

Internet Engineering Task Force
Internet-Draft
Intended status: Informational
Expires: February 2, 2009

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August 2008

IETF Streaming Media, Current Status
draft-jaeggli-ietf-streaming-media-status-00

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Abstract

This document describes the operation of the audio streaming service provided for the IETF from IETF 62 up to the most recent (IETF 72) meeting. Efforts associated with meetings prior to IETF 62 back to IETF 49 as well as a proposal for the current effort were detailed in the now expired draft [draft-jaeggli-ietftv-ng-01.txt](#). The purpose of this document is to inform future efforts to deliver streaming media services for remote or local participants of the level of service and the technology that was employed.

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IETF Streaming

August 2008

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IETF Streaming

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1. Introduction

Since IETF 62 there has been an audio stream provided for each of the 8 scheduled meeting rooms. This service has been provided by volunteers with the financial support variously of the IETF chair, the IAD and by the Internet society. This audio streaming service supplanted a earlier effort which provided video/audio streaming and recording for two of the 8 parallel rooms.

This draft is intended to document the service as it is currently run with the hope that this will be useful if future planning and or the requirements for a production service.

2. History

The situation prior to IETF 62 is described in the now expired draft [draft-jaeggli-ietftv-ng-01.txt](#). The decision to move away from the video production and ip multicast streaming model was done on the basis of a couple of considerations most notably, the cost both monetary and in human capital of delivering the existing service, the inability to scale beyond two rooms without a significant larger effort, and finally the limitations on remote usage that ip multicast placed on on the audience of potential participants

There are essentially three sets potential constituents for the streaming/recording of IETF meetings. Participants local to the IETF monitor the activities of other working groups, remote participants monitor working groups in which they have an interest, and finally users of the archive, either for timeshifting purposes or for purposes of historical curiosity. To the extent that all three groups were being served poorly by the the pre-62 service, our goals in providing a new service included increasing the usability for all three groups.

It was proposed that for a new service that IP multicast transport

would be abandoned in favor of tcp http based mp3 streaming. This approach has been demonstrated to work in number of challenging environments. In contrast to the multicast transport will likely to work in situations where the participants did not have control over their own network. Because of the ubiquity of httpd streamed internet radio stations, client support for this streaming model is essentially ubiquitous.

The service moved from mixed video/audio/slides to audio only. While this may have been a functional step back, it substantially reduced the volunteer staffing requirements to the point that instead of using an average of 6 volunteers to cover two meeting rooms, a single

volunteer can under most circumstances manage all 8 parallel meetings.

[3.](#) Current Service

The current service consists of the following components:

- o A webserver which hosts the streaming schedule and the playlists for the 8 channels, plus a unified 8 channel playlist
- o One or more servers running the icecast-2 http streaming server. Client requests on the basis of the playlists are made to these systems and the audio encoders are connected to them. As configured presently bandwidth requirements run approximately 64kb/s per client and 8x64Kb/s for the audio streaming servers
- o One encoder/recorder per stream. In the present setup each encoder is a compact linux system running the muse internet radio application and displaying to an internally hosted vnc session
- o one or more management workstations. The management station is used to remotely control the local vnc sessions on each of the encoders visually inspect the audio meter and filter settings in the muse application as well as initiate or halt recordings based on the schedule or other considerations (meetings run over).
- o Line or microphone level feed in each of the 8 rooms to be recorded. This facility is provided by the AV contractor or

facility used for the meeting. In some cases it must be specially arranged ahead of time. Variouslly this has been provisioned directly on in-room mixers (most venues) via a centralized audio distribution system (as in Toronto or Seoul) or via a mix as in Chicago. Historically the final responsibility for securing this resource has been in the hands of the secretariat function as that is where the contractual relationship with the contractor has resided.

