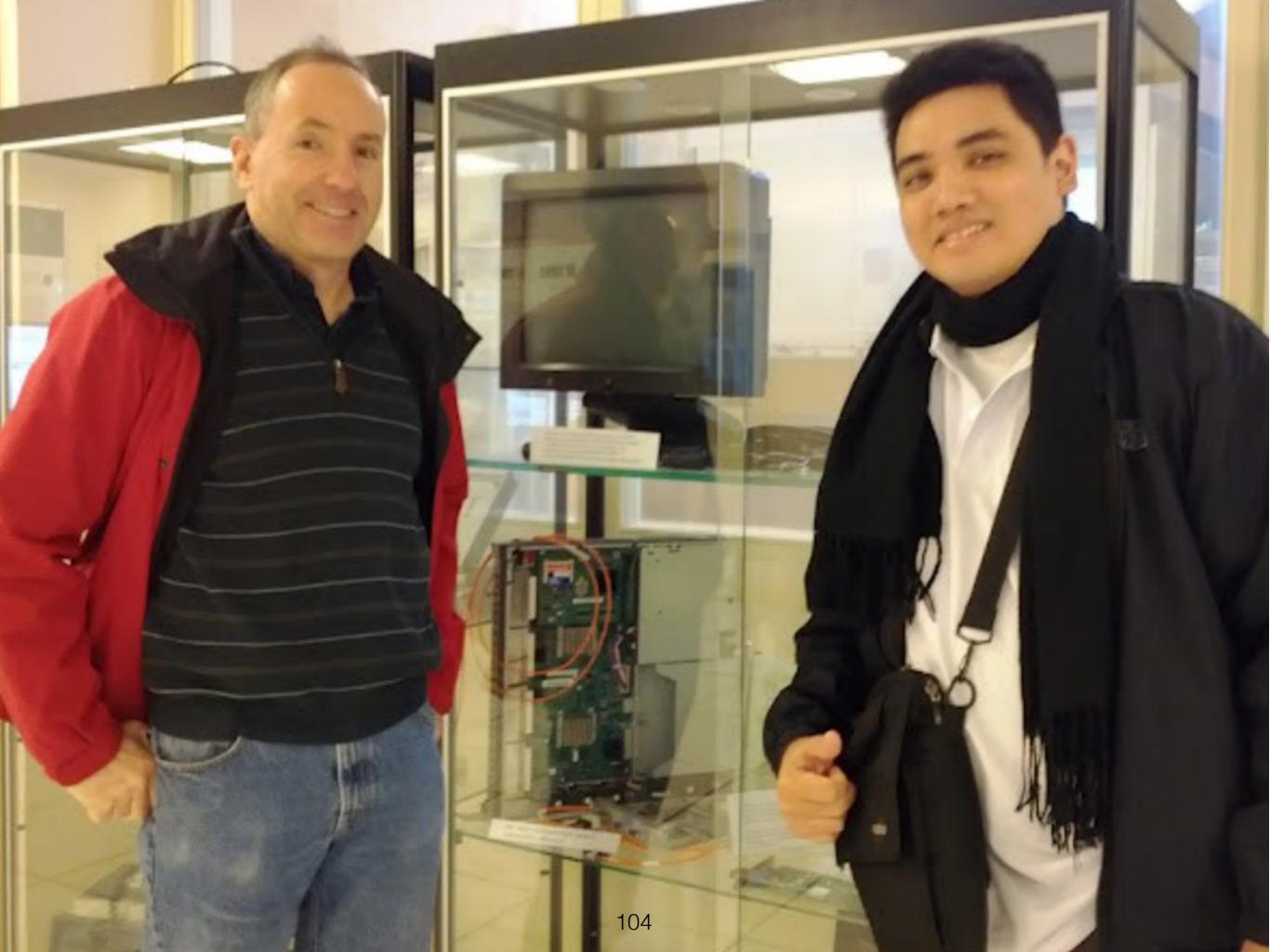
- Network trainings
- Network Operator Groups (NOG)
- Look for the peering managers of the networks (or their closest equivalent)

# PeeringDB

Global System Statistics	7055
Total Peering Networks  Total Public Exchange Points  Total Unique Public Exchange Presences	542
	21549
Total Unique Facilities  Total Private Facilities	1670
Total Unique Private Facility Presences	12752

## How to promote the IX

- Network trainings
- Network Operator Groups (NOG)
- Look for the peering managers of the networks (or their closest equivalent)
- Collaboration with other IXs



