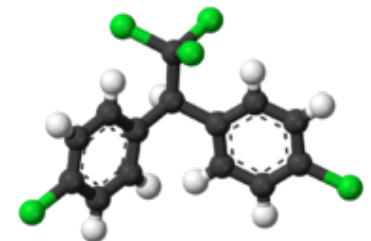




Debugging Data Transfers

**Mario Kadastik, Olga Kodolova,
James Letts, Nicolò Magini**

**WLCG Collaboration Workshop
Victoria, BC, Canada
September 2, 2007**

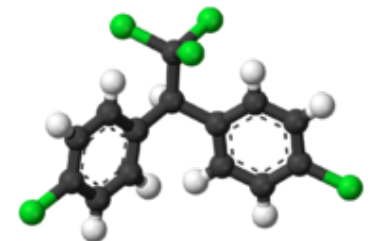




Outline

- **Task Force Charge**
- **History of Commissioning Activity**
 - ◆ **Metric**
 - ◆ **Tools**
 - ◆ **Keeping links commissioned - what needs to be done**
- **Consequences for Monte Carlo Production**
- **Site Status as of Thursday August 30th**
- **Conclusions and Questions**

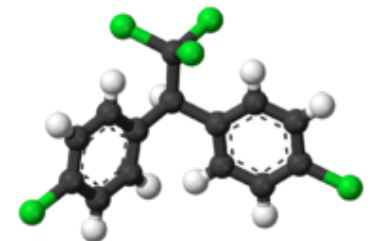
- **References to twiki documentation throughout <https://twiki.cern.ch/twiki/bin/view/CMS/DebuggingDataTransfers> is the main page.**





Task Force Charge

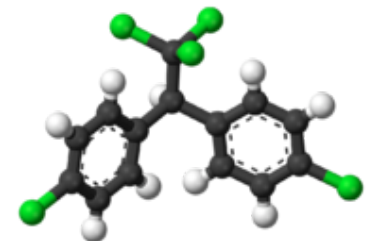
- **Created in early July 2007**
<https://twiki.cern.ch/twiki/bin/view/CMS/DDTCharge>
- **Concerned with commissioning LINKS BETWEEN SITES, not site commissioning itself.**
- **Define the METRIC by which links are considered commissioned and handed over to Data Ops.**
- **Concentrate on:**
 - ◆ T1-T1 cross-link mesh
 - ◆ T1 downlinks to regional T2
 - ◆ T2 uplinks to regional T1
 - ◆ T1 downlinks to non-regional T2
- **Only commissioned links in Prod, all in Debug, new instance of PhEDEx**





Task Force Charge

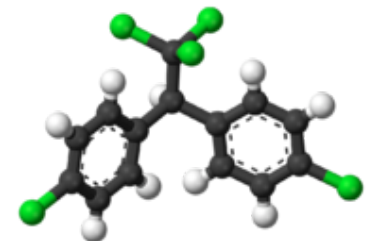
- **Task Force Members: M. Kadastik, O. Kodolova, N. Magini and myself.**
- **Lots of help:**
 - ◆ **Tool Development from B. Bockelman and S. Sonajalg (summer student)**
 - ◆ **T2 Liasons: K. Bloom and G. Bagliesi**
 - ◆ **PhEDEx admins, Central Ops.**
 - ◆ **Networking experts**
 - ◆ **FTS experts**
 - ◆ **Site admins from T1, T2, CERN.**
 - ◆ **And many more...**





Definition of the Metric

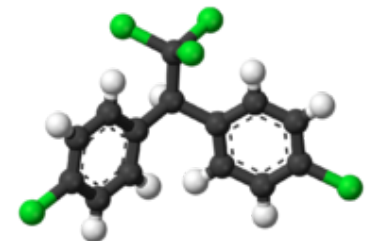
- **First task was definition of Commissioning Metric**
- **After a few iterations:**
 - ◆ **Link with T2 endpoint:**
 - 300GB/day for 4/5 days (to match service commitment)
 - 1.7TB in 7 day period (4x300GB+500GB)
 - ◆ **Others (T1-T1, T0-T1):**
 - 300GB/day for 6/7 days
 - 2.3TB in 7 day period (6x300GB+500GB)
 - ◆ **Decommissioning (PROBLEM-RATE):**
 - No 300GB/day in 7 consecutive days





