

TRIUMF Tier 1 Status Update  
US LHC Network Working Group Meeting  
October 23, 2006

HEPnet/Canada: Randall Sobie, Ian Gable  
TRIUMF: Reda Tafirout, Steven McDonald

# *Tier-1 centre at TRIUMF*

---

- Build a large scale data intensive analysis facility for 24x7 operations.
- Canada only involved in ATLAS
- All services to be provided with high reliability & availability †
  - Grid services:
    - CE : Compute Element
    - SRM : Storage Resource Manager
    - FTS : File Transfer Service
    - LFC : LCG File Catalog
    - VOBOX : ATLAS Data Management
  - Databases: Oracle (conditions data), MySQL, PostgreSQL
- System should be highly scalable: smooth growth/expansion for the coming years (minimize downtimes). Fault tolerant.

† Under WLCG MoU, cannot be down for more than 1 week/year.

---

# LCG MoU

---

## **TRIUMF signed the MoU last week:**

- Between parties participating in the project:
  - CERN
  - Tier-1 centres
  - Tier-2 centres
- Description of Tier-0 / Tier-1 / Tier-2 roles
- Minimum Service Levels and Response times
- Grid operations
- Pledged resources

# Tier-1 for ATLAS

---

## ATLAS Tier-1's for pp running

<i>Tier-1 centre</i>	<i>% of resources</i>
ASGC	7.7
BNL	24
CNAF	7.5
FZK	10.5
NDGF	5.5
NIKHEF	13.0
IN2P3	13.5
PIC	5.5
RAL	7.5
TRIUMF	5.3

