# Canadian HEP Network requirements and challenges

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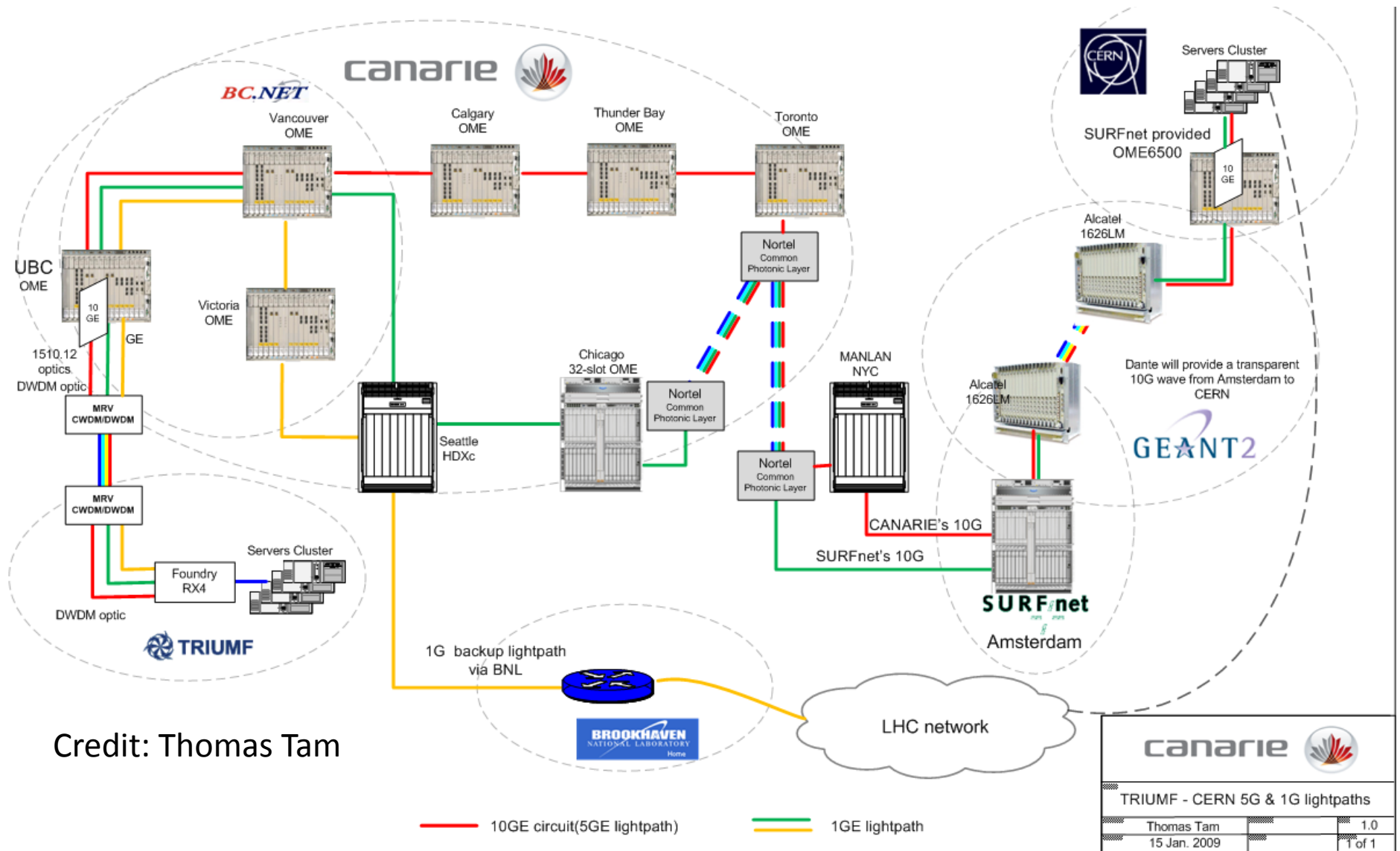
CANARIE Inc., Ottawa, Canada

