

PREGINET Updates

TEIN4 NOC Annual Workshop

Oct 31 – Nov 4, 2016

MYREN NOC, Malaysia

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Advanced Science and Technology Institute

Outline

- PREGINET
- Other networks managed and operated by PREGINET/DOST-ASTI
 - PhOpenIX (Internet Exchange)
 - GovNet (Government Network)
- Collaborations
 - Embedded Systems
 - Weather/Climate
 - iGovPhil-GovCloud
 - CoARE (HPC and Science Cloud)

PREGINET

- Philippine Research, Education and Government Information Network
- Started as a government project of DOST on June 2000.
- It interconnects and catalyzes research among academic, government, and research institutions.
- Currently, it connects 61 Locations around the country (Government, Research and Academic Institutions).

Network Setup

- Five POPs around the country
 - 3 in Metro Manila, 1 in Laguna w/in IRRI, 1 in Cebu
- Connections to partners are mostly leased from local-loop providers/telco.
- Has a 11Gb aggregate link to two ISPs.
- Has a 1 Gb to APAN/MAFFIN.
- Has a 1 Gb link to TEIN via Hongkong.
- Has a 4 Gb link to PhOpenIX
- Has 1 Gb link to IRRI
- Has 10 Gb link to Government Network

Network Setup

- Upcoming links
 - 10 Gb IPL link to Hongkong (for Commodity internet, TEIN, HKIX and Google cache)
 - 10 Gb IPL link to Japan
 - 14 x 1 Gb link to Regional Government Network
- IP address and ASN
 - ASN is 9821
 - IPv4 block is 202.90.128.0/19
 - IPv6 block is 2001:d18::/32

Network Equipment

- Routers
 - Cisco 7604, 7304, 7204, some 2600s
 - Juniper M5, M10, M20
- Switches
 - HP Procurve 2500, 2600, 2920, 35yl
 - Extreme x670, x460, x440

PREGINET Services

- Services offered by PREGINET to its partners
 - Network connectivity to commodity internet and to international research and education networks
 - Network connectivity to PhOpenIX
 - Server Colocation
 - Video Conferencing
 - Supports Telemedicine activities
 - Video Streaming
 - Voice over IP (VoIP)
 - Web hosting and DNS management

Telemedicine


TEMDEC Video_2016-08-09_140554

Search Participants

Participants: 10


- Advanced Science and Techn...
- Alvin
- Davao Doctors Hospital**
- George
- National Kidney and Transpl...
- (Guest) shunta@temdec
- SLMCGC
- TEMDEC
- University of Cebu Medical C...
- UP Manila

SLMCGC
 TEMDEC



UP Manila

- ❖ 1908 - first UP campus
- ❖ 14 hectares
- ❖ Premier institution for Health Sciences
- ❖ Medical Courses/Professions
- ❖ Chancellor Carmencita D. Padilla
- ❖ 9 degree granting units
- ❖ www.upm.edu.ph



National Kidney and Transplant Institute

SLMCGC

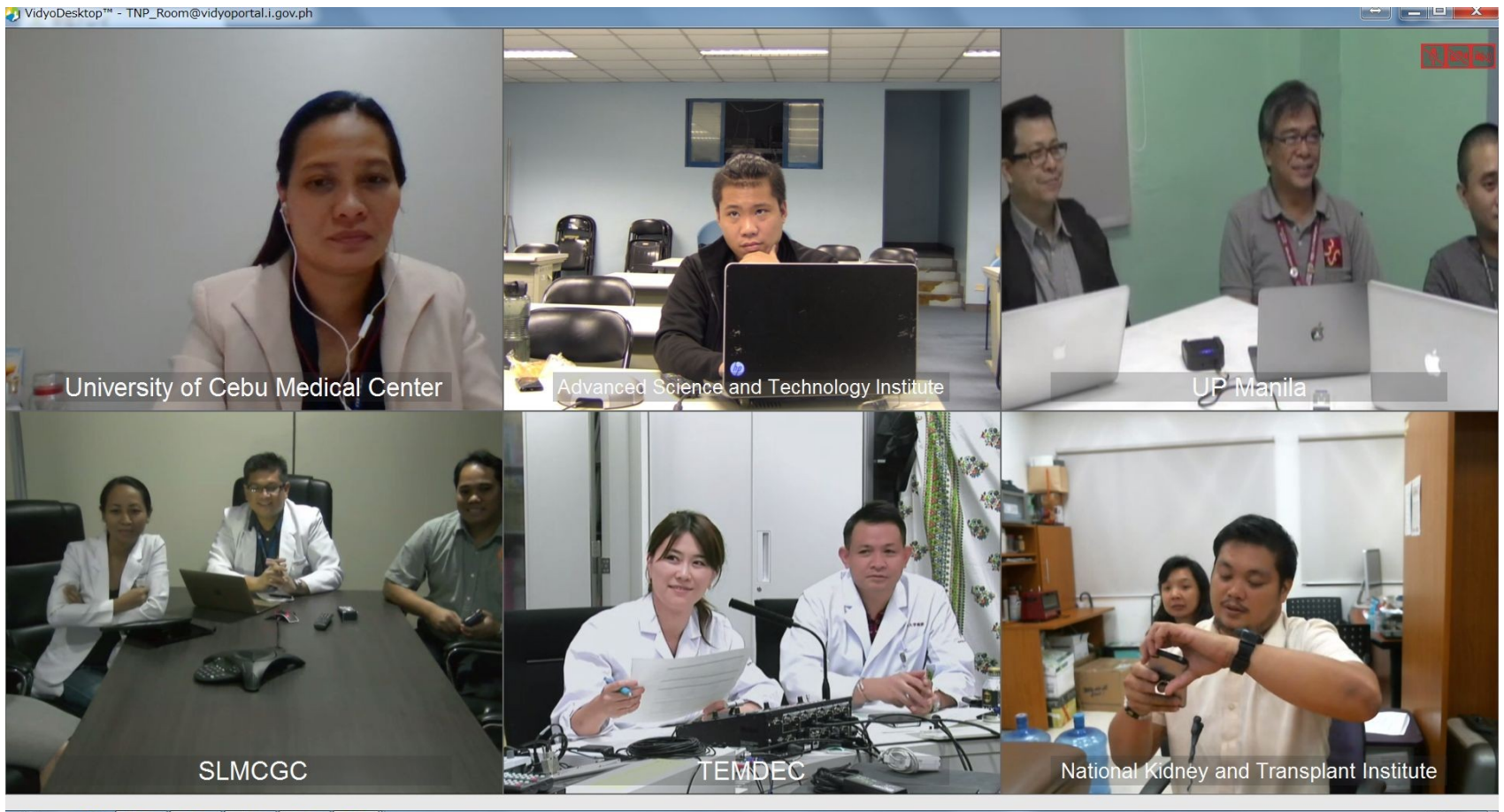
University of Cebu Medical Center

Advanced Science and Technology Institute

DAVAO DOCTORS HOSPITAL
KYUSHU

DEPARTMENT OF SURGERY
1980
DAVAO DOCTORS HOSPITAL
Self View

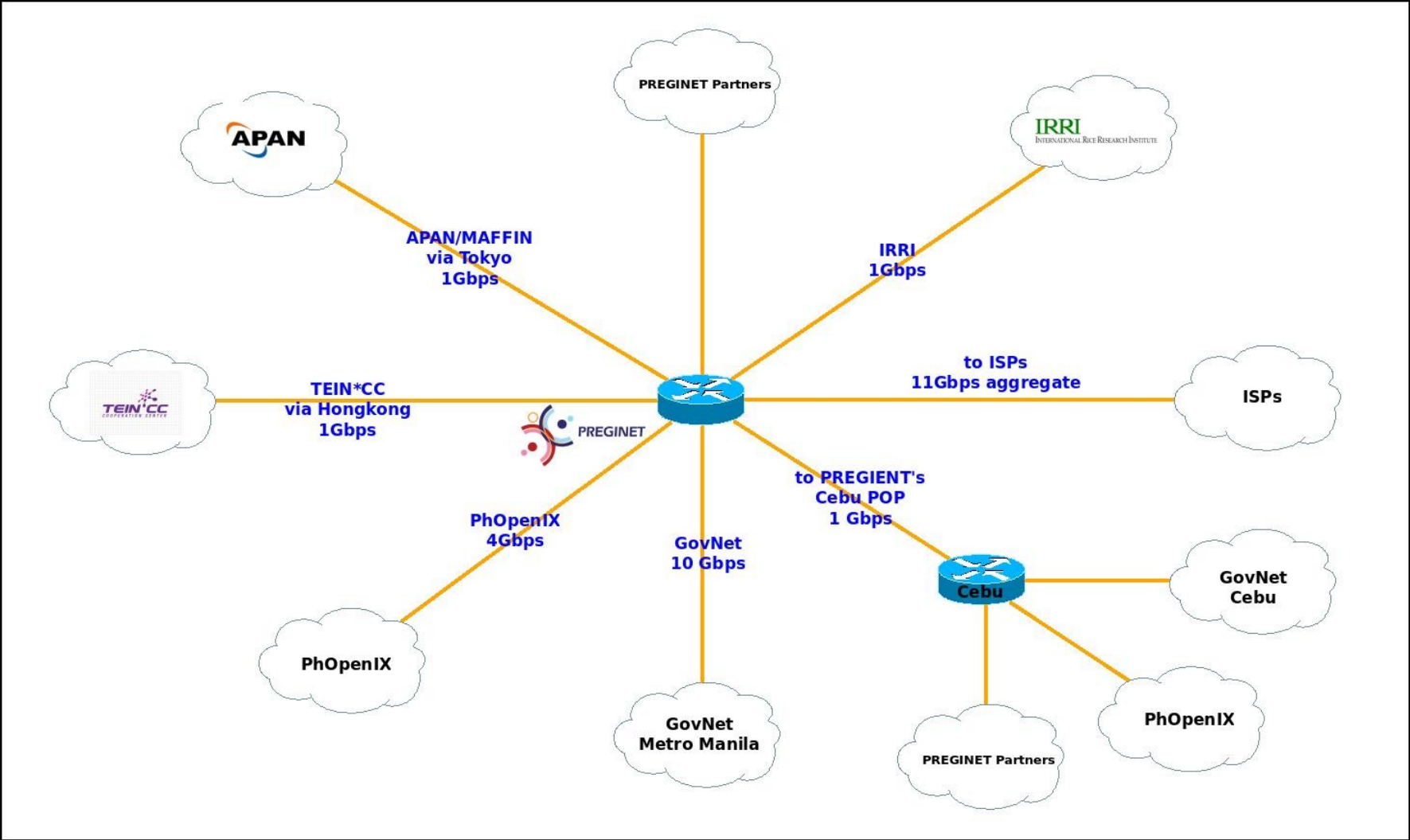
Telemedicine



Network monitoring and management tools

- Cacti
- LibreNMS
- perfSONAR
- Nfsen
- Rancid
- Redmine
- Netdot

Network Diagram



Other networks managed and operated
by PREGINET/DOST-ASTI

PhOpenIX

- Philippine **Open** Internet **eX**change
- Started operating on 2007
- Currently accessible from 4 location
- Carrier-neutral IPv4 and IPv6 Multilateral Peering Exchange
- Non-profit membership-based
- Open to all
- Layer 2 Exchange (supports 10/100/1000 Base T interconnect, 10 Gigabit Ethernet SFP+ ports)
- Main goal is to keep local traffic local
- <http://phopenix.net/>

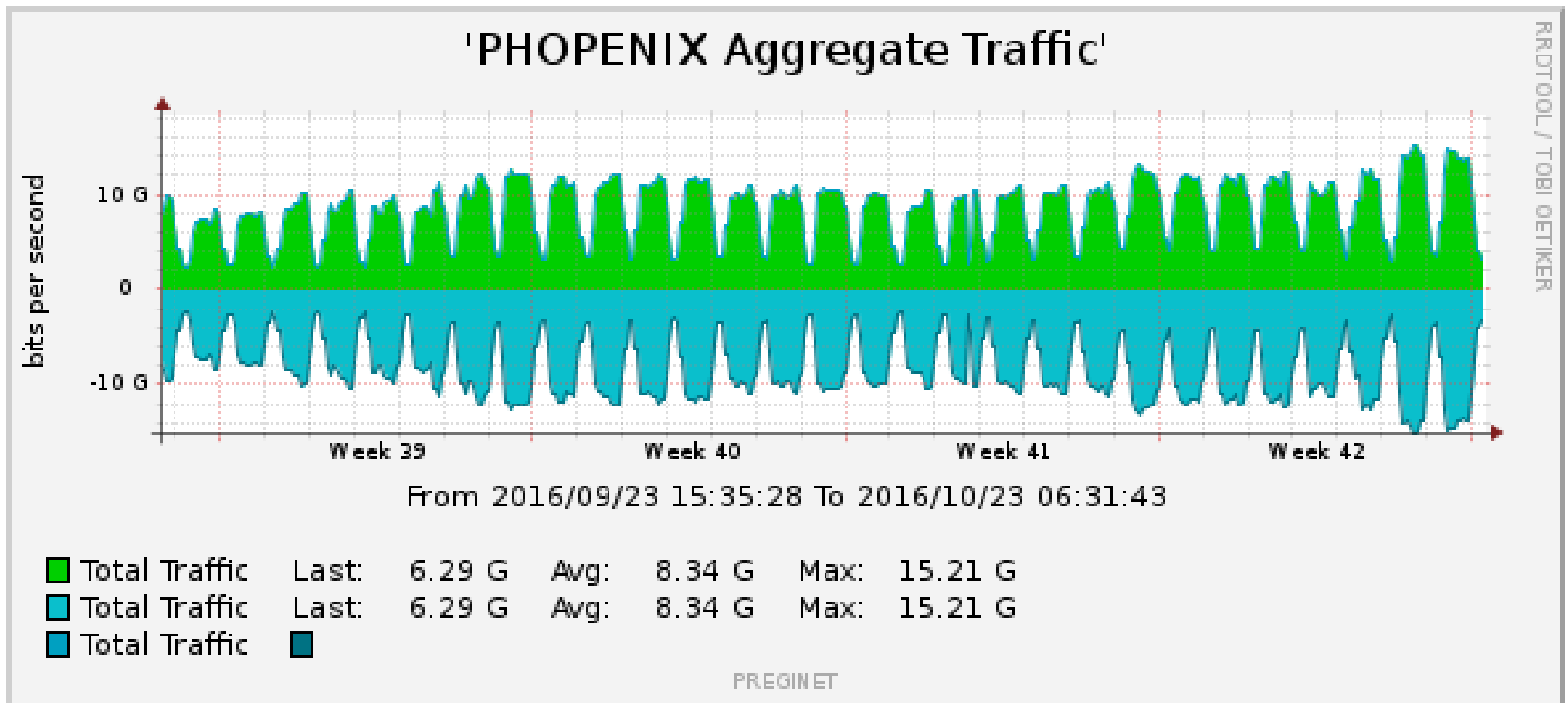
Membership thru the years

- 2007 – 8
- 2008 – 1
- 2009 – 3
- 2010 – 2
- 2011 – 0
- 2012 – 0
- 2013 – 1
- 2014 – 11
- 2015 – 8
- 2016 – 14