**TRIUMF is providing resources for ATLAS experiment only.**

# Tier-1 Peering

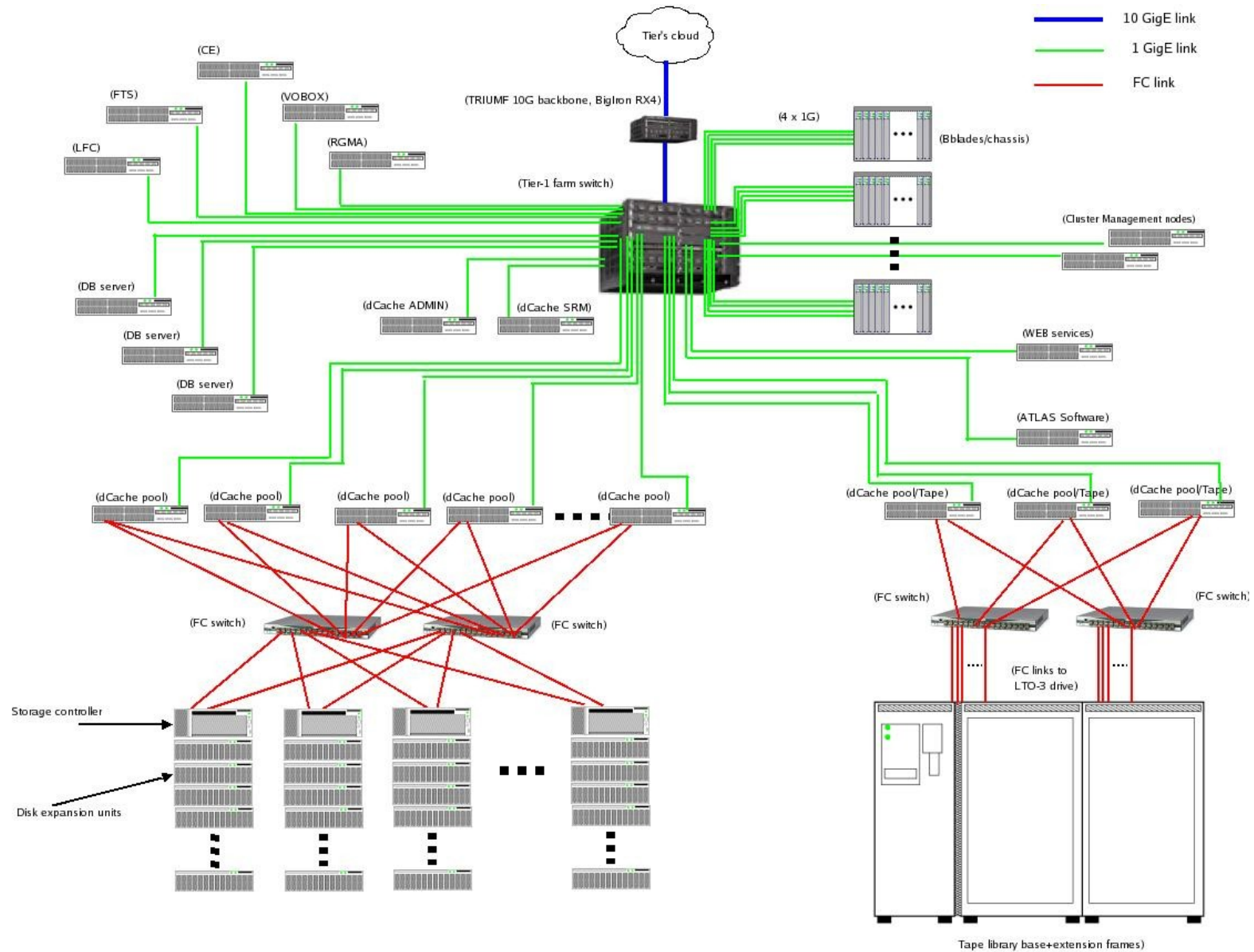
---

<i>T1-T1 Association</i>	
FZK & IN2P3	BNL
CNAF	RAL
NIKEF/SARA	TRIUMF & ASGC
NDGF	PIC

**ATLAS computing model: requires full T1-T1 matrix for