The Americas Academic Network Summit

Meeting Thursday, 5th September 2019,

Convention Center – Hotel Krystal, Cancún México

Minutes of the Meeting

A. Participants at the Meeting:

1. Howard Pfeffer (Internet2, USA)
2. Louis Fox (CENIC, USA)
3. Tom Fryer (GEANT)
4. Ana Hunsinger (Internet2, USA)
5. Benedicto García Ordoñez (RUNBA, Nicaragua)
6. Luis Castillo (RAU, Uruguay)
7. Marco Antonio To (RAGIE, Guatemala)
8. Julio Ibarra (AmLight, USA)
9. Patricia Hernández (RedNESAH, Honduras)
10. Natalia Gallo (RedNESAH, Honduras)
11. Kevin Thompson (NSF, USA)
12. Tania Altamirano (RedCLARA)
13. Mónica López (RENATA, Colombia)
14. Luz Miriam Diaz Patigño (RENATA, Colombia)
15. Mirta Podestá (RAU, Uruguay)
16. Carlos Gamboa (RedCONARE, Costa Rica)
17. Carlos Casasús (CUDI, México)
18. Eduardo Grizendi (RNP, Brazil)
19. Paola Arellano (REUNA, Chile)
20. Jim Ghadbane (CANARIE, Canada)
21. Juan Pablo Carvallo (CEDIA, Ecuador)
22. Galia Rivas (CEDIA, Ecuador)

23. Salma Jalife (Subsecretary of Comunications, Secretariate of Communications and Transport, México)
24. Christian O'Flaherty (ISOC, Uruguay)
25. Israel Rosas (ISOC, Mexico)
26. Luis Eliécer Cadenas (RedCLARA)
27. Mark Urban (RedCLARA)

B. Welcome, Introduction

Following welcoming words to all participants to this Meeting, Luis Eliecer Cadenas (Executive Director of RedCLARA) addressed the audience a presentation of relevant events and developments concerning the Research and Academic Networks, at global level, especially from a point of view of the Americas.

Reviewing firstly efforts made to diversify and enhance services structure of the RENs in the region:

Expansion of the federation of identity, a very important feature for the whole community; Federation Services accessible in the Cloud; Eduroam Services accessible through the Cloud;

More generally, all services that can be offered even in countries where there is no NREN currently available, to be fostered in particular in Peru, Bolivia, Belice a.o.

Further: Working sessions related to this meeting:

In January, first edition of the Americas Academic Network Summit, first approach to know more about each other's initiatives.

We have the pleasure that Louis Fox (CENIC) could make it and is present this time.

Talks about Global Network Architecture (GNA)

Elaborating a Working Plan

Focusing thematic work on Climate Change

Looking for Alliance with AmeriGEO through Agreement

Large representation of Americas' RENs; only missing Argentina this time.

Round of presentation of the participants.

C. Individual presentations:

Howard Pfeffer – Internet 2: Updates since Last Meeting in Mexico
Efforts deployed to deliver the entire US ecosystem at high-level:

Next Generation Infrastructure (NGI):
To support Data intensive researchers, through software driven infrastructure, through Cloud research and administration, and also financially.

Basis: Review of services and services models: Started listening to requirements and actual solutions, services and Internet2 infrastructure portfolio that the community really needs.

On optical side: NGI plans for optical upgrade. Map: up to 100G waves.

Partner in this process: CIENA

On packet side: Large Community Meeting, July 16 & 17 (University of Minnesota): on specific technologies; biggest piece was on orchestration and control closer to end users. Positive feedback overall.

Cloud Connect:
Announced March 2019, "Direct connect" solutions with AWS, Google and Microsoft. 30 out of 43 Network Members, campuses using service through Cloud Connect Portal access.

Atlantic Pacific Research and Education Exchange (AP-REX)
Internet2 responsible for overall exchange; trials with partnerships with other countries: on the Support side, and on the Planning side.

