

Activity Alignment Recommendations



Real Time Communications (RTC) Next Generation Communications for Internet2 Campuses

The Real Time Communications Advisory Group (RTC-AG) recommends the following adjustments to current Internet2 activities in order to better meet the needs of the developing RTC application space.

Creation of a Standing Real Time Communications Steering Committee

RTC-AG recommends the creation of a standing Real Time Communications Steering Committee (RTC-SC) to coordinate the activities of the various working groups considering questions in RTC. The charge of the RTC-SC will be to:

1. Manage the creation, development and closure of RTC working groups.
2. Support the harmonization of technical activities across the various RTC working groups to promote consistency of direction and re-use of work products.
3. Facilitate communication among the various RTC working groups to ensure that diverse perspectives are well understood within the more narrow activities of specific RTC working groups.
4. Advise Internet2 with regard to resource allocation for RTC-related activities and projects.
5. Maintain an overarching architectural vision for RTC that is inclusive of the breadth of RTC-related activities, addresses near term needs of the membership, and promotes an aggressive and forward looking vision of the RTC application space.
6. Promote Internet2 RTC activities within the membership and to the public.
7. Act as a focal point for communications with Internet2 corporate members, vendors and the development community in order to maintain a consistent message about development direction.

Membership

Membership in the RTC-SC should be open to all Internet2 university and corporate members. Additionally, all RTC working group chairs have mandatory membership in the RTC-SC. Finally, RTC-SC membership should include the participation of high level Internet2 management. Leadership should be rotating.

Disposition of Current RTC-Related Working Groups

RTC working groups should be named RTC-xx in order to be consistent with the MACE structure. RTC-AG recommends the following re-alignments for existing working groups.

1. **Presence and Integrated Communications (PIC).** PIC is currently active and should remain so. This activity should be re-named RTC-PIC and continue forward with its mission of exploring next generation communication services.
2. **Voice Over IP Working Group (VoIP-WG).** At the commencement of RTC-AG work, the VoIP-WG was inactive and functioning as a SIG. RTC-AG recommended that this group be changed to a SIG. This shift has occurred although it should be called RTC-VoIP-SIG to follow the consistent naming scheme convention.
3. **Creation of an RTC Middleware Working Group.** A new working group, RTC-Middleware, should be created. RTC-Middleware will be charged with the exploration of identity management, security, H.350, directory services, addressing architectures and location services middleware. It is expected that middleware components developed here will be shared across the various RTC working groups so that work progresses in a layered model, without each application having to develop a full vertical solution model. RTC-SC will work to support this commonality of approach.
4. **Creation of a Data Collaboration Working Group.** A new working group, RTC-DataCollab, should be created. Data collaboration has been a long standing issue within Internet2, both as an identified need and a frustration at the lack of appropriate solutions. RTC-AG recognizes the following about data collaboration:
 - a. **Few standards exist.** The lack of standards for this application has led to the development of an entire industry of incompatible, proprietary data collaboration systems from the private sector. To date, there has been no reasonable open standard around which the higher education community could rally.
 - b. **Campus Investment in Data Collaboration Tools is Very High.** IT organizations are under extreme pressure from their user communities to implement collaboration tools. The current market is such that these tool sets are very expensive, and yet the campuses are paying for them. This is an indication that there may be motivation to solve the problem.
 - c. **Content Lock.** Because the current tool sets are neither open nor standardized, the content that campuses are archiving in them is becoming locked up in proprietary formats. This will either result in loss of that property, great expense to migrate it forward to a next generation tool, or great expense to maintain the property in the proprietary format going forward.

Efforts to address this problem in the past have not met with success. This may in part be because involvement has been divided between technologists, who have an interest in the solution, and CIOs, who have an interest in controlling the spiraling cost of providing the service. In spite of this reality, RTC-AG feels that there is still potential for the university community to come together to address this issue. Participation in the working group may include a fee or commitment of staff time and travel funding in order to ensure both that

the group has some resources with which to address its objectives, and also to ensure that the participants are truly serious about moving forward. Additionally, Internet2 should provide matching seed money for this effort. If sufficient interest can be developed in such a direct approach and a sharp focus defined, then the initiative should move forward, hopefully with an eye toward the creation of a standardized architecture, or else the issue should be deprecated until another period of re-examination. It is expected that the RTC-DataCollab WG will be responsible for development issues and will work closely with the Internet2 Commons to deploy and test solutions.

