



The LHC Island of the CERN Control Centre is a busy working environment with many status displays and running software applications. An audible event announcer was developed in order to provide a simple and efficient method to notify the operations team of events occurring within the many subsystems of the accelerator. The LHC Announcer uses speech synthesis to report messages based upon data received from multiple sources. General accelerator information such as injections, beam energies and beam dumps are derived from data received from the LHC Timing System. Additionally, a software interface is provided that allows other surveillance processes to send messages to the Announcer using the standard control system middleware. Events are divided into categories which the user can enable or disable depending upon their interest. Use of the LHC Announcer is not limited to the Control Centre and is intended to be available to a wide audience, both inside and outside CERN. To accommodate this, it was designed to require no special software beyond a standard web browser. The paper describes the design of the LHC Announcer and how it is integrated into the LHC operational environment.

Announcements are generated on a dedicated server computer running Scientific Linux. The server generates announcement text based upon data received from either the LHC Timing System or external software processes via a standard LHC device server and translates the announcement into an audible message which can then be delivered to clients by a web server. In order to prevent disruption of the operational version of the Announcer, there are separate web servers for the CERN Control Centre and users not on the operational computer network. Figure 1 illustrates the processes involved to create an announcement and deliver it to a user's web browser.

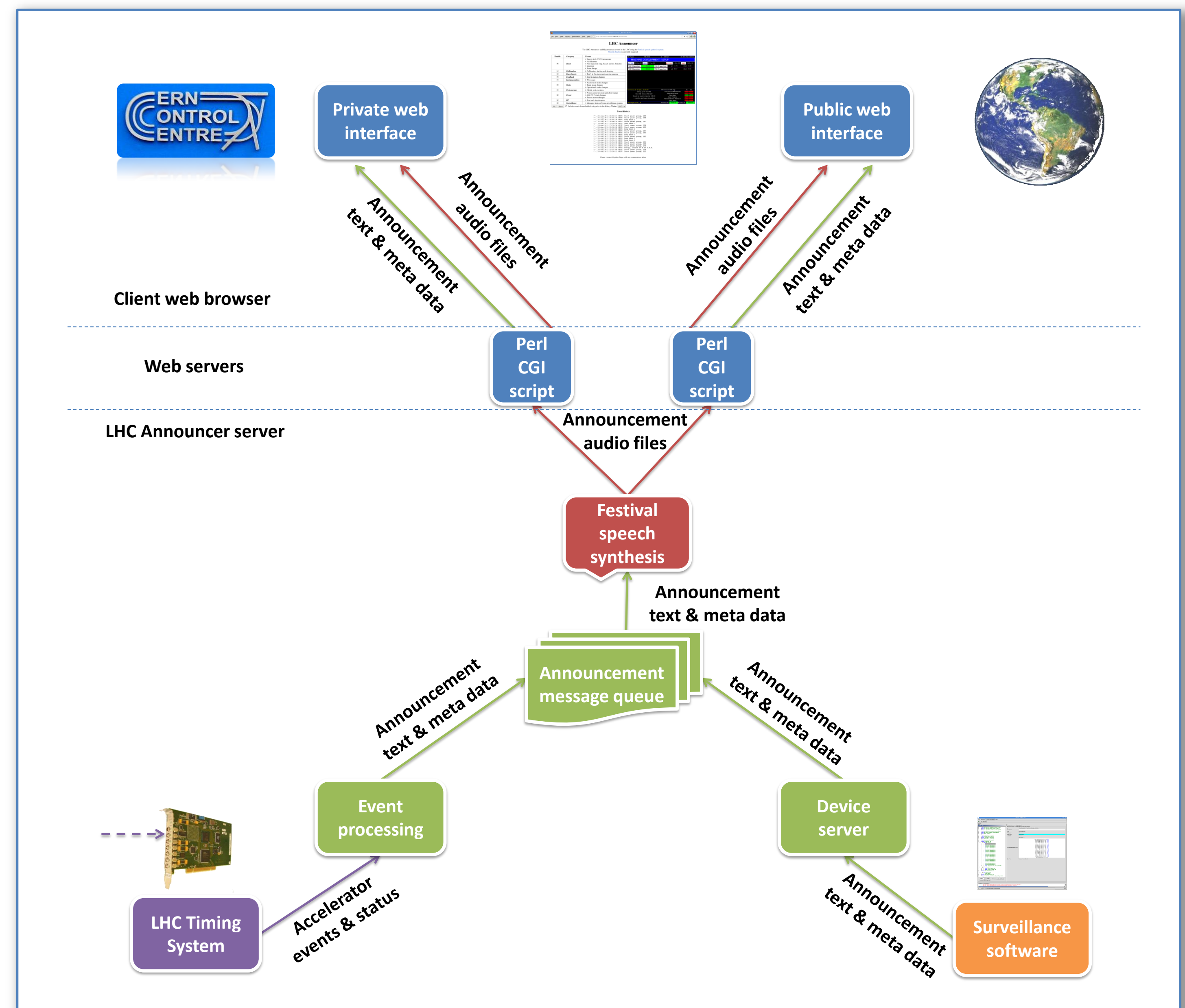


Figure 1: The LHC Announcer system architecture

In order to make the LHC Announcer easily available to as wide an audience as possible, it was decided to use a web interface. As a result, only a standard web browser is required to run the LHC Announcer, rather than a dedicated application.

