Global Cloud Services In Higher Education: Developing, Deploying and Enhancing through Community Collaboration

A TERENA Panel Discussion with members of the Global Cloud Services working Group

June 2013
Who is the Global Cloud Working Group?
Volunteer Charter Member NREN’s representing Europe, Americas, and Asia Pacific

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Global Cloud Services Working Group Charter

“We are a team dedicated to the widespread adoption of federated cloud services that benefit the global research and education community. In partnership with those we serve, the Global NET+ team will provide simple, consistent and streamlined access to highest value cloud services, offered at the best possible terms and conditions, to all participating institutions.”

We are extending the NET+ principles pioneered by Internet2 and coordinating GLOBALLY.
What Global NET+ Program is NOT:

- It is NOT a “buyers club” for collective one-off purchases.
- It is NOT a marketing system where providers sell to higher education.
- It is NOT primarily about price – although getting highest value is a driving goal.
- Is NOT “one way” - it isn’t exclusively provider changing to meet our needs.
- It is NOT driven by one campus, country, NREN or Company/Provider.
Global NET+ Phases for Development and Catalog of Service Participation Opportunities

Community requirements developed in a standardized approach

NET+ Portfolio: Design, Contract, Provisioning, Deprovisioning, Ongoing Stewardship, Sunsetting

Cloud Provider
- Service Orchestration
  - Service Layer
    - SaaS
    - PaaS
    - IaaS
  - Resource Abstraction and Control Layer
    - Physical Resource Layer
      - Hardware
      - Facility
- Cloud Service Management
  - Business Support
  - Provisioning/Configuration
  - Portability/Interoperability
- Security
- Privacy
- Cloud Broker
- Service Intermediation
- Service Aggregation
- Service Arbitrage

Cloud Carrier

Cloud Consumer

Commercial and Community Services Providers

Cloud Auditor
- Security Audit
- Privacy Impact Audit
- Performance Audit

Convening and representing "the Community"

Describe basis for and facilitate external audit services. [Commercial Audit Firms]

Identity Management “Trusted Identity in Education” (not part of NIST* model)

Global R&E Networks

Identity

NET+ View of NIST Model

Services “Above the Network”

Services at scale—leveraging the advanced network, identity management infrastructure, and market power of the R&E community

Services delivered globally—leveraging NREN R&E partnerships around the globe with thousands of beneficiaries

Service model transformation—tailored for R&E, fundamentally changing the way higher education and industry do business in the cloud

A community partnership started in March 2013 in the US with 2 services and 13 campuses and has grown to 38 services and 333 US campuses US now with 11 Global NREN partners.
Global NET+ Services IS the following:

- Driven by needs of Research Universities - but benefiting all participating R&E Institutions
- Delivered over the advanced R&E Networks
- Coordinated across all participating NRENs
- Delivers value to both higher ed and providers
  - Tailored services
  - Dramatically Reduced administration
  - Special pricing and business terms
  - Master Service Agreements/Negotiated contracts
  - On-going involvement with service providers
  - Global scope – Globally shared benefit
Three Options for R&E “Discount” in the Cloud

A. Each Campus/NREN/Country/Consortium negotiates and gets its own price [Traditional]

B. Each Campus/NREN/Country/Consortium gets a prorated share of discount based on consumption [Current]

C. Each participating Campus/NREN gets the same increasing discount based on combined global volume [NET+]
R&E Participants define Global NET+

- **Member**: A qualifying institution that can evaluate, sponsor, or use a NET+ service.

- **Provider**: The entity (company, campus or REN) that is responsible for the service.

- **dREN**: DIRECTING Research and Education Network: Responsible for developing the service with provider and sponsoring institution. Leading through Inquiry to SV phase and serving as the primary distributor globally to all pREN’s.

- **pREN**: PARTNER Research and Education Network: Responsible for distributing service to member institutions and coordinating with the dREN for any issues re the provider.
R&E Participants define Global NET+

**R&E Institutions (Members) of participating NREN’s:**

- **Inquiry** phase helps discover and review service catalog.
- Partner institutions **Evaluate** proposed solutions.
- **Sponsor** Service Validation phase w/ Service Providers.
- Facilitate phased **Adoption** by other campuses.
- Decide readiness for **General Availability** in conjunction with dNREN, Campuses, and Service Providers.
- Determine when services no longer meet community needs and recommend **Sunsetting**.
Inquiry
This is where things usually start. A campus has a particularly troublesome challenge; or a provider has a cloud-based service that could be used to solve a common need of the broader R&E community. Either of these scenarios just might present the perfect opportunity to develop a valuable service offering.

Evaluation
Internet2, service provider and university study an offering to determine whether it is suited to be a Internet2 NET+ Service offering.

