

DEMONSTRATION: LIGHT PATHS AND DATA TRANSFER NODES FOR AIRCRAFT MAINTENANCE

Air France-KLM uses a 100 Gbit/s link, connected to Netherlight, to research an aircraft maintenance industry use case. Via this open exchange, Data Transfer Nodes (DTNs) of Air France-KLM in the Netherlands and iCAIR - present in Chicago at StarLight - connect to each other using light paths over their links. In this demonstration, users at SC'17 in Denver will experience the difference in file transfer rates with and without using DTNs.

USE CASE: AIRCRAFT MAINTENANCE

Besides people and luggage, aircrafts transport data they generate, like flight information, technical statistics and sensor readings. These data tell pilots and engineers if the aircraft's critical systems are doing their job safely. When data are transferred and analyzed rapidly, defects can be solved more quickly, possibly even while the aircraft is waiting at the gate. When receiving the data within minutes, expert engineers in a remote airport can rapidly verify with the home base engineers if an engine vibration warning was caused by the engine or by a failing sensor.

INTERNET VS LIGHT PATH

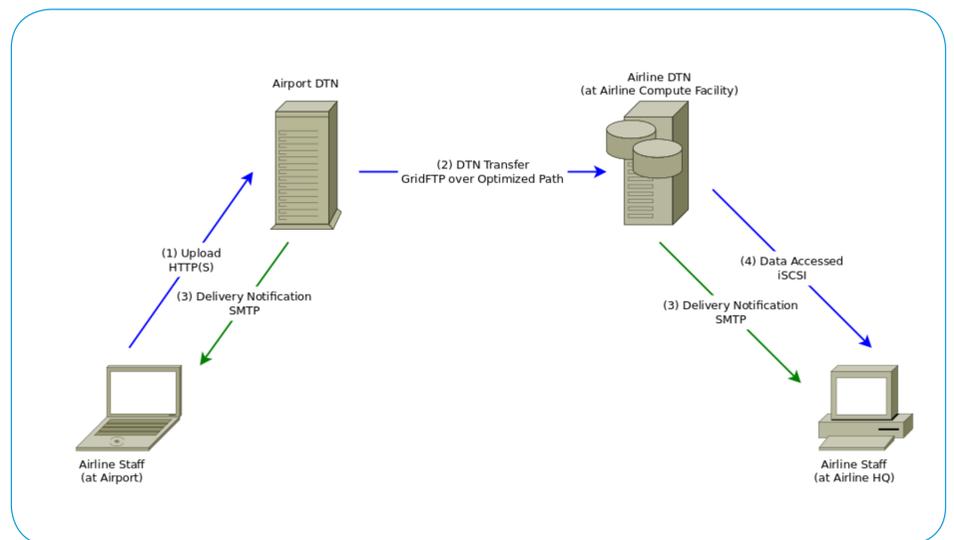
Air France-KLM uses a 100 Gbit/s light path and researches its benefits. Using light paths, you can transport huge amounts of data at high speed and with a guaranteed bandwidth between 2 points. When using high volumes of data, the current Air France-KLM's Internet connections are not private or fast enough to transfer the data within the requested time frame. Transferring a terabyte of engine data via the current Internet connections would take around 30 hours; with a 100 Gbit/s light path this could take less than 2 minutes.

AIR FRANCE-KLM CONNECTED TO NETHERLIGHT

Ciena and SURF facilitate the connection from Air France-KLM at Schiphol to NetherLight, SURF's European hub for international light paths in Amsterdam. SURF provides the 100 Gbit/s light path from Air France-KLM via NetherLight to the aircraft's destination. For this demonstration, the location is Starlight in Chicago, a hub similar to NetherLight.

DATA TRANSFER NODES

Data Transfer Nodes are high-performance systems that are optimized to transfer huge amounts of data. The interconnects between these systems exist of high-capacity dedicated bandwidth, removing network bottlenecks within the mesh of global DTNs. To date, DTNs are present on a small scale, e.g. a couple per continent. By copying a file from an end user system directly into the nearest DTN, the global DTN system sends the file to the DTN nearest to the final file destination, optimizing the process of high-latency international transfers.



LIVE DEMONSTRATION

In this demonstration, there are two end user systems, one in Amsterdam and one in Chicago. Neither system will be optimized for long range transfers, however each will have access to a nearby Data Transfer Node. Visitors are allowed to transfer pre-prepared datasets between the systems via the DTNs with graphs showing various performance metrics. As a comparison, the performance of a direct connection between the two systems - without using DTNs - will also be shown. The intention is to show that systems not optimized for long distance transfers can benefit from using nearby DTNs to facilitate the transfer and decreasing file transfer time.

RESEARCH IN OTHER INDUSTRIES

In addition to the aircraft research, high bandwidth, low latency light paths offer possibilities for research in other industries as well. For example, fundamental research on data transfer protocols suitable for these bandwidths can also help excel diagnosis by doctors when they can have access to terabytes of patient and other related research data within minutes, instead of days or weeks. Imagine what this would enable other research disciplines to do too. Possibilities are almost infinite!

More information: www.surf.nl/en/100-G-Air-France-KLM