The LHC Announcer web interface (shown in Figure 2) plays audio announcing any events that occur from the moment that the web page is opened. A rolling history of the last 20 received events is displayed at the bottom of the page, along with the time at which they occurred.

Categories of event (e.g. Beam, Collimation and RF) can be enabled or disabled, allowing the user to select the types of events that they wish to hear. A further option allows events from disabled categories to be included within the event history, in which case they will be shown greyed-out to distinguish them from events that were audibly announced.

A drop-down menu allows the user to add a Vistar fixed display to the web page, allowing the status of the LHC and the other elements of the accelerator chain upon which it depends to be shown visually in parallel to audio event announcements.

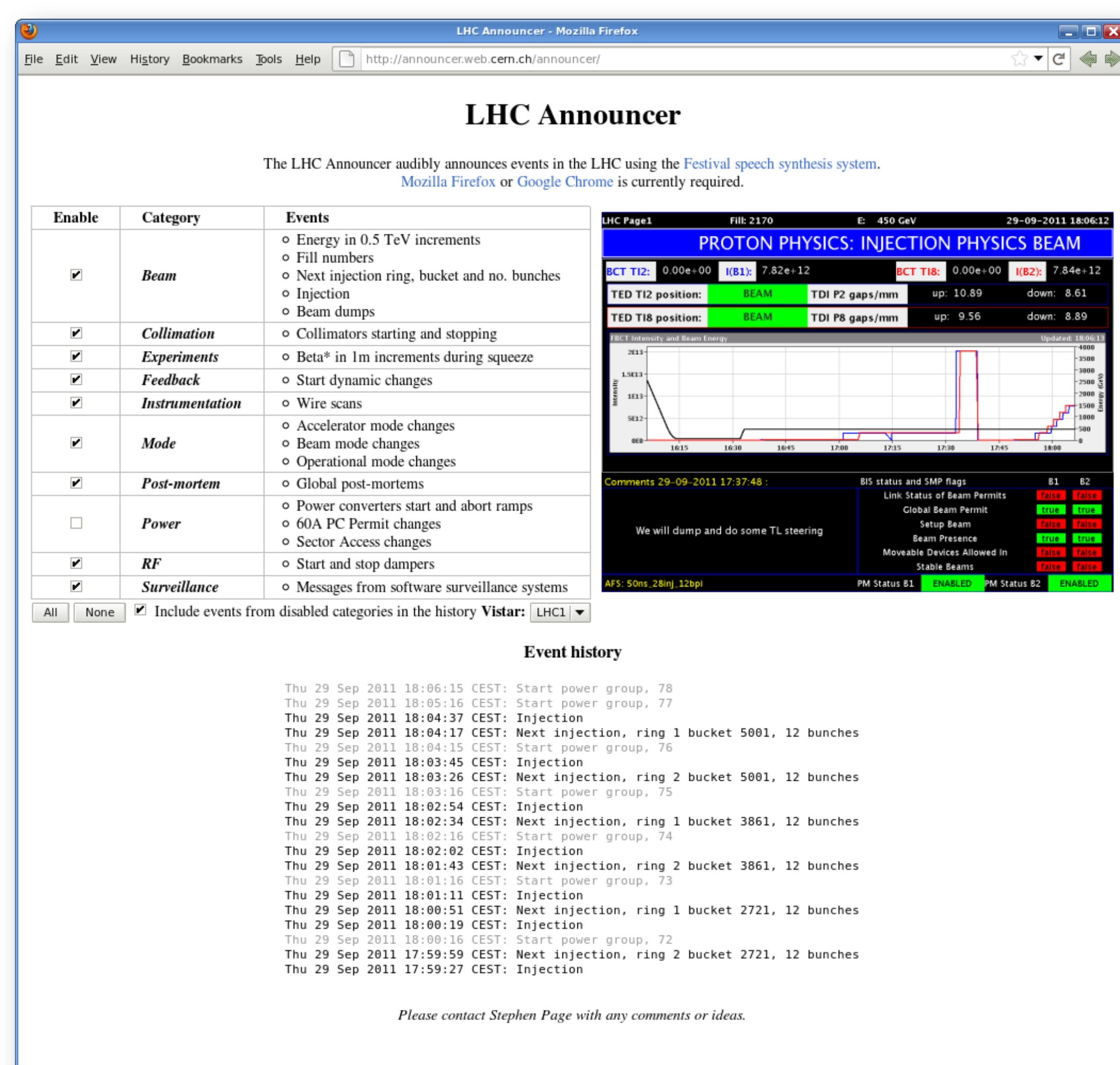


Figure 2: The LHC Announcer web interface

During 2011 a new monitoring infrastructure called Big Sister was put in place for the LHC. Through logic which correlates information from different accelerator systems, the LHC Big Sister can anticipate failures, providing operators with enough warning time and preventing the beams from being dumped, allowing a more efficient operation of the LHC. The LHC Announcer was chosen as the communication mechanism from Big Sister to the operations team. In this way, the operator does not need to actively seek information, rather the information arrives in the form of an audible message. Many beam dumps have been avoided thanks to the combined action of Big Sister and LHC Announcer. The Big Sister application is shown in Figure 3.