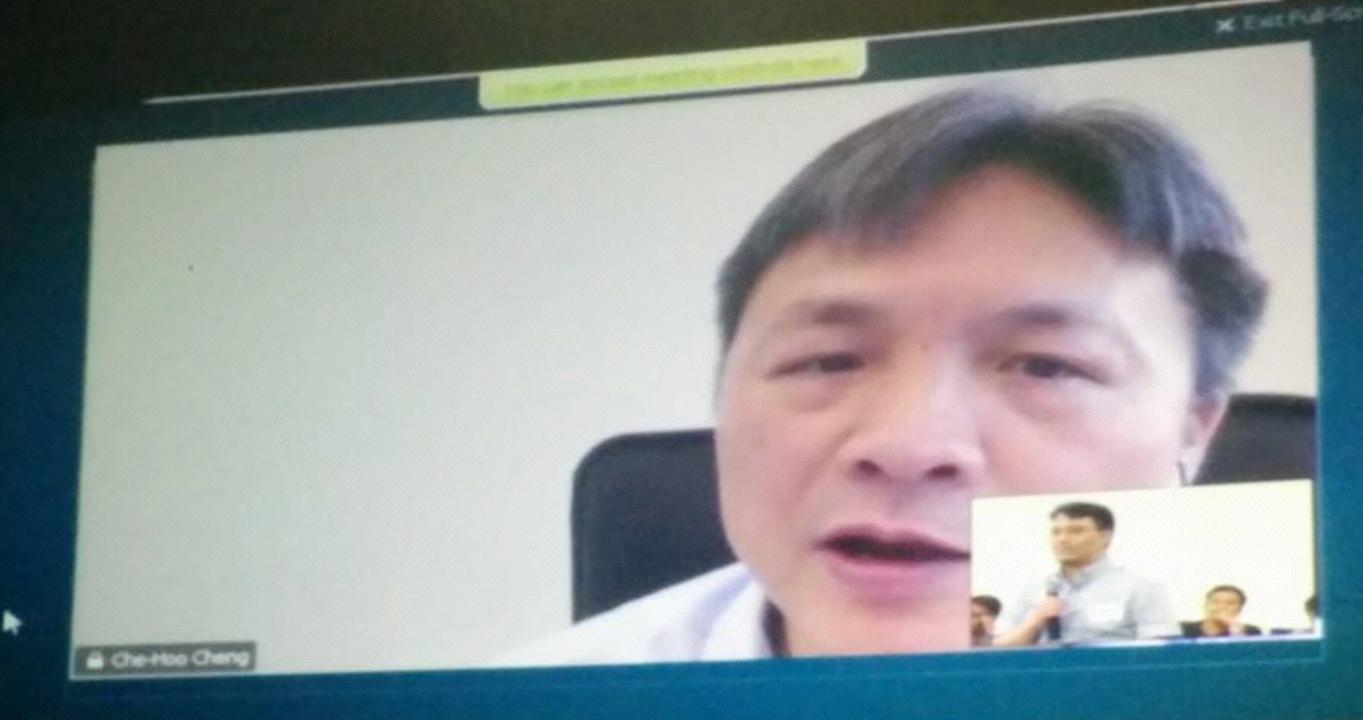


# Nepal Internet Exchange (NPIX)

Gaurab Raj Upadhaya CEO/Tech Chair

gaurab@lahai.com

wg@npix.net.np

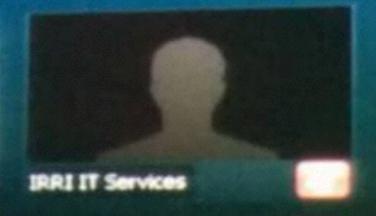


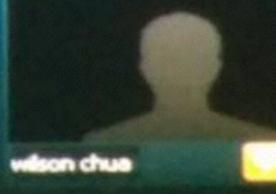


Che-Hoo Cheng



Bob Laughakamai





### **APNIC**

**Get IP** 

Manage IP

## IDSeries: An Open exchange: history of Indonesia's IXP

By Robbie Mitchell on 26 Aug 2015

Categories: Community, Tech matters

Tags: APJII, IDseries, Indonesia, ISP,

IXPs

2 Comments



In early 2000s, Malaysia and the Philippines recognized the success of Indonesia's IXP and sought out Johar's help in creating an IXP for their country.

"Because I was involved in setting up all these IXPs, which are relatively similar, I've always played with the idea of connecting them all."