data movement between sites (2<sup>nd</sup> pass AOD,...)**

- Peering designed around network topology.
- 10 GigE CERN link goes by NIKHEF

# Reference design



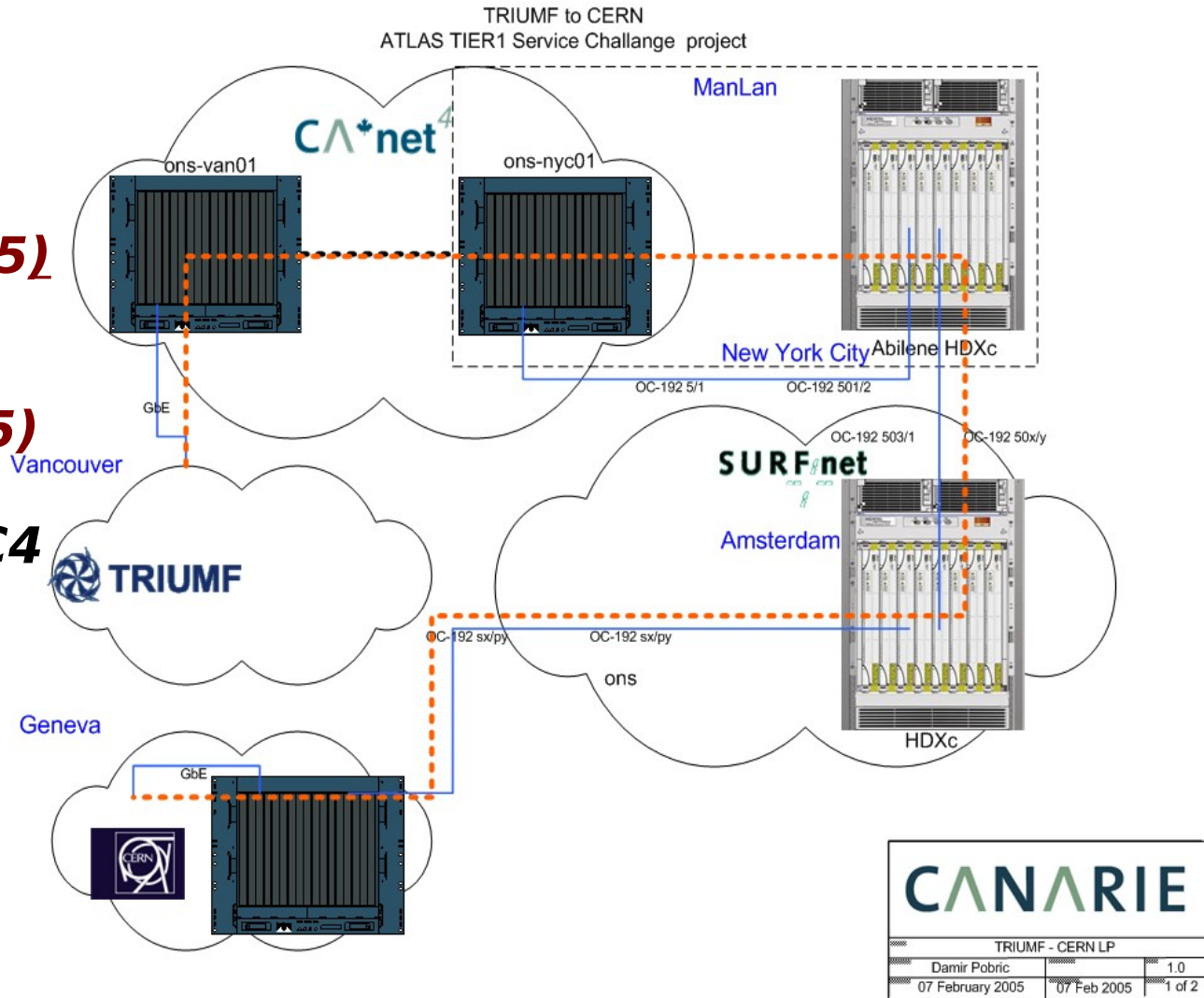
Fully funded, procurement underway, installed early to mid 2007

