Running LIGO workflows on the OSG

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OSG-Users meeting
Fermilab July 26/27 207

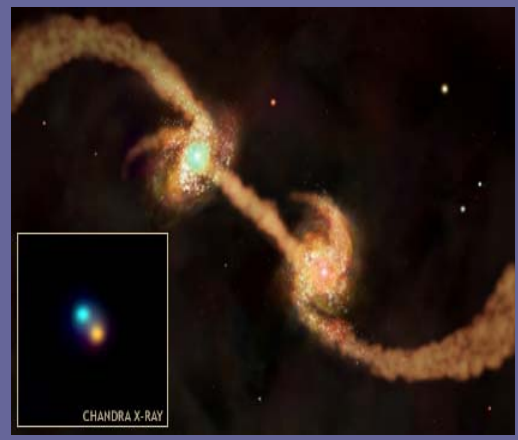
Laser
Interferometer
Gravitational Wave
Observatory

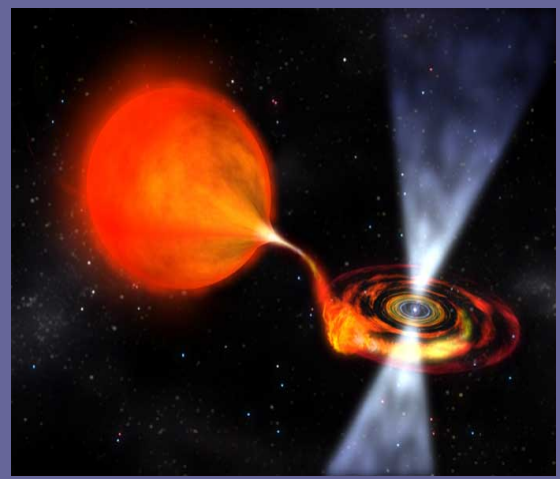
G070489-00-R

What are Gravitational Waves?

Gravitational waves are ripples in the fabric of space and time

- Emitted by accelerating masses
- Sources: Compact Binaries, Bursts, Continuous Wave Source, Stochastic Background