48
“directly
peered”
ASNs

<http://www.phopenix.net/members>

Current PhOpenIX aggregate traffic as of Oct 23, 2016



<http://www.phopenix.net/traffic>

Services/Contents at PhOpenIX

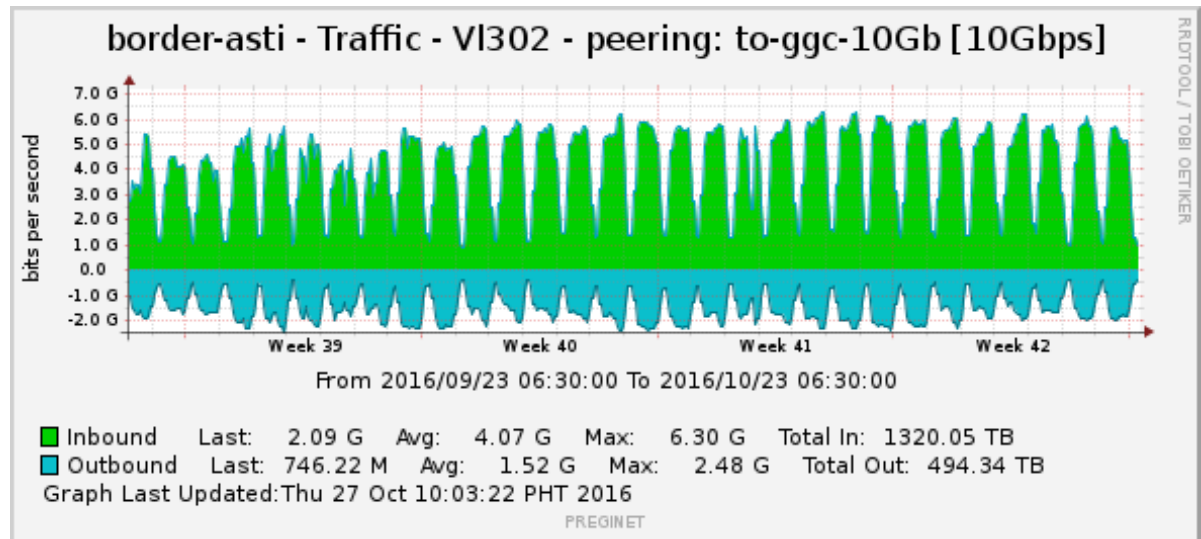
- CDNs

Google global cache

Traffic IN
to PhOpenIX



Traffic OUT
to PhOpenIX

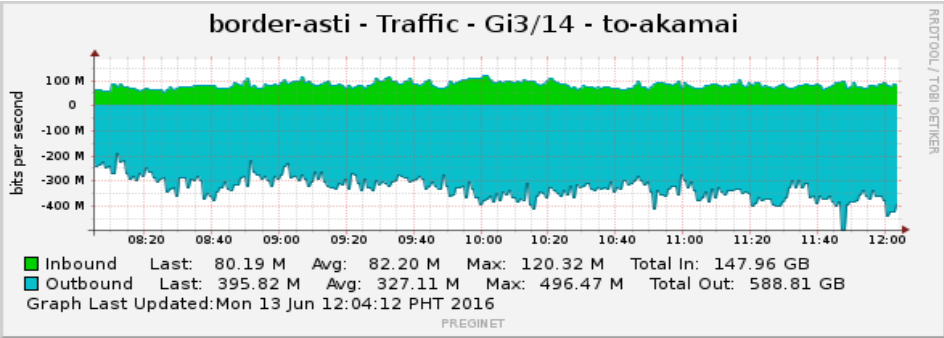


Services/Contents at PhOpenIX

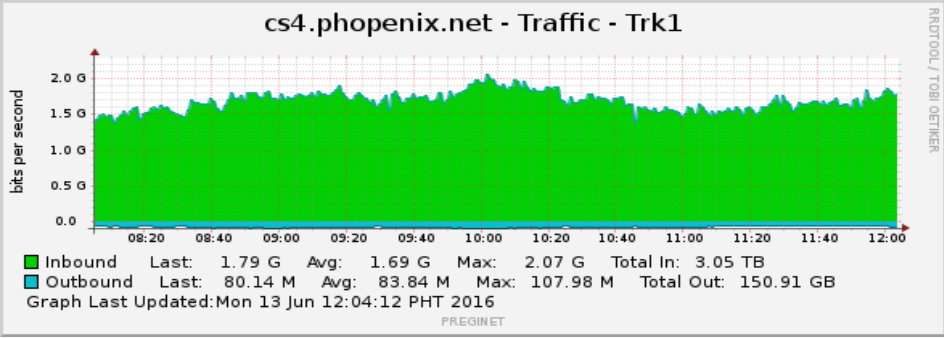
- CDNs



Traffic IN
to PhOpenIX



Traffic OUT
to PhOpenIX



Services/Contents at PhOpenIX

- Root DNS mirror instance

List of Root Servers

Hostname	IP Addresses	Manager
a.root-servers.net	198.41.0.4, 2001:503:ba3e::2:30	VeriSign, Inc.
b.root-servers.net	192.228.79.201, 2001:500:84::b	University of Southern California (ISI)
c.root-servers.net	192.33.4.12, 2001:500:2::c	Cogent Communications
d.root-servers.net	199.7.91.13, 2001:500:2d::d	University of Maryland
e.root-servers.net	192.203.230.10	NASA (Ames Research Center)
f.root-servers.net	192.5.5.241, 2001:500:2f::f	Internet Systems Consortium, Inc.
g.root-servers.net	192.112.36.4	US Department of Defence (NIC)
h.root-servers.net	128.63.2.53, 2001:500:1::803f:235	US Army (Research Lab)
i.root-servers.net	192.36.148.17, 2001:7fe::53	Netnod
j.root-servers.net	192.58.128.30, 2001:503:c27::2:30	VeriSign, Inc.
k.root-servers.net	193.0.14.129, 2001:7fd::1	RIPE NCC
l.root-servers.net	199.7.83.42, 2001:500:3::42	ICANN
m.root-servers.net	202.12.27.33, 2001:dc3::35	WIDE Project

10 in North America

2 in Europe

1 in Asia

Before PhOpenIX, there was no root-server mirror in PH

Services/Contents at PhOpenIX

- Root DNS mirror instance
 - Currently PhOpenIX mirrors the
 - I-root
 - D-root
 - E-root
 - L-root
 - J-root

Services/Contents at PhOpenIX

- Looking Glass

← ⓘ | lg.phopenix.net/cgi-bin/

lg.phopenix.net - Multi-Router Looking Glass (MRLG)
Running MRLG Version 5.5.0 (IPv6+SSH)
A service of [PHOPENIX](#).
Note: ALL access to this interface is logged.

Router: rs2.phopenix.net - RouteServer-2 ▾

Password: (if required)

Query:

- show ip bgp
- show ip bgp summary
- show ip protocols
- show ip route
- show ipv6 route
- show version
- trace
- ping

Argument: (many commands require an IP address as argument)

http://lg.phopenix.net/cgi-bin/index.cgi is running:
Multi-Router Looking Glass version 5.5.0 (IPv6+SSH)
© 2000-2014, John Fraizer - [OP-SEC.US](#)
Source code: <http://mrlg.op-sec.us/>.

Services/Contents at PhOpenIX

- Network Time Protocol (NTP)
 - ntp.phopenix.net
 - ntp.pagasa.dost.gov.ph



PAGASA's atomic clock (photo from www.interaksyon.com)



Republic of the Philippines

PHILIPPINE ATMOSPHERIC, GEOPHYSICAL AND ASTRONOMICAL SERVICES ADMINISTRATION
"tracking the sky...helping the country"

PHILIPPINE STANDARD TIME

Services/Contents at PhOpenIX

- Mirrors Linux Distribution



This is the public mirror service of PREGINET.

Access to the software archives is available via [HTTP](#) or [FTP](#).

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

Index of /

File Name ↓	File Size ↓	Date ↓
CPAN/	-	2016-Jun-13 13:17
Linux/	-	2016-Mar-20 13:27
R/	-	2016-Jun-13 12:13
centos/	-	2016-May-25 23:58
debian/	-	2016-Jun-13 12:00
debian-cd/	-	2016-Jan-28 09:09
epel/	-	2016-May-29 01:46
fedora/	-	2016-May-17 06:56
pub/	-	2016-May-25 22:25
raspbian/	-	2016-May-10 20:04
tex-archive/	-	2016-Jun-13 01:02
ubuntu/	-	2016-Jun-13 11:31
ubuntu-cdimage/	-	2016-Jun-13 13:42
ubuntu-releases/	-	2016-May-30 18:31

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



GovNet (Government Network)

- Fully owned by the government
- Currently deployed in Metro Manila and Cebu City. With other regional government networks also being develop.
- There are 160 government offices connected in Metro Manila network, and 13 government offices in Cebu network.
- Has at least 160Km of Fiber Optic cable runs
- Its main benefit is lower costs of internet services and faster data transfer for government-to-government communications
- <http://i.gov.ph/>

Network setup

- Will run purely on ethernet with MPLS on top
- Has a 10 Gb Backbone to the POP with 1 Gb drop to end-nodes
- Will be using Extreme X480 switches at POP and Allied Telysyn fiber to copper converters at the end-nodes

PREGINET Collaborations

Collaborations

- PREGINET works closely with CoARE and Embedded System groups of ASTI
- Also works closely with the Department of Information, Communication and Technology in designing and operating the iGOV project
- Also works closely with other research groups, like NOAH.

Embedded Systems Group

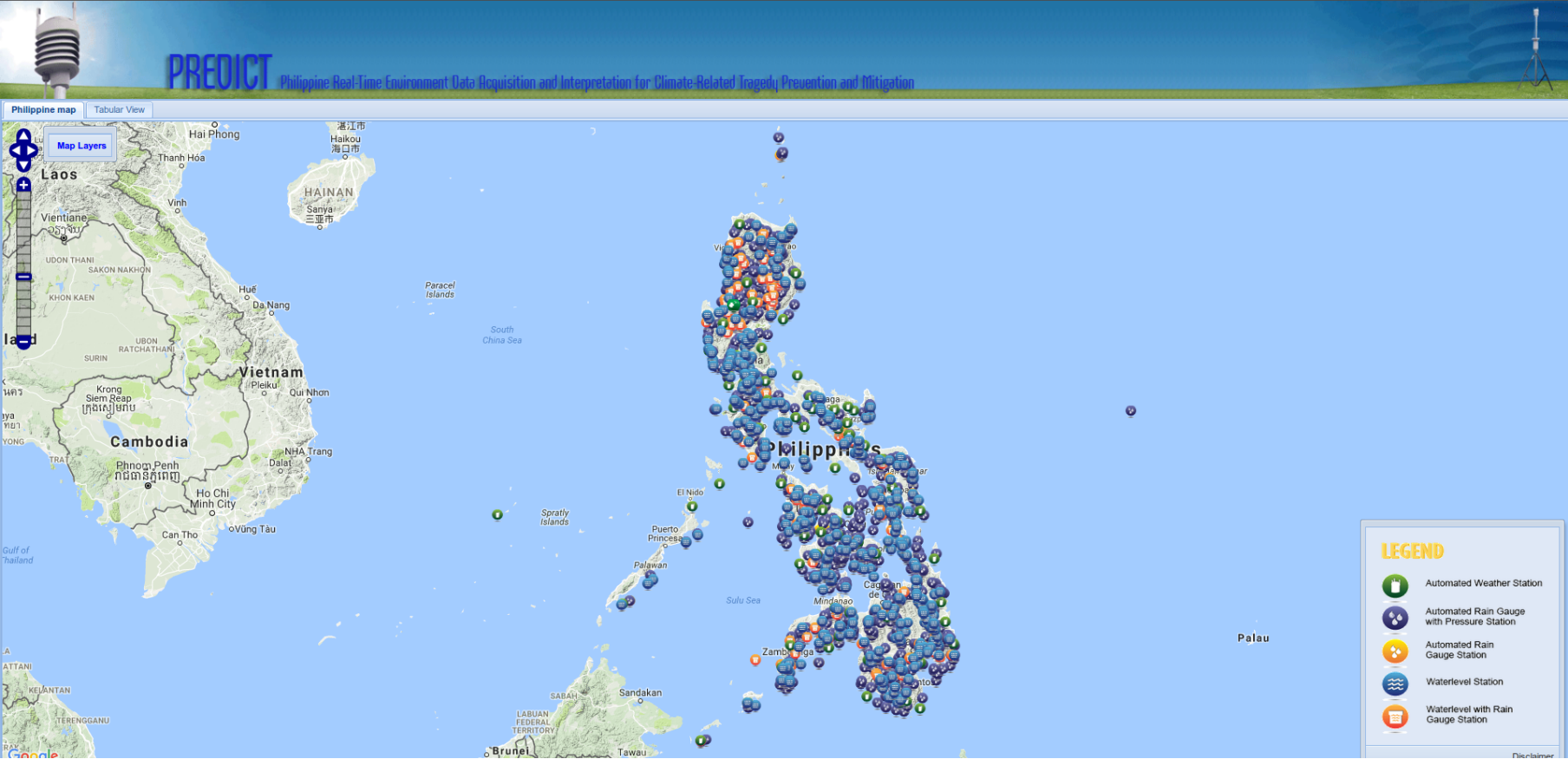
- Responsible for deploying sensors around the Philippines
- The goal is to build locally assembled modular sensors
- Deployed 1733 sensors in the whole country
- Data collected is mainly used by PAGASA and by other reasearch groups like NOAH.
- <http://embedded.asti.dost.gov.ph>