Pilot collaboration with Pacific Wave to increase capacities between East and West; expanding on international traffic.

Trust & Identity
Enhancing ability to create collaboration through Trust and Identity: InCommon Federation.

Ana: bilingual basic information

Consistency on one basic thing: metadata specifications; metadata have to be accurate and complete; have to adopt policies. There has been a huge uptake on adoption (InCommon).

Software: New Federation Metadata Distribution Service (MDQ) deployed in Summer; memory footprint, tremendous amount of work.

The path forward: enhance capabilities; more people using InCommon; focus on professionalizing support; more training through specific programmes to communities.

InCommon Academy: One-stop shop; at scale; interaction with peers. Great feedback; successful programme.

Other Activities
AMLIGHT South American Astronomy Coordination Committee Face-to-Face /
Virtual Meeting hosted by REUNA

Global Summit: Executive track presentation on RedCLARA

Etc.

Jim Ghadbane – CANARIE Updates
Update of Funding
1. CANARIE being refunded, one major challenge faced is capacity to support absorption of this substantial increase in funding (63%).
2. Other challenges: Security
3. And: Expansion of connectivity to remote areas in the North

Work on Identity Management

"Meeting Room" set up as a cube to allow temporary access

The more people use ID features, the better:

<mark>Cybersecurity breaches actually dropped dramatically, especially as some Regionals have taken up ID Management aggressively</mark>. There is largely misrepresentation about people or organizations, actually more trust, more sharing means more security.

Work with Canadian Regionals

Just had CANARIE Annual Meeting previous week: Looking back and identifying plans

National Strategic Plan

Part of overarching strategy is CANARIE being involved from Day 1 in projects involving Regionals, working directly with communities together with NRENs or Regionals that serve the needs of the communities.

Partitioning of functions, developing solid <mark>community of NREN security specialists</mark>, sharing info, resources, developing JOINLTY elements of response and mitigation to threats.

Even if they don't talk about cybersecurity right now, they WILL inevitably start to ask about it.

A lot of value added is to be provided from the NRENs.

Relevant Global Items

1. Long-term connectivity to Europe
2. <mark>Satellites to provide better connectivity in certain places</mark>
3. GNA merged with GLIF in GNA-G (GNA started by CEO Forum, but a lot of overlap work… better merged)
4. <mark>GLIF Map</mark>: every organization around the World to provide data

Discussion points:

Promoting a "Global Language" format for data; Map global picture that can be drilled down to every member institution, to trace NREN and how it connects to others.

It shows the real value of local connectivity, in context, to be community driven.

To a question from Christian about how finances are reflected, Jim: as it concerns ALL of us, and there is no independent funding any more, people have to participate. It is becoming a totally open construct, not exclusive, any interested universities are welcome, also in the technical group. There are links to documents.

About the <mark>FinBench Group: the idea is to have a clearer picture of the Total Investment in the Global Network</mark>.

Even the GREN started to use it.

Even if some local ISPs can't give access to certain business details, the concept is to give an image of all what GREN provides, some ideas were adopted to simplify the message, since in the end the real purpose is to help… paying the bill

Question from Howard: where are the critical test points?

Tom: The GEANT interactive Map basically shows backbone connectivity, with links to NRENs etc.. It does NOT include national connections. Every participating network has to be

responsible for its own data. There is no staff specifically assigned to this task, it is based on a simple spreadsheet. It is a repository as well as a map, with references to federations, to eduroam.

It will greatly help if resources are to be allocated to that task: 1 at CANARIE, 1 at GEANT.

Kevin Thompson – NSF Thoughts about US Global and regional collaboration and investment

Security research program: NSF investing, in recent years; as large facilities require to be made more secure. Relevant Plans are coming out, with a compelling message.

E.g. Cybersecurity Innovation for CyberInfrastructure CICI, including SSC, RDP & CCoE

IRNC Program:

NSF´s global presence

Presence through observatories, ships, instruments

Directorate for Education

International partnerships with research communities

Instrument sources, especially vessels, e.g. for ocean observation, are mostly still poorly connected.

