

## Medida de TS-DF (Time Stamp Delay Factor)

La llegada del transporte IP a nuestra industria del Broadcast requiere adaptarse a las nuevas técnicas y familiarizarse con los sus indicadores. La tecnología IP ya lleva tiempo entre nosotros y sus técnicas de medición también. Sin embargo, fue necesario desarrollar nuevos algoritmos para su uso en Broadcast.

Es en este contexto aparece el indicador TS-DF que mide la fluctuación de una red y su efecto acumulativo en el tiempo.

Hagamos memoria:

### MDI (Media Delivery Index) : ¡ Un índice Famoso !

En 2006 se publicó la descripción de MDI (RFC4445) que se utilizó como un indicador de calidad teniendo en cuenta las desviaciones de un sistema instantáneamente y a largo plazo. Consta de dos componentes: el Factor de Retardo (DF) y la Tasa de Pérdida de Medios (MLR). Basado en la evaluación de la estabilidad del flujo, DF funciona muy bien en las redes CBR (Constant Bit Rate), pero es ineficiente e impreciso en las redes VBR.

Un grupo de ingenieros ha trabajado para reemplazarlo en este tema y ha propuesto el **TS-DF**.

### Le TS-DF (Time Stamp Delay Factor)

La idea de este algoritmo es adquirir datos durante un segundo (que es una muestra suficientemente larga para un flujo de 1Mbps). A continuación, mide la estabilidad de la marca de tiempo presente en los encabezados de paquetes y calcula el valor máximo menos el valor mínimo para cada paquete dentro de la segunda ventana de 1s. La medición se realiza de nuevo cada segundo y puede trazarse en un gráfico. Este método está descrito en el TECH EBU 3337 y funciona bien tanto para los flujos CBR como para los VBR. Ya está implementado en Tektronix Prism.

## TS-DF measurement (Time Stamp Delay Factor)

In our Broadcast industry, the advent of IP transport requires to adapt to new techniques and to become familiar with new indicators. The IP has a long life and measurement techniques too. However, new algorithms had to be developed in order to adapt to Broadcast.

It is in this context appears now the TS-DF indicator that measures the jitter of a network and its cumulative effect over time.

Here you need to remember:

### MDI : A famous index !

It was in 2006 that was published description of MDI (RFC4445) which was used as a quality indicator taking into account the excesses of a system in both instant and long term. It consists of two components: the Delay Factor (DF) and Media Loss rate (MLR). Based on assessment of the stability of the flow, DF works very well and has proven its interest in CBR networks (Constant Bit Rate), but it is inefficient and imprecise on VBR networks.

It is to replace it that a group of engineers has worked on this issue and has proposed the **TS-DF**.

### TS-DF (Time Stamp Delay Factor)

The idea of this algorithm is to acquire data over one second (that is a long enough sample for a stream of 1Mbps). It then measures the stability of the timestamp present in packet headers and calculates the Max value minus the Min value for each packet inside the 1s second window. The measurement is made again each second and could then be plotted in a graph. This method described in the 3337 TECH EBU is working well for CBR streams as well as for VBR streams.

It is already implemented in the Prism.

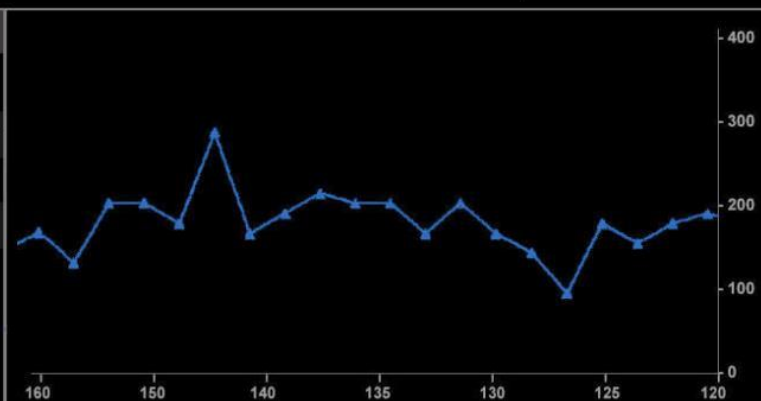
### Time-Stamped Delay Factor

Source/Dest: 134.062.248.049 / 239.1.1.3 (Video)

Protocol: ST2022-6

#### TS-DF

Min: 11.06 uS  
 Max: 418 uS  
 Mean: 186.84 uS  
 Std Dev: 0.18 uS



### TS-DT measurement within Prism.

Two criteria have to be checked in the curve to show a real stability in the system :

1. Should be as flat as possible
2. Should be the as low as possible

The H axis is the time from the beginning of the session in seconds.

The V axis is in micro Second

The Mean Value (on the left) gives the size of the buffer that should be used for this path.

The Standard Deviation gives a level of confidence and shows how the values are scattered around the mean value. The best is the lowest.