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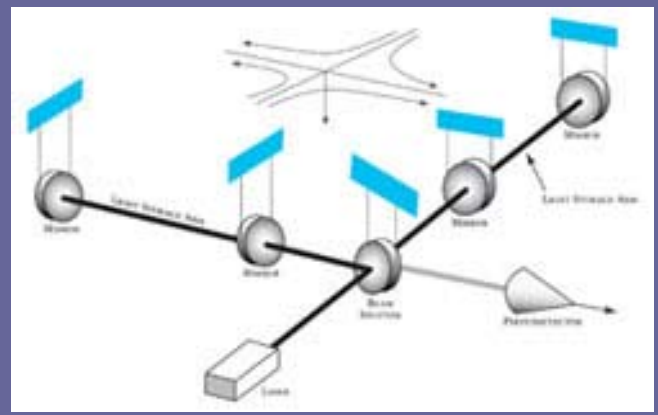
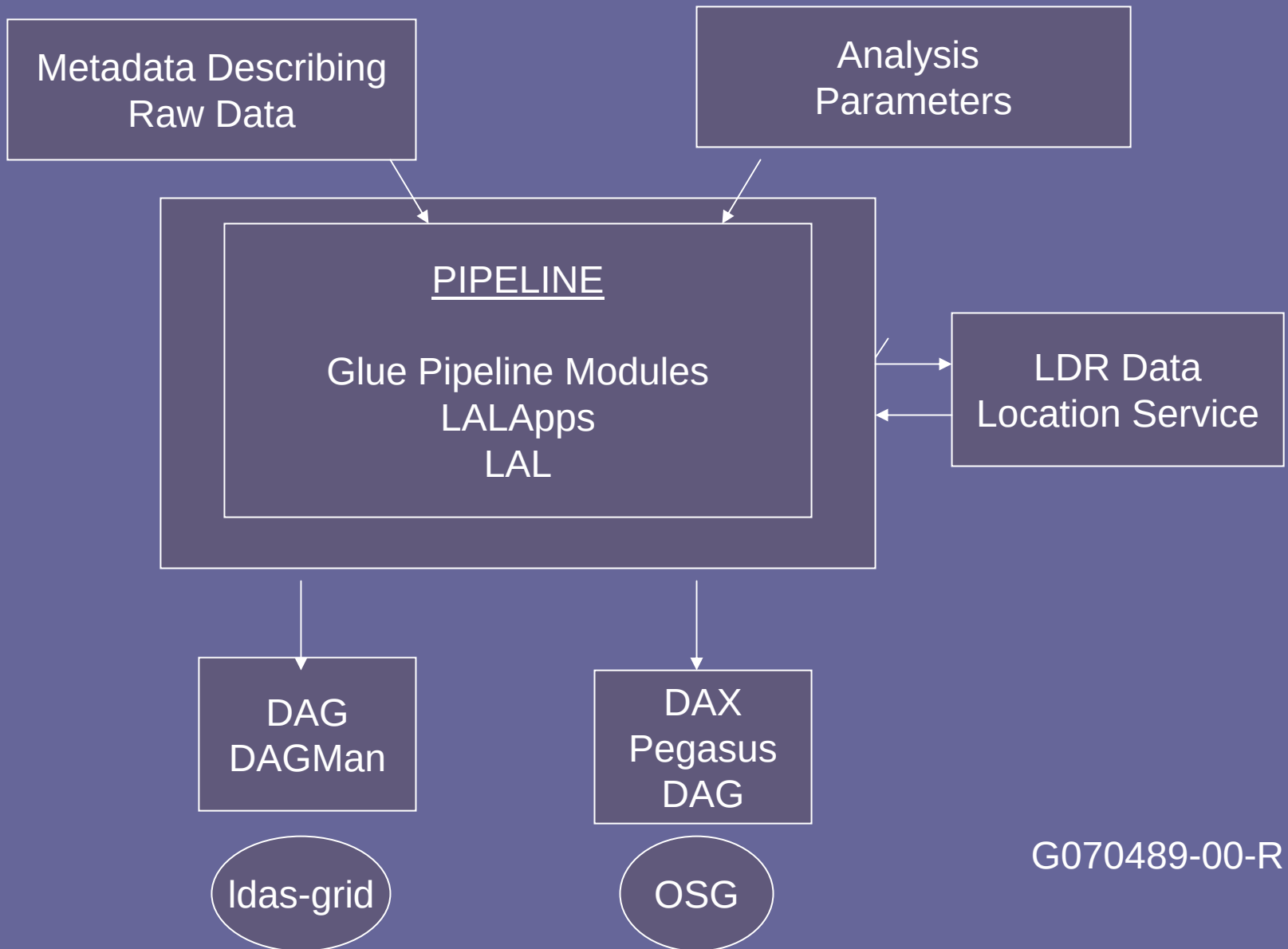
The Interferometer

- GW decreases distance between test masses in one arm of the L, increasing it in the other
- Distance is measured by bouncing high-power laser light beams between test masses
- L1, H1, H2 detectors