NSF Networking Investments

(most important slide)

How to connect super computers

CC* Campus Cyberinfrastructure: Program to improve campus networks
Upgrade; e.g. from 10Gbps to 100 Gbps, with Internet2

IRNC International R&E Network Connections
How Science is conducted includes global connections

IRNC Awards

4 categories

One common "Unit": 100 Gbps: Julio will take it up.

Open Exchange Points on US soil

At NSF strong emphasis on measurement: funding the other end of the connection.

IRNC current status: last year of funding for current Awards; likely to release another solicitation, though maybe not in time before to have new Awards in place before current one end.

Principles for the Global R&E Networking Fabric

7 years ago co-developed with Jean-Luc Dorel (EC)

"Virtual Exchange Point" fully consistent with principle of interoperability

End-to-End

Coordinated, to meet the needs of science and education (in terms of networking) for next 10 years.

Sidebar on ==Americas Science Cloud and HPC Cooperation==
New supercomputer NSF-funded (Frontera, Univ of Texas, Austin)

==Exploring Clouds for Acceleration of Science E-CAS==
Cloud Access Award: giving scientists access to cloud computing platforms
==Open Science Grid: already sites available in Brazil==
CC* Area #4

Emerging and Continuing Themes & Observations
NSF % of global footprint decreasing

Plans / ==Projects are getting larger==, pose challenges to the Community for the next decade.

e.g. ==Multi Messenger Astronomy==; connecting remote instrumentation:

Event Horizon Telescope: how the Science is going to be conducted: not with one single instrument any more e.g. black hole image with contributions from many different instruments.

Our global r&e network fabric:
little participation yet, but expecting increase

South Cone Telescope…

Pay attention to where instruments are based…

Next Decade may see the ngVLA
US Centric

From ngvla.nrao.edu
Good idea from picture; domestic challenges; giving order of magnitude of step up in sensitivity.

"==OneWeb brings fiber-like internet for the Arctic in 2020==
Larger plans with satellites

Date that will be made available

Emerging and Continuing Themes and Observations (3 of 4)
Measurements for network engineering: we are lacking instruments

Questions we OUGHT to be able to answer; what do we need in terms of commodity data; deeper understanding of measurement needed.

Example from portal.netsage.global, with 7-days summary of flows.

Emerging and Continuing Themes and Observations (4 of 4)
In coming years, opportunities:

- *Testbeds*
- <mark>*Deeper integration of storage and compute "in line"*</mark>   *"compute & cashing" in places in US and EU*
- *Circuit leases*
- *Power of partnerships*

Jim: With science instrumentation evolving, what will be the cost of cybersecurity; data centers not connected;

Kevin: this is to insinuate integrated thinking: it has to be done.

Louis Fox – CENIC and PACIFIC WAVE Opportunities for Collaboration

CENIC has a history of collaboration with Latin America

Representatives of Charter Associates hold seats at Board. Includes a seat for public libraries.

<mark>20 million Californians use CENIC</mark>!

Among those: major research facilities, secondary schools

Map of CENIC Layer 3 Network
West regional network
Pacific Wave
Peering exchange, collaborating with partners around the Pacific

Broadband Equity
Significant role of CENIC in the West
- *A lot of talented people exist but with little opportunity: Library Initiative was created.*
- *Broadband improvement Grant Program*
  California is largely a rural state
  <mark>Public schools: make a significant contribution; standardized tests for schools</mark>
- *Google & AT&T: Tribal Digital Village to connect tribes in the West of the US independent indigenous networks (as testbed)*

Advancing Research in the Americas
My 1st international travel!

Current initiatives:
- AmLight
- <mark>Cross-border connections to Canada and Mexico</mark>
- In the Pacific Region, to the Pacific Islands

<mark>List of initiatives: we work together as a community</mark>

One of the great things that NSF has fostered: to connect North and South.