Sensors



<http://embedded.asti.dost.gov.ph/products>

PREDICT









<http://fmon.asti.dost.gov.ph/weather/predict/>

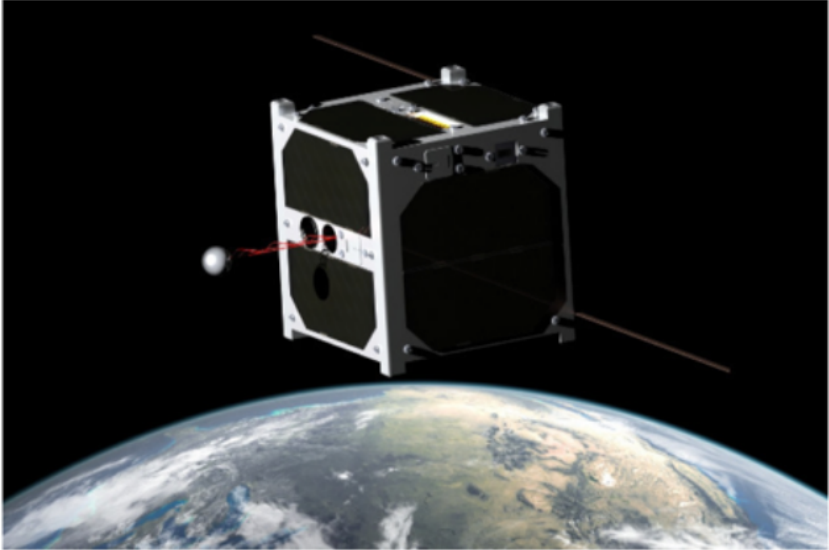
Philippine Satellite Project

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
@pjaranada
Published 12:11 PM,
March 10, 2015
Updated 1:23 PM, March
10, 2015

-  62
-  22K
-  422
-  Reddit
-  Email
-  22K



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.

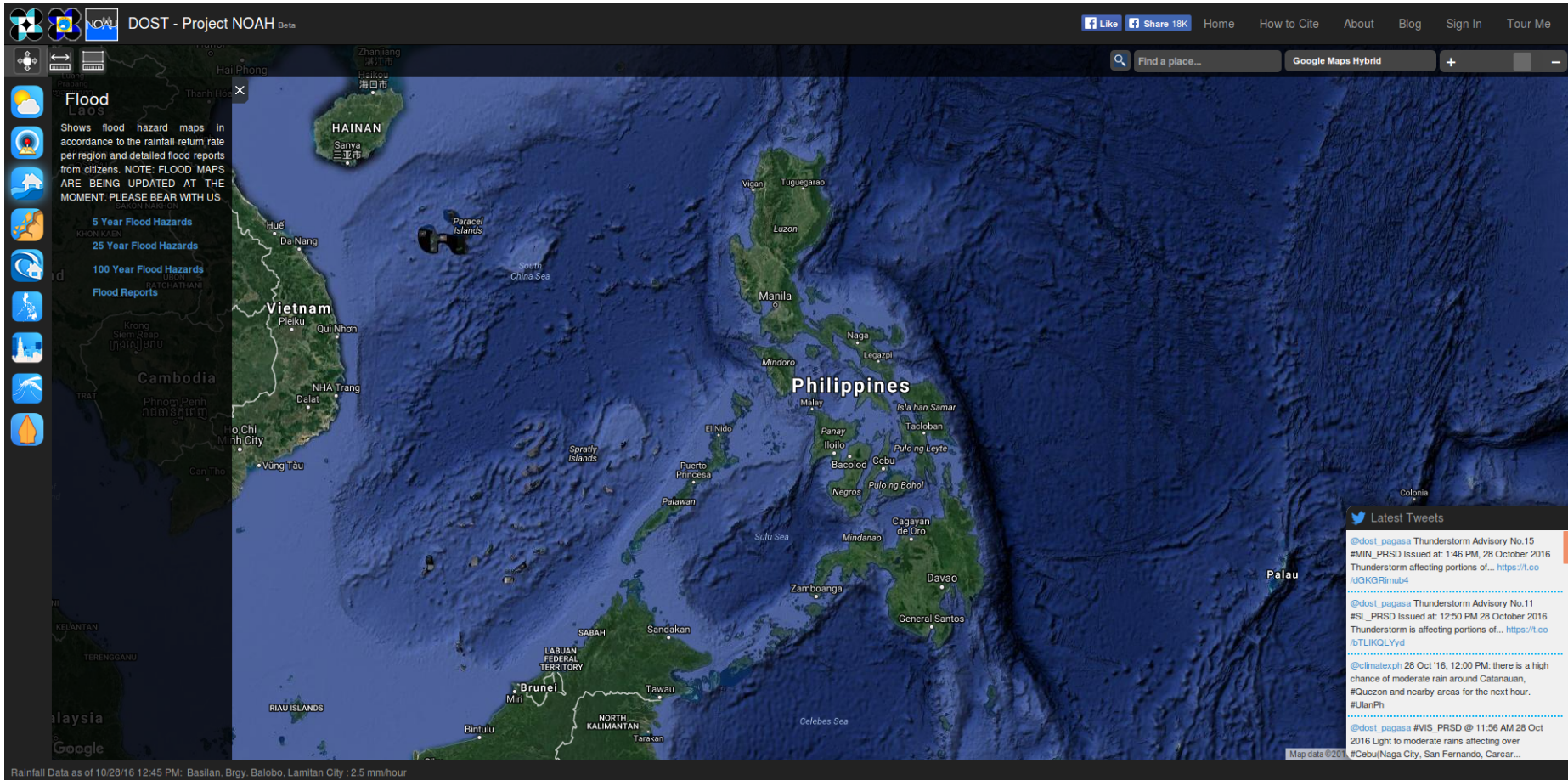
Philippine Satellite Project

- “Diwata” was launch on March 23, 2016.
- It will be used to provide real-time images for disaster risk management and other applications
- The Ground receiving station is connected to PREGINET
- The Philippine NREN is the primary storage facility of the data collected by this infrastructure

NOAH

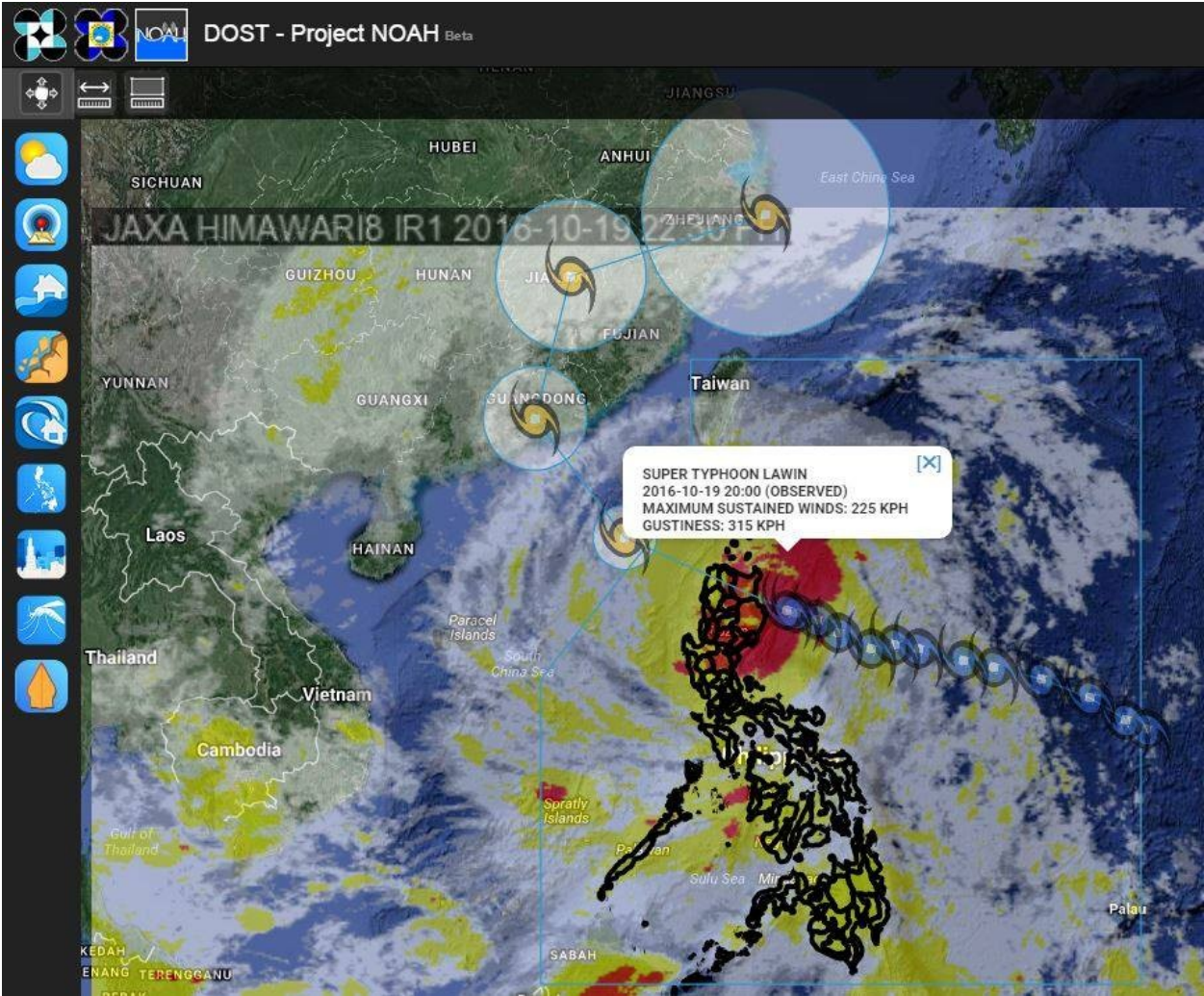
- **N**ationwide **O**perational **A**ssessment of **H**azards
- To develop high-resolution hazard maps for various type of natural hazards using frontier science and cutting-edge technology.
- Integrate doppler radar, ground stations, and satellite remotely-sensed data into forecast models
- Use of 3D LIDAR technology for generation of hazard maps and flood inundation models
- <http://www.noah.dost.gov.ph>

NOAH



<http://www.noah.dost.gov.ph>

NOAH



CoARE: Computing and Archiving Research Environment

Aims to foster collaboration by providing a platform for easy storage, analysis and sharing of environmental and geospatial data, as well as provide better access to high performance computing resources

Services:

- HPC
- Science Cloud
- Storage

URL: <https://coare.asti.dost.gov.ph>

CoARE Services: HPC

High-performance Computing (HPC)

- Has 2 clusters: Duke (352 cores) & TUX (2312 cores)
- Total: 2664 cores
- Uses SLURM as workload manager

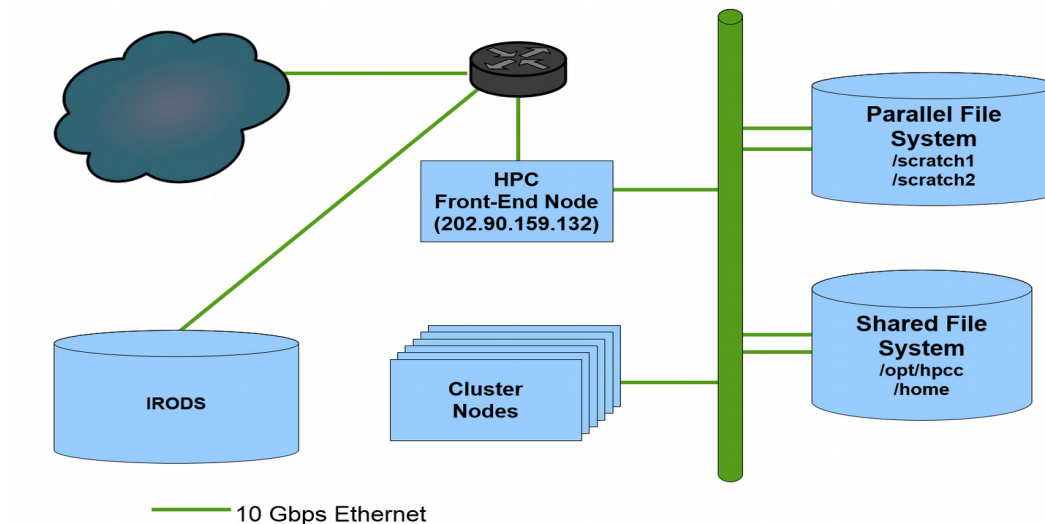


Image reproduce from:

https://coare.asti.dost.gov.ph/projects/coare/wiki/System_Architecture_and_Hardware_Specifications