Service Validation
A sponsor and group of universities work with the service provider and Internet2 to define the NET+ service.

Early Adopter
Universities begin using the NET+ service and continue working with Internet2 and the service provider to develop it further.

General Availability
The NET+ service is open to eligible universities. Quarterly Advisory Board meetings continue to inform the service roadmap.

Sunset
This phase marks the end of the lifecycle, when a service is in the process of moving out of NET+ availability, and ongoing subscriptions sunset at the end of existing terms or twelve months, whichever is later.
Domains of Global NET+ Cloud Services

**IaaS**
- Trusted Identity In Education: Identity and Access Management
- Infrastructure Platform, & System Security as a Service

**SaaS**
- Software as a Service: Academic, Research and Administrative

**VVC**
- Voice, Video & Collaboration as a Service

**Content**
- Content Services: eText, Research and Academic Content

Running Across the High Speed Community R&E Global Networks

Globally Aligned Federated, Identity, Integration, Architecture and Standards

Global Agreements, Contracts, Provisioning & Deprovisioning

**Internet2-Net**
Six Criteria for inclusion in the portfolio

1. Offered services scale to have a national impact
2. Can/do/will leverage the R&E global networks
3. Can/do/will use common R&E federated identity
4. Provider is willing to negotiate a global contract that will satisfy significant portion of community
5. Provider is willing to adopt and support the community’s needs with respect to security, privacy, compliance and accessibility
6. Provider is prepared to work with community to customized services to meet the unique needs of education and research
# Global Service Priorities

Voted on top service priorities - Top services selected to deploy first

<table>
<thead>
<tr>
<th>SERVICE</th>
<th>LEAD</th>
<th>STATUS</th>
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</thead>
<tbody>
<tr>
<td>Adobe Connect</td>
<td>Internet2*</td>
<td>Completed SV. Mexico First</td>
</tr>
<tr>
<td>Amazon AWS</td>
<td>Internet2*</td>
<td>in SV. Expect EA 6/30/2013</td>
</tr>
<tr>
<td>Microsoft Azure</td>
<td>JANET*</td>
<td>GA- New. 2 Subscribers</td>
</tr>
<tr>
<td>Box</td>
<td>Internet2*</td>
<td>GA. 40 Subscribers – Aust. First</td>
</tr>
<tr>
<td>Canvas</td>
<td>UWash</td>
<td>SV. Expect EA on June 2013</td>
</tr>
<tr>
<td>Evernote</td>
<td>SURFnet*</td>
<td>Inquiry</td>
</tr>
<tr>
<td>Evough</td>
<td>CalTech</td>
<td>Pending Agreement</td>
</tr>
<tr>
<td>Microsoft 365</td>
<td>Colorado State</td>
<td>SV. Expect GA on 5/1/2013</td>
</tr>
<tr>
<td>vCloud (Dell)</td>
<td>Clemson</td>
<td>Evaluation. Expect SV Summer 2013</td>
</tr>
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Adobe Connect

Area: Software as a Service: Academic, Research, and Administrative
Solution: Web conferencing platform for web meetings, eLearning, and webinars
Provider: Adobe
Sponsor: Case Western, CUDI, Internet2

Status
- Functional Validation complete
- Security Assessment in progress
- Costs lowered using Amazon agreement

Next Steps
Finalize contract for US Deployment.
Convert Contract to Mexico Use.
Amazon Web Services

Area: Infrastructure, Platform and System Security as a Service
Solution: Amazon Web Services
Provider: DLT Solutions and Amazon Web Services
Sponsor: University of Virginia, Internet2, Janet

Status
- Global Aggregation and volume discounts
- User friendly self-service portal to provision services
- InCommon integration
- Network peering
- Pilot program to mostly eliminate data transfer costs

Next Steps
Finalize legal agreements with DLT for Global Use.
Area: Infrastructure, Platform and System Security as a Service

Solution: Large data initiatives, such as genomics, can save on bandwidth charges, shifting those resources toward direct research-related activities.

Provider: Microsoft

Sponsor: U of Washington, Internet2, SURFnet

Status
- Participation is Open
- Global Participation prepared however requires- InCommon
- Open to all educational and research institutions
- No restrictions on use – Student, Faculty, Staff
- No Data Charges In or Out.
- Legal Agreement Done. Global in Development.
Box

Area: Infrastructure, Platform, and System Security as a Service
Solution: Storage and collaboration service
Provider: Box
Sponsor: UC Berkeley, AARNET, Internet2

Status
- 40+ universities
- Network peering being upgraded to 10G
- First phase of accessibility development complete
- New pricing tiers for smaller schools

Next Steps
Updated agreement to support Common Wealth Legal Countries
Canvas

Area: Software as a Service: Academic, Research, and Administrative
Solution: Learning Management System
Provider: Instructure
Sponsor: University of Washington