Measuring the Metric

- Next task was developing a tool to actually implement this metric
- Developed by B. Bockelman, M. Kadastik, Sander Sonajalg (summer student).
- Script reads PhEDEx information
- Real-time web page:
<http://io.hep.kbfi.ee:8889/app/>





Measuring the Metric

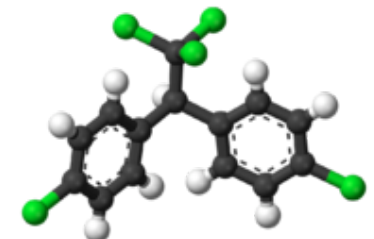
	ASGC	CNAF	FNAL	FZK	IN2P3	PIC	RAL
T0							

Key:

- NOT-TESTED
- PENDING-RATE
- COMMISSIONED
- PROBLEM-RATE

	ASGC	CERN	CNAF	FNAL	FZK	IN2P3	PIC	RAL
ASGC								
CERN								
CNAF								
FNAL								
FZK								
IN2P3								
PIC								
RAL								

- Row->Column upper half of box
- Column->Row, lower half of box
- PROBLEM-RATE are links which were COMMISSIONED but the rate dropped below limit.

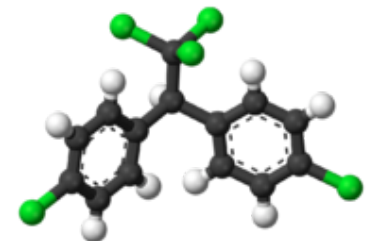




Measuring the Metric

	ASGC	CERN	CNAF	FNAL	FZK	IN2P3	PIC	RAL
Bari		Yellow	Red/Green	Yellow	Yellow	Yellow		
Beijing		Yellow	Yellow	Yellow		Yellow	Yellow	
Belgium_IIHE		Yellow		Yellow	Yellow	Green		
Belgium_UCL		Yellow		Yellow	Yellow	Green		
Budapest		Yellow		Yellow				
CIEMAT_TMP							Yellow	
CSCS	Yellow	Yellow	Red	Red	Red	Yellow	Yellow	Yellow
Caltech	Yellow	Yellow	Red	Green	Red	Yellow	Yellow	
DESY		Yellow	Yellow	Green	Red	Green		
Estonia		Yellow		Yellow	Yellow		Red	Green
Florida	Yellow	Yellow	Yellow	Green		Yellow	Yellow	Yellow
GRIF_DAPNIA						Yellow		
GRIF_LAL						Yellow		
GRIF_LLQ			Yellow	Yellow		Green		
GRIF_LPNHE						Yellow		
HEPGRID_UERJ				Yellow	Yellow	Green		
IHEP		Yellow						
ITEP		Yellow						

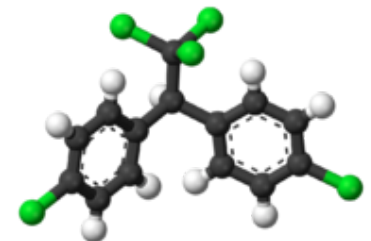
- T1 to/from T2 links
- Many sites don't have a single commissioned uplink or downlink!
- If regional T1 is not working, then commission a link to/from another T1!





