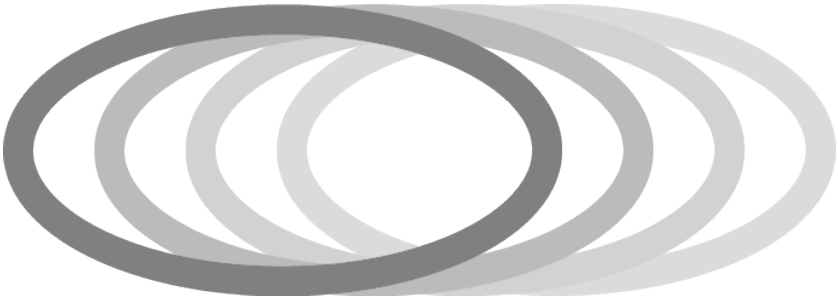
SIENNA

NDI™

# NDI Router

## White Paper v4.62



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# An IP Video Protocol which works today

## NDI Protocol

The NDI (Network Device Interface) protocol has delivered broadcasters and video professionals with a practical, and useful mechanism to connect video software and hardware on a local area network. NDI carries high quality compressed video, uncompressed audio and bi-directional metadata over a TCP socket connection. NDI includes a very fast, good quality codec to allow low latency, low CPU overhead encoding and decoding to pass resolution, aspect ratio and frame rate independent video across existing gigabit networks. NDI Services are advertised with mDNS and are thus automatically discoverable by other NDI devices on the same LAN. A wide variety of products, and utilities exist to support the NDI protocol, including free utilities to create, and view NDI sources. NDI is offered to the world, without qualification and with a royalty free license by its creators, Newtek Inc.

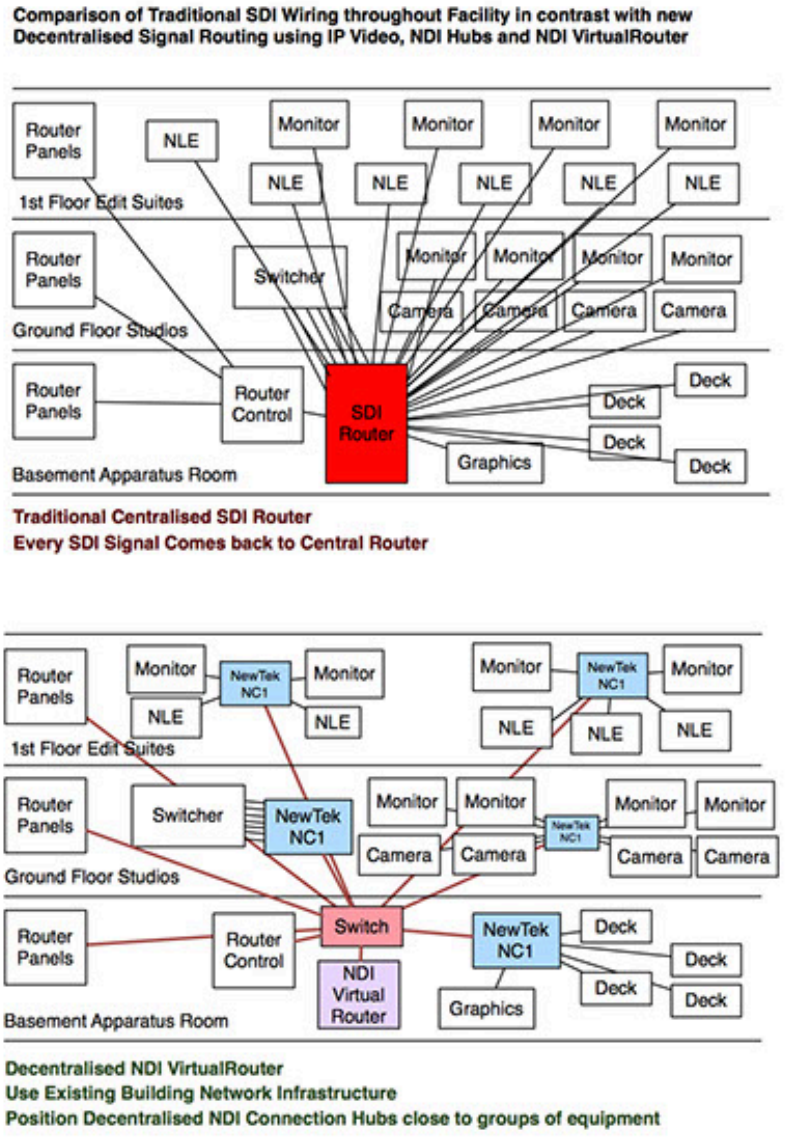
- **Works perfectly on existing Gigabit LANs and high quality WIFI networks**
- **Compressed video - ProRes / DNxHD type quality**
- **Very fast, license free codec included - 250 fps HD encoding per CPU core**
- **~ 100mBit/s for HD, scalable to 4K and beyond.**
- **Low latency, typically about 1 frame**
- **Uncompressed multi channel audio**
- **Use bonjour discovery for very easy deployment**
- **Bi-directional metadata support**
- **Compatible with Mobile Devices - mobile phone NDI Camera products**
- **Embedded support for Alpha Channel on same stream using BGRA**

**Unsurprisingly NDI has been rapidly adopted by hundreds of product developers and the end user installed-base of NDI now dwarfs that of all other professional IP video protocols combined.**

NDI was designed for local area networks, using TCP sockets and bonjour (mDNS) service announcements. With the rapid adoption of NDI, customers are now beginning to ask for a mechanism to extend their NDI local area networks, to create entire production facilities with native NDI across the workflow.

# NDI Router

A great complement to the NDI Processing Engine is the Sienna NDI Router - which emulates a traditional SDI Router using the Probel SWP08 & BMD VideoHub control protocols and uses incoming commands to create routing between defined NDI sources and virtual destinations created by the Router Module. This can be used for example to construct a virtual router with numerous NewTek NC1 type interfaces, defining ‘Sources’ and ‘Destinations’ which can interface with existing Router Control Systems. The Router Emulation Module achieves this with virtual NDI sources, which allow for routing between NDI devices *without* any processing stage - avoiding any additional latency or CPU load.



## Tally Translation Module

The NDI Router also has a tally translation feature which converts NewTek protocol tallies, from TriCaster, TC1 and IP Series switchers into industry standard TSL_UMD v3.1 protocol to feed into tally, multi viewer and under monitor display systems, including compatibility with labels in the Multiviewers of the Sienna NDI Processing Engine

This module also updates the channel labels in the NewTek system when routing of NDI Sources takes place, ensuring that the channel label displayed in the TriCaster GUI, and on any smart labelled buttons on control interfaces reflects the short name of the actual NDI source currently being routed to that channel.

# The User Experience

## Central configuration via Web Interface

The Sienna NDI Processing Engine has a web based interface for constructing and monitoring processing chains using the various modules available.

NDI Sources and Virtual Destinations are presented in a graphical interface where users can drag modules into a canvas, then drag connections between inputs, modules and outputs.

Complete ‘patches’ of connectivity can be constructed and saved in templates for instant recall later on when required.

## Operating System

The Sienna NDI Router runs on macOS 10.12 or later or Ubuntu 18.04 LTS. A quad core i7 CPU or better is recommended along with at least 8GB of RAM.

# Development Status and Roadmap

This document provides an outline of the requirements anticipated by broadcasters, and proposed functionality to deliver solutions.

## Sienna NDI Router

The NDI Router module, with its Tally module is complete and shipping for macOS and Ubuntu.

## For More Information:

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