# Networking: 1 GigE T0 -T1 lightpaths

## Currently (TRIUMF-CERN):

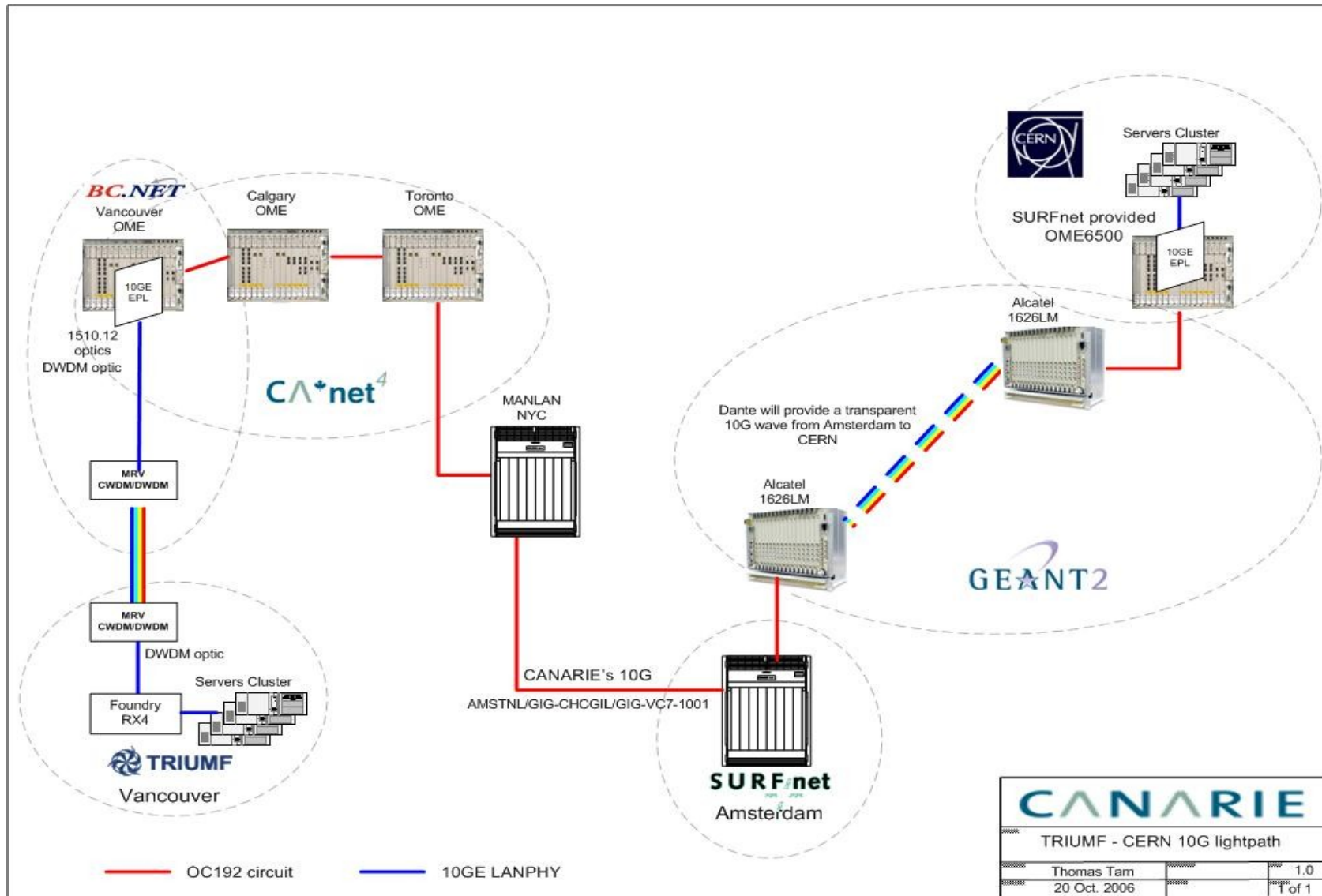
- **1<sup>st</sup> GigE circuit**  
*(since April 18<sup>th</sup> 2005)*
- **2<sup>nd</sup> GigE circuit**  
*(since July 19<sup>th</sup> 2005)*
- **Used for SC3 and SC4**

