

# Executive Summary



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

### Introduction

Real Time Communications (RTC) is an emerging set of converged applications that includes voice over IP, video conferencing, instant messaging, unified messaging, presence, and data collaboration tools. Increasingly, RTC is expanding to include machine communications, paging, surveillance, security, intercom and entertainment functionality. Thus, RTC is not just about voice over IP, but rather represents the next generation of communication technologies that will augment and replace current services.

The Internet2 Real Time Communications Advisory Group (RTC-AG) was convened in 2005 by the Applications Strategy Council to develop strategic directions for Internet2 with regard to RTC in support of collaboration within and among Internet2 member campuses and peer networks. The primary purpose of the RTC-AG is to develop, monitor and evolve an Internet2 RTC strategic agenda, which encompass principles, architecture(s), roadmaps for development, guidance to Internet2 members on selecting and deploying tools for real time collaboration.

RTC is of strategic interest to Internet2 campuses because:

- RTC fosters highly effective inter-institutional collaborations such as supporting the development and execution of research and the provisioning of services to regional partners, thus enhancing connections with partner institutions and elevating institutional profiles.
- Communication services offered by innovative private sector service providers often outstrip those offered by campuses, thereby rendering communication services a factor in attracting and retaining faculty, staff and students, much like data networking capabilities have been over the last decade.
- Users are implementing RTC regardless of campus positioning, either on their own or through external providers, leaving the campuses without a coherent communications infrastructure, yet many public safety and campus operations depend upon such a coherent capability.
- Existing voice services have lost luster and revenue in the face of mobile carriers.

## Benefits of the Internet2 RTC Architecture

Internet2 has worked with RTC experts from its membership to identify an architectural roadmap to guide RTC deployment at member campuses and RTC activities within Internet2. The goals of this effort are to:

- Ensure that campus RTC deployments are compatible so that campuses can utilize their RTC infrastructures for communication and collaborations beyond campus borders.
- Make it easy for campuses to share the best thinking on RTC strategic and technical directions.
- Focus the development efforts of Internet2 corporate partners and the RTC market in general by articulating a common set of requirements.
- Help campuses to realize the value of integrating RTC applications with enterprise infrastructure and operations, creating communication tools of much greater value and customization than can be achieved by commercial service providers.
- Allow a large variety of endpoint types, from soft phones, IM clients, data collaboration tools, IP phones and video room systems to interoperate, leveraging the strength and security of the enterprise core with the diversity, scalability and resiliency of peer to peer functionality at the endpoints.
- Enable campuses to retain, recapture and enhance campus public safety services and business offerings that are growing beyond the control of the campus as students and staff opt for public, free, or commercial alternatives

## RTC Use Case Scenarios

The following use cases illustrate some of the scenarios that an RTC enabled campus might encounter.

**Research Collaboration**      A telemedicine program creates a community of interconnected child care centers which use video and web sharing tools to explain to each other how they are addressing daily challenges in operations, regulatory compliance, special needs and financial assistance programs. Because these communications sometimes involve children and protected healthcare information, all of the sessions are encrypted. The telemedicine group sponsoring the program uses the same technology to meet weekly with their state human services department to develop a follow-on grant they plan to submit for a statewide trial that they hope could lead to the development of a statewide service to improve early childhood education.

**Education and Instruction**

A guest lecturer in Islamic Studies from a sister institution in Qatar addresses students in a US classroom via video teleconference. During the lecture, students from Qatar and the US ask each other questions through a group chat tool about the content of the talk. The class is recorded and podcast so that students can review the discussion on their portable music players prior to the exam. The class includes an assignment for “buddies” from the US and Qatar to collaborate on a problem, and because of the time difference, presence enabled instant messaging software allows students in both countries to see when their buddies are online for discussions. The students also note that the teaching assistant has “virtual office hours” that afternoon and resolve to video chat with her over a particularly thorny issue. The same system that supports the Islamic Studies class also hosts a continuing education program within the state for nursing certifications as well as supporting an executive MBA program offered via distance education to local business professionals at their offices.

**Administrative Applications**

Construction on campus is causing road closures through a critical traffic area because backhoe digging unearthed an undocumented duct bank. Pictures taken at the site via camera-phone are sent back to the facilities design department who determine the duct is carrying fiber optic cables that provide Internet service to the residence halls. Within 30 minutes, the campus news services department sends a text message that appears on every telephone on campus that reads “Warren Street closed due to emergency repairs. Take River Road. Residence Halls will experience 30-second Internet outage at 4pm while data traffic is re-routed.” The next afternoon, officials from the IT, facilities and news services departments meet via video to discuss the need for better coordination of campus GIS information.

## Community

All year the basketball team has been picking up energy. Alumni who subscribe to the campus “Alumni-Net” service receive text messages whenever their favorite players score. They also receive short video podcast interviews from the coach and chancellor each month with updates on the team’s progress. Unfortunately, the campus’ bitter rival is also having a particularly strong year. That, combined with the discount ticket coupons dropped in Alumni-Net text mailboxes last month has resulted in a sold out game. As alumni park their cars and walk across campus toward the stadium, the location services engine displays a campus map on their cell phones which shows other classmates’ locations. The display indicates an impromptu gathering of the class of ‘83 right behind the bell tower and also shows that a courtesy bus will arrive in eight minutes, which might just give enough time for a quick hello to old friends and still make it to the game on time. Students use the same location services infrastructure to connect with each other before and after the game, having developed sophistication with the tool since it has also been used to support study groups throughout the year. Because the system is available only to authenticated campus users, they feel safe posting more personal information and the result has been a number of unexpected friendships and professional networking opportunities.

## Timeline For Action

The Internet2 RTC Reference Architecture describes the various technical standards and directions that campuses should pursue. The following timeline describes a reasonable path that a campus should consider following in order to effectively participate in the emerging real time communication and collaboration environment. Key participants in each stage are noted.

- Year 1
  - Development of a comprehensive and strategic plan for campus RTC services.
    - *Campus CIO*
    - *IT Managers*
    - *Vendors*
    - *RTC Technical Professionals*
    - *Internet2 Program Manager*
  - Establishment of large scale SIP connectivity trials.
    - *IT Managers*
    - *Vendors*
    - *RTC Technical Professionals*
    - *Internet2 Program Manager*
- Year 2
  - Development of staff to implement campus RTC strategy.
    - *Campus CIOs*
    - *IT Managers*
  - Implementation of middleware services to support RTC architecture.
    - *IT Managers*
    - *Vendors*
    - *RTC Technical Professionals*
    - *Internet2 Program Manager*
  - Implementation of basic RTC services.
    - *IT Managers*
    - *RTC Technical Professional*
    - *Internet2 Program Manager*
- Years 3-4
  - Basic RTC services offered in production.
    - *IT Managers*
  - Development of advanced RTC service offerings.
    - *IT Managers*
    - *Vendors*
    - *RTC Technical Professionals*
    - *Internet2 Program Manager*
- Year 5
  - Advanced RTC services in full production.
    - *IT Managers*
  - Migration away from current protocols and toward next generation RTC protocols built on top of the existing middleware platform.
    - *IT Managers*
    - *Vendors*
    - *RTC Technical Professionals*
    - *Internet2 Program Manager*