Keeping Links Active

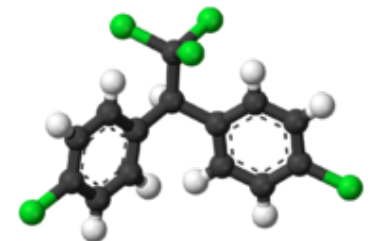
- **Physics transfers are not enough to meet the metric of 300GB/day**
- **LoadTest is needed to provide steady rate**
- **Decision to move LoadTest to the Debug instance of PhEDEx**
- **All LoadTest subscriptions in Prod were removed on August 29th.**
- **Tasks for sites (urgent!):**
 - ◆ **Get PhEDEx agents running in Debug instance**
 - ◆ **Create LoadTest samples in Debug**
 - ◆ **Inject samples (usually by the source site if possible) into PhEDEx**
 - ◆ **Subscribe to LoadTest samples**
 - ◆ **Get your links commissioned!**
- **Procedures documented on twiki pages**





Keeping Links Active

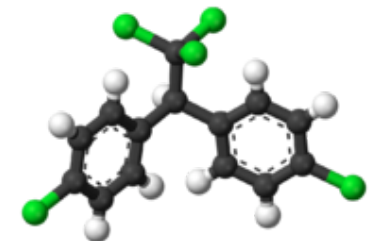
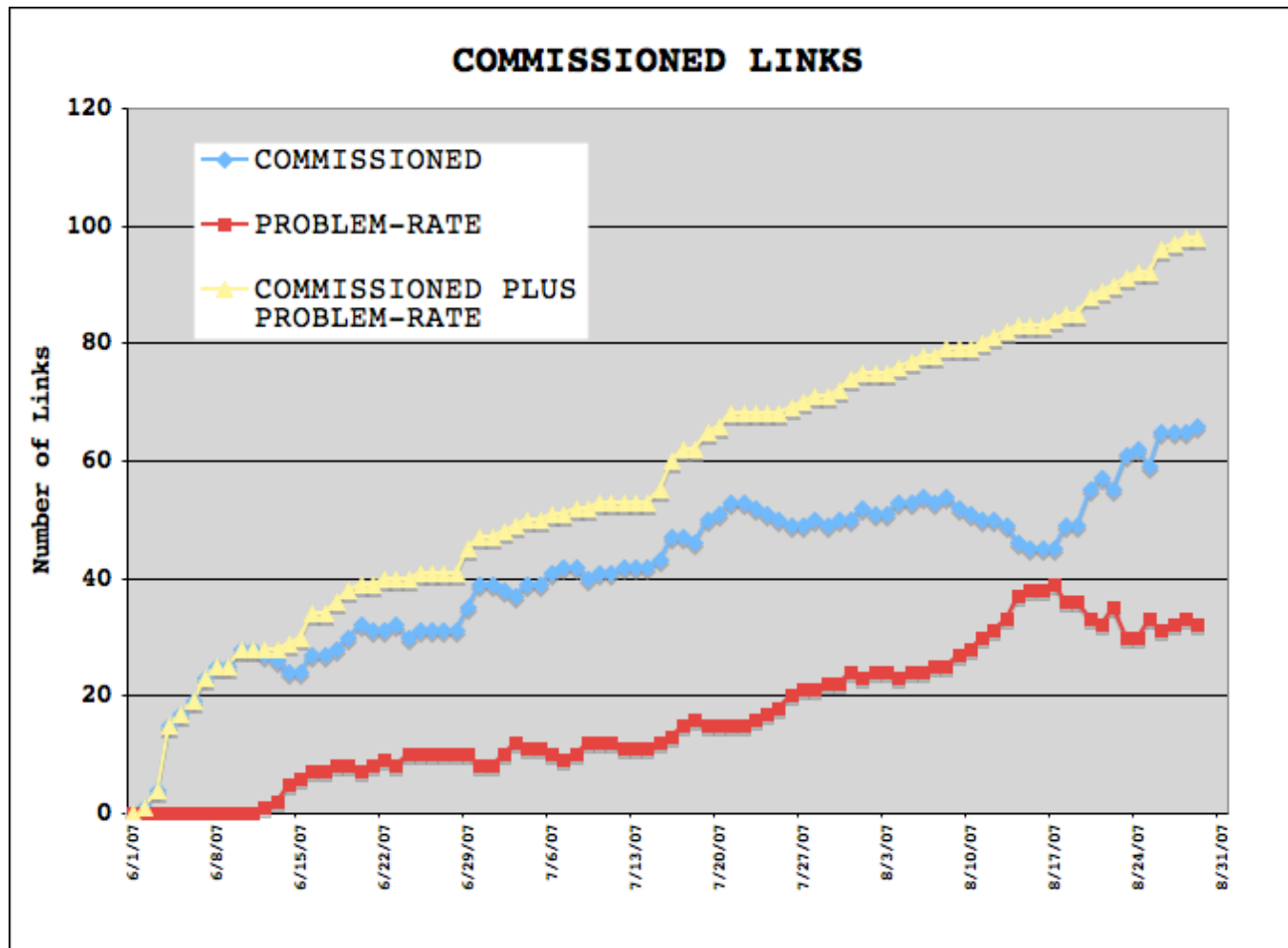
- **T2 Check List has 48 Sites, 7 T1s plus CERN**
- **Please Update the Check Lists!**
- **Status as of Thursday August 30 (from PhEDEx web pages not Check Lists):**
 - ◆ 36/48 (75%) T2s have subscribed to at least one T1 load test sample in Debug
 - ◆ 38/56 T1-T1 subscriptions
 - ◆ 24/56 (42%) sites have created load test samples in Debug. All T1 except CNAF, plus 17/48 T2s.
 - ◆ 17/48 (35%) T2s have subscriptions on the uplink to at least one T1
- **Uplinks will not get commissioned without load test samples at the T2s!**