Workflow Generation



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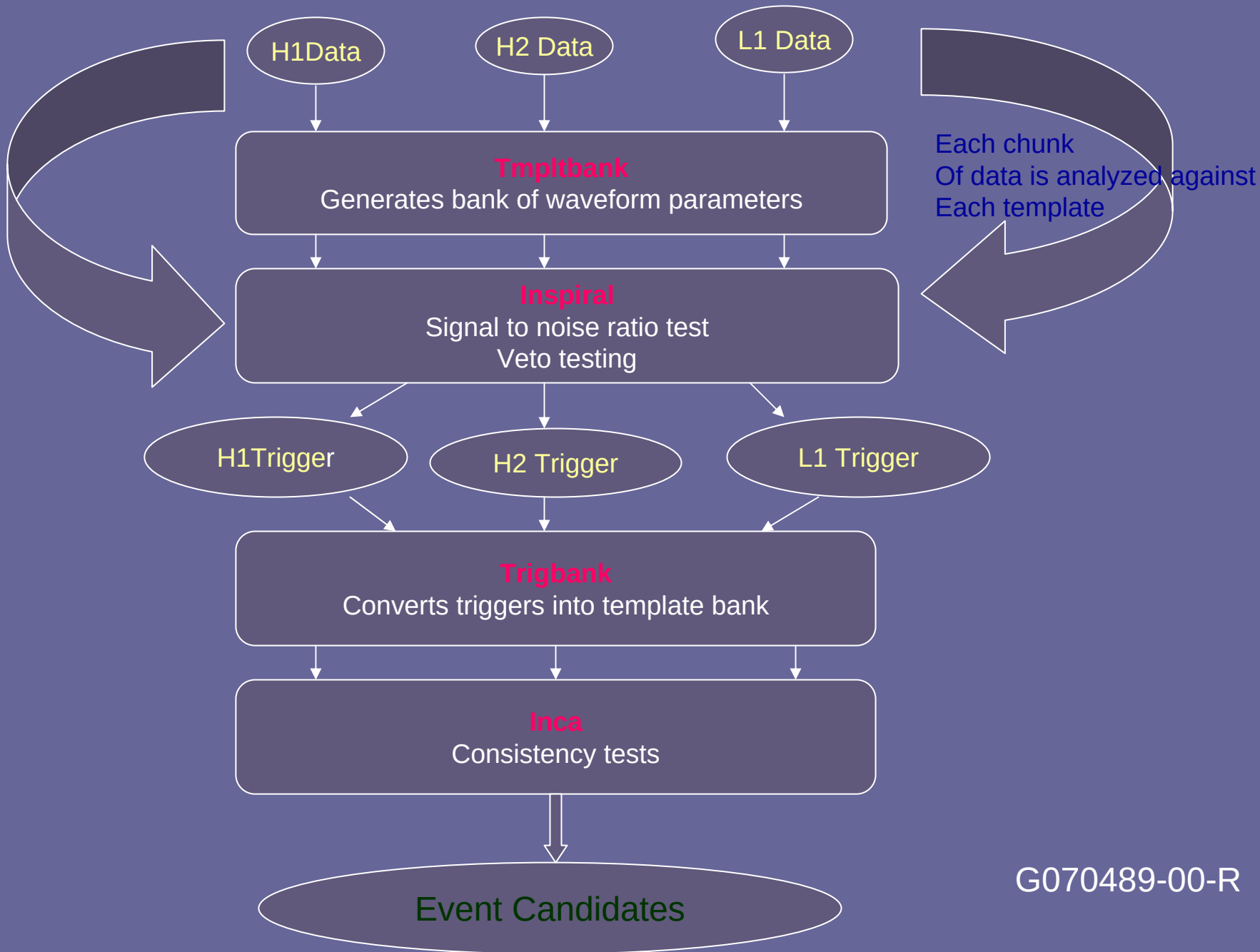
Inside The Pipeline



