Item # 5

Stress testing of COG travel model server

Presentation to the Travel Forecasting Subcommittee

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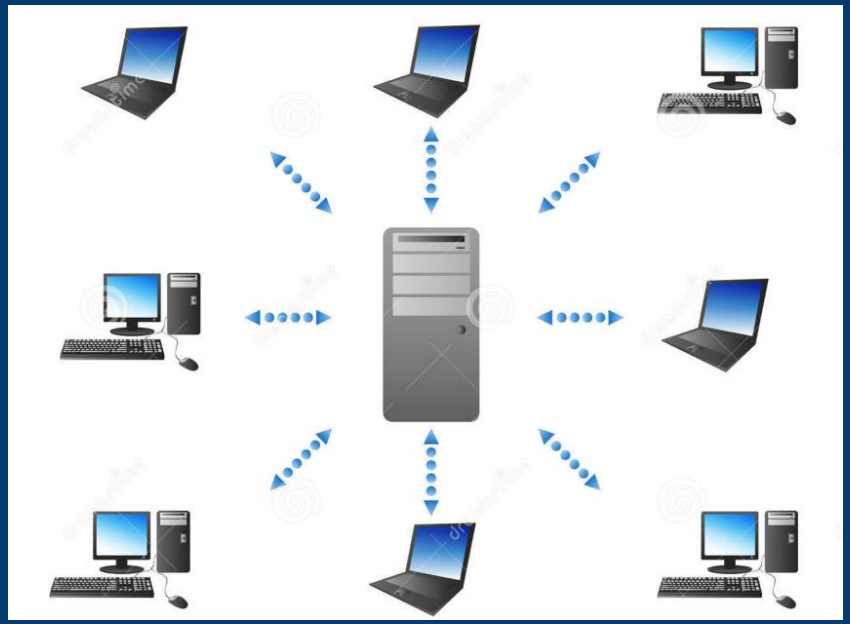
National Capital Region Transportation Planning Board (NCRTPB/TPB)

Metropolitan Washington Council of Governments (MWCOG/COG)

Background

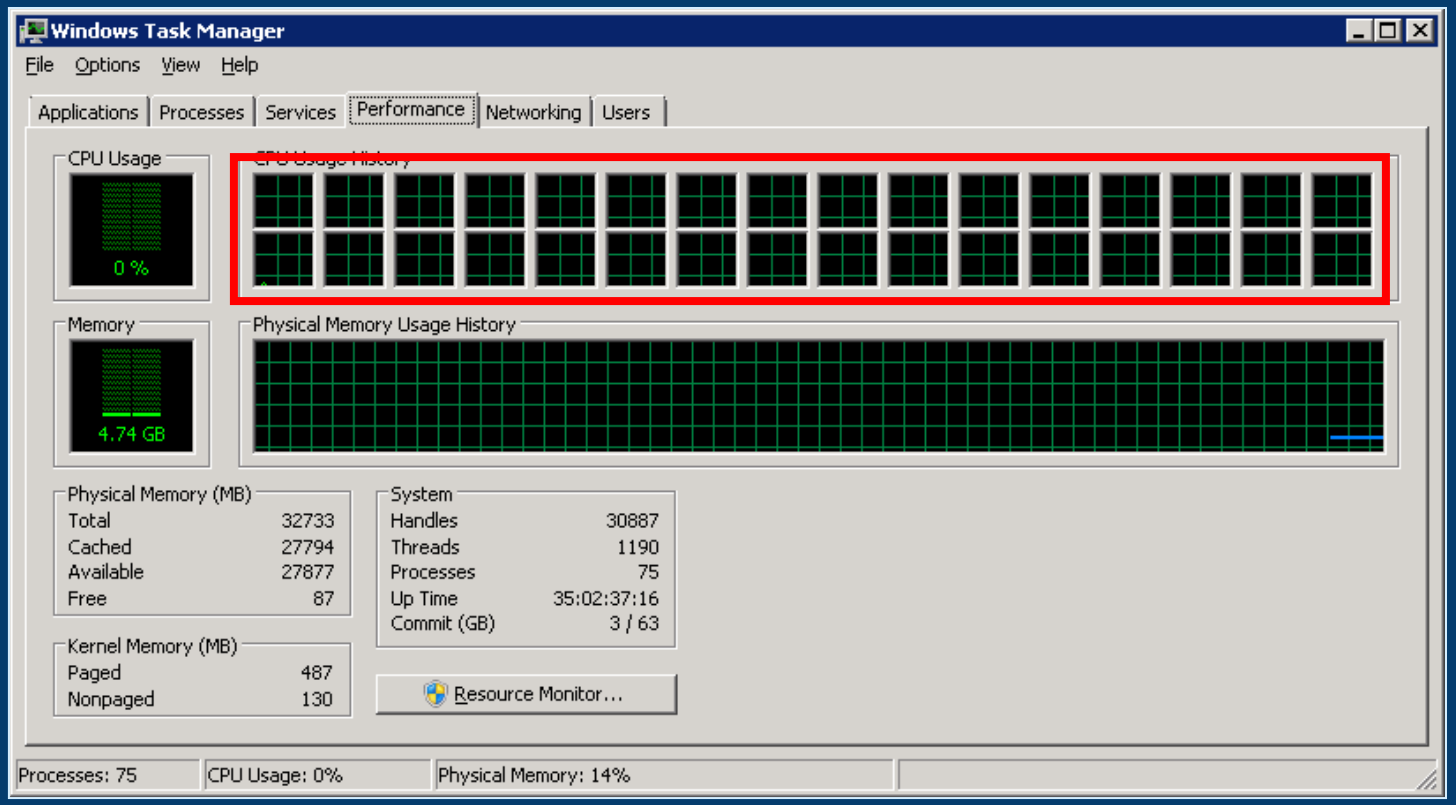
- Most model runs at COG are conducted on servers
- Server accommodates multiple users