- TRIUMF
- BCNET
- CANARIE
- SURFnet
- CERN



# Networking: 10 GigE T0-T1

- MoU effective between TRIUMF, HEPNET & CANARIE
- Presently commissioning a 10 GigE link TRIUMF-CERN:





# Canadian ATLAS Computing Model

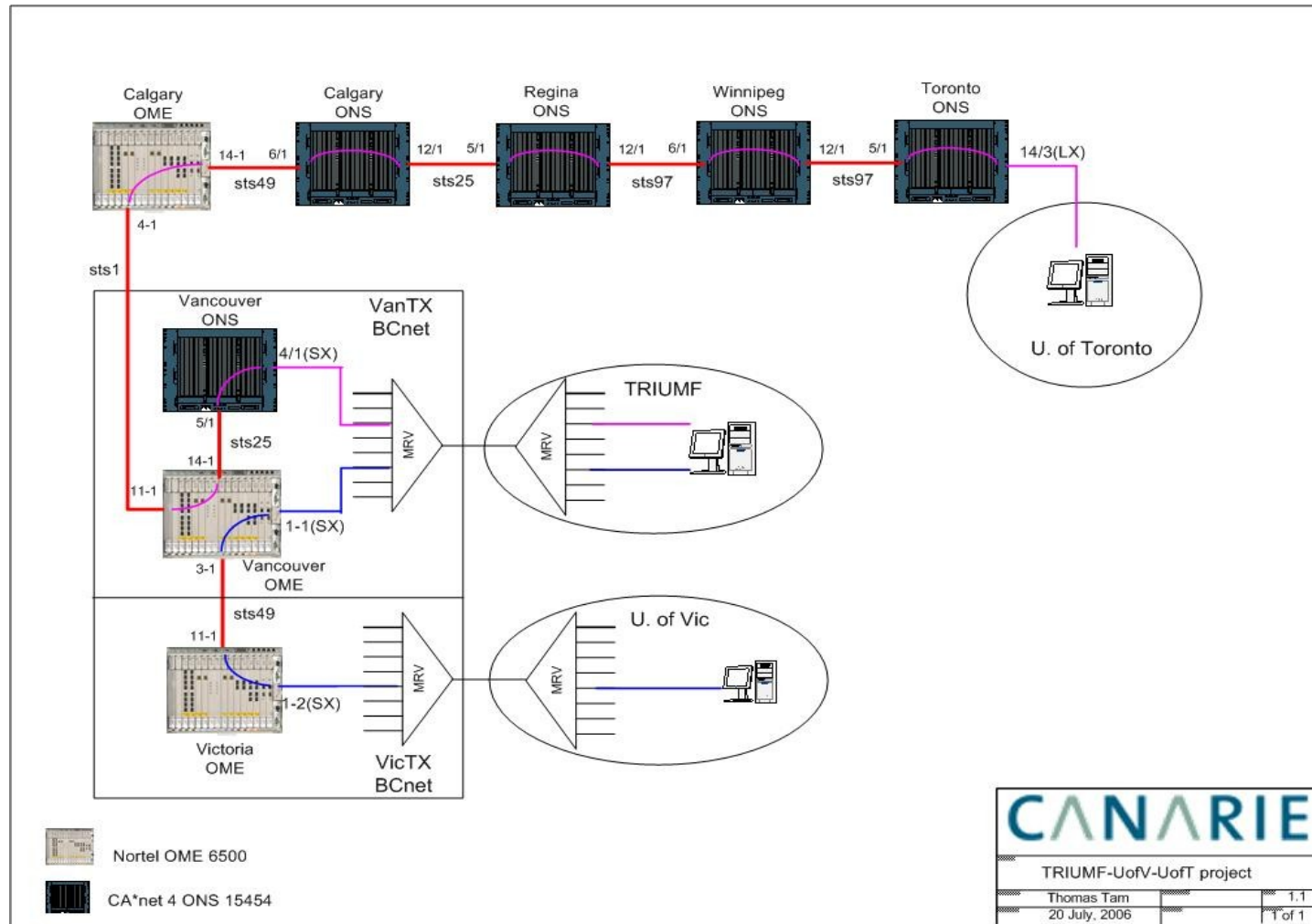
---

- Two distributed Tier-2s
  - Western T2: Simon Fraser U, U of Victoria, U of Alberta
  - Eastern T2: U of Toronto, McGill U