History of Commissioned Links

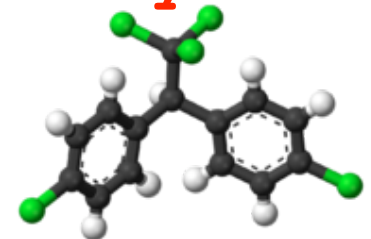
- "Vacation Effect" in August
- Steady Influx of New Links





History of Commissioned Links

- Many new links commissioning
- Certain percentage become PROBLEM-RATE also, why so many?
- Do we expect a new round of problems next week associated with the LoadTest migration to Debug?
- Should we see some more improvement (decline in PROBLEM-RATE?) now that vacations are over?
- Steady influx of New Links - 98 total!
- And a steady increase in the number of COMMISSIONED LINKS - 40 to 66 since early July



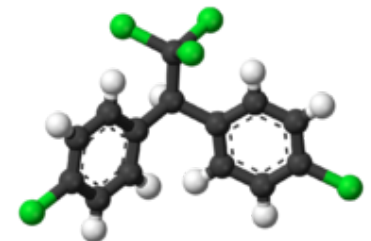


Other Tasks

- **Maintaining Contact Lists for Sites**

<https://twiki.cern.ch/twiki/bin/view/CMS/DDTContactList>

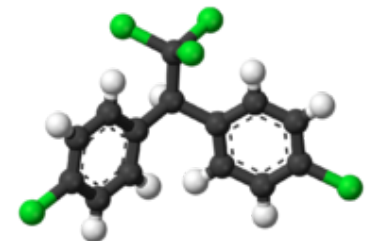
- **Helping sites get in contact with Experts to solve problems**
- **Tracking common problems and solutions on the twiki**
- **Reporting to CSA07 Thursday integration meeting.**