PIREN

Pacific Islands: International Exchange Point on Guam

Advancing Research in the Americas

Aim at making it seamless for nations that have to cross through the US

Making it easier, through collaborations, especially with <mark>key science drivers</mark>, like

- <mark>epidemiology;</mark>
- <mark>oceanography (oceans, the "lungs" of our planet)</mark>
- <mark>climate-related research</mark>

El niño events

e.g. Inter-american Institute

Data sharing around this topic

Have to do more of what Julio does, for LSST, etc.

HPWREN, AlertWildfire, WIFIRE & CENIC

Sensors, cameras (infrared etc), machine learning of instruments; analysing amount of data about how fires spread

Fire Weather Monitoring and Prediction in WIFIRE

First responders can go in; how to deploy human resources to fight fire; used in several thousands fires in California!

TUBBS FIRE, SONOMA COUNTY 2017

System in place: no lives loss; not totally contained, but far less consequences

CALINKS

If firefighters lose communication

PROPOSED CALinks Network using GeoLinks' Fixed Wireless and CENIC's optical fiber backhaul

- Estimate calculations: costs related to fires aprox. 1 Billion USD
- Not just in West US, extend collaboration to Latin America, etc.
- Better understand effects on air quality; on buidings -on carpets!. We still don't understand what the effects are on human health.

Global Research Platforms & NRENs

Frictionless scientific network with international partners, on a larger scale. Workshops; e.g. in <mark>San Diego Pacific Research Platform (FIONA)</mark>

Arts, Culture

SFJAZZ

Rich context valued by members

Demo: trombone players from Czech Republic, world famous; master class. Musicians and engineers come out with new knowledge.

AMAZING things can result from collaboration; this is just the beginning!

Luis: Now an introduction to the regional connectivity projects underway:

Eduardo Grizendi – RedCLARA and RNP International Connections
New submarine cables (2018-2021)

3 cables:
1. Monet
2. SACS
3. EllaLink

Current International Links

LA – USA (2019) : LSST Project
We can highlight 2 optical channels with Angola Cables

LA – Africa (2020)
With funding from NSF: use if SACS Cable; 1 optical channel of 100 Gbps operational end 2019-beginning 2010 (Fortaleza – Luanda).

LA – Europe (2021)
BELLA Project, RedCLARA + GEANT ; BELLA-S + BELLA-T.

- Segment Fortaleza – Porto Alegre: backbone of 100 Gbps
- Segment Fortaleza – Porto Alegre: dark fibre from the Power Company OPGW; backbone finished
- Segment Porto Alegre – Buenos Aires: tender process almost completed; 6 optical channels; aprox. 2.5 MUSD, signed contract expected end of the year.
- Segment Buenos Aires – Santiago de Chile: tender in process; RedCLARA: 2.3 MUSD
- Segments in Chile and Route on Pacific Coast: Santiago-Arica, border to Peru; - Antofagasta; - La Serena: big infrastructure, concentrating astronomical facility.
- Segment Chile - Ecuador: PCCS; indirectly connected to Chile through Panama.
- Segment Ecuador – Colombia: small segment, tender concluded, contract in negotiation & almost for signature.

Luz Miriam Diaz Patigño:
The recent change in government in Colombia presents a challenge for the Network (RENATA)

Luis Eliécer Cadenas – Central America
Central America: current state of connectivity

Central America: Intended, project

It is supposed to be a very important project: there is almost no infrastructure in each of the countries of the region, in spite of attempts in the last 8 years.

We prepared technical proposals, totalling aprox. 4 M USD per country (5 countries), + 5 M USD for the backbone in the region.

Depending on decisions of the Mexican Government.

Tuxtla Mechanism Meeting; Declaration of the Summit supporting the Project: it is about to get something important for the region, connecting more people, with considerably more capacity.