Transatlantic Network Workshop, CERN 2010-06-11

**HEPnet/Canada**

# Current Architecture



Tier-0

Tier-1

University of Victoria

Simon Fraser University

University of Alberta

TRIUMF

McGill University

University of Toronto

—— 10 GE
—— 1  GE

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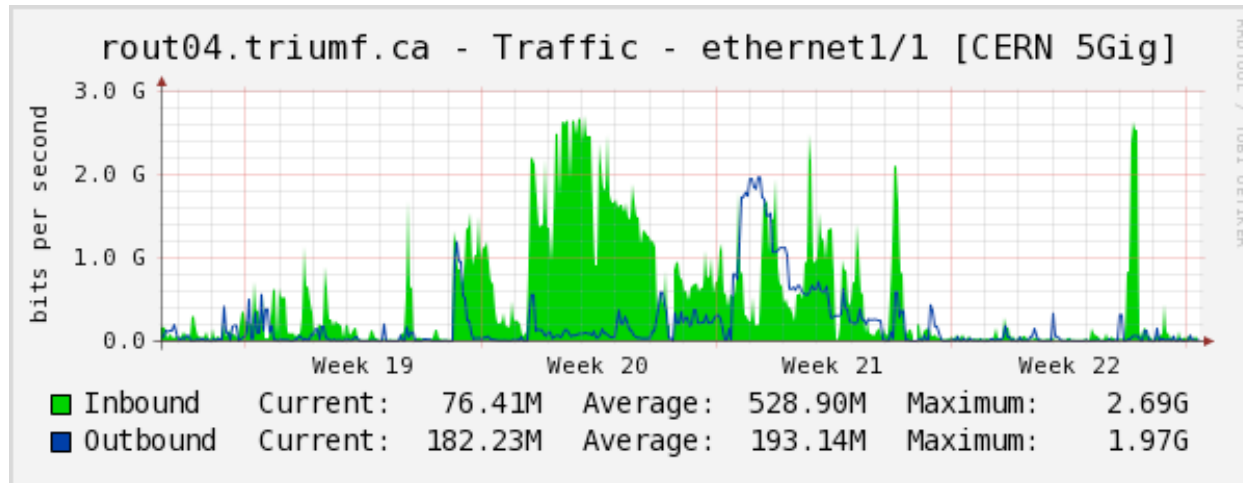# Transatlantic Architecture



Credit: Thomas Tam

# Current Canadian Model

- Canadian Tier-1 to Tier-2 network follows the LHCOPN model with TRIUMF acting as the centre of a star network.

- Tier-2 to Tier-2 traffic transits TRIUMF

- Operational for ~ 2 years.

- Expansion to 10 G lightpath between Tier 1 - 2 possible but not optimal.
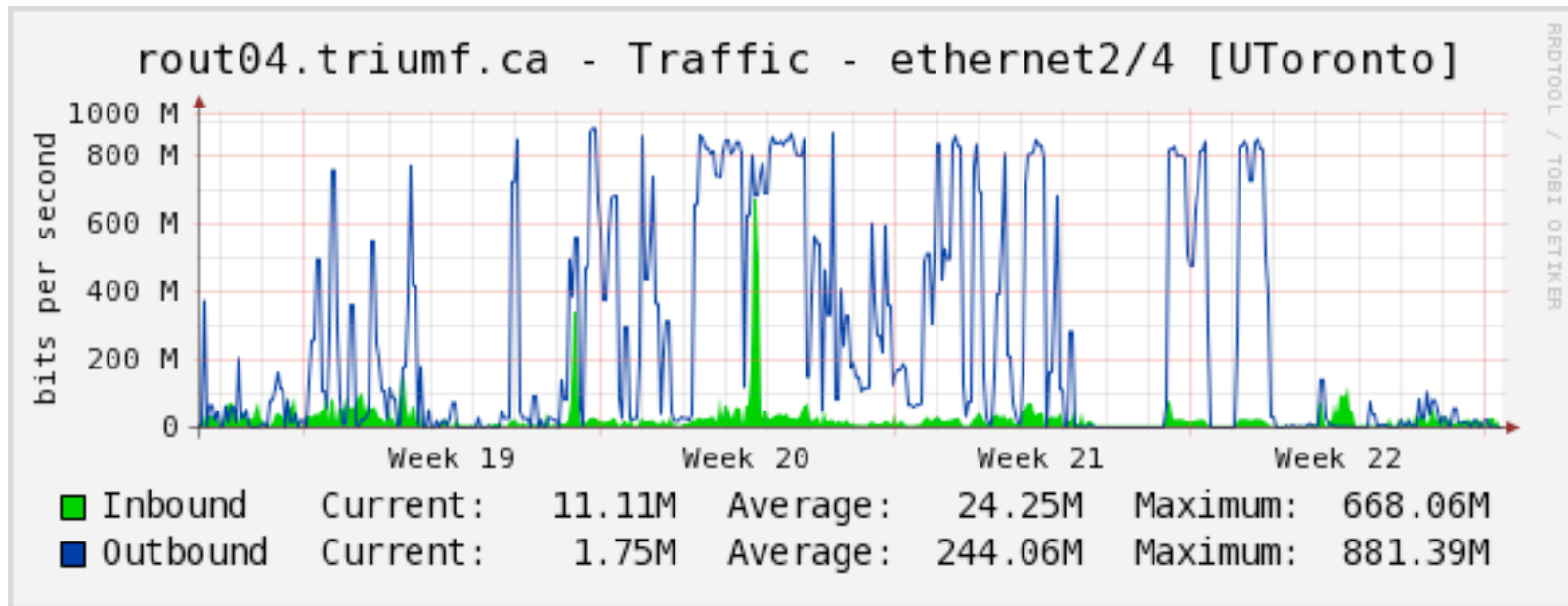
# Usage