CoARE Services: Science Cloud

Science Cloud

- Provides cloud-based services to researchers and students by providing virtual machines (VM). It is utilized by students and researchers who have the following requirements:
 - website hosting
 - file backup;
 - cloud computing;
 - cloud database; and
 - test and development.
- Capacity
 - Storage: 22.76 TB
 - Memory: 1.09 TB
 - CPU: 192 logical CPU

CoARE Services: Storage

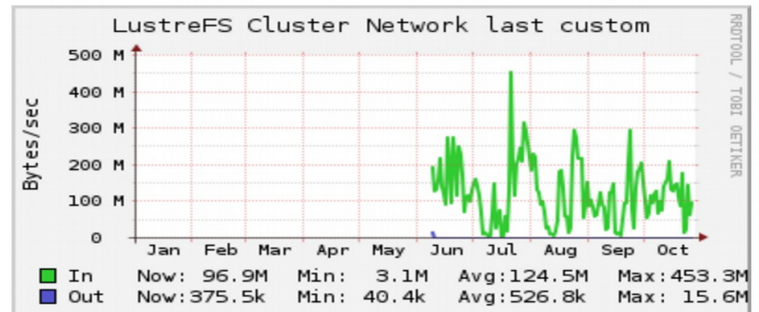
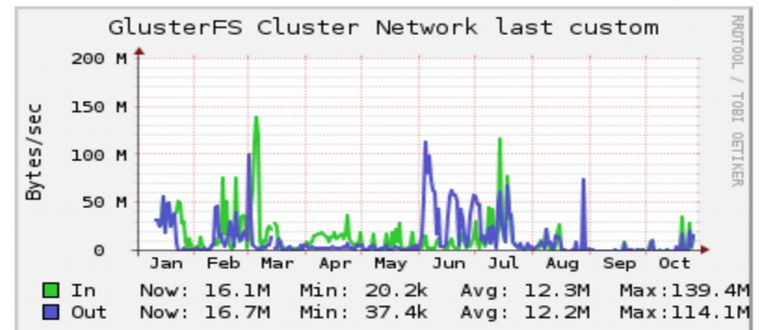
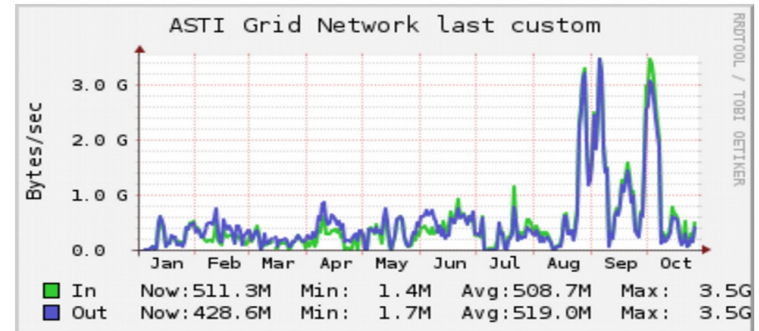
Storage

A durable and highly available repository is setup to store CoARE stakeholders' environmental and geospatial data. The repository can be used to store data, short-term or long term. The CoARE Project has different storage options to accommodate various storage requirements of facility users:

- iRODS
- HPC Home Directory
- HPC Scratch Space
- Cloud Storage
- Other (Magnetic Tape)

CoARE Network Utilization

- HPC Cluster overall:
 - 3.5G peak (3Q 2016)
 - 500M average
- GlusterFS or /home directory:
 - 114-139M peak
 - 12M average
- LustreFS or /scratch directory:
 - 453M peak
 - 124M average



CoARE Heavy Users

Bioinformatics

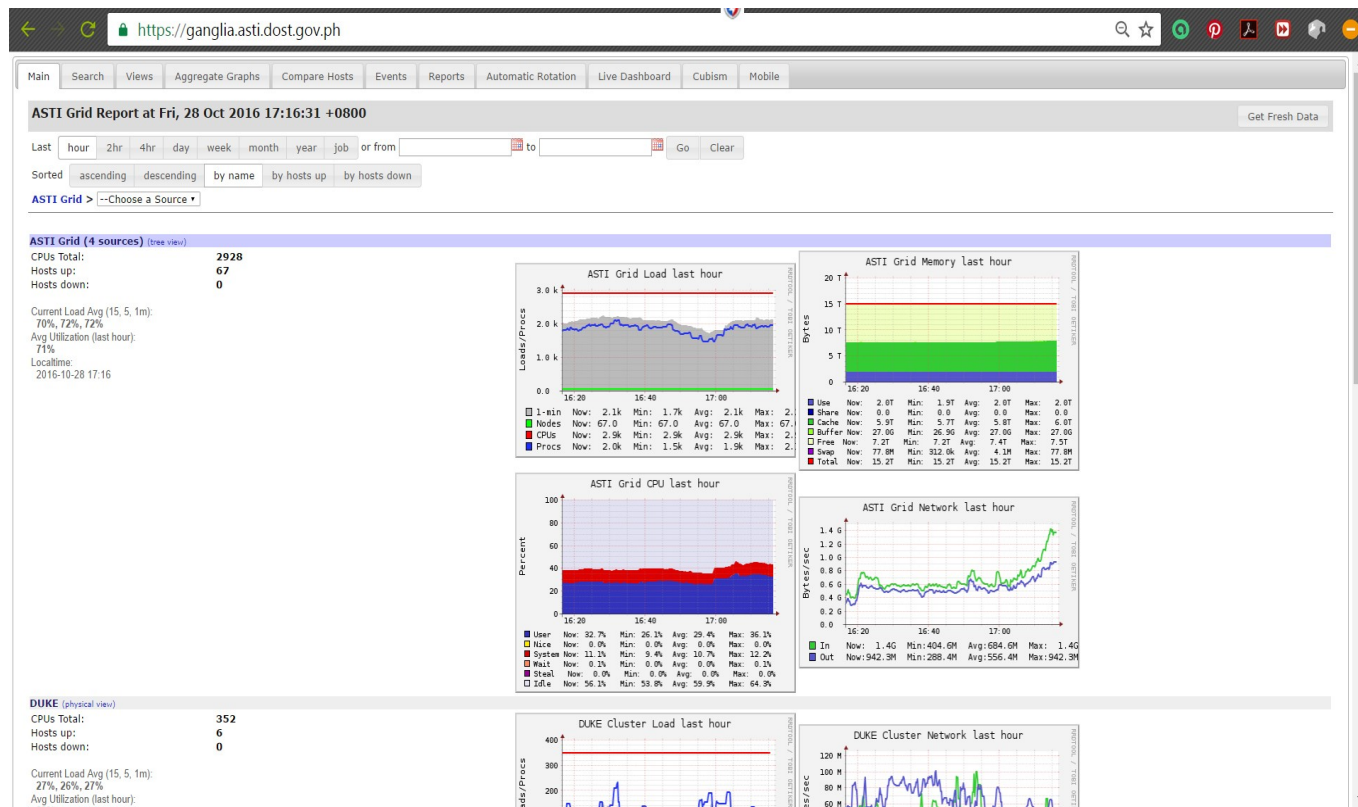
- International Rice Research Institute (IRRI) for 3, 000 Rice Genomes Project
- UP – National Institute of Health
- Philippine Genome Center

Weather and Climate

- PAGASA (Philippine Atmospheric Geophysical and Astronomical Services Administration)
- Project NOAH (Nationwide Operational Assessment of Hazards)
- Phil-LiDAR1 under
 - UP Institute of Environmental Science and Meteorology
 - 3D flood and hazard maps

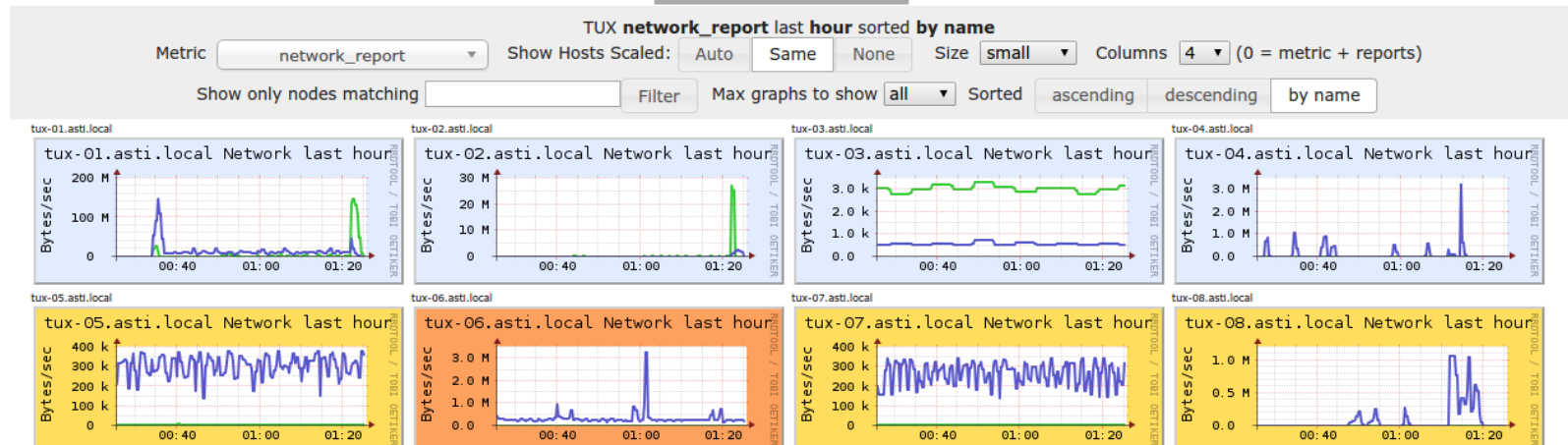
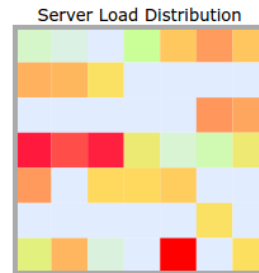
CoARE Monitoring Tools: Ganglia

Ganglia (For HPC & Storage): <https://ganglia.asti.dost.gov.ph>



CoARE Monitoring Tools: Ganglia

Ganglia (For HPC & Storage): <https://ganglia.asti.dost.gov.ph>



CoARE Monitoring Tools: Snipe-IT

Asset management

The screenshot displays the Snipe-IT web interface for asset management. The top navigation bar includes the title 'ASTI Asset Management', a search bar with the placeholder 'Lookup by Asset Tag', and user information for 'Arnel' with an 'Admin' role. The main content area is titled 'View Asset CoARE-092' and features a green success message: 'Success: Asset updated successfully.' Below this, there are tabs for 'Details', 'Licenses', 'Components', 'Maintenances', 'History', and 'Files'. The 'Details' tab is active, showing a table of asset information:

Company	Advanced Science and Technology Institute
Asset Name	Data Center Switch
Serial	1524N-42076
Manufacturer	Extreme Networks
Model	Summit X670V-48x-FB
Model No.	17101
Purchase Date	Apr 14, 2015
Supplier	Accent Micro Technologies Incorporated (AMTI)
Warranty	36 months (Expires 2018-04-14)
Notes	General Specifications QUALITY OF SERVICE AND POLICIES -1280 Gbps switch bandwidth, 952 Mpps forwarding rate (Summit X670V with VM4-40G4X) -Store-and-Forward and Cut-Through switching support -Less than 1 micro second latency (64-byte packet) -9216 Byte maximum packet size (Jumbo Frame) -128 load sharing trunks, up to 32 members per trunk -4,094 VLANs (Port, Protocol, IEEE 802.1Q) -2,048 ingress and 1,024 egress ACL rules per switch
Created at	September 28, 2016 06:49PM

To the right of the details table is a photograph of the Summit X670V-48x-FB network switch, a rack-mountable device with numerous ports on the front panel.

