A GRID AND CLOUD-BASED DATABASE OF PRE-COMPUTED SCENARIOS OF TSUNAMIS IN MANILA TRENCH

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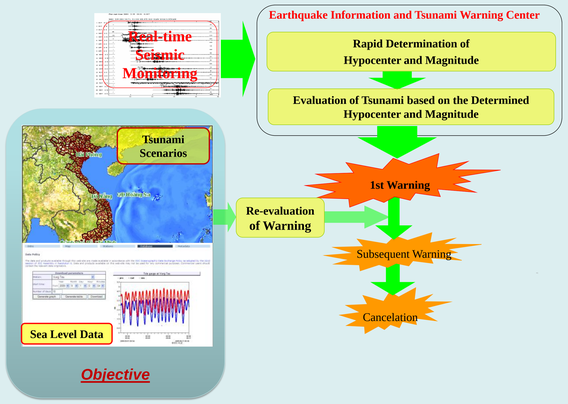
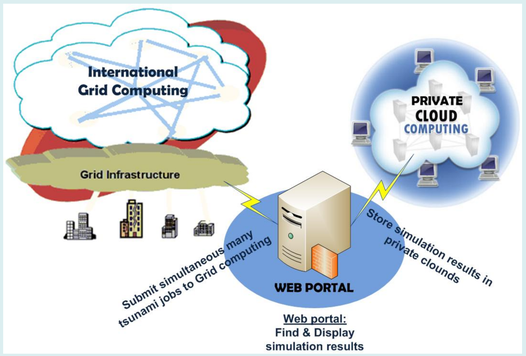
OBJECTIVE

Investigating the tsunami sources in the Manila Trench, capable of affecting the coastline and built tsunami grid calculation database for tsunami warning in Vietnam in the future

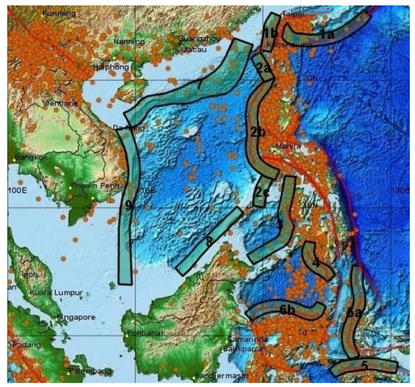


EARLY WARNING SYSTEM

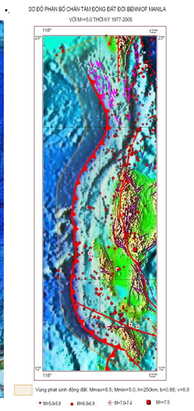
SOLUTION



SOURCE ZONES CAPABLE OF GENERATING TSUNAMIS AFFECTING VIETNAMESE COAST



9 source zones



Manila trench

No.	Mw	Long. (ºE)	Lat. (ºN)	L (km)	W (km)	H (km)	δ (degree)	λ (degree)	θ (degree)	u0 (m)
1	8	119.3	17.5	151	47	12	24	90	177	5.28
2	8.5	119.3	17.5	313	70	18	24	90	177	9.61
3	9	119.3	17.5	646	101	27	24	90	177	17.49
4	9	121.8	23.53	501	141	24	15	90	87	16.71
5	7.5	110.46	17.13	89	25	17	78	-45	57	2.97
6	7.5	108.52	16.91	89	25	17	78	-45	172	2.97

Some parameters of tsunamigenic earthquake scenarios in Manila trench

COMCOT CORNELL MULTI-GRID COUPLED TSUNAMI MODEL

Input parameters

- `Fault Model, Wave Maker, Submarine LS/Transient Motion`
- `Configurations for all grids`
- `Terrain data: (East Vietnam Sea.xyz, MienTrung.xyz, DaNang.xyz,…): X: latitude, Y: longitude, Z: height`

Input data size: tens to hundreds MBs

Results:

- `z_xx_yyyyyy.dat: Wave height of region xx at time yyyyyy.`
- `zmax_xx_yyyyyyhrs.dat: Wave height max (zmax) of region xx at yyyyyy hrs.`
- `zmax_layerxx.dat: Wave height max (zmax) of region xx`

Size of file depends on size of Terrain data

Number of file depends on Total and interval time

Total output data ~10sGB.

PRE-CALCULATE TSUNAMI MODEL THROUGH DIRAC

Python is the main development language

- `from DIRAC.Interfaces.API.Dirac`
- `import Diracfrom DIRAC.Interfaces.API.Job import Job`