TRIUMF – CERN in May (2 hour average)



TRIUMF – U Alberta in May (2 hour average) – typical Canadian Tier-2
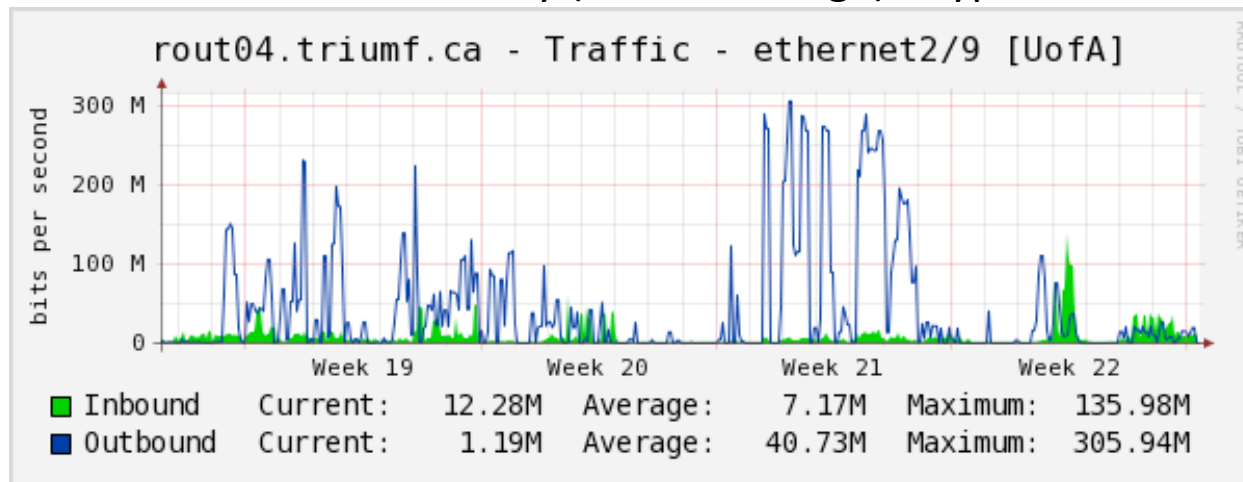
# Usage

TRIUMF – U Toronto (2 hour average) in May – large Canadian Tier-2

# Future Requirements

- Tier 1 – to Tier 0:
  - TRIUMF is a smaller Tier-1: 5% of ATLAS data.
  - Circuit currently provisioned at 5G Transatlantic, can be increased to to 10G relatively easily.
- Canadian Tier-2 capacity still growing.
  - Tier-2s likely to require capacity between 1G-10G
- Moving to 10 G network for Western Canada Tier-2s.
  - Single 10 G into TRIUMF for Western Tier-2s
  - Tier-2 peering done in Vancouver Transit Exchange, rather then at TRIUMF.
  - Exploiting unused capacity in existing regional HPC consortium network (WestGrid).
  - allows for burst activity without the need for dedicated lightpaths
- Eastern Canada solution under study
  - University of Toronto, has large Tier-2

# Challenges

- Not enough fibre path diversity.

- Large distance scales, Tier-2s up to 3700 km from TRIUMF.

- Undersea fibre cut between Victoria and Vancouver (1 Month to fix, alternate route via Seattle established quickly)