CoARE Monitoring Tools: Snipe-IT

Asset management

Components Create New

Search Refresh Grid Download

Component Name	Location	Category	Total	Min. QTY	Remaining	Actions
10/100/1000BASE-T SFP module, Category 5 cable 100m link, RJ45-Connector	Research and Development Division (RDD)	Transceivers	96	0	96	Checkout Edit Delete
10GBASE-SR SFP+, 850nm, LC Connector, transmission length of up to 300m on MMF	Research and Development Division (RDD)	Transceivers	192	0	192	Checkout Edit Delete
VIM4-40G4X, 4 40GBASE-X QSFP+ ports module for Summit X670V	Advanced Science and Technology Institute	Switch Modules	4	0	4	Checkout Edit Delete
550W AC Power Supply module for Summit switches, Front-to-Back airflow	Research and Development Division (RDD)	Power Supply Unit	8	0	8	Checkout Edit Delete
Extreme Power Cord, 10A NEMA 5-15P, IEC320-C13 PCS	Research and Development Division (RDD)	Power Cords	8	0	8	Checkout Edit Delete
Mellanox MC2206125-007 Passive Copper Cable IB QDR 40Gb/s QSFP 7m	Research and Development Division (RDD)	Network Cables	9	0	9	Checkout Edit Delete
40 Gigabit Ethernet QSFP+ passive copper cable assembly, 0.5m length	Research and Development Division (RDD)	Network Cables	4	0	4	Checkout Edit Delete
Quat to Serial Small Form Factor Pluggable Adapter (ETH 10GbE, 40Gb/s to 10Gb/s, QSFP to SFP)	Research and Development Division (RDD)	Network Cables	6	0	6	Checkout Edit Delete
10-meter 10GBASE-CR SFP+ Pre-terminated Twin-ax Copper Cable	Research and Development Division (RDD)	Network Cables	1	0	1	Checkout Edit Delete
10Gb Multimode Duplex 50/125 Fiber Optic Patch Cable (10 Meters, LC/LC)	Research and Development Division (RDD)	Network Cables	96	0	96	Checkout Edit Delete
Mellanox MAM1Q00A-QSA Cable Module ETH 10GbE 40Gb/s to 10Gb/s QSFP to SFP+	Advanced Science and Technology Institute	Network Cables	6	0	6	Checkout Edit Delete
10Gb Duplex Multimode 50/125 Fiber Patch Cable, (5 Meters, LC/LC)	Research and Development Division (RDD)	Network Cables	96	0	96	Checkout Edit Delete
Lenovo 45W 20V 2.25A ADLX45NCC3A 36200247 45N0297 45N0298 AC Adapter, Battery Charger, Power Supply with Power Cord	Advanced Science and Technology Institute	AC Power Adapters	4	0	2	Checkout Edit Delete

Showing 1 to 13 of 13 rows records per page

CoARE Monitoring Tools: Snipe-IT

Asset management

Asset Tag	Serial	Model	Status	Checked Out To	Location	Category	EOL	Notes	Order Number	Checkout Date	Expected Checkin Date	In/Out	Actions
CoARE-092	1524N-42076	Summit X670V-48x-FB	Ready to Deploy		Research and Development Division (RDD)	Network Switch	2015-04-14	General Specifications QUALITY OF SERVICE AND POLICIES -1280 Gbps switch bandwidth, 952 Mpps forwarding rate (Summit X670V with VIM4-40G4X) -Store-and-Forward and Cut-Through switching support -Less than 1 micro second latency (64-byte packet) -9216 Byte maximum packet size (Jumbo Frame) -128 load sharing trunks, up to 32 members per trunk -4,094 VLANs (Port, Protocol, IEEE 802.1Q) -2,048 ingress and 1,024 egress ACL rules per switch	ARE-16-02-0005				Checkout Info Edit Delete
CoARE-091	1524N-42075	Summit X670V-48x-FB	Ready to Deploy		Research and Development Division (RDD)	Network Switch	2015-04-14	General Specifications QUALITY OF SERVICE AND POLICIES -1280 Gbps switch bandwidth, 952 Mpps forwarding rate (Summit X670V with VIM4-40G4X) -Store-and-Forward and Cut-Through switching support -Less than 1 micro second latency (64-byte packet) -9216 Byte maximum packet size (Jumbo Frame) -128 load sharing trunks, up to 32 members per trunk -4,094 VLANs (Port, Protocol, IEEE 802.1Q) -2,048 ingress and 1,024 egress ACL rules per switch	ARE-16-02-0005				Checkout Info Edit Delete
CoARE-090	1524N-42081	Summit X670V-48x-FB	Ready to Deploy		Research and Development Division (RDD)	Network Switch	2015-04-14	General Specifications QUALITY OF SERVICE AND POLICIES -1280 Gbps switch bandwidth, 952 Mpps forwarding rate (Summit X670V with VIM4-40G4X) -Store-and-Forward and Cut-Through switching support -Less than 1 micro second latency (64-byte packet) -9216 Byte maximum packet size (Jumbo Frame) -128 load sharing trunks, up to 32 members per trunk -4,094 VLANs (Port, Protocol, IEEE 802.1Q) -2,048 ingress and 1,024 egress ACL rules per switch	ARE-16-02-0005				Checkout Info Edit Delete
CoARE-089	1524N-42082	Summit X670V-48x-FB	Ready to Deploy		Research and Development Division (RDD)	Network Switch	2015-04-14	General Specifications QUALITY OF SERVICE AND POLICIES -1280 Gbps switch bandwidth, 952 Mpps forwarding rate (Summit X670V with VIM4-40G4X) -Store-and-Forward and Cut-Through switching support -Less than 1 micro second latency (64-byte packet) -9216 Byte maximum packet size (Jumbo Frame) -128 load sharing trunks, up to 32 members per trunk -4,094 VLANs (Port, Protocol, IEEE 802.1Q) -2,048 ingress and 1,024 egress ACL rules per switch	ARE-16-02-0005				Checkout Info Edit Delete

CoARE Plans

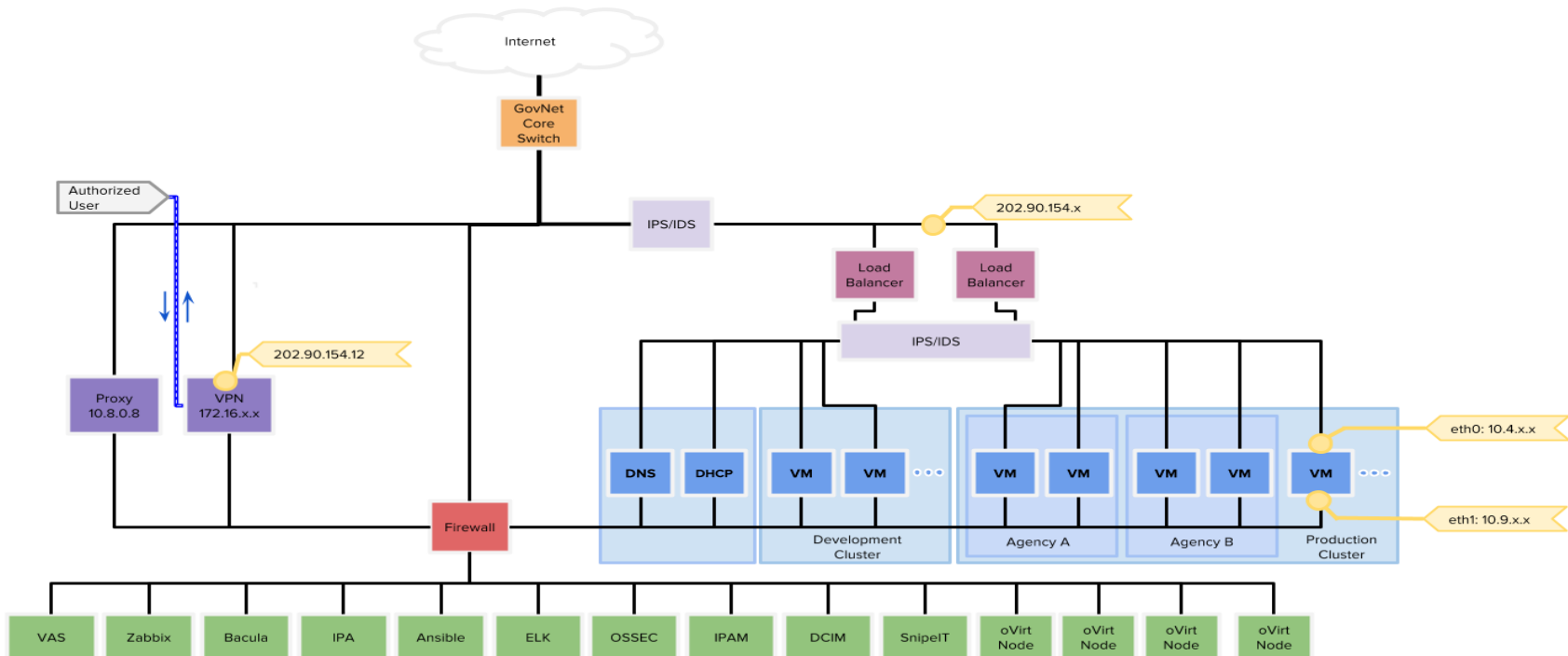
- Setup of Site 2 (Equipment are deployed. Setup is on-going)
- Extend data management and database applications to accommodate increased number of data sources
- Upgrade of the existing computing system facility intended to test and run computationally intensive applications for numerical weather prediction, climate modeling, as well as big data analytics and data modeling
- Upgrade of the existing storage. Target capacity is 1.5PB
- ITIL adaptation for SLA

GovCloud: Brief Background

- Cloud Infrastructure-as-a-Service (IaaS)
- Part of Integrated Government Philippines (iGovPhil) Project
- DICT (Department of Information and Communications Technology) and DOST-ASTI (Department of Science and Technology – Advanced Science and Technology Institute) joint implementation
- To support iGovPhil-developed applications including GovMail
- Offered to other agencies as well including:
 - **PAGASA** (weather)
 - eHATID (health)
 - DOTC (transportation)
- Connected to PREGINET or GovNet network
- <http://i.gov.ph/govcloud>

GovCloud General Network Topology

- Public (via load balancer) and private (accessible via VPN) network
- OpenVPN vs SSLVPN
- Various management/monitoring tools



GovCloud: Network Utilization

- Notable utilization: PAGASA (weather bureau) website
- During category 5 super typhoons:
 - Typhoon Nepartak (Butchoy)
 - 2-10 July 2016 at 175 Gb
 - Typhoon Haima (Lawin)
 - 13-21 October 2016 at 543 Gb

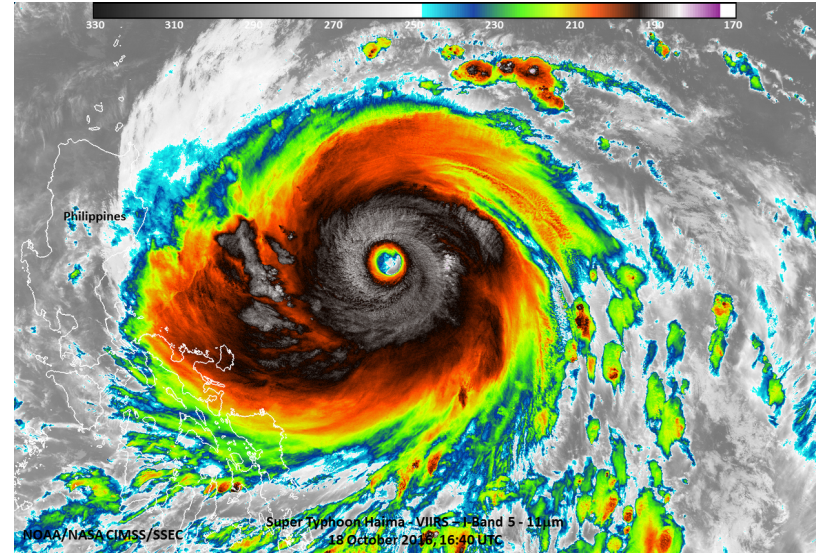
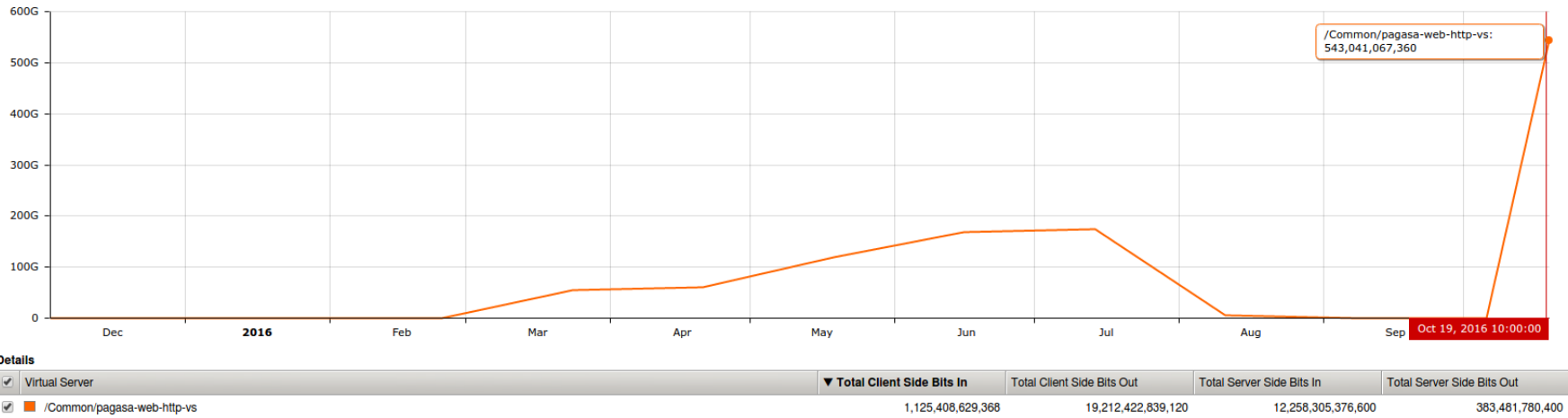