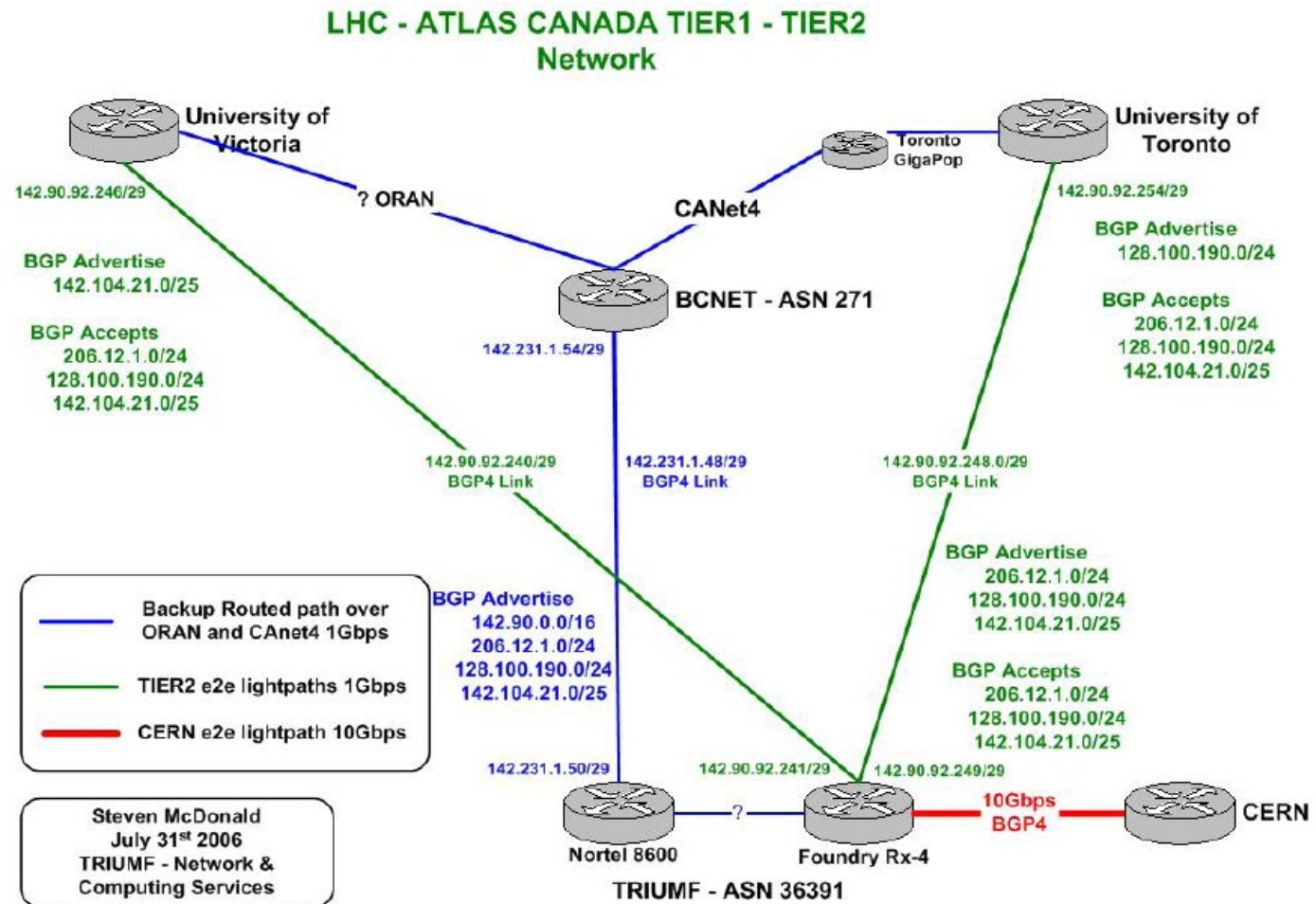
# Networking: T1-T2 Lightpaths

- University of Victoria, and University of Toronto first T2 sites to be connected by 1 G lightpaths



# Networking: T1-T2 Continued

- Backup Routed over CA\*net4 and ORANs



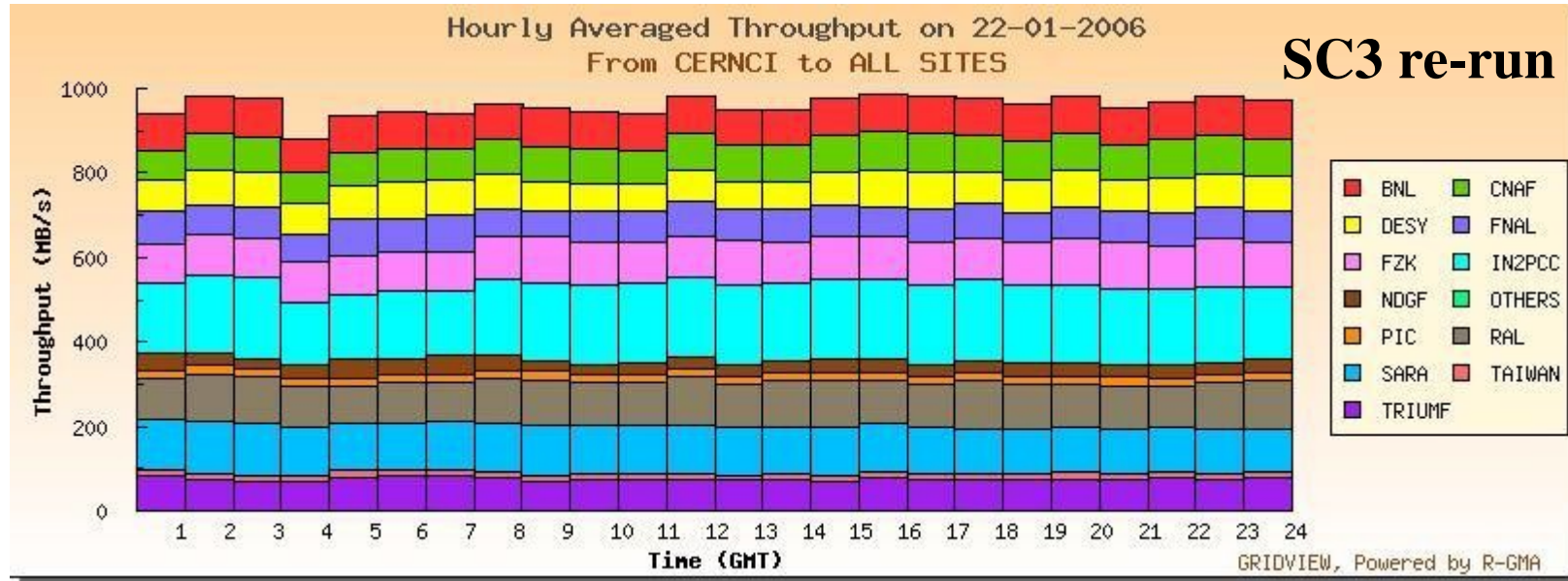
# Service Challenges (SC3 & SC4)