5. **SIP.edu.** SIP.edu represents much of what the RTC-AG envisions as a next generation deployment activity for Internet2. This activity should be nurtured, grown and expanded. The existing SIP.edu working group is currently active, though it appears to be functioning primarily as a venue for the sharing of SIP deployment experiences. This working group would benefit from a re-focusing. Deployment experience sharing should occur within RTC-VoIP-SIG (if it represents near term telephony) and RTC-PIC (if it represents next generation communication modes). In addition to the sharing of deployment experiences, there is a significant middleware development component within this working group that is of tremendous value to the membership. This work should continue, and be expanded beyond SIP into a more protocol neutral mode. Thus, SIP.edu should continue as-is until RTC-Middleware is effectively off the ground, and then the SIP.edu project should be folded into that stable activity.
6. **Integrated Infrastructure for Instant Messaging (I2IM).** This working group is currently dormant, but focused on essential middleware issues and may be revived at some future time. Harmonization of activities between PIC and I2IM is important.
7. **Video Middleware (VidMid-VC).** VidMid-VC is currently dormant. It should be closed and its efforts around identity management, security, H.350 and directory services moved into RTC-Middleware.
8. **ITEC.** The issue of the role of the Internet2 Technology Evaluation Centers (ITECs) in RTC has not yet been discussed, but is worthy of examination and is a work item for RTC-SC.

Background

Each of the working groups noted above has realized remarkable accomplishments including the shepherding forward of major deployments, the development and showcasing of innovative applications and the creation of international standards. Therefore, a primary goal of Internet2 should be to retain the energy of the dedicated individuals in each group. In spite of these successes several problems are evident.

1. **Overlapping Activities and Mixed Messages to the Membership.** All of the working groups listed above deal directly with RTC protocols including H.323, SIP and XMPP, and while their foci are different, each has created a different solution to a common set of problems. This sends mixed messages to the membership with regard to appropriate direction, and also represents inefficient use of working group resources. The following examples are illustrative of the issue:
 - a. **Addressing.** Several working groups have identified dial plans or other addressing mechanisms which in many cases are incompatible and in other cases orthogonal. This has led to the existence of islands of communication.

- b. **911 and Presence.** Both the VoIP-WG and PIC deal with location services in support of e911 and innovative applications, respectively. A large body of thought has developed around each of these activities, and yet there is little cross-fertilization. However, campuses seeking to implement RTC are keenly interested in the alignment of location services so that they can re-use critical system components and achieve maximum reliability and security.
 - c. **Directory Services.** Both SIP.edu and VidMid-VC have directory-enabled RTC, but they accomplish it differently and recommend different approaches to the user community.
2. **Varying degrees of activity.** Both I2IM and VidMid-VC are currently dormant, having completed major projects and uncertain of next steps, and VoIP-WG has been converted to a SIG. PIC and SIP.edu are active, but would benefit from an infusion of new individuals with renewed energy and diverse perspectives.
 3. **Confusion of Message to Internet2 Corporate Members.** Many corporate members have shown interest in collaborating with Internet2 on the development of new technologies or the modification of their current systems to support ideas developed within the Internet2 community. Development time is one of the most precious resources that technology companies possess, and when a corporate member Internet2 liaison identifies an area of interest, it is a profound commitment of effort and money to endeavor toward co-development. The existence of multiple working groups with different priorities and different messages makes it difficult for corporate members to navigate the maze of Internet2 activities and feel confident that their scarce development dollars are being spent on activities that truly represent the priorities of the broader Internet2 community.
 4. **RTC Emerging as a Critical Application.** RTC began as a set of innovative applications such as voice over IP and video conferencing that were of emerging technical interest. Now, however, RTC has become a driving force within the academy. VoIP has developed into a full-fledged commodity application. The existence of VoIP service providers, combined with near-ubiquitous wireless presence, has deflated campus-provided telephony as an engine of revenue on many campuses. On some campuses IM represents the largest share of traffic flow. Now that RTC has left the lab and has entered the campus at large, very real transitions are happening in terms of staff re-organization and training, and upgrades to the network to accommodate the application. Internet2 should ensure that its member-directed activities reflect this reality.

The coordination of RTC-related working groups will ameliorate these problems and bring a new focus to Internet2 efforts in this space.

RTC Priorities

Internet2 should support the work of RTC working groups by providing support to work in the areas noted below. Additionally, the new working groups, through RTC-SC, should be encouraged to propose specific projects within each area for consideration for supplemental funding. “Reference Architecture” refers to the architectural guidelines recommended by RTC-AG and maintained by RTC-SC.