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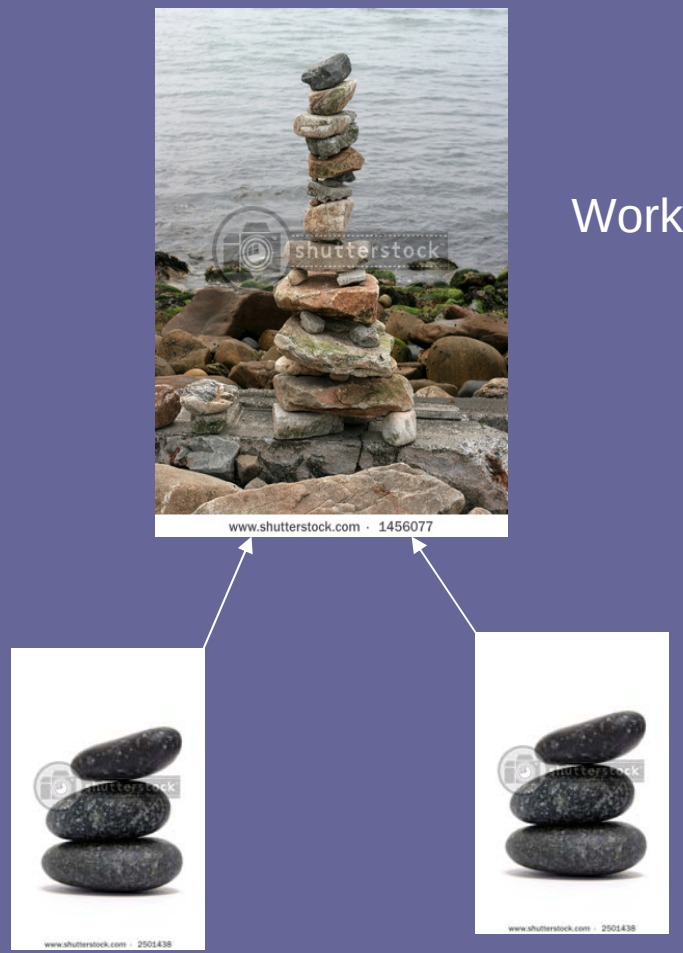
Workflow Size