Consequences of (De)Commissioning

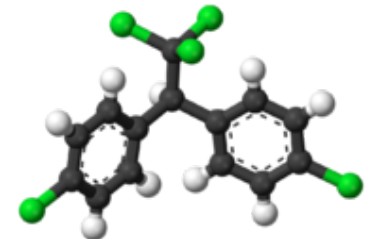
- Non-commissioned links are scheduled to be removed from Prod on or around August 30th.
- Means no physics transfers on these links
- Also could mean no movement of Monte Carlo production data
- List of links which are considered essential for production:
<https://twiki.cern.ch/twiki/bin/view/CMS/DDTProductionUplinks>
- Most important:
 - ◆ Every T2 have one COMMISSIONED uplink to T1 or to CERN
 - ◆ Every T1 have COMMISSIONED uplink to CERN
- What to do if links are not COMMISSIONED, but needed for Production?
- Decided at last Thursday meeting, extend deadline for deactivating these uplinks to September 10th





Consequences for Production

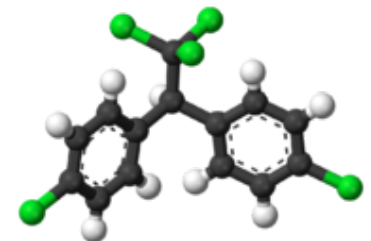
- **OSG team (FNAL; US and Brazil)**
 - ◆ US T2's COMMISSIONED uplinks to FNAL
 - ◆ Brazilian sites almost COMMISSIONED (200GB/day)
- **LCG3 team (IN2P3; Italy, Spain, Lisbon)**
 - ◆ IN2P3 uplink to CERN almost COMMISSIONED
 - ◆ 3 T2 uplinks COMMISSIONED, 3 others very close
 - ◆ Lisbon and Budapest need to start transferring data, contacted by N. Magini
- **LCG6 team (FZK & RAL; UK, Estonia, Vienna...)**
 - ◆ FZK uplink to CERN is COMMISSIONED
 - ◆ No T2 uplinks COMMISSIONED, most not even close
- **LCG5 team (FZK & IN2P3; various European T2s)**
 - ◆ IN2P3 link to FZK COMMISSIONED, but not yet to CERN
 - ◆ 3 COMMISSIONED T2 uplinks: Belgian T2s and Warsaw
 - ◆ RWTH has an COMMISSIONED uplink to FNAL only





Site Status

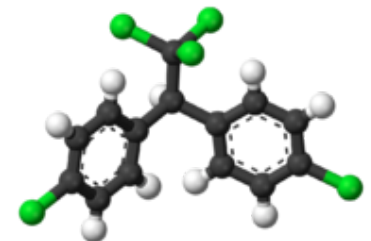
- **Goal for T1s: link to CERN and at least 3 T2s (both directions)**
 - ◆ FNAL & FZK link to/from CERN fully COMMISSIONED
 - ◆ RAL downlink PROBLEM-RATE, uplink OK
 - ◆ ASGC, IN2P3, PIC uplinks PENDING, downlinks OK
 - ◆ Bi-directional COMMISSIONED links to T2s:
 - FNAL (8), CNAF(3), IN2P3 (2), PIC (1), ASGC (1)
- **Goal for T2s: At least one commissioned uplink and downlink to T1.**
 - ◆ 15 T2s have met this requirement
 - ◆ 4 more have met it in the past but are now PROBLEM-RATE
- **All as of Thursday August 30th.**





Conclusions

- Lots of Link Commissioning work has been done, still a lot to do!
- Migration to Debug is urgent, especially for T2 to T1 uplinks which are needed for Production
 - ◆ Lots of activity getting transfers working in Debug!
 - ◆ T2 sites need to create load test samples
 - ◆ Hopefully there will not be a new increase in PROBLEM-RATE links next week
- 6/7 T1s not meeting minimum goal yet (COMMISSIONED link to and from CERN and 3 T2s)
- 33/48 T2s not meeting minimum goals yet (one uplink, one downlink COMMISSIONED)
- DDT Final Report due November 15, after CSA07 is over.





Questions

- Do sites feel this project is helping them?
- Do sites find the rate targets too high/low?
- Are sites fixing real problems that were preventing things from working?
- Do sites feel like results are a stable gain or simply the result of one month of living in challenge mode?