Carlos Casasús:

Mexico's support to the Project has been channelled though AMEXCID, with funds for supporting projects in Central America, especially with conditions in Central America that changed recently, and increasing awareness that support is desperately needed. With threats of economic sanctions to Mexico. It is almost assured that funds for fiber rings will be made available.

Technical details are being elaborated, and discussions with the EC carried out to complement Project with a link for segment between Panama and Colombia.

To Mexico, and also to the US, Northern Ring of the Americas; trying to fix the timeline of funding.

Improved SLAs are needed, for applications to be reliable.

Salma Jalife:

From the governmental backbone that is being set up in Central America, some of the capacity should be given to RedCLARA.

The Government gives funds to build the backbone, but within the countries that receive it, the counterparts are changing a lot. Once a timeframe has been set up for a country, if the country doesn't use the Funds to be applied for, it stays on "standby" until someone asks for it.

Important to find the right government official to apply and submit the requests for funding. In some countries it is the Ministry of Finance, in others the Ministry of Science and Technology, for instance. It is important to have the right contacts.

Carlos Casasús:

We are close to a conclusion, and the end result will be a Northern BELLA-T!

Jim Ghadbane:

Salma worked at CUDI and has strong knowledge of the whole matter. There are important humanitarian issues that are currently underlying any decision-making process in the region, so is there an ear for that? And do we know which is the targeted provider for the infrastructure?

Luis Eliecer:

A tender process will be carried out, that will determine to which provider a contract will be awarded.

Eduardo Grizendi:

This is not an easy matter; but going back to slide

Current International Links:

With the BELLA-T Project largely underway, with all the international links being deployed, the challenge is now to solve the problem of Central America.

Luis Eliecer:

Following contacts with the European Commission, we know an increase of the EC Contribution can be made available, up to aprox. 20 % of the total cost, which would amount to aprox. 1.6 M€. Crucial is the contact with the Mexican government to increase investment.

GNA de las Américas
Use of Globenet cables

Paola Arellano:

Global Submarine Cables: between Latin America and Asia/Oceania?
Important opportunity for the NRENs: a cable to the South. Operation expected March next year 2020.

Chile as a Digital Hub of Southern Cone

Undersea Cable: Asia – South America Digital Gateway

Project Schedule (Asia – South America Digital Gateway)

900 km needed to reach the Antarctic

RedCLARA as a Digital Hub for R&E of Latin America

Luis Eliecer:

To conclude the presentation of this part:

CLARA is working to obtain commitments; from "Cooperation", to go to real "Collaboration"!

Julio Ibarra- AmLight Express and Protect
Outline: where we were 5 years ago; evolution, where we are; AmLight SACS Project.

AmLight Express and Protect Vision
Backbone of 40 G at the time; then new cables being built MONET, increasing capacities (>680 G).

Sao Paolo – Fortaleza – Miami

Partners and Goals
Part of the Vision:

Brazil is a key partner

CLARA Partnership: long-term vision of collaboration, continuingly evolving over time; using both optical spectrum and leased capacity.

AURA: representing LSST

AmLight ExP Network Infrastructure January
Since January: Total 200 Gbps

AmLight ExP Network Infrastructure Today
Total: 630 Gbps between US and Latin America; exciting significant achievements with Brazil, RedCLARA and Latin American NRENs.

Large Synoptic Survey Telescope (LSST)
One of main reasons for considerable upscaling is: LSST

Funded by NSF together with private funding.

Connection from Northern Chile to Illinois.

Challenge: LSST Use Case

All the operators involved on the right (of figure on slide) had to coordinate to build this infrastructure and make it operational.

2018 was the first opportunity to test it.

Network Infrastructure resources in the Southern Hemisphere

Linking the Western Hemisphere to the Eastern one FROM THE SOUTH.

Thanks to SACS being made available.

+ Cable to Europe.

AmLight – SACS

From Fortaleza (Brazil) to Luanda (Angola): new express route, in the South Atlantic; operated by AmLight Consortium (RNP, SANReN).