In 2014, Johar was able to recognize this concept when he first connected the Open IXP to the Philippines IXP and six months later Malaysia's IXP. He says there have been some technical problems but the results are



Johar Alam Rangkuti, Administrator of OpenIXP - Wikimedia Commons

https://blog.apnic.net/2015/08/26/an-open-exchange-history-of-indonesias-ixp/

http://www.slideshare.net/apnic/anexperiment-in-connecting-internetexchanges-between-3-different-countries

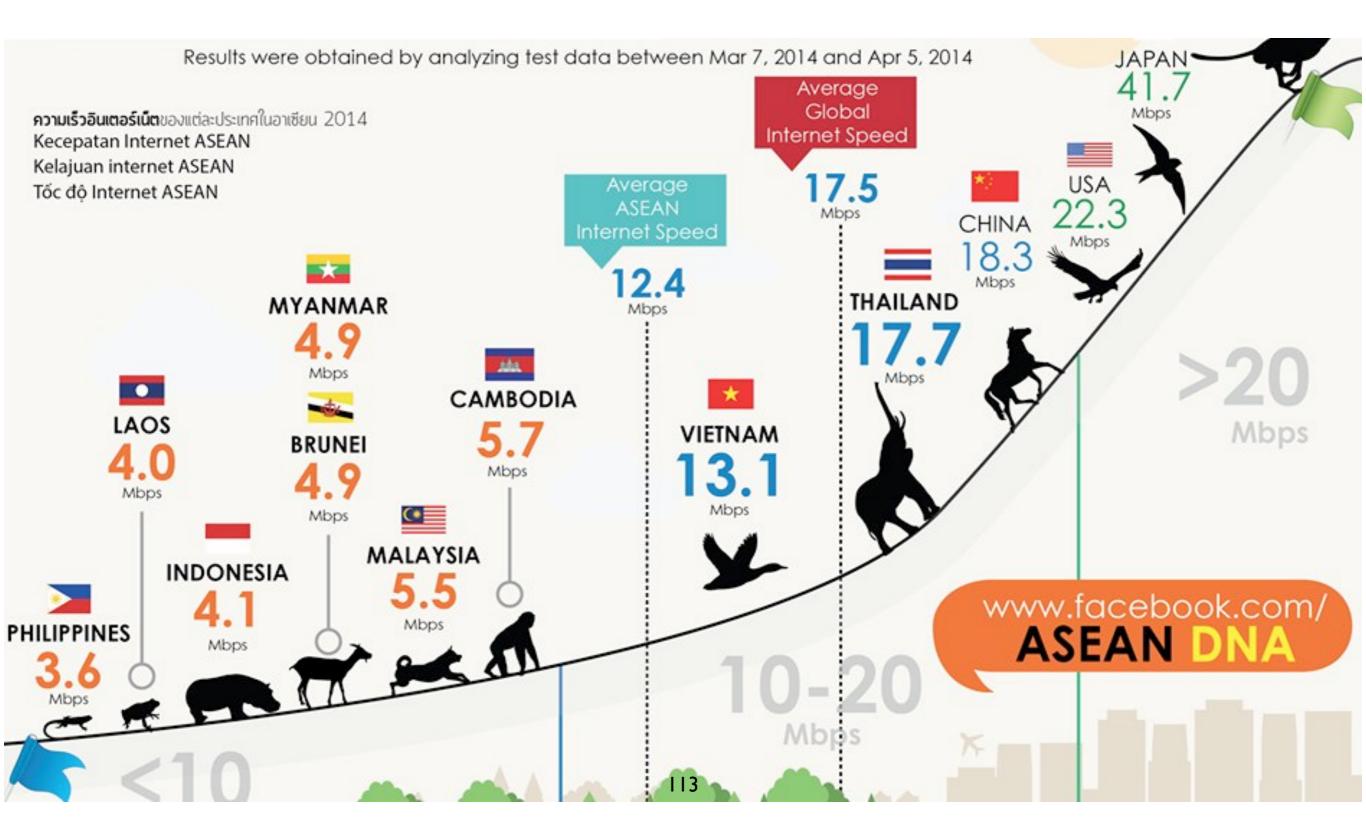


## How to promote the IX

- Network trainings
- Network Operator Groups (NOG)
- Look for the peering managers of the networks (or their closest equivalent)Collaboration with other IXs
- Collaboration with other IXs
- Ask APNIC for the AS numbers in your territory, and check each and every WHOIS entry of each and every AS:-D

# Having a Big Brother helps

# "Perceived" current situation of PH internet



#### Gov't urged to remedy slow PHL Internet; PLDT put to task

By BEA MONTENEGRO September 16, 2014 9:13pm



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Why Internet is slow in PH

By Atom Araullo, ABS-CBN News Posted at 09/16/2014 3:23 PM

The Philippine government has been called upon to intervene in the sorry state of Philippine Internet infrastructure, with calls for public regulation of local Internet service providers (ISPs)—particularly local telco giant PLDT.