Submitting job

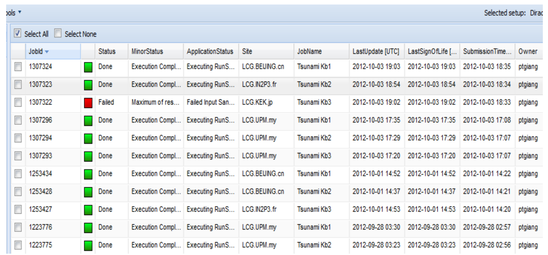
- `jobID = dirac.submit(j)`

Job Monitoring

- `print dirac.status(jobid)`

Job Output

- `print dirac.getOutput(jobid)`



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1307323	Done	Execution Compl...	Executing RunS...	LCG.INGP3.fr	Tsunami Kb2	2012-10-03 18:54	2012-10-03 18:54	2012-10-03 18:34	ptgiang
1307322	Failed	Maximum of res...	Failed Input San...	LCG.KEK.jp	Tsunami Kb3	2012-10-03 19:02	2012-10-03 19:02	2012-10-03 18:33	ptgiang
1307296	Done	Execution Compl...	Executing RunS...	LCG.UPM.my	Tsunami Kb1	2012-10-03 17:35	2012-10-03 17:35	2012-10-03 17:08	ptgiang
1307294	Done	Execution Compl...	Executing RunS...	LCG.UPM.my	Tsunami Kb2	2012-10-03 17:29	2012-10-03 17:29	2012-10-03 17:07	ptgiang
1307293	Done	Execution Compl...	Executing RunS...	LCG.UPM.my	Tsunami Kb3	2012-10-03 17:20	2012-10-03 17:20	2012-10-03 17:07	ptgiang
1253434	Done	Execution Compl...	Executing RunS...	LCG.BEIJING.cn	Tsunami Kb1	2012-10-01 14:52	2012-10-01 14:52	2012-10-01 14:22	ptgiang
1253428	Done	Execution Compl...	Executing RunS...	LCG.BEIJING.cn	Tsunami Kb2	2012-10-01 14:37	2012-10-01 14:37	2012-10-01 14:21	ptgiang
1253427	Done	Execution Compl...	Executing RunS...	LCG.INGP3.fr	Tsunami Kb3	2012-10-01 14:53	2012-10-01 14:53	2012-10-01 14:20	ptgiang
1223776	Done	Execution Compl...	Executing RunS...	LCG.UPM.my	Tsunami Kb1	2012-09-28 03:30	2012-09-28 03:30	2012-09-28 02:57	ptgiang
1223775	Done	Execution Compl...	Executing RunS...	LCG.UPM.my	Tsunami Kb2	2012-09-28 03:23	2012-09-28 03:23	2012-09-28 02:56	ptgiang

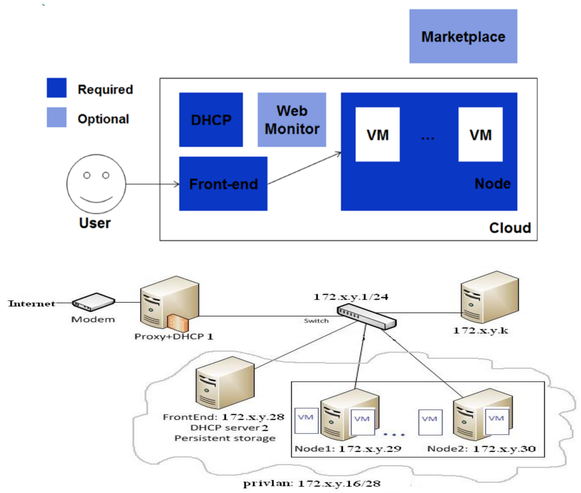
BUILD DATABASE SYSTEM AND PRIVATE CLOUD

Build Database system and private cloud

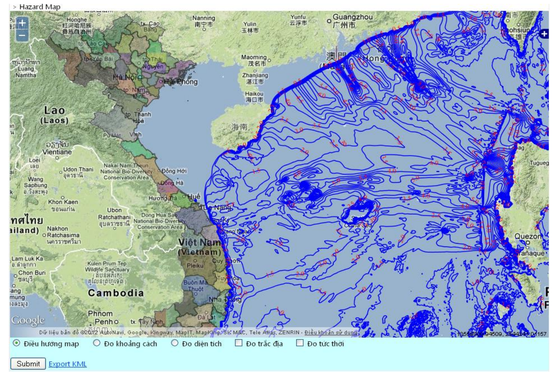
- Stratus lab, MySQL

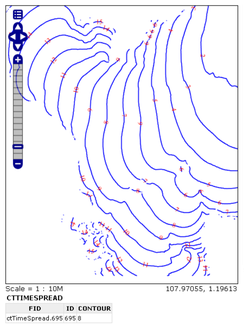
2xIBM Server

- Processor: Intel xeon(R) CPU X5650 @ 2.67GHz x12
- Disk: 500GB

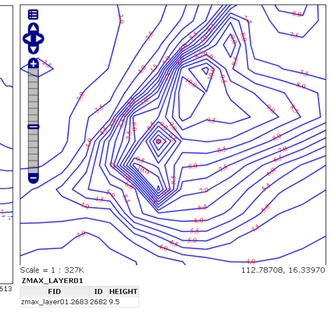


WEB PORTAL

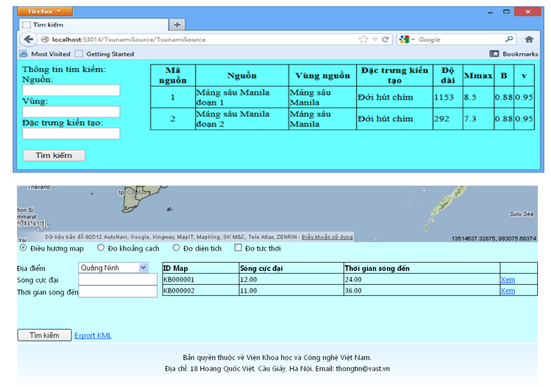




Wave Transmission time



Wave Height



Search function