Source: Internet

Background

- Newest server (tms6) purchased in 2012
  - 16 physical cores + Hyper-Threading = 32 virtual cores (threads)



Background

- Expectation for newest server
  - Ability to run 4 concurrent model runs
    - Each run requires a max. of 8 threads (in traffic assignment), i.e., 4 x 8 = 32
  - Plan: Share server across two teams that perform model runs

Background

- In the past, we executed 4 concurrent model runs
  - Cube 6.0.2, Ver. 2.3.52 model
- Recently, even 2 concurrent model runs, launched by multiple users, had stability problems => crashes
  - Cube 6.1 SP1, Ver. 2.3.57 model, integrated transit walkshed process

Source: Internet

Background

- What was source of stability problems?
- We decided to run a series of stress tests on newest server to determine max. no. of concurrent model runs
- We contacted Citilabs
  - Before testing: Citilabs gave us a software update ("fix") that we tested
  - After testing, we shared memo (dated 10/29/14) and travel model

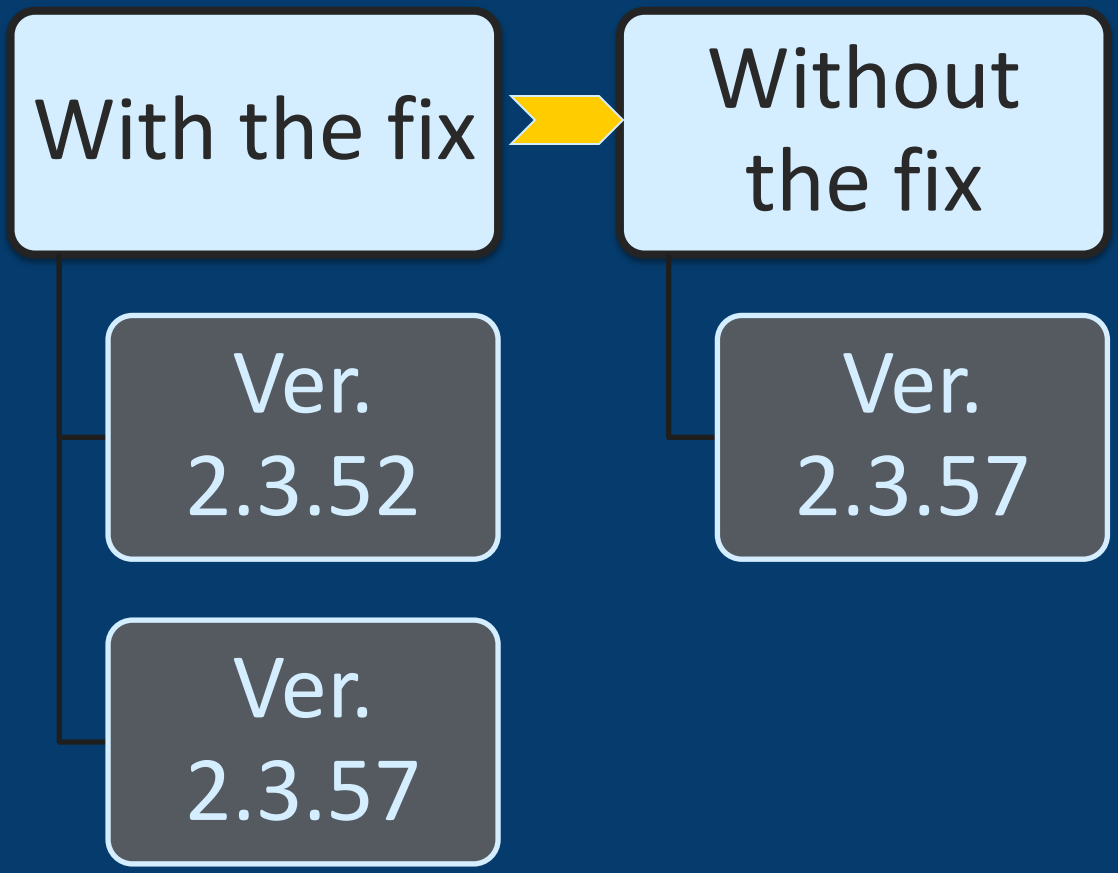
Possible causes of instability

1	Cube version change
2	Automated ArcPy walkshed process
3	Other model changes

Issues considered

1	**No. of concurrent model runs**
2	No. of users launching model runs
3	ArcPy walkshed process
4	Software fix from Citilabs (Updated Voyager.exe & Tputlib.dll)

Scenario categories



Failure vs success

- Failure: At least one run fails
- Success: All runs complete

Tests with the Citilabs fix

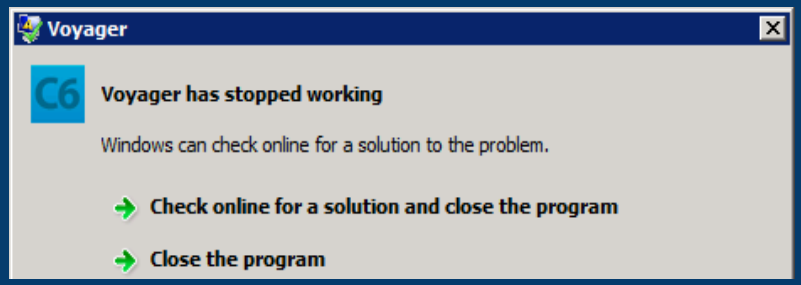
Success: 4