AmLight – SACS Global Exchange Points

Facilities for interconnection

Reducing latency considerable between Americas and Africa.

Building increased resilience with links with different capacities.

Tom: This means multiple backup routes and traffic route alternatives.

Jim: Also in the northern part of the Atlantic

Tom: RNP connecting to New York also

Jim: We have to see the Global Picture to optimize the network.

Timeline for AmLight – ExP and AmLight – SACS

2020: SACS from Fortaleza to Cape Town

2021: activating spectrum for LSST

Thank Yous:

To all the parts involved that made this networking possible

D. Exchange of views:

Luis Eliecer:

Conversation and Ideas:

To form a Working Group for the Americas;

To conceive a logical architecture, taking into account:

- The BELLA and the Central American Investments;
- The bad connectivity in Central America and Mexico;
- Open Exchange Points.

Let's see how we can proceed from there, and conduct an open conversation that leads to a concrete Action Plan.

Jim Ghadbane:
Key topic: Finance

Any kind of business model always to analyse Cost vs. Revenue.

From there, one question is: what can be done to reduce costs.

Tasks connected to network architecture are to analyse availability of high-speed networks, that can lead to an increase of cost performance, combined with more redundancy.

Not covered here are domestic challenges.

GNA-G: is a mechanism to reduce costs; it should not only involve technical people. Finding ways to Exchange Points has been considered? A lot of work on the GNA Network: if it can connect to certain Exchange Points, it can connect to GEANT, etc…

Julio Ibarra:
In the Southern Hemisphere, there is a clear evolution: working closely with partners, multiple carriers, aggregation with submarine cables.

Exchange Points are: Miami, Panama, Fortaleza, Sao Paulo, Santiago de Chile.

With CLARA present in every point, aggregation can be built up in all those exchange points.

Jim Ghadbane:
Is there a general direction to connect with those points instead of building up own international connectivity?

Luis Eliecer:
Yes;

In particular with Marco present in GNA; in San Diego; however the level of maturity is too low in some places to have an aggregate view. We hope in a near future to have a more coordinated view.

Howard Pfeffer:
In terms of architecture, the concept of GNA is connected to Exchange Points; but not every path between 2 Points is equivalent.

On top of this: rules on how you want traffic to flow, etc., have to be considered.

Luis Eliecer:
Related to points to be considered for later:

HPC capacities in Latin America

SCALAC cooperation for super computing; an agreement is to be signed with SCALAC (note: has been signed in the meantime). A special academic Council is to be designated in CLARA, to design a policy approach.

This will lead to redistributing capacities; topology etc. should take this into consideration; thus organising a macro-project, therefore impacting architecture decisions will have to be taken.

Therefore a clear view of where we want to go is needed!

Carlos Casasús:
With the help of Salma, efforts are being undertaken for reconstructing CUDI's network.

In the design, for example in the case of the connection to the US to California, to optimize rather than one single exchange point, it is more optimal to have several border crossings (e.g. San Diego – Tijuana)

Other worries: if we allow universities to connect directly to exchange points, we can endanger the business model. For example, the University of Sao Paulo that is by-passing RNP.

Tom Fryer:
A regional network actually enables precisely smaller countries to emerge in the network landscape.

Howard Pfeffer:
It is crucial to sit down with the Regionals and agree on things, talking through.

Julio Ibarra:
It is an adopted practise; always to be in conversation with CLARA and the NRENs.

Louis Fox:
The problem in the relationship with carriers that have their own relationship with members is that there might be issues because they may be "cherry-picking" institutions.

Jim Ghadbane:
Members could have chosen e.g. a single exchange Point; the biggest Internet Exchange in Canada. But actually they don't: what the Regionals provide IS what they want.

There are notions of architecture and functionality, and in the policy adopted they weigh in what works or not.

So it has been determined that if you want to connect to CANARIE, you have to connect to the regionals. It really comes down to a policy issue, it is a policy that has to sustain that scheme.