# You Tube (i) 2:37 / 3:25 Senator Bam Aquino on free IP peering 1,207

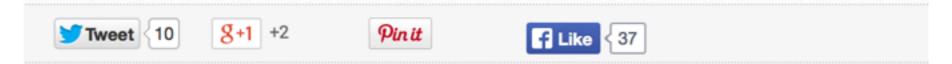
#### **Pressure on PLDT to solve** PH's slow Internet

At a Senate hearing on the cause of slow Internet connection in the Philippines, discussions focus on mandatory IP peering, a policy that government can't implement because of protests from the telco player



#### Gov't mulls making broadband Internet as basic service

Posted on September 17, 2014



In order to exercise its power to regulate the telecommunications industry and consequently speed up the "slow and expensive" Internet connection in the country, the government is proposing to reclassify Internet broadband as a basic service rather than a mere value-added service.



Improving Quality Standard of #PHInternet

November 7, 2014 2:00 pm

NTC Head Office, NTC Bldg, BIR Road, East Triangle, Diliman, Quezon City

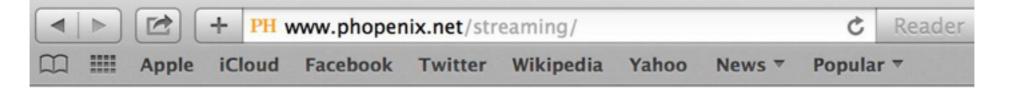
SEND YOUR QUESTIONS & SUGGESTIONS IN THE COMMENT SECTION!

Livestreaming: http://www.phopenix.net/streaming/

Photo: www.ncta.com

#PHInternet





#### **NTC Public Hearing**

#### **PREGINET Broadcaster**



**Improving Quality Standard of Philippine Internet** 

November 7, 2014 2:00 PM



Committee on Trade, Commerce and Entrepreneurship joint with Public Services





#### PH regulator to measure internet service performance

June 08, 2015















The National Telecommunications Commission is close to issuing a memorandum order that will update a previous issuance on minimum speed of broadband connections. But this time, the policy is targeted at measuring internet quality of service over setting minimum standards.

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#### Chiz calls on NTC to produce new guidelines for Internet speed, cost

Posted on September 14, 2015

G+1 +5



Pinit

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Instead of merely testing Internet speeds, the National Telecommunications Commission (NTC) should conduct an audit to assess the coverage and quality of service of telecommunications companies (telcos) to pressure them into making Internet access faster and cheaper, Sen. Francis "Chiz" Escudero said.







# Grace Poe to youth: Use 'slow' internet to call out govt wrongdoings, rally behind FOI bill

August 12, 2015 4:49pm

Tags: gracepoe, internet, foibill

By ROSE-AN JESSICA DIOQUINO, GMA News

Even after hitting the slow pace of internet connection in the country, Sen. Grace Poe on Wednesday called on the youth to use it and their social media "power" to point out the government's failures and triumphs.

At the International Youth Day celebration of the National Youth Commission (NYC), Poe said, "The world is changing with unprecedented speed. Ang mabagal lang ang internet natin."

She pointed out that 45 percent of the world's internet users are below the age of 25 years old.

"In many countries, they have undergone major socio-political developments, young people are shown to be a part, if not the leading movement, for change and challenging the social power structures," Poe said in her speech.



#### Bongbong: Faster Internet should be priority of next administration

Technology from Newsbytes.ph

August 3, 2015 - 08:59 AM

#### Article Highlights:

- Wading into the ICT space, Sen. Ferdinand "Bongbong" R. Marcos Jr. said faster Internet speeds and robust telecommunications systems should be a priority of the next administration.
- With these changes in global commerce, he said the next administration should adopt a mindset where telecommunications, especially the Internet, is part of the Philippines' essential infrastructure.
- Internet metrics provider Ookla found that the Philippines averaged a download speed of just 3.64 megabytes per second (Mbps), which ranked 176th out of 202 countries worldwide.

# PNoy: Too many subscribers, too few services cause of slow Internet speed in PH

Posted on September 8, 2015 by Marcus V



Photo Credit: Philippine Daily Inquirer



- Gov't to investigate snail-paced Internet speed in PH
- Cause could be oversubscribing, little expansion of telco services
- No need to create separate department, DOST can handle the problem

MANILA, Philippines – Amid the outcry over the country's excruciatingly slow Internet speed, President Benigno Aquino said he has directed both the Department of Science and Technology (DOST) and the National Telecommunications Commission (NTC) to look into whether telco companies are over-subscribing Paternet users without expanding their services.