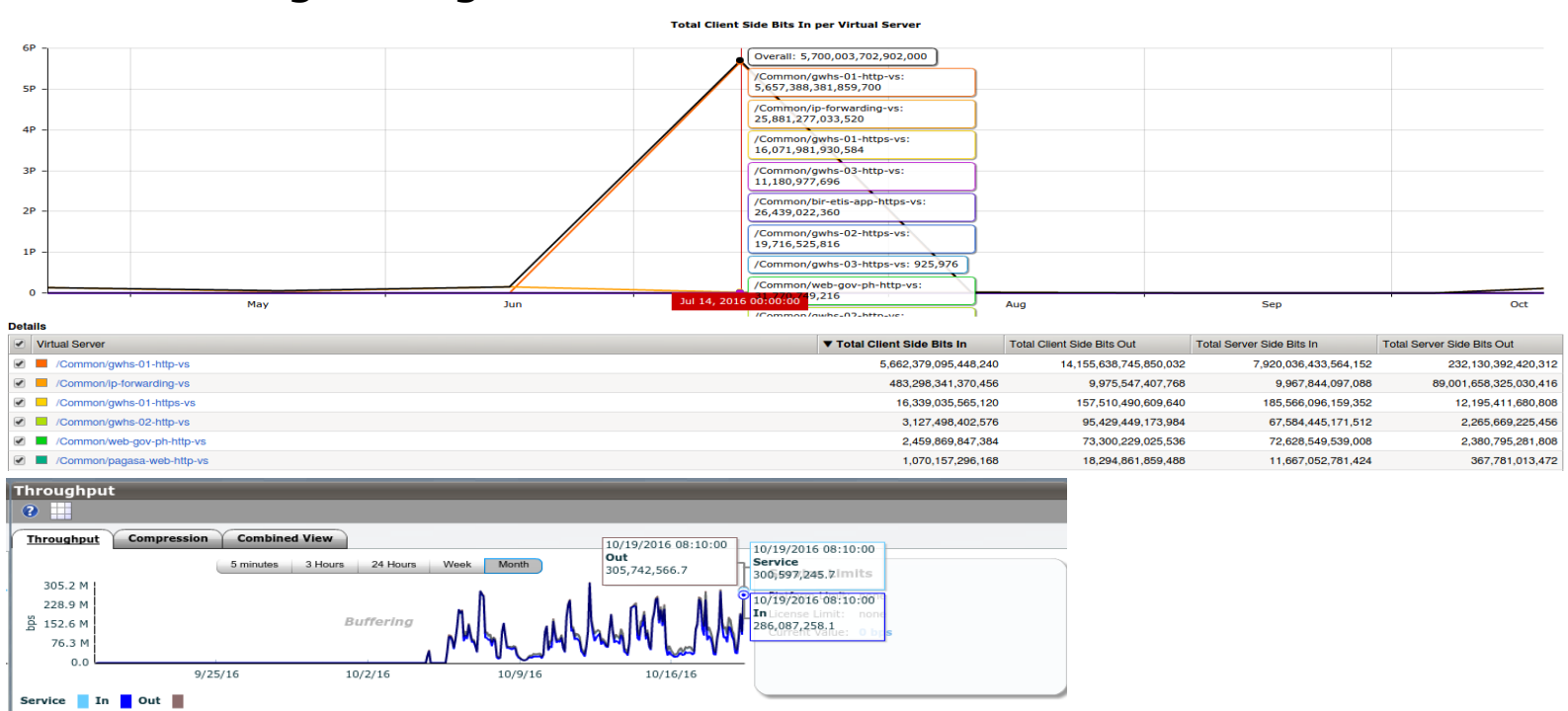
Image reproduced from:
<http://www.nasa.gov/sites/default/files/thumbnails/image/haima-npp-102016.png>

Total Client Side Bits In per Virtual Server



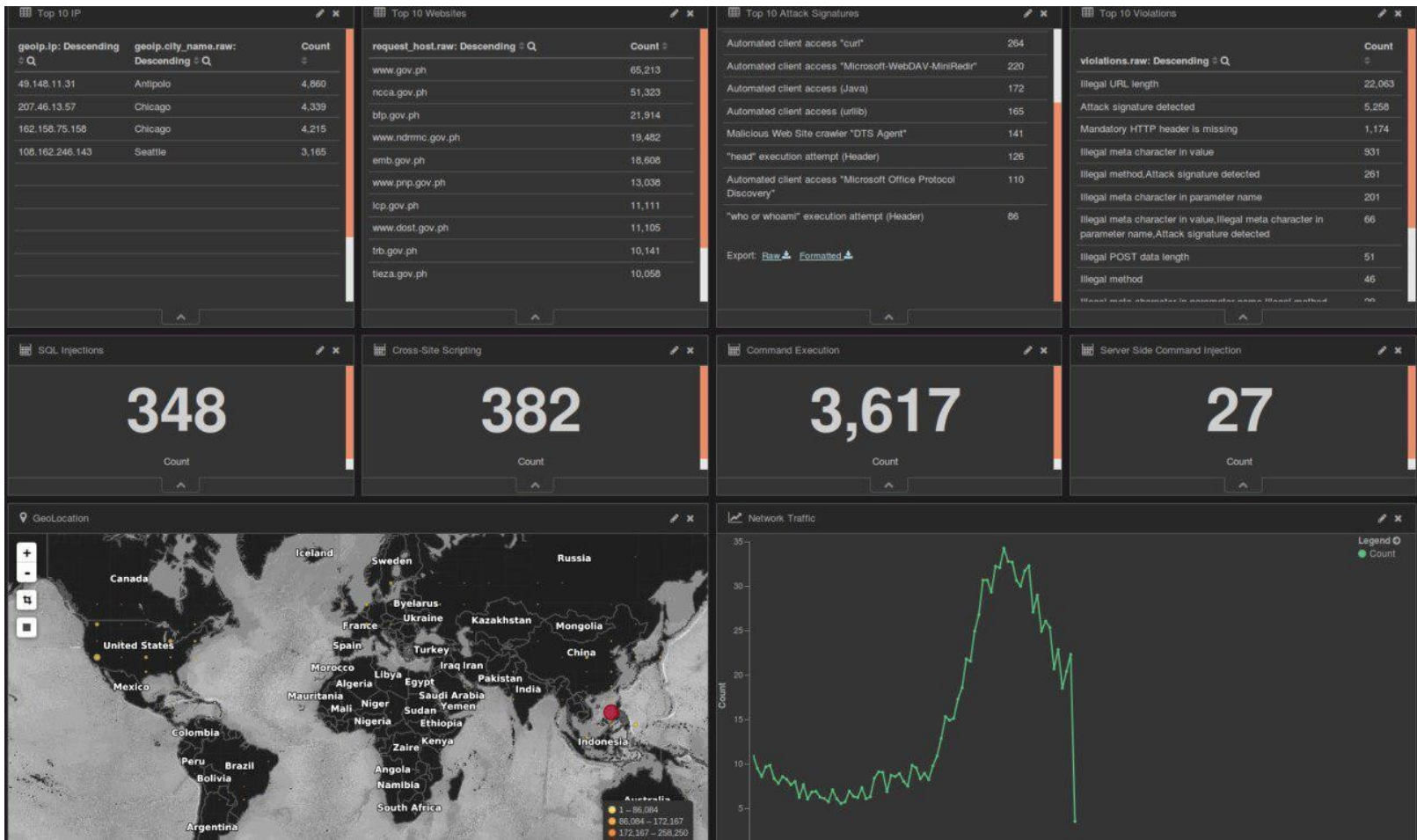
GovCloud Monitoring Tools: Load Balancer

- Load balancer: F5 BIG-IP with Analytics
- With web application acceleration (optimize utilization aside from load balancing) and firewall (security, logged traffic trend)
- Dynamic load balancing (predictive) of traffic for critical applications
- Limited log storage



GovCloud Monitoring Tools: ELK+ OSSEC

- For managing load balancer logs
- Currently used for network security related monitoring



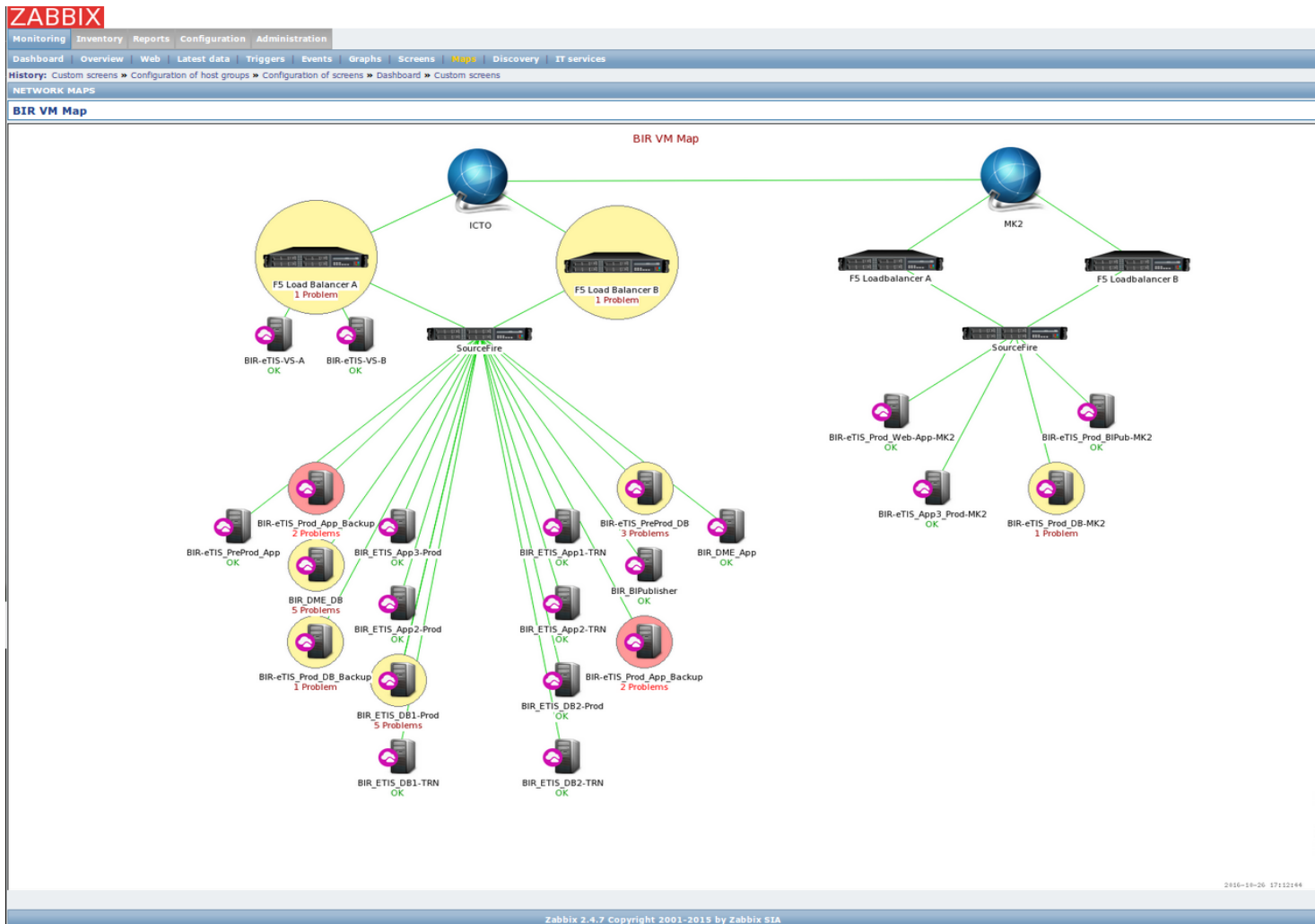
GovCloud Monitoring Tools: Zabbix

- Monitoring of compute and storage utilization of virtual machines, equipment utilization via SNMP, and network traffic
- Customized network traffic monitoring per user



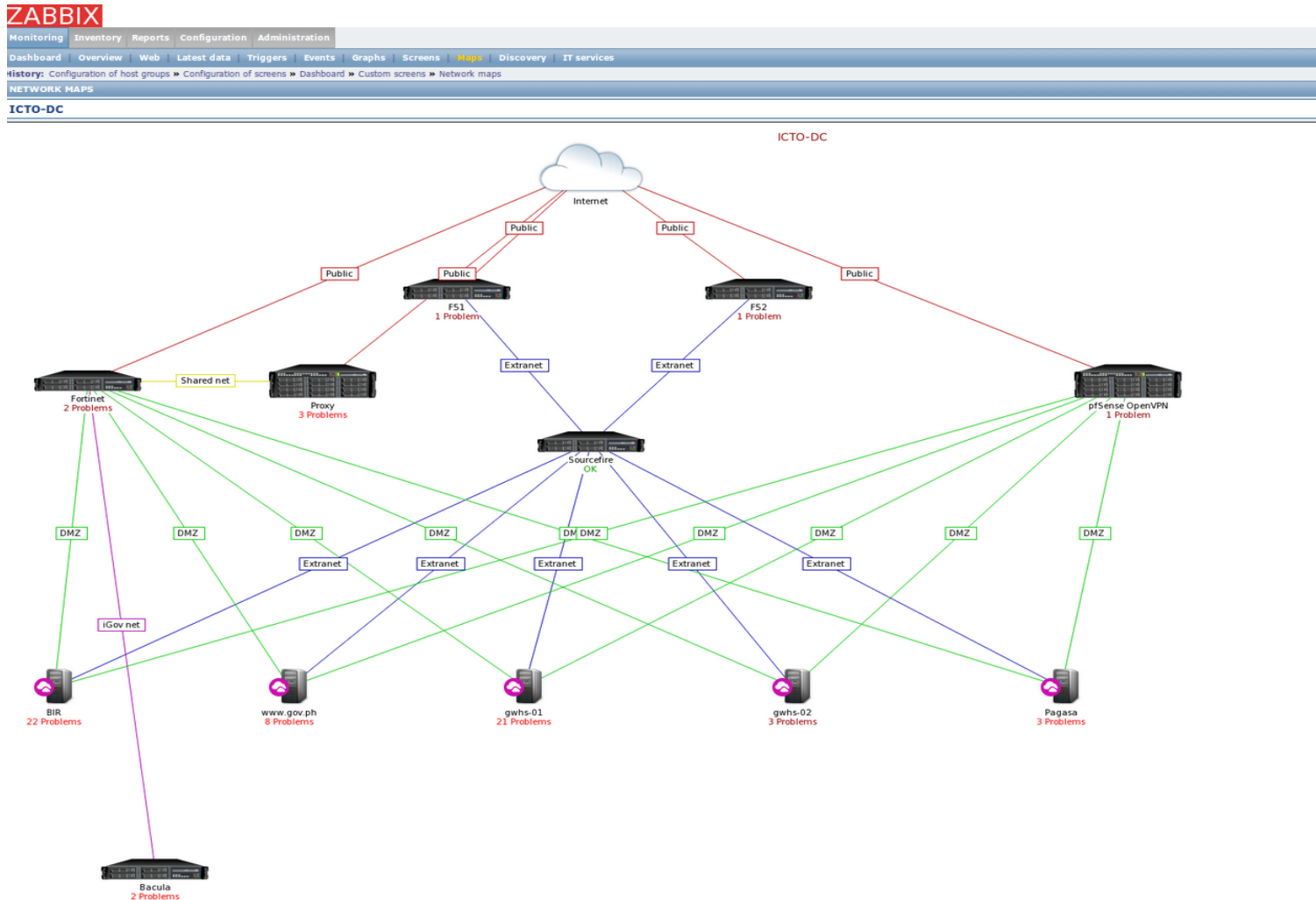
GovCloud Monitoring Tools: Zabbix

- Customized map view monitoring per virtual machine or equipment



GovCloud Monitoring Tools: Zabbix

- Customized map view monitoring per virtual machine or equipment



GovCloud Monitoring Tools: PHPIPAM

- PHPIPAM: IP address management
 - For provisioning
 - Auto-detection
 - IP-based uptime monitoring

