Deploying cutting-edge educational services in the Greek School Network

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Abstract

The Greek School Network (GSN) is the nationwide network that connects all units of primary and secondary education in Greece. GSN offers a significant set of diverse services to more than 15.000 schools and administrative units, and more than 60.000 teachers, placing GSN second in infrastructure size nationwide. GSN has relied on the emerging power of open source software to build cutting-edge services capable of covering internal administrative and monitoring needs, end user demands, and, foremost, modern pedagogical requirements for tools and services. GSN provides a wide set of advanced services, varying from web mail to virtual classrooms and synchronous/asynchronous tele-education. This paper presents an evaluation of GSN open source services based on the opinions of users who use GSN for educational purposes, and on usage and traffic measurement statistics. The paper reaches the conclusion that open source software provides a sound technological platform that meets the needs for cutting edge educational services deployment, and innovative, competitive software production for educational networks.

Keywords: open source software, school network, educational services

1. Service based on open source

GSN rests on the separating border between the academic and the commercial worlds, since its business objective is not solely cost or profit optimization. It has been designed and is being maintained by a group of Research Centers and Universities, under the directions of the Ministry of Education. From an operational point of view, GSN acts in the way a commercial service provider would, continually trying to offer new educational services as IT evolves, and studying new business relationships between GSN and other internet stakeholders. GSN also adheres to academic influence since it is maintained by capital and human resources closely related to the academic community.

Open source software is an ideal solution for organizations seeking to combine innovation, competitive solutions and educational value, since it bridges enterprise technologies with its scholar origin. GSN has developed numerous autonomous services and educational tools that enable all modern e-learning methodologies. The

development process involves combinational engineering work and often results in contributions to the open source community. Open source code has been used, modified and/or contributed to various projects such as Apache, PHP, JetSpeed, Moodle, PHPBB, BIND, Radius, Qmail, OpenSSL, PHP, Mysql, Horde, Squid, Cricket and more. The GSN services can be divided into the following categories:

- basic services: network connectivity, user authentication and authorization, GSN portal, students portal, automatic registration
- communication services: email, email antivirus and anti spam, electronic lists, discussion groups, instant messaging, teleconference, news
- web hosting: teacher and school pages hosting, authoring tools for web pages, dynamic pages hosting, database service
- advanced services: video on demand (VoD), live casting, synchronous and asynchronous e-learning
- complementary services: electronic cards, e-magazines, calendar, address book, work list, personal notes, virtual drives
- central infrastructure services: naming service (DNS), directory service (LDAP), distributed helpdesk, online statistics, school GIS service
- management services: users management service, network monitoring, network security, remote router administration

2. Value and growth

Data presented in this section record usage statistics and user acceptance for some of the GSN services mentioned above. The overall (incoming and outgoing) traffic through GSN has nearly doubled in the last three years for an average annual growth of about 23%. Similar growth rates have been recorded for all core GSN services, reflecting growing end-user acceptance, as more users accept GSN services in their daily routine. More than 60% of educational units read their new messages within 12 hours, while the corresponding number is 19% for teachers. Active user accounts were below 10.000 in June 2003 and above 60000 in December 2006. The number of e-mail and dial-up teacher accounts is also growing fast. As of 2004, each teacher e-mail account was also a dial-up account. At that time more than 85% of teachers that were assigned a GSN username for e-mail also received dial-up service. This number is above 95% today, corresponding to more than 57,000 accounts. Webmail connections and GSN portal access usage have also increased substantially during the past years. Webmail service reached 10,000 connections per month in June 2003 and more than 55,000 in May 2005. The rapid increase shows that teachers who are capable of using such services actually do so. Even during the summer months usage hardly declines signifying that the service has become popular.

Other statistical data about GSN usage include measurements conducted by the Observatory of Information Society by means of a telephone research based on

the eEurope-2010 methodology. The research included 801 randomly selected schools during the period 06/06/05 - 29/06/05. According to these results, 95% of the schools are online (broadband connections are 6%). 92% of schools use their email account and 35% of them publish a school web page. Workstation usage records show that workstations are used for educational purposes (73%), dedicated for teachers usage (57%), and for administrative/managerial reasons (55%). The same research found that students use workstations for establishing familiarization with computer technology (91%), homework preparation/studying (78%), games (52%), collaboration with other schools (25%), communicating with other students/teachers (22%), and information retrieval (5%). Internet is used by teachers mainly for searching teaching material and course preparation, email communication, administrative and management tasks (each more than 85%). Internet also serves communication with other teachers (35%), collaboration with other schools (32%) and communication with students (14%).

An end-user assessment of network and services has also been performed. A sample of 2910 teachers answered through the GSN portal to a structured questionnaire regarding the use of GSN services during the period from 1/1/2006 to 30/5/2006. GSN was evaluated by more than 33 categories of specialized personnel. 68.9% of the users asked use only GSN for network access. Connection frequency is "at least once a week" in 88.1% of the cases, while 92.1% of all users explicitly state that they use GSN for educational purposes. Answers to explicit questions show that 93% of the users are aware of the SCH domain and the existence of the portal, 73% of them know about the GSN helpdesk service, and 49% of them have used it. Dominant services are the email and the dialup service. The usage of the web hosting service is also becoming increasingly popular. From May 2005 to December 2006 the number of teacher's web pages has increased by 44% to about 2000. All services but GIS are evaluated positively by more than 50%. GIS is evaluated positively by 47.8% of the users.

3. Conclusion

GSN uses open source solutions in the vast majority of the services it provides. Usage and evaluation statistics show that the GSN deployment model is successful. It is safe to claim that GSN maintains a thoroughly tested, reliable set of cutting-edge educational services. Most services have become popular with the users during the last few years. Users are also aware of the advanced educational services offered, and they state that they use GSN for educational purposes. Usage for advanced educational services is, however, still rather moderate, but we expect such services to follow core GSN services in quality and acceptance. GSN plans to continue exploiting the educational value and the dynamics of open source software. Now that IT evolution has made workstations capable of hosting heavy logic, open source is becoming highly competitive in the service development area.