## Output of big brother

## Updates!



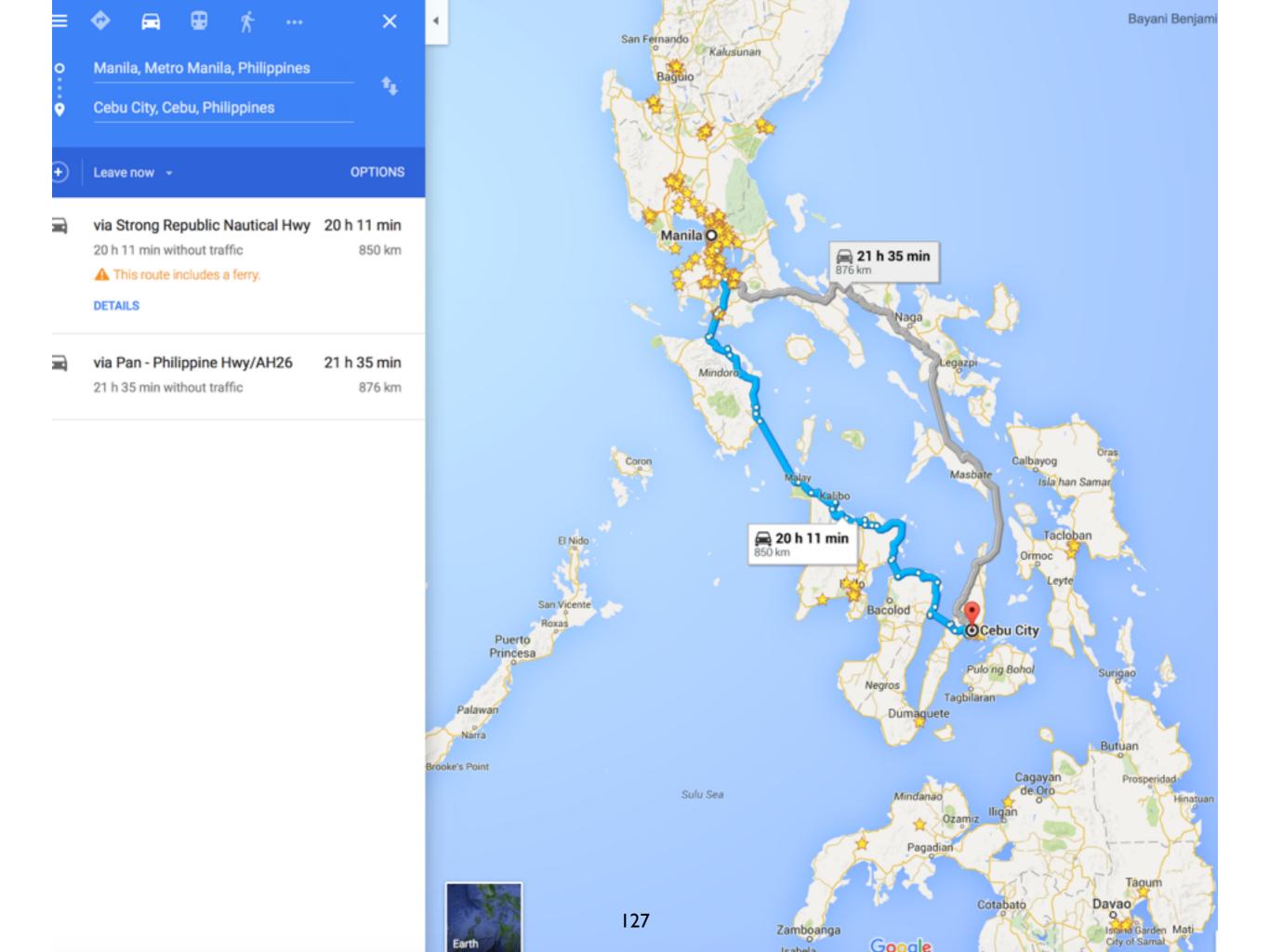
Installed a switch at PLDT Vitro

Start: Sept 7, 2015

Ends: Sept 6, 2017

# Updates! Installed a switch at Cebu City

This is around 580 kilometers from Manila





## Moving forward

- More networks at the Manila switches
- More content (CDNs)
- Setup internet exchanges outside of Manila (i.e. Cebu)
- IP blocks for expansion
- Lobby for donation of more equipment
- More network training
- Become a member of the APIX Assoc.
- BGP communities soon

One guy or one organization will have a difficult time in growing an internet exchange. They need the buy-in of their local community for it to grow.

# http://www.phopenix.net/pacnog2015.pdf

bani@asti.dost.gov.ph