The whole system will get stronger if everyone is happy with the architecture then there is nothing to talk about.

Juan Pablo Carvallo:
The model is far from perfect; CEDIA ideally to have direct connection to AmLight; especially in the case of the Galapagos Islands, a lot of laboratories from the US universities that are interested, but there is no way to connect them except by satellite. New fibre would be required; with AmLight, NSF, etc.

The only country really connected on the Pacific side actually is Chile. However the Ecuador perspective is now much better.

Mark Urban:
If we can "unlock" Peru it will help

Juan Pablo Carvallo:
The Galapagos are really a very important natural "laboratory", and any project helps.

Ana Hunsinger:

Even in the case of the Project in Central America, the Focus should be on science.

In Canada and in the US there are a lot of use cases; e.g. with astronomers, etc. What is important is inventorizing and highlighting such cases.

There are dozens of examples in Ecuador and in Central America, e.g. in connection with the very significant biodiversity. So the reason why Ecuador or Costa Rica need to have connectivity can be shown through identifying those cases, of ecosystems. We should bring those up and put them out.

Jim Ghadbane:

The Galapagos are in a way the moral equivalent of a data source opportunity

A case for building up GREN; participating in the discovery.

Louis Fox:

It is a 2-ways street: helping the community to access data is also a source of knowledge itself.

Without reciprocity, it doesn't work.

An Asset inventory would be of an immense value to the rest of the world, building stronger cases.

Luis Eliecer:

With the process of extracting data, a lot of resources is lost. By working with scientific teams, we will all be better in developing capacity to think. Better processes will result. Increase the intelligence goes through creating capacity.

Julio Ibarra:

It strikes me however how so much of the generated data is NOT moving, not circulating (from the researcher's desk…), e.g. in biodiversity etc.

Luis Eliecer:

It is true that a lot of researchers are (still) working like that, but: "who pays decides the music to play": if you want to receive the funds for your research, you should do it openly… and work in openness.

On another point of view, we are very much led by the availability of funds, whererby we should actually think in a more complete way:

To create and maintain the General Architecture point of view, we should see what is the best way to interconnect, and advance on these ideas in the first place in order to get the funds.

Americas Science Cloud

Basing on the experience of the on-going European Open Science Cloud EOSC; the benefit of working in beta-protocol together in CLARA would be: a working prototype

A main prototype platform, to nourish the main articles produced in the region, and therefore to help all the countries in the region.

3 big infrastructures currently:

- USA: Dataverse (Harvard University)
- EU: Invenio (CERN)
- AmeriGEO: CKAN

These are covering the world in terms of managing data; interoperability is fundamental in view of the need to work together.

We aim at 2-3 actions to be implemented before launching a definite strategy.

Julio Ibarra:
It is the Libraries that leverage whatever universities have.

Luis Eliecer:
A project about open science repositories lead to the constitution of LA REFERENCIA, which is working with institutional libraries. This is a conversation in working

"Plan S": publish everything in a definite timeline.

Howard Pfeffer:
We should be thinking about how much capacity will be needed.

Jim Ghadbane:
We should carry out a study?

Luis Eliecer:
Elements are still needed to our understanding; we are prototyping: we don't have the information about how to manage that, or putting the data in storage outside, to the US, EU, Amazon, etc.

Howard Pfeffer:
Storage can be expensive; we have to understand the type of storage needed.

Luis Eliecer:
We are not thinking about building this; we currently just take advantage of agreements we have, focus on the common side of the problem. To understand how to build a project in this field, it will take a lot of time,

We have to show what we need.

Jim Ghadbane:
There are certain expectations at the institutions. For some institutions, there is NO WAY the government should intervene. In Ontario e.g. institutions have to come to grips with whatever is coming up.

Luis Eliecer:
We have started to work on 1 specific topic: Climate Change

We are contacting researchers to evaluate theirs needs; basing on interesting use cases. We are not trying to solve everything from the start. This might be an agile approach to the problem of data.

