



UNIVERSITY OF PENNSYLVANIA CASE STUDY

Schooled in Next Generation Telephony Solutions, The University of Pennsylvania and Digium Join Forces to Develop and Pilot a Campus-Wide Unified Messaging Platform Using Asterisk- The Industry's First Open Source PBX

University's Converged Networking and Telecommunications Group Extends Solution With Single Data Message Store Based on the Internet Message Access Protocol

With a costly to maintain aging copper infrastructure, and the availability of a very modern fiber infrastructure, the University of Pennsylvania recognized an opportunity to take advantage of next generation telephony solutions and the vast potential for adding functionality for its users. Embarking on an initiative to provide telephony and other voice related services over the campus data network, Information Systems and Computing (ISC) is piloting an open source solution that provides cost-effective high function enhanced media services, such as departmental voice systems, voice messaging, automatic call distribution, and operator services.

The 750-person pilot began in the fall of 2005 with the deployment of Digium's Asterisk. The University found it was able to offer better services over the IP network at a cost comparable to its existing legacy system. To ensure functionality met users' needs, ISC worked with Digium to extend the solution with a robust unified messaging platform that allows for consistent email and telephone access to voicemail in a single standard data message store. By choosing Asterisk, the University of Pennsylvania has increased the availability of modern communications products to pilot participants within its campus community while at the same time controlling rising infrastructure costs.

Recognized as the first university in America, the University of Pennsylvania is an historic, Ivy League school with highly selective admissions and a rich history of innovation in interdisciplinary education and scholarship. Located in the heart of Philadelphia, visitors will find a picturesque campus amidst a dynamic city and world-class research institution.

Majoring In Opportunity: University Recognizes Potential For Data Networks To Deliver Flexible, High Function, Cost-Effective Telephony Services

Running the networking and telecommunications operations for the 269-acre campus is the 300-person strong ISC team that provides integrated data, telephony and video services to more than 30,000 community members of the university faculty, students, and staff. Wanting to provide very cost-effective, flexible, high function services and recognizing that its IP network would help it deliver against that goal, ISC embraced open source and open standards software that could be developed and customized in a way that meets the University's needs.

"One of the drivers for moving to a more modern, IP-based voice communication system is moving from multiple separate network infrastructures to just one. We already have a very highly reliable modern fiber infrastructure that supports our computer users," said Dikran Kassabian, senior technology director for the University of Pennsylvania's Information Systems and Computing group. "The older solutions we are operating are part of legacy telephony and while they have provided good service, they are reaching the end of their life in terms of hardware and software.

"We needed a forward-looking solution, one that had a future and could be flexible enough to be configured and extended by us, at a cost of operation that is no more than what we were currently incurring."

Enter Asterisk created by Digium, the industry's first open source PBX. Asterisk is a complete open source PBX. It runs on Linux, BSD and MacOSX and provides all of the features you would expect from a PBX – and more. Asterisk handles voice over IP in many protocols, and can interoperate with almost all standards-based telephony equipment using relatively inexpensive hardware. Providing voicemail services with Directory, Call Conferencing, Interactive Voice



Response and Call Queuing, Asterisk also has support for three-way calling caller ID services, ADSI, SIP and H.323, as both client and gateway.

Combined with a high performance, configurable SIP Express Router (SER), the University of Pennsylvania ISC has started its journey of providing next generation telephony services to its user community, based on Asterisk.

Open Source Solution Matriculates At Campus Network

The appeal of Asterisk is not so much that the University is able to download the software for free, but that the solution can be developed and customized in a way that meets the needs of the University of Pennsylvania community. One need is to have a robust Unified Messaging solution that combines voice mail, e-mail and fax mail into a central mailbox where users can send, retrieve and manage all their messages using any communication device.

Although Kassabian notes that Asterisk is easy to use out of the box, the way it had been developed created two copies of a message – one viewed through the email client and one still available through phone mail – creating difficulty in user management. Recognizing that users were reading messages in one place and having them appear unread in yet another, ISC set out to improve the solution by creating a single message store based on the IMAP protocol.

“We worked with Digium to specify a way that works and that can be brought into the main product and maintained thereafter,” said Kassabian. “Using some of our local staff, consultants, and professionals from Digium, we built the IMAP message store into the code and expect it in the next full release of Asterisk. It is improved usability for end users and through our collaboration with Digium, we anticipate the functionality we need will be part of future versions for us and others.”

Kassabian notes that the University is well staffed to implement open source solutions and recommends others educate themselves on the benefits of a merged networking and telecommunications staff – an element he cites as critical to project success.

“For organizations about to embark on the same implementation path, having a merged networking and telecommunications department provides cost effectiveness and flexibility along with good service,” he said. “Our direction is one of organizational convergence. We brought the data and telecommunications organization together, we are in the process of infrastructure convergence, bringing together the services of data, voice and video onto one fiber and copper IP network, and service convergence where people with different expertise in IT and telephony work together side by side.”

Open Source Solution is Head of the Class in Terms of Cost and Functionality

From a strategic perspective, Kassabian anticipates the solution will enable the University to reach its business goal of providing the best service possible at the least cost. Converging the organization and then operating one infrastructure rather than three offers a clear win. Now, the University is able to reap the rewards of having cross-trained staff operating one common infrastructure in a way that works cost effectively and reliably for the University.

“Early financial analysis indicated that in the short term we are able to provide better service for the same cost,” said Kassabian. “In the long term, we anticipate it will drive the price down and give us the benefit of cost avoidance for the expensive in-ground copper fixes needed to maintain our current telephony infrastructure.”

In addition, as more applications become voice enabled, the solution could offer future possibilities for communication needs on the campus. Kassabian anticipates the number of users to scale and imagines a day where they can provide integration from student’s wireless phones to the campus network so they can take advantage of no-charge dialing or access to University resources like calendars and other applications right from their phones. In the near future, Kassabian believes soft phones – applications on the desktop that enable users to place and receive calls – could play an important role.

“Asterisk has been a key component in this pilot in providing flexible and cost effective service to our user community, using the IP network, which is the future infrastructure for all our communication services,” said Kassabian. “This is really the start of a larger project - there is so much more we have in front of us in terms of modernizing and building the next generation of communication services for the University of Pennsylvania. We anticipate Asterisk will play a part in this effort.”