The LHC Announcer has proved useful to a number of different types of user. Its main purpose is to inform operators within the CERN Control Centre of events occurring in the LHC, which may require their attention. Additionally, some equipment experts use the Announcer in order to be informed of events that may relate to tests that they are performing.

The public version of the LHC Announcer web interface has also been popular with people around the world who are interested in the operation of the LHC. As such, it also makes a useful contribution to the publication of CERN's activities and the fostering of public interest.

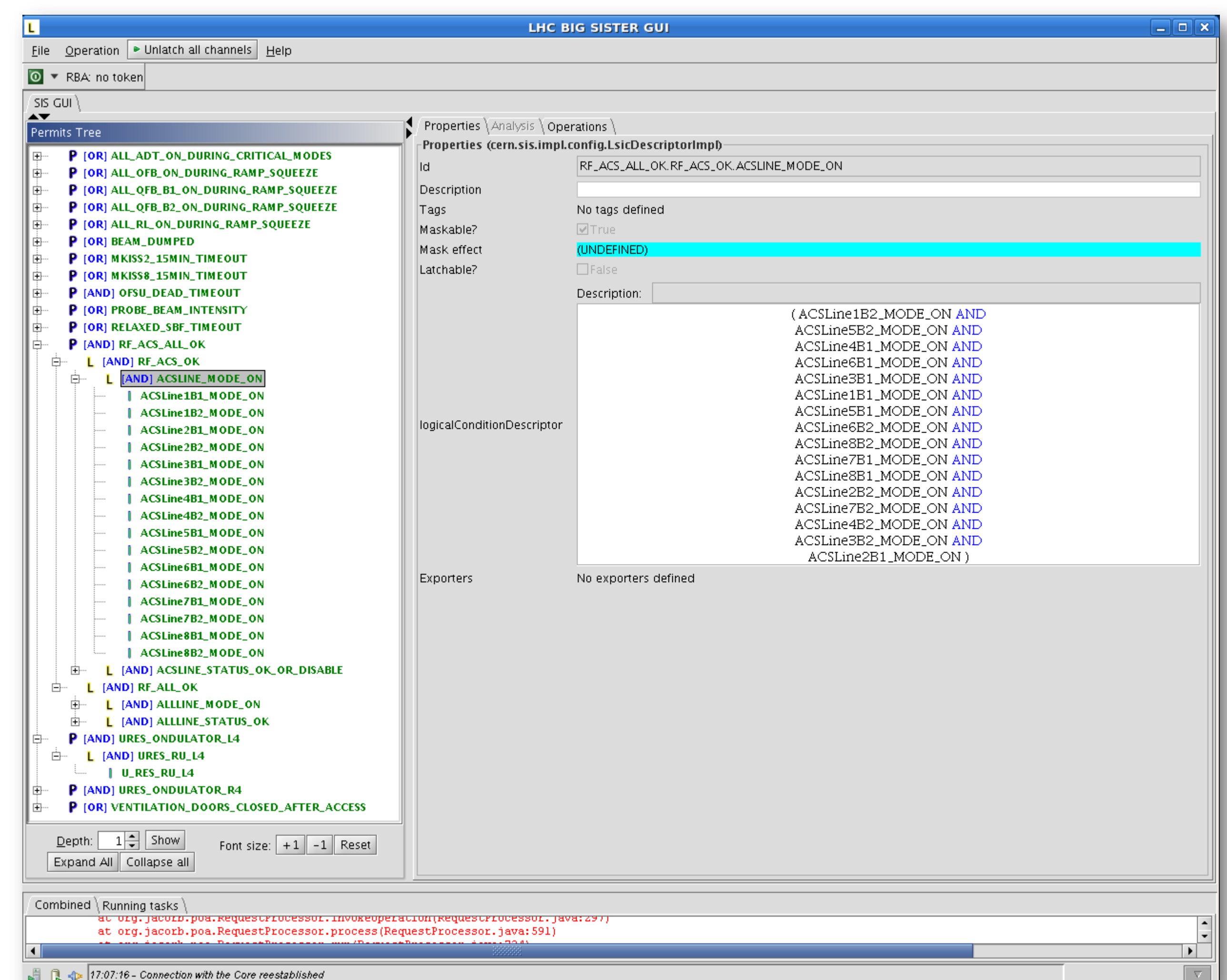


Figure 3: The LHC Big Sister application