Each observatory produces data

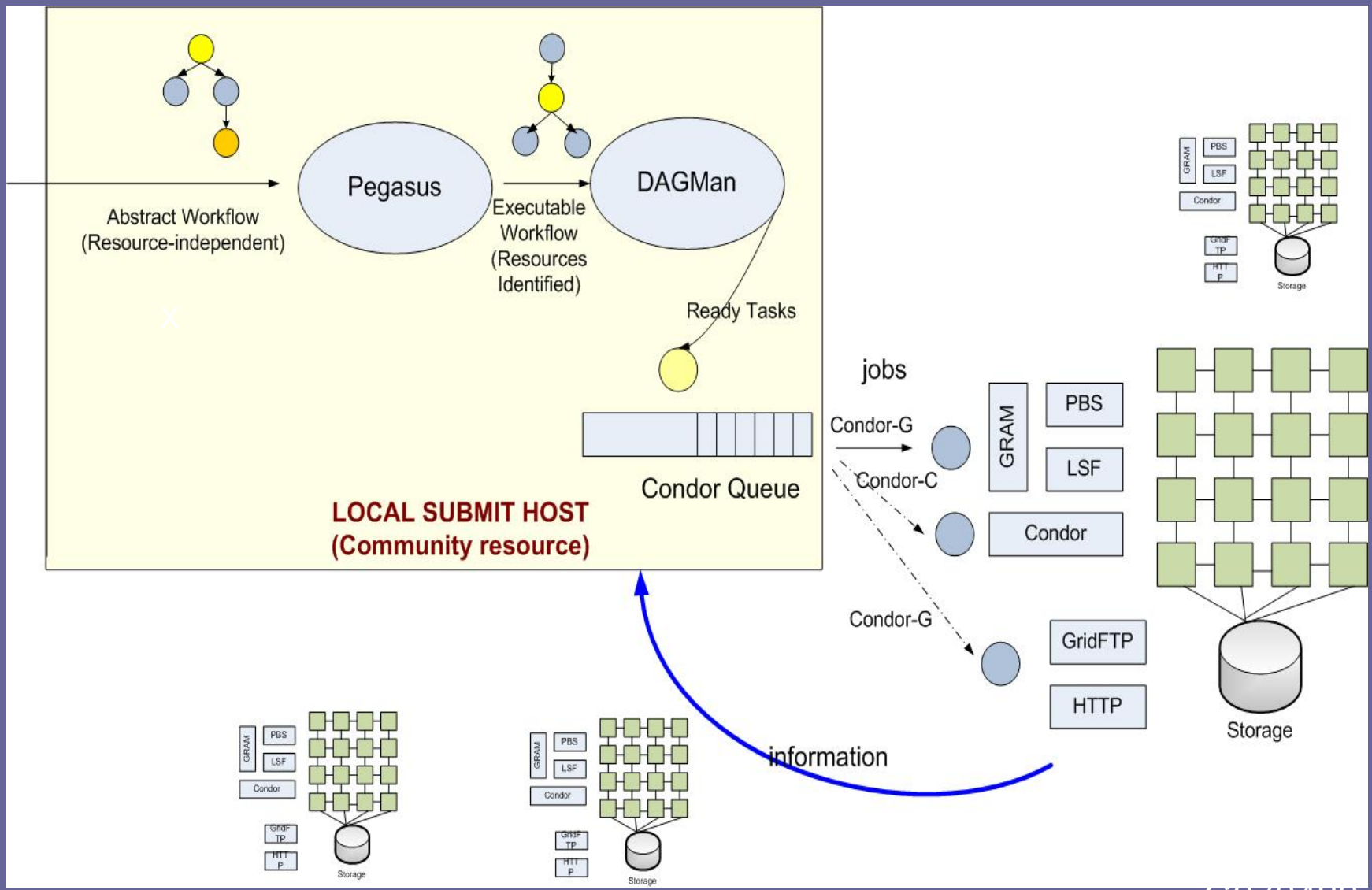
Each chunk of data is analyzed with each of the templates