The screenshot displays the PHPIPAM web interface for a specific subnet. The interface is divided into several sections:

- Subnet details:** Shows information for subnet 202.90.154.0/24 (255,255,255.0). It includes hierarchy (GDC01 - Public Network), description (Public Network), permission (Read / Write / Admin), usage (105 used, 149 free, 66% total), VLAN (99 - 154_net), device (Fortinet), and nameservers (10.8.0.4).
- Usage graph:** A pie chart showing 41% of the subnet is used (green) and 59% is free (white).
- IP addresses in subnet (Page 1/4):** A table listing individual IP addresses and their associated hostnames and services.

IP Address	Hostname	Device	Service	Prod_CL	pub
202.90.154.126	node-1203f1c3.i.gov.ph	Fortinet	GovPH-www.gov_ph_Web_1	Prod_CL	pub
202.90.154.127	node-cb116a8a.i.gov.ph	Fortinet	GovPH-TMS_Web	Prod_CL	pub
202.90.154.128	node-cb116a8a.i.gov.ph	Fortinet	BIR-eTIS_Training_App_1	Prod_CL	0
202.90.154.129	node-cb116a8a.i.gov.ph	Fortinet	BIR-eTIS_Training_App_2	Prod_CL	0
202.90.154.130	node-cb116a8a.i.gov.ph	Fortinet	IGov-PMGov_Dev	Prod_CL	0
202.90.154.131	ubuntu	Fortinet	DBM-NPS_Test-New	Prod_CL	pub
202.90.154.132	node-a66aef8.i.gov.ph	Fortinet	BIR_DME_App	Prod_CL	pub
202.90.154.133	node-a66aef8.i.gov.ph	Fortinet	BIR_DME_DB	Prod_CL	0
202.90.154.134	node-a66aef8.i.gov.ph	Fortinet	DOTC_OTP-ObA	Prod_CL	pub
202.90.154.135	node-745e8299.i.gov.ph	Fortinet	DOTC_BMIS_App	Prod_CL	pub
202.90.154.136	node-52183e00.i.gov.ph	Fortinet	IGov-PhPay	Prod-CL	pub
202.90.154.137	pay.gov.ph	Fortinet	IGov-PhPay	Prod-CL	pub
- Visual subnet display:** A grid view of the entire 202.90.154.0/24 subnet, with each cell representing an IP address. The grid shows a mix of green (used) and white (free) cells, with a tooltip for the IP 202.90.154.206 (node-1a897b41.i.gov.ph).

GovCloud Monitoring Tools: oVirt

- oVirt: virtual resource manager
- Hypervisor host and virtual machine level IP address, FQDN, VLAN allocation and network monitoring

The screenshot displays the oVirt Engine Web Admin interface. The top navigation bar includes the oVirt logo, a search bar, and user information (admin). Below the navigation bar, there are tabs for various system components: Data Centers, Clusters, Hosts, Networks, Storage, Disks, Virtual Machines (selected), Pools, Templates, Volumes, and Users. A table lists the virtual machines with columns for Name, Host, IP Address, FQDN, Cluster, Data Center, Memory, CPU, Network, Display, Status, and Uptime. The table shows various VMs with their respective resource usage and uptime. At the bottom, there is a log of recent events, including user logins and disk operations.

Name	Host	IP Address	FQDN	Cluster	Data Center	Memory	CPU	Network	Display	Status	Uptime
IGov-GWHS_HelpDesk_BOC	bch1-hx5-09	10.5.0.96 10.9.1.172	node-1e759301.i.gov.ph	Prod_CL	IGovPH_GDC-01	27%	6%	0%	VNC	Up	44 days
IGov-GWHS_HelpDesk_Web	bch1-hx5-09	10.4.41.101 10.9.4.191	helpdesk.i.gov.ph	Prod_CL	IGovPH_GDC-01	20%	78%	0%	VNC	Up	44 days
IGov-GWHS_Taiga	bch1-hx5-14	10.5.0.95 10.9.4.185	node-8247d850.i.gov.ph	Prod_CL	IGovPH_GDC-01	33%	8%	0%	VNC	Up	44 days
IGov-GWHS_Web_1	bch1-hx5-07	10.4.3.106 10.9.4.139	node-b608d4d4.i.gov.ph	Prod_CL	IGovPH_GDC-01	55%	100%	11%	VNC	Up	44 days
IGov-GWHS_Web_2	bch1-hx5-10	10.4.3.102 10.9.4.181	node-2c8392a5.i.gov.ph	Prod_CL	IGovPH_GDC-01	30%	56%	22%	VNC	Up	44 days
IGov-GWHS_Web_Custom	bch1-hx5-10	10.4.3.206 10.9.3.22	node-1af22450.i.gov.ph	Prod_CL	IGovPH_GDC-01	21%	13%	0%	VNC	Up	44 days
IGov-Moodle_Training	bch1-hx5-08	10.12.2.126 10.4.13.101	node-b4c3b080.i.gov.ph	Dev_CL	IGovPH_GDC-01	19%	13%	0%	VNC	Up	11 h
IGov-PhPay	bch1-hx5-14	10.4.18.101 10.9.4.247	pay1.pay.gov.ph	Prod_CL	IGovPH_GDC-01	18%	0%	0%	VNC	Up	43 days
IGov-PhPay_DB	bch1-hx5-12	10.4.18.104 10.9.3.15	paydb1.pay.gov.ph.i.gov.ph	Prod_CL	IGovPH_GDC-01	13%	1%	0%	VNC	Up	42 days
IGov-PhPay_Staging	bch1-hx5-12	10.4.18.107 10.9.4.42	pay1.pay.gov.ph	Prod_CL	IGovPH_GDC-01	27%	1%	0%	VNC	Up	40 days
IGov-PMGov_DICT_Web-Server	bch1-hx5-06	10.4.3.108 10.9.4.64	node-e5a02ec7.i.gov.ph	Prod_CL	IGovPH_GDC-01	85%	0%	0%	VNC	Up	2 days
IGov-PMGov_WebDB	bch1-hx5-13	10.4.3.109 10.9.4.251	node-5bfde0c6.i.gov.ph	Prod_CL	IGovPH_GDC-01	23%	2%	0%	VNC	Up	5 days
IGov-PMGov_Web-Server	bch1-hx5-13	10.4.3.110 10.9.1.173	node-691be965.i.gov.ph	Prod_CL	IGovPH_GDC-01	36%	2%	0%	VNC	Up	1 day
IGov-PMGov_Web-Server-Test	bch1-hx5-12	10.4.3.111 10.9.4.124	node-aa9241a1.i.gov.ph	Prod_CL	IGovPH_GDC-01	14%	0%	0%	VNC	Up	18 h
IGov-PREGINET_FreePBX	bch1-hx5-09	10.4.27.101 10.4.27.101	node-1dae8a0d.i.gov.ph	Prod_CL	IGovPH_GDC-01	15%	5%	0%	VNC	Up	42 days
IGov-PREGINET_Netflow	bch1-hx5-11	202.90.154.177 10.9.4.157 1	node-a09e60bf.i.gov.ph	Prod_CL	IGovPH_GDC-01	3%	0%	0%	VNC	Up	42 days

Log messages:

- 2016-Oct-19, 11:25 User janine logged in.
- 2016-Oct-18, 17:44 Add-Disk operation of iGov-PMGov_Web-Server-Test_Disk4 was initiated on VM iGov-PMGov_Web-Server-Test by janine.
- 2016-Oct-18, 17:44 Disk iGov-PMGov_Web-Server-Test_Disk4 was successfully detached from VM iGov-PMGov_Web-Server-Test by janine.
- 2016-Oct-18, 17:44 VM iGov-PMGov_Web-Server-Test disk iGov-PMGov_Web-Server-Test_Disk4 was unplugged by janine.
- 2016-Oct-18, 17:40 The disk iGov-PMGov_Web-Server-Test_Disk4 was successfully added to VM iGov-PMGov_Web-Server-Test

GovCloud Monitoring Tools: OpenDCIM

- OpenDCIM: infrastructure inventory management
- Data center level (power, space, environmental monitoring)

The screenshot displays the OpenDCIM web interface for the NGDC DCIM Data Center Statistics. The interface includes a search bar, a navigation menu, and a main content area with a statistics table and a cabinet layout diagram.

openDCIM
NGDC DCIM
Data Center Statistics

Language: en_US

Search by Name: [Advanced]

Reports

- Rack Request Form
- User Administration
- Issue Escalation
- Template Management
- Infrastructure Management
- Supplies Management
- Power Management
- Path Connections
- Edit Configuration

ICTO Data Center

	Infrastructure	Occupied	Allocated	Available
Total U 1092	86	523	26	457
Percentage	7.9%	47.9%	2.4%	41.8%

Computed Wattage 87446 Watts
Measured Wattage 7600 Watts
Design Maximum (kW) 0 kW
BTU Computation from Computed Watts 298365 BTU
Data Center Size 1000 Square Feet
Watts per Square Foot 87 Watts
Minimum Cooling Tonnage (Based on Computed Watts) 28 Tons
Average Temperature 0 °F
Average Humidity 0 %

Composite View of Cabinets

The cabinet layout diagram shows a grid of cabinets labeled with alphanumeric codes (e.g., C1-1, B1-1, A1-1) and color-coded by status. The layout includes sections for PKI (PKI 1-8), PACU (PACU 1-4), and R (R 1, R 2). A BCP (Business Continuity Plan) area is also visible.

GovCloud Monitoring Tools: OpenDCIM

- Network rack monitoring
- Infrastructure details populated manually

openDCIM NGDC DCIM Data Center Cabinet Inventory

Search by Name: [Advanced]

Reports

- Rack Request Form
- User Administration
- Issue Escalation
- Template Management
- Infrastructure Management
- Supplies Management
- Power Management
- Path Connections
- Edit Configuration

Home

- Gov Cloud Philippines
 - ICTO Data Center
 - ASTI CoAre
 - BIR LOT C
 - F5/SourceFire/Fortinet
 - GCP Racks
 - GCP Racks 2
 - Gov Cloud Servers
 - Government CA System
 - IBM Servers
 - Monitoring System
 - New Network Rack
 - A1-5
 - A1-6
 - A1-9
 - New Server Rack
 - PKI
 - Root CA System
 - SSO
 - GCP Rack 1
 - GCP Rack 2
 - GCP Rack 3
 - GCP Rack 4
 - GCP Rack 5
 - GCP Rack 6
 - GCP Rack 7
 - GCP Rack 8
 - GCP Rack 9
 - Storage Room
 - MK2
 - General Storage Room

Cabinet A1-9		Cabinet A1-9 (Rear)	
Pos	Device	Pos	Device
42	EXTREME X80-NEW	42	
41		41	
40	IGOV_BM-153-SW1-NEW	40	IGOV_BM-153-SW1_NEW/Rear
39	IGOV_SOURCEFIRE-NEW	39	IGOV_SOURCEFIRE-NEW/Rear
38	IGOV_SOURCEFIRE-2U-NEW	38	IGOV_SOURCEFIRE-2U-NEW/Rear
37		37	
36		36	
35	IGOV_3600-FORTINET-NEW	35	IGOV_3600-FORTINET-NEW
34		34	
33		33	
32	F5-VIPRION-NEW	32	F5-VIPRION-NEW/Rear
31		31	
30		30	
29		29	
28	169-254-118-140-NEW	28	169-254-118-140-NEW/Rear
27	IGOV_OPENNBI-LAS-FORTINET	27	IGOV_OPENNBI-LAS-FORTINET
26	IGOV_SSO-SW-NEW	26	IGOV_SSO-SW-NEW/Rear
25		25	
24	IGOV_SMT-ELC-SW-NEW	24	
23	QUALYS-NEW	23	QUALYS-NEW/Rear
22	F5-A-NEW	22	F5-A-NEW/Rear
21	F5-B-NEW	21	F5-B-NEW/Rear
20	IGOV_VPN-NEW	20	IGOV_VPN-NEW/Rear
19		19	
18		18	
17	IGOV_BIR-IPSEC-NEW	17	IGOV_BIR-IPSEC-NEW/Rear
16		16	
15		15	
14		14	
13		13	
12		12	
11	BLACKDIAMOND X8	11	BLACKDIAMOND X8/Rear
10		10	
9		9	
8		8	
7		7	
6		6	
5		5	
4		4	
3		3	
2		2	
1		1	