Status
- Service validation complete
- InCommon integration
- Discounted and waterfall pricing
- Custom end user terms of use

Next Steps
Open to US Early Adopters in May 2013. Global Program Pending Sponsoring NREN
### Evernote

**Area:** Software as a Service: Academic, Research, and Administrative  
**Solution:** Personal Content Mgmt System  
**Provider:** Evernote  
**Sponsor:** SURFnet, Internet2

#### Status
- Contact made with provider
- Discussions just underway

#### Next Steps
Face to face meeting (video) with Surf and Internet2 and Evernote with US Office.
Office 365 Education

Area: Software as a Service: Academic, Research, and Administrative
Solution: Office desktop suite in the cloud and cloud productivity platform
Provider: Microsoft
Sponsor: Colorado State University and University of Florida, SURFnet

Next Steps
Move to Early Adopter phase in next 2 months

Status
• Customized contract
• Additional no-cost support options
• InCommon testing being planned
• Online community of practice site will be established

Global NET+
SeeVogh

<table>
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<th>Area:</th>
<th>Video, Voice, and Collaborations as a Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solution:</td>
<td>Simplified interface, high-end, video collaboration</td>
</tr>
<tr>
<td>Provider:</td>
<td>Evogh</td>
</tr>
<tr>
<td>Sponsor:</td>
<td>University of Maryland Baltimore County</td>
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**Status**
- Participation is Open
- InCommon integration completed
- Business agreement nearly completed

**Next Steps**
- Identify Global Sponsor.
- Document Qualified Regions for SV.
- Sign Agreement
V-Cloud On-Demand

Area: Infrastructure, Platform and System Security as a Service

Solution: Multi-tenant Infrastructure-as-a-Service (IaaS) hosted in secured Dell datacenters

Provider: Dell
Sponsor: Indiana University

Status
- Participation is Closed
- InCommon participation required
- Higher education only is pending

Next Steps
- Global Sponsor Needed.
- Global agreement work still pending.
So how does all this work work anyway?
Five Areas of NET+ Collaboration

• Network Utilization: Shared Understanding and commitment to leverage the global R&E networks
• Identity Management: Commitment to collaboration on federated identity standards to support global access.
• Accessibility: Working towards universal accessibility in all Cloud services..
• Security: Standard security framework to support external audit (Global Cloud Security Alliance)
• Legal: Common Master Service Agreement that will cascade benefit to all participants
It Starts with a NET+ Global Partnership Agreement

- Sign Mutual Agreement
- $10k /Annual Participation
- Promote Services
- Set your own prices
- Share in the Savings
- Leverage your R&E Network
- Participate in Voting on Catalog In/Sunset

Global NET+
NET+ Takes on the Burden of Contracting for the Cloud

- dREN works with Service Providers and campus to craft a “Business Agreement”
- Has multiple types of contractual arrangements to suit different SP and institutional needs
  - Type B – most SPs will use this (based on Box model)
  - Type A – Internet2 assists but contract is between organization and SP
  - Type R – Internet2 assists but contract is between organization and a reseller
  - Type P – Based on the Global NREN Partner Program to allow Directing or Partner RENs to serve their participants
dREN in NET+ Takes on the Burden of Contracting for the Cloud

• Can work through Global Partners (or Large Account Resellers as necessary)

• The pREN has responsibility for converting agreement to local language and applicability but not changing the basic terms.

• Leverage “power of the community” and economy of scale to negotiate favorable terms so that global aggregation benefits all global participants.

• Reduced administrative process: “ready to sign” contracts!
dREN in NET+ Takes on the Burden of Payment Processing for the Cloud

• dREN works with Service Providers and counsels from participating organizations to craft a “payment process” that ensures that best price is passed through and administrative costs are covered.

• Has multiple types of payment processes to suit different SP and institutional needs
  - Type B1 – contract specifies wholesale price; dREN specifies retail price
    - P-B1: Partner specifies retail price.
  - Type B2 – contract specifies retail price; dREN gets paid admin fee by SP;
    - P-B2: Partners bill customers for retail plus their admin fee.
  - Type A – contract specifies retail price; dREN gets paid admin fee by SP;
    - P-A: Partners bill customers for their admin fee directly.
  - Type R – Reseller publishes retail price; dREN gets paid admin fee by SP;
    - P-R: TBD.
NET+ Contractual Relationships – Type B1 (for “Box”)

1. SP invoices I2 at wholesale
2. I2 invoices EC at retail
3. EC pays I2
4. I2 pays SP at wholesale

* Qualified Organization defined by BA with each SP
NET+ Contractual Relationships – Type B2 (new payment scheme)