---

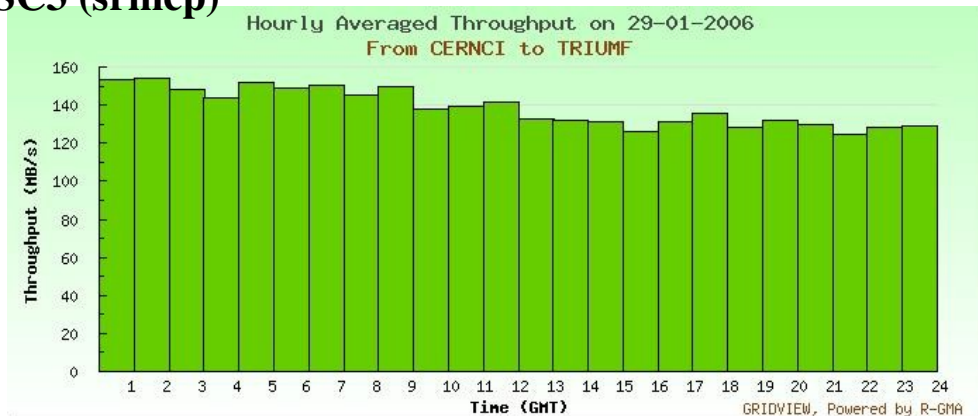
- **Intensive Service Challenges activity (so far mainly Tier0-Tier1):**
  - robustness of storage
  - networking
  - LCG baseline services (FTS, SRM, VO...)
- **Time line:**
  - April: SC4 disk-disk, disk-tape throughput tests ✓
  - May: Deployment of new middleware and services ✓
  - June: start of ATLAS SC4 test suite (Tier0-Tier1, Tier1-Tier1, Tier1-Tier2's) ✓
  - October: ATLAS DB replica deployment @ TRIUMF
  - November: reprocessing, distributed analysis tests.
- **Important to fully participate in these activities (ensure Tier-1 readiness).**

# TRIUMF in SC3 (re-run)

- Successful participation in the Service Challenges:



