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Nonblocking Multicast Networks for Transporting Stream Media


By Takeshi Shimizu

Leaf-spine architecture has been widely adopted as a scalable multistage network. However, for media transport purposes, nonblocking conditions for any combination of multicasts should be taken into account. In this paper, a new approach for building three-stage Clos networks with nonblocking multicast capability is proposed. First, a wide-sense nonblocking (WSNB) condition and a rearrangeable nonblocking (RNB) condition for nonblocking multicast networks are presented. The proposed conditions focus on the distribution of inputs at the middle stage rather than the distribution at the output stage. Second, the proposed conditions are evaluated by mapping to leaf-spine networks with commodity building block switches. The

network size is evaluated by calculating the sum of the required building block switches. In the best case of the evaluation results, up to 50% of the switches can be reduced compared with the best-known WSNB condition, and the proposed WSNB networks show good coverage in relatively small but practical network sizes. The proposed RNB networks always show better results than the known RNB multicast conditions.

Analyzing SMPTE ST 2110 Streams Using EBU's Open-Source Software

By Ievgen Kostiukevych, Willem Vermost, and Pedro Ferreira

The transition to IP-based studios is probably the biggest technology change broadcasters have faced over the past 30 years. The European Broadcasting Union (EBU) Live IP Software Toolkit (LIST) provides a software-only offline analyzer that is able to verify the conformance of streams to the SMPTE ST 2110 standards. This paper starts by explaining the typical LIST offline analyzer workflow, then focuses on its architecture designed so that it is accurate, performant, and flexible enough to plug in analysis modules for future needs. Finally, we demonstrate the LIST's major features, step by step, with real-world examples. 

Digital Object Identifier 10.5594/JMI.2019.2906006
Date of publication: 25 April 2019