Markup Key

- (T) - Template Unassigned
- IGov Cloud
- Reservation

Cabinet Metrics

- Space: 81%
- Weight / 0l
- Computed Watts: 3 kW / 0 kW
- Measured Watts: 0 kW / 0 kW
- Approximate Center of Gravity: 8 U

Power Distribution

Add CDU

Last Audit: Never

Model: APC

Data Center: ICTO Data Center

Install Date: 2016-08-11

Zone: New Network Rack

Tags:

Certify Audit

Add Device

Audit Report

Map Coordinates

Edit Cabinet

Delete Cabinet

[Return to ICTO Data Center]

GovCloud Monitoring Tools: OpenDCIM

- Port-mapping inventory
- Ports also manually populated

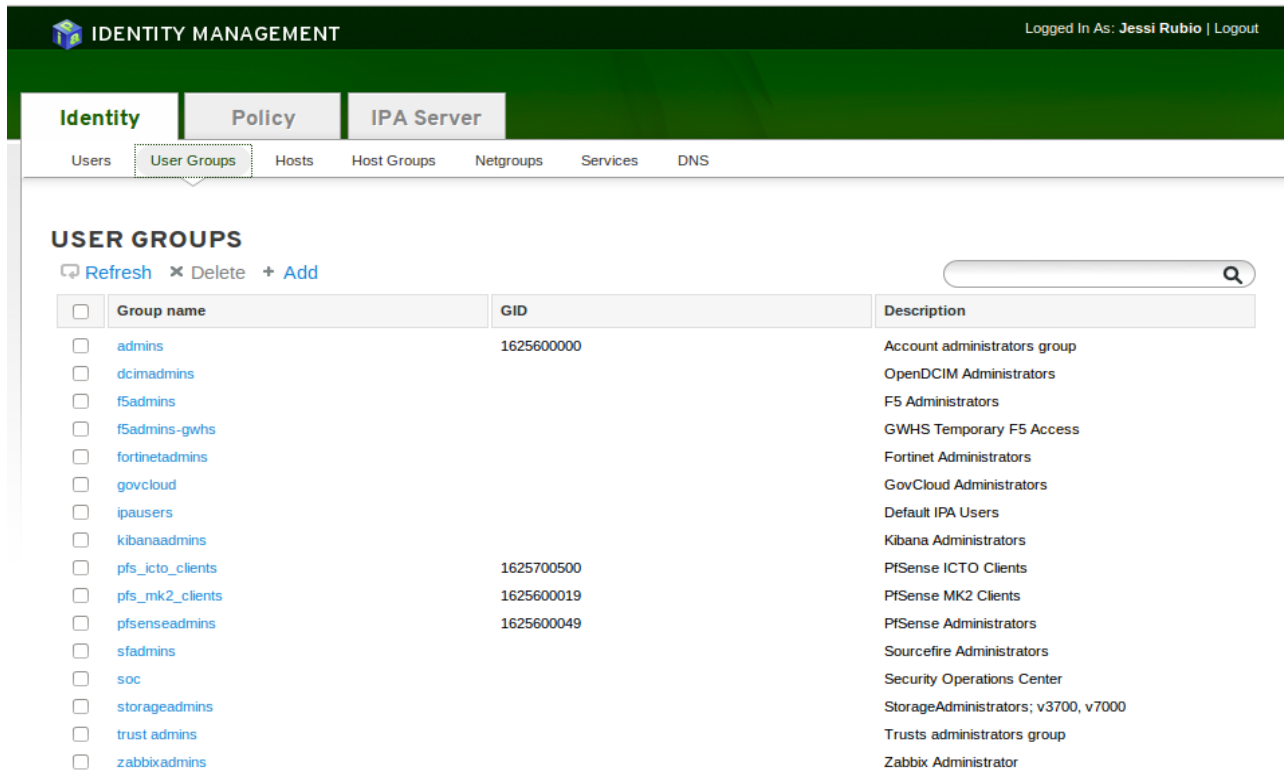
No power connections defined. You can add connections from the power strip screen.

#	Port Name	Device	Device Port	Notes	Media Type	Color Code
1	Port1	BLACKDIAMOND X8	Port19	BDX-8 uplink		
2	Port2	IGOV-SOURCEFIRE-NEW	S2-P2			
3	Port3					
4	Port4					
5	Port5					
6	Port6	R-20_NR2	Port1			
IGOV IBM-153-SW1_NEW[Port6] → R-20_NR2[Port1] → R-20_NR2 PATCH PANEL[Port1] → IGOV IBM-153-SW2[Port2]						
7	Port7	IGOV_MGMT-CLOUD-SWNEW	Port16			
8	Port8					
9	Port9					
10	Port10					
11	Port11					
12	Port12					
13	Port13					
14	Port14					
15	Port15					
16	Port16					
Path of R-21 NR2 - Port 5						
32	Port32					
33	Port33					
34	Port34	R-20_NR2	Port11			
IGOV IBM-153-SW1_NEW[Port34] → R-20_NR2[Port11] → R-20_NR2 PATCH PANEL[Port11]						
35	Port35	R-21_NR2	Port9			
IGOV IBM-153-SW1_NEW[Port35] → R-21_NR2[Port9] → R-21_NR2 PATCH PANEL[Port9] → IGOV_BLADECHASSIS_NEW[eth0-p1]						
36	Port36					
37	Port37	R-21_NR2	Port5			
IGOV IBM-153-SW1_NEW[Port37] → R-21_NR2[Port5] → R-21_NR2 PATCH PANEL[Port5] → IGOV_BLADECHASSIS_NEW[eth0-p2]						
38	Port38					
39	Port39					
40	Port40	R-21_NR2	Port8			
IGOV IBM-153-SW1_NEW[Port40] → R-21_NR2[Port8] → R-21_NR2 PATCH PANEL[Port8] → IGOV_BLADECHASSIS_NEW[eth0-p2]						
41	Port41	R-21_NR2	Port12			
IGOV IBM-153-SW1_NEW[Port41] → R-21_NR2[Port12] → R-21_NR2 PATCH PANEL[Port12] → IGOV_BLADECHASSIS_NEW[eth0-p2]						
42	Port42	R-21_NR2	Port3			
IGOV IBM-153-SW1_NEW[Port42] → R-21_NR2[Port3] → R-21_NR2 PATCH PANEL[Port3] → IGOV_BLADECHASSIS_NEW[eth0-p1]						
43	Port43					
44	Port44			lscp w34		
45	Port45	R-20_NR2	Port7			
IGOV IBM-153-SW1_NEW[Port45] → R-20_NR2[Port7] → R-20_NR2 PATCH PANEL[Port7]						
46	Port46	IGOV_OPENNEBULA-FORTINET-NEW	Port9			
47	Port47					
48	Port48					

[Update] [Copy] [Certify Audit] [Delete] [Export Connections] [Print] [Log View]

GovCloud Monitoring Tools: IPA

- Identity, Policy, and Audit (IPA) : managing users across GovCloud hosted services including monitoring tools
- Recommended practice



The screenshot displays the Identity Management web interface. At the top, there is a green header with the text "IDENTITY MANAGEMENT" and a user login status "Logged In As: Jessi Rubio | Logout". Below the header, there are three main tabs: "Identity", "Policy", and "IPA Server". Under the "Identity" tab, there are sub-tabs for "Users", "User Groups", "Hosts", "Host Groups", "Netgroups", "Services", and "DNS". The "User Groups" sub-tab is selected, and the page title is "USER GROUPS". There are action buttons for "Refresh", "Delete", and "Add", and a search bar. The main content is a table with three columns: "Group name", "GID", and "Description".

<input type="checkbox"/>	Group name	GID	Description
<input type="checkbox"/>	admins	1625600000	Account administrators group
<input type="checkbox"/>	dcimadmins		OpenDCIM Administrators
<input type="checkbox"/>	f5admins		F5 Administrators
<input type="checkbox"/>	f5admins-gwhs		GWHS Temporary F5 Access
<input type="checkbox"/>	fortinetadmins		Fortinet Administrators
<input type="checkbox"/>	govcloud		GovCloud Administrators
<input type="checkbox"/>	ipausers		Default IPA Users
<input type="checkbox"/>	kibanaadmins		Kibana Administrators
<input type="checkbox"/>	pfs_icto_clients	1625700500	PFsense ICTO Clients
<input type="checkbox"/>	pfs_mk2_clients	1625600019	PFsense MK2 Clients
<input type="checkbox"/>	pfsenseadmins	1625600049	PFsense Administrators
<input type="checkbox"/>	sfadmins		Sourcefire Administrators
<input type="checkbox"/>	soc		Security Operations Center
<input type="checkbox"/>	storageadmins		StorageAdministrators; v3700, v7000
<input type="checkbox"/>	trust admins		Trusts administrators group
<input type="checkbox"/>	zabbixadmins		Zabbix Administrator

GovCloud Monitoring Tools: Helpdesk

- Helpdesk (Open Source Ticket Request System or OTRS) : managing client-side support requests

Dashboard

Reminder Tickets

My locked tickets (0) | My watched tickets (0) | Tickets in My Queues (0) | All tickets (0)

TICKET#	AGE	TITLE
none		

Escalated Tickets

My locked tickets (0) | My watched tickets (0) | Tickets in My Queues (0) | **All tickets (0)**

TICKET#	AGE	TITLE
none		

New Tickets

My watched tickets (0) | Tickets in My Queues (0) | **All tickets (40)**

TICKET#	AGE	TITLE
9209560	2 d 6 h	[Samsung R&D Institute Philippines] Data Request: Cloud Computing Services in the Philippines
9209460	9 d 0 h	Activation of PAGASA's website instance at ASTI
9209453	9 d 3 h	PAGASA Website Server Error
9209451	9 d 4 h	PAGASA Website Server Error
9209445	9 d 4 h	Tech Support for PAGASA web hosting
9209434	9 d 7 h	PAGASA Website Server Error
9209391	11 d 0 h	Monitor is DOWN: igovph-pagasa
9209365	13 d 19 h	PAGASA website transfer to kidlat

7 Day Stats

Created Closed

Day	Created	Closed
Sat	0	0
Sun	1	0
Mon	1	0
Tue	2	3
Wed	2	0
Thu	3	3
Fri	1	0

Upcoming Events

none

OTRS News

GovCloud Monitoring Tools: Redmine

- Redmine: project management tool
- Useful for configuration and troubleshooting documentation
- Tickets, wiki, gantt/roadmap

The screenshot displays the Redmine web interface for the 'Integrated Government Philippines (iGovPhil)' project. The top navigation bar includes links for Home, My page, Projects, Contacts, People, Administration, and Help & Support. A search bar is present, and the user is logged in as 'j'. The main navigation menu is active on the 'Issues' tab, with other options like Overview, Activity, Roadmap, New issue, Gantt, Agile, Calendar, Documents, Wiki, Forums, Files, Contacts, and Settings.

The main content area is titled 'My Tickets In Progress' and includes filters and options. Below this is a table of tickets, categorized by priority: Immediate (1), High (2), Normal (3), and Low (1). Each ticket row shows its ID, tracker, status, priority, subject, update time, due date, and progress percentage.

#	Tracker	Status	Priority name	Subject	Updated	Due date	% Done
Immediate 1							
1911	Feature	In Progress	Immediate	Test email fetching in redmine	09/22/2016 10:17 AM	09/30/2016	<div style="width: 100%;"></div>
High 2							
3307	Feature	Feedback	High	Create a report on the rack migration activity issues	09/22/2016 08:16 AM	09/12/2016	<div style="width: 100%;"></div>
3393	Feature	Feedback	High	Revise D&Rs of GovCloud's Technical Project Staff	10/05/2016 01:32 PM	09/21/2016	<div style="width: 100%;"></div>
Normal 3							
2427	Feature	In Progress	Normal	[Qualys] orientation of endusers in acknowledging and resolving reported vulnerabilities	09/22/2016 08:18 AM	06/10/2016	<div style="width: 100%;"></div>
3889	Feature	New	Normal	Create proxy.i.gov.ph VM in GDC01	10/26/2016 11:43 AM	10/27/2016	<div style="width: 100%;"></div>
3849	Feature	In Progress	Normal	Configure redmine.asti.dost.gov.ph at GovCloud for HA	10/26/2016 10:49 AM	10/28/2016	<div style="width: 100%;"></div>
Low 1							
3901	Feature	In Progress	Low	Configure a deadline reminder plugin in redmine.asti.dost.gov.ph	10/27/2016 10:52 AM	10/28/2016	<div style="width: 100%;"></div>

Additional elements include a right-hand sidebar with navigation options like 'View all issues', 'Summary', 'Calendar', 'Gantt', 'Agile board', 'Version planning', 'Agile charts', 'Issues burndown', and 'My custom queries'. A footer note states '(1-7/7)' and another footer note indicates 'Also available in: Atom | CSV | PDF'.

GovCloud Plans

- Implement HA configuration in monitoring tools
- Load balancer and switch upgrade with increasing network traffic trend
- GCP Cloud (OpenStack, 2304+ cores, 6144GB memory, 2.5PB storage by end of 2016)
- NextGen Cloud (1000 VMs, outsourced managed services)

Download presentation here at
www.pregi.net/teinws2016.pdf