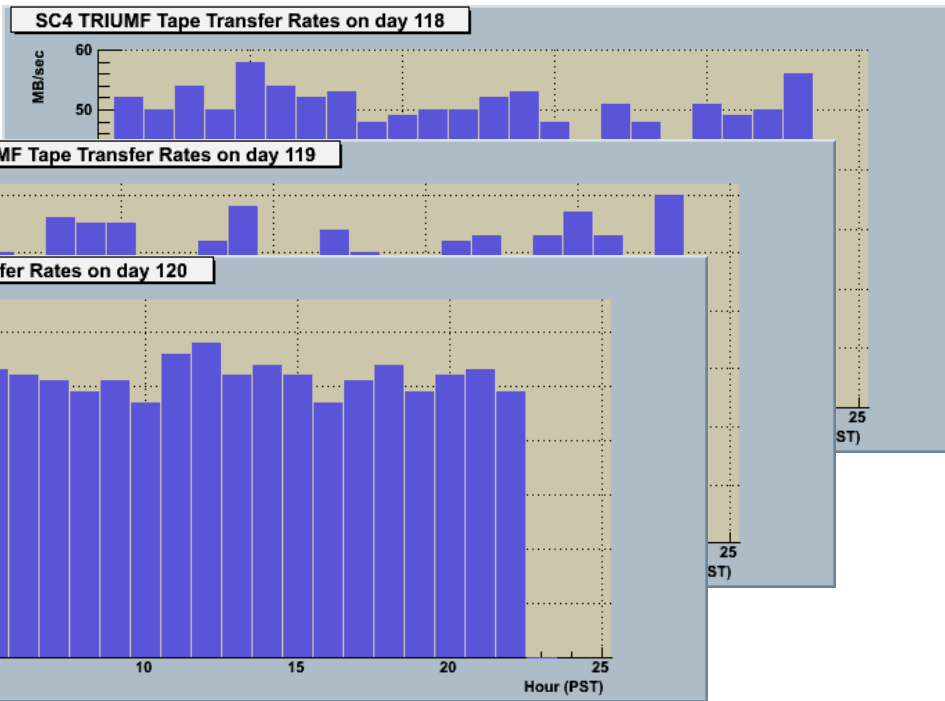
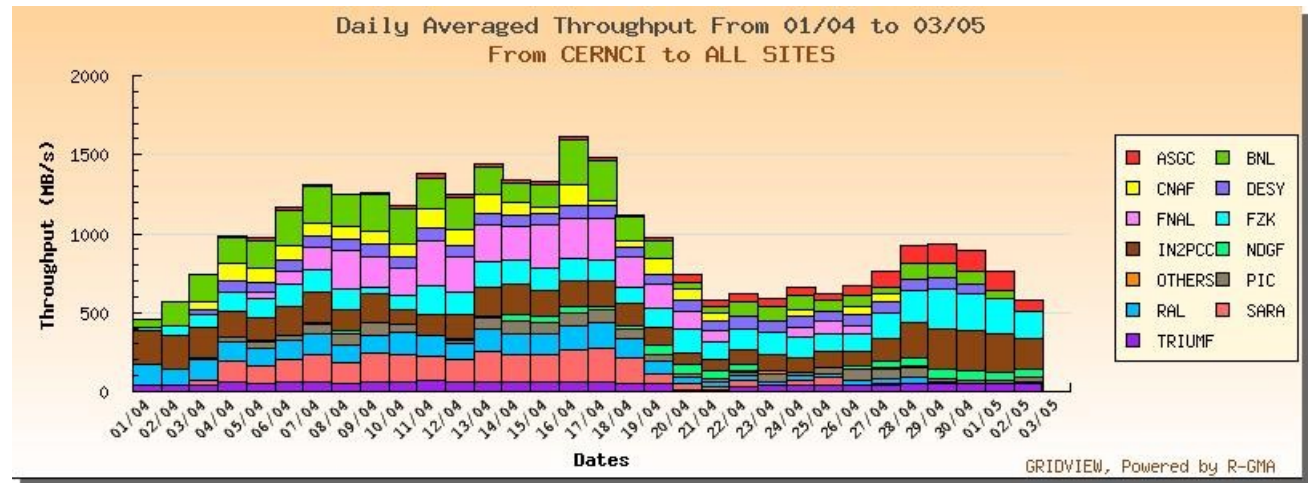
## SC3 (srmcp)



- Goal of 50 MB/s exceeded in independent tests

# TRIUMF SC4 disk-disk & disk-tape

- *disk-disk sustained above target rate for 2+ weeks (Goal of 50 MB/s)*



- *disk-tape at ~ 50 MB/s*

# *Summary / To do...*

---

- At present, a fully functional Tier-1 cluster
  - Providing Grid services for ATLAS production
  - Successful participation in the Service Challenges
  - Need to only expand in CPU & storage capacities
- Finalize 10 GigE link (TRIUMF-CERN), completion of Amsterdam-CERN portion (November 1st)
- T1-T2 Connections to University of Victoria and University of Toronto in progress (Finish in November).
- Plans for further 1G T2 connections.