- o Network connectivity for the encoders, is required and has been traditionally provided as part of the delivery of the IETF network

In total, the live audience for the service has remained relatively small notwithstanding the considerable improvement in feasibility of participation. Time shifting considerations, as well as the effort required to participate in working group activities have in practice limited maximum concurrency in remote participants to around 100 simultaneous users and generally much lower. That is to say that local working group participation is approximately an order of

magnitude higher than remote. exceptions exist for particularly high interest topics where people who might not otherwise participate in a working group (journalists for example) choose to tune in for monitoring purposes.

[4.](#) Archival Storage

Archival storage has been provided up to this point first by the University of Oregon's Wideolab project and more recently by the Network Startup Resource Center also at the University of Oregon. This facility provides access to raw recordings during and after the IETF meeting proper. At the time of this document, recordings back to IETF 49 (62 for audio only) require approximately 350GB of storage. The secretariat during the Neustar era maintained a backup (not publicly available) of the archive.

Usage of the the archive is sporadic, but peaks for a month or two following a given meeting. To some extent the usability of the current archive is compromised by the lack of post-production (noted in shortcomings).

5. Shortcomings of the Existing Service

The existing service has a number of notable shortcomings. Some of these are a product of decisions made in order to minimize the outlay of effort and capital required to field the service. Others have become apparent as a product of operational experience. It would be desirable to be able to alter some of the elements of the service in order to address some of the more egregious limitations.

- o Lack of direct control. Due to the headless nature of the systems used for recording there is no interface to manage the recording present in the the working group. working group chairs have little idea if their session is in fact being recorded, if the remote participants are recieving reasonable quality audio, if the speakers are being picked up by the microphones etc. moreover sessions that meet outside of scheduled hours are at the mercy of volunteers as to whether recording of their meeting occurs or not. One way to address this would be to provide web interfaces to the recording system in order facilitate direct control of the recorders. The current software platflorm and work flow does not support this however.
- o Limited attention... In order to deliver the service in a cost-effective fashion the volunteer participation was scaled back to a single operator at a time. this results in divided attention and a

non-zero error rate in terms of issues like failure to initiate recordings, inability to debug issues with more than one audio stream in parallel and dividing time between the management workstation located in the noc and the recorders located in the meeting rooms.

- o Lack of post-production. When video was being recorded, post-production involved removing the recorded material prior to and after the break-up of each working group, due the availability of visual queues and the a fact that week resulted in only about 80 hours of video post-production for a given IETF meeting could be performed in a couple of days. With the adavent of the recording of 8 parallel tracks of recording the jump to 320 hours or more worth of audio recording has made post-productio of the audio infeasible given the current amount of volunteer time available.

- o Audio only, no slides, no back channel. The are considerations driven by the choice of streaming technology and the complexity of interoperating with the multiple platforms used to present at the IETF. Making more material available during the meeting proper would require more equipment, more rigorous standardization of process or probably both.
- o Equipment aging. The equipment purchased in 2004 has aged fairly gracefully but is being to suffer from attrition. Moreover, some of the considerations that drove equipment choices in 2004 have changed. One of the requirements for the 2004 purchase was that the choosen servers be checkable as luggage, which due to increased baggaged restrictions becomes increasing infeasable (the 8 recorders and power-supplies weigh approximately 48lb)s. While smaller encoder systems are now feasible, the requirements for such systems should be considered in the context of future plans for the service

6. Conclusion

As when the transition from mutlicast to the audio streaming service was made there are both challanges and oportunites in the present situation. The service as it stands now requires little enough effort to deliver that it can be handled at the current service level by one person. Even so it needs an update. It could be expanded to include new services if there is energy to do so. Some effort should be made to preserve the legacy that is the present in the recorded materials from IETF 49 to present.

7. Acknowledgements

The current IETF streaming effort has been generously support by a large cast of characters Including the present and previous IETF chairs, the Internet Society, the secretariat in several of it's forms, the University of Oregon, and numerous volunteers who have expended time energy and capital to keep this service going. .

[8.](#) IANA Considerations

This memo includes no request to IANA.

[9.](#) Security Considerations

This document does not engender any security considerations.

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