1. Operational Activities

- a. **Sharing of deployment experiences related to the reference architecture.** This should include technical, deployment and organizational challenges. For example, members should have a forum in which to discuss not only which products they’ve chosen and report on the status of that deployment, but also how they have engaged (or not) their departments of public safety and legal counsel to ensure that 911 requirements are being met, yet appropriate policy is in place to safeguard users’ private information such as their status and physical location.
- b. **Promoting deployment of reference architectures.** A strategic goal of RTC is to facilitate large scale adoption of the reference architecture. This will accomplish several important goals for the membership:
 - i. **Enabling very large scale RTC network availability** so that many hundreds of thousands of people are instantly reachable over the RTC fabric. Reaching this critical mass should be a measure of the working group’s success.
 - ii. **Facilitating campus interoperability.** By ensuring that campuses conform to specific signaling, addressing and interconnection guidelines, campuses are assured that their investments in technology will in fact yield interoperable results with other domains and collaborators.
 - iii. **Creating a market for Corporate Member Work Products.** Because many campuses will be deploying the same or similar technologies within the reference architecture, corporate members can be assured that their commitments to develop technology targeted at Internet2 needs will result in products for which there is an immediate and informed market. The efficacy of this process should be a measure of the effectiveness of RTC activities.
- c. **Publishing and Outreach.** In order to promote large scale adoption of the reference architecture it will be necessary for the group to produce recommendations, user guides and best practices documents targeted at technologists, users, IT managers and policy administrators. These products will be one of the key communication tools available to the group. This activity may also include the sponsorship of workshops, colloquia and training sessions.

2. Research and Development Activities

- a. **Security and Identity Management.** The exploration of end to end authorization tools for RTC should be a major focus of R&D activities, leading to the publication and subsequent adoption of the developed architectures. This activity should also explore more near term solutions to the problems of RTC spam and best practices for campus security.
- b. **Location Services.** This activity should explore presence, e911 and the underlying location services architectures in support of these applications such as SIMPLE, XMPP and geopriv. It should also include regular review of regulatory issues such as work in NENA around 911 architectures for VoIP.
- c. **Disaster Recovery.** Disaster recovery is a very broad area that should receive support within Internet2. Disaster recovery includes transport redundancy, data backups, and many applications of which RTC is one. Therefore it is likely that disaster recovery should constitute a SIG within Internet2, but that domain specific disaster recovery initiatives should occur within the appropriate working groups. For example, disaster recovery activities for RTC should explore ways to implement RTC locally that make it robust, but also technical methods and contractual relations that allow campuses and service providers to be able to switch their RTC services to an alternate provider in the event of natural or man made catastrophe.
- d. **Next Generation Protocols.** The reference architecture provides a roadmap for deployment for the immediate future, but RTC-AG is well aware that RTC architectural concepts continue to advance. For example, the ITU-T is already considering the creation of a next generation RTC protocol (H.325). Beyond that, there is recognition within RTC-AG that future RTC architectures may be much more decentralized and peer to peer-like than what we see today. Internet2 should support creative investigations into these areas.
- e. **Mobility.** Mobility is a key feature of developing applications, and explorations in this area are worthy of support from Internet2. Mobility includes the ability of an individual to change physical locations, change to a different network and change to a different network access device.

Deprecated Activities

Internet2 should not emphasize the following activities:

1. **Numeric Addressing.** RTC-AG has identified URL-based dialing (e.g. sip:john.doe@ivyleague.edu) as an extremely strategic technology and this should be promoted. Several numeric dialing forms are in play, including ENUM, e.164, GDS and a new proposal (ISN) based on network numbers. Internet2 should be careful not to grow even more incompatible dial plans, but should take a wait and see approach to support in this area. If clear direction emerges, then this position can change.
2. **Sharing of Trunks and Gateways for Toll Bypass.** There have been many attempts toward and discussions about using Internet2 or other advanced networks for universities to create a regionally or nationally distributed set of gateways that could be shared for the purposes of reducing long distance costs. This is a problem that is of

little technical, research or strategic interest and is simply a matter of potential cost savings. Further, it is anticipated that falling prices for commodity long distance will reduce the advantage of such an IP trunking infrastructure. Therefore, RTC-AG recommends that Internet2 not pursue or lead this activity. However, Internet2 should recognize that there may be interest from specific members to pursue this, and Internet2 should be prepared to maintain productive liaisons with these activities. There is, however, an important application of gateway sharing for disaster recovery purposes, and this should be supported.

Internet2 Commons

The Internet2 Commons' role should be expanded beyond the provision of services and into a clearinghouse for information related to corporate members' technologies that conform to the reference architecture. In fact, the initiative already leans in this direction, but this charge should be formalized. It should be noted that RTC-AG does NOT recommend that the Commons be charged to perform rigid interoperability or protocol conformance testing as this would be too great an undertaking. Rather, its focus should be on acting as a focal point for corporate member interface into the Internet2 community, especially with respect to production or near-production products that support the reference architecture, and as a place for members to turn when they are researching potential solutions for the campus' RTC needs.