Juan Pablo Carvallo:

There is no need of having one only place; data can be stored in many places, and there are tools to find the data (to collect / reconstruct etc.); software to be developed in cooperation with NRENs.

Luis Eliecer:

This exists indeed; stored data through algorithms. This has already been invented and it is a reasonable bet on what should and can be done.

Jim Ghadbane:

EDUGAIN could be leveraged; with the right to modify, to aggregate.

Example with AARNET

Luis Eliecer:

There are other problems with the data processing.

Move a lot of data to a big storage: not always.

Howard Pfeffer:
- Power systems
- Organizations
- Categorizing

Luis Eliecer:

Protocol harmonisation, so that we can Interchange metadata

Jim Ghadbane:

File senders,

Data movement and manipulation

Then storage

Where is the value added?

What tools can we give to support the community?

Luis Eliecer:

We have to think about the value to society; maybe certain things are more expensive, but more effective together. I am using money in the best way possible to generate knowledge.

Howard Pfeffer:

Another purely economic effect is the scale.

Luis Eliecer:

We also need to choose the value of the data.

Kevin Thompson:

In different situations, there are scenario-driven things.

There are storage resources at campus level, then at regional level and national level.

How much storage is needed: it has to be estimated.

A data management plan is required; the scientific community should go beyond their practices not to share. Colleagues deal all the time with open data policy issues.

Julio Ibarra:
There is a community within NSF dealing with a long-term ecological research programme, where the community goes to field stations. With the Internet however, space grew.

In the rate of ecological change, there is a major shift; but they have to learn how to start to share. Many still want to have their credit first.

NSF has to influence that change; different stations would be funded to do this.

In the Marine Ecology Group, they need the time; this community IS sharing globally.

Kevin Thompson:
We should reduce the time for data staging;

OSG data federation derivative.;

Restrained environment;

What role can the NRENs play to increase the leveraging?

Louis Fox:
Our research communities are heterogeneous and very much determined to do it their way.

Howard Thompson:
In certain models, they move data, bit still they don't want to pay long term storage. Trade-offs are needed. In biomedics e.g. they keep the data on their laptops.

Jim Ghadbane:
Issue in Canada: tracking; if you are to come with a policy on that, you better come with money.

Still interested in concentrating data.

Howard Pfeffer:
Cashing mechanism: spreading the data vs. cloning. Long term storage IS an issue. It becomes expensive because of the projection in time?

Eduardo Grizendi:
What is our role in all that? It is not only transport and storage of data, it is much more complex than that.

Jim Ghadbane:
At AARNET there was a poll in the community, that the main issue resulted in being solving the movement issue, without considering the storage.

Tania Altamirano + Mark Urban:
Climate Change and AmeriGEO

Luis Eliecer:
About the HPC Community:

10 resources in Latin America:

Big Centers in: Mexico, Brazil and Argentina

Smaller ones in: Colombia, Costa Rica, Ecuador and Chile.

Role of NRENs to connect those computers/facilities. Some of them are already connected to CLARA (in Chile and Colombia).

We will reach an Agreement; a Committee for the use of these capacities, with administrative procedures to make it available, through a Computing Science Committee.

Ana Hunsinger:
There is an office in Denver, with information available to anybody.

Luz Miriam Diaz:
Universities and Government have a plan to explore to have more activities.

A global organization to provide 100Gbps in 1 channel; gather more universities; move big data, use open data, offer more services and tackle more topics.

There is a discussion going on about connectivity because of complexity in Colombia.

The trust in RENATA's infrastructure is growing.

Luis Eliecer:
Many things discussed;

- We should create a Working Group
- First to agree on what we are going to do
- More frequent conversations
- Working with the CEO Forum
- Keep informed

Jim Ghadbane:
Impetus to have American portion of GN active;

Perspective from NRENs about the main challenges.

It was a great week, for a better understanding, to make tangible priorities.

And basic connectivity is still a challenge!