1. SP invoices I2 at retail
2. I2 invoices EC
3. EC pays I2
4. I2 pays SP at retail
5. SP pays I2 admin fee

* Qualified Organization defined by BA with each SP
NET+ Contractual Relationships – Type A (for “Assisted”)

1. SP invoices EC at retail
2. EC pays SP
3. SP pays I2 admin fee

* Qualified Organization defined by BA with each SP

Global NET+

Internet2
NET+ Contractual Relationships

– Type R1 (for “Reseller”)
[required by some large service providers]

1. SP invoices EC at retail
2. EC pays SP
3. SP pays I2 admin fee

* Qualified Organization defined by BA with each SP
NET+ Contractual Relationships – Type R2 (for “Reseller”)
[required by Microsoft and possibly others]

1. SP invoices EC at retail
2. EC pays SP
3. SP pays L2 admin fee

* Qualified Organization defined by BA with each SP
NET+ Contractual Relationships
– Type P-A1 (for “Global Partners”)

Service Provider → Business Agreement → Enterprise Customer Agreement → Terms of Service Agreement → Non-I2 Member Organization*

1. SP invoices EC at retail
2. EC pays SP
3. SP pays dREN admin fee
4. pREN invoices EC admin fee
5. EC pays pREN admin fee

* Non Member Qualified Organization defined by BA with each SP
NET+ Contractual Relationships – Type P-B1 (for “Global Partners”)

1. SP invoices dREN at retail
2. dREN invoices Partner at retail
3. Partner invoices EC at retail plus admin fee
4. EC pays pREN
5. pREN pays dREN at retail
6. dREN pays SP at wholesale

* Non Member Qualified Organization defined by BA with each SP
NET+ Contractual Relationships – Type P-B2 (for “Global Partners”)

1. SP invoices dREN at retail
2. dREN invoices Partner at retail
3. pREN invoices EC at retail plus admin fee
4. EC pays pREN
5. pREN pays I2 at retail
6. dREN pays SP at retail
7. SP pays dREN admin fee

* Non Member Qualified Organization defined by BA with each SP
NET+ Contractual Relationships
– Type P-A2 (for “Global pREN”)

1. SP invoices EC at retail
2. EC pays SP
3. SP pays DR admin fee
4. Partner invoices EC admin fee
5. EC pays Partner admin fee

* Qualified Member Organization defined by BA with each SP
** Directing REN may be Internet2 or an international partner REN
What’s should a campus to do? Start now!

1. Create a campus strategy for internal & external cloud services.

2. Shift from a culture of central or departmental control to one of sharing, reuse, and value added differentiation.

3. Evaluate NET+ Catalog. Examine your own portfolios and consider which projects could benefit from NET+ scale.
What are the big barriers/challenges

1. Every campus, connector, NREN and country believes it can do better than others. We must resist the temptation to go it alone.

2. The Sales structure and country managers. They are not compensated to do the right thing for higher education but they will spend time to divide and conquer (see #1).

3. Providers: Must have executive sponsorship to make it work, and for many legacy companies, it just one.

4. Lawyers. Working in the cloud is new and everyone needs to use the red pen.
Barriers/challenges continued

5. Procurement policies and laws. Different everywhere. All based on pre cloud concepts.

6. Security/Privacy. Still evolving in cloud so need to expect it not to be perfect but not wait until it is.

7. Identity: Must move beyond simple federation and into aligned middleware for provisioning and deprovisioning at scale.

8. Timezones and Resources. We need to move faster than we are, and in parallel, but we need to stay coordinated so we can get things a bit tuned before we scale to more participating NREN’s.
What’s should a campus to do? Start now!

1. Create a campus strategy for internal & external cloud services.

2. Shift from a culture of central or departmental control to one of sharing, reuse, and value added differentiation.

3. Evaluate NET+ Catalog. Examine your own portfolios and consider which projects could benefit from NET+ scale.
What’s should a campus to do? Start now!

4. Develop a campus identity solution built on open standards.

5. Support competition for services so there are choices—but constrained, not unlimited choices.

6. Implement Global NET+ Successor language NOW for all contracts.
What’s should a campus to do? Start now!

7. Create a “cloud first” culture by partnering with your legal and procurement teams. Restructure internal processes and policies with cloud in mind.

8. Confirm which NREN supports your campus and country. Anticipate starting in late Fall 2013 or Winter 2014.
Q&A with Panel Members

Mary Fleming (AARNET)
Shel Waggener (Internet2)
Dan Perry (Janet)
Steve Cotter (REANNZ)
Harold Teunissen (SURFnet)
Questions / Discussion

FOR MORE INFORMATION:

- To sign up for a service
- To ask a question
- To register for a training

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Catalog and FAQ at:
http://Internet2.edu/netplus