A chunk of data takes about 5 minutes to be analyzed

Each template bank job takes about 5 minutes



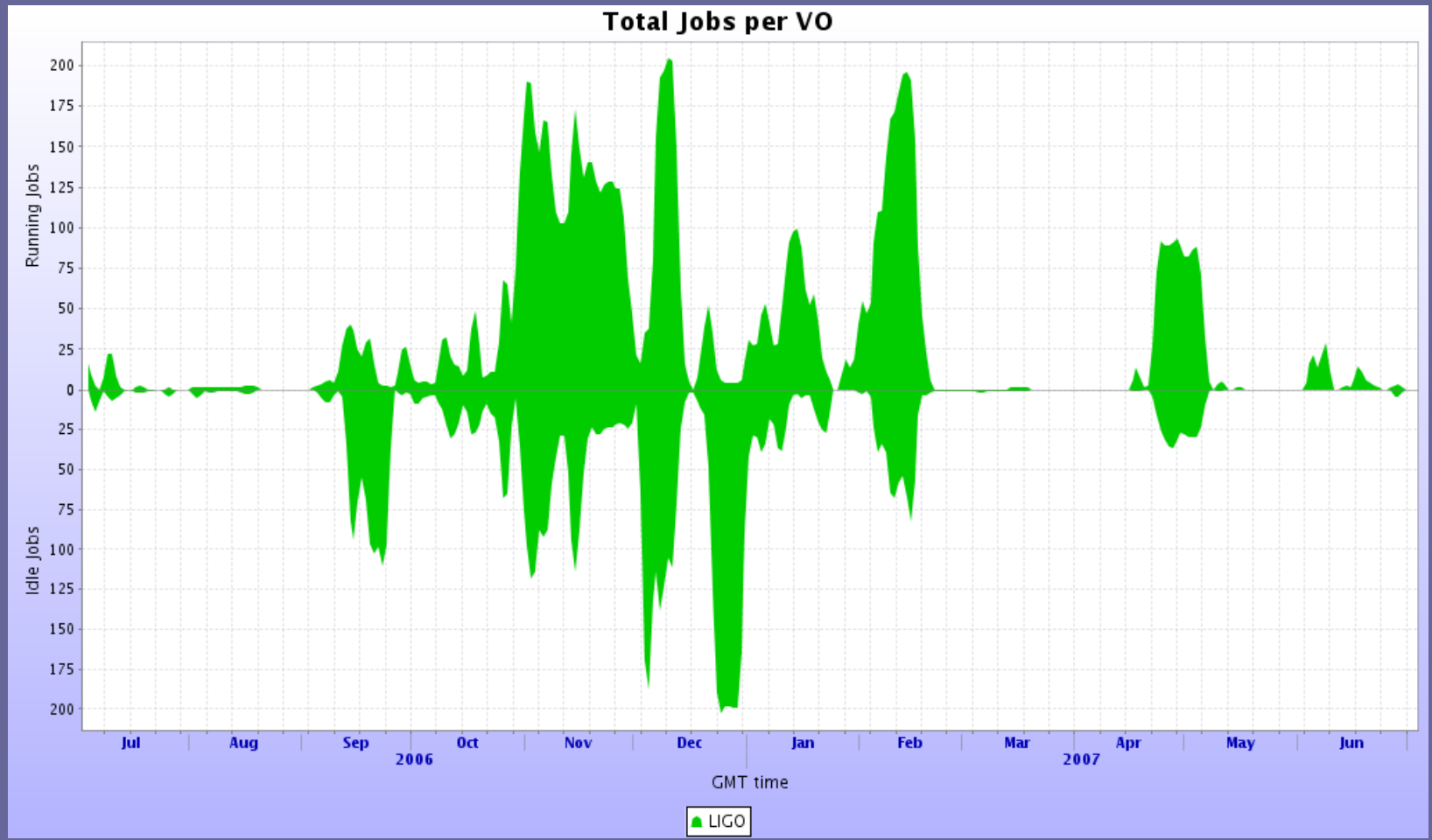
Running Workflows on the OSG



The Inspiral Pipeline On UWMilwaukee

Number of Jobs Local (No DT)	Number of Jobs OSG (DT)	Run Time Local	Run Time OSG	Rescue Dags OSG	Disk Usage
189	363	0:52	2:39	1	8.1G
374	717	3:18	3:05	1	17G
828	1585	3:07	3:24	1	39G
2167	4117	10:46	15:46	1	96G
3956	7487	16:52	37:14	2	173G

Monitoring with monALISA



Challenges and Solutions

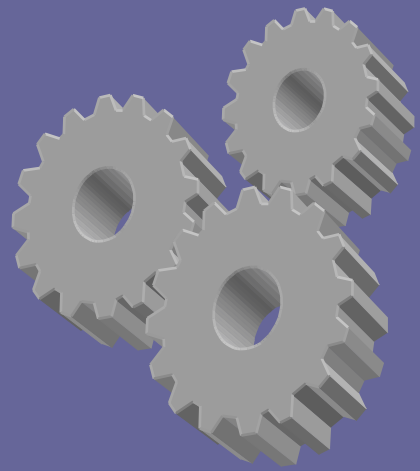
Large Data Sets

Long Data Transfer Times

Disk Space Problems

Challenges and Solutions

Large Data Sets



Compressing data (LIGO)

SRM

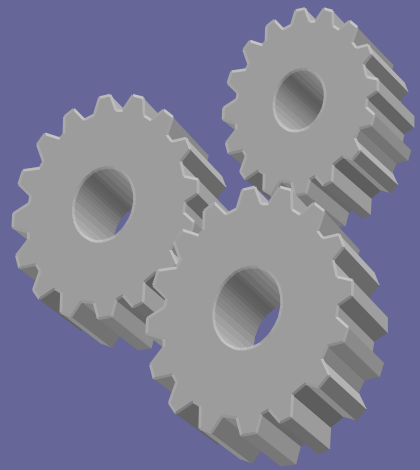
Challenges and Solutions

Work
Flow
Design

Cleanup issues
Disk space problems

Challenges and Solutions

Work Flow Design



Dynamic Cleanup (Pegasus 2.0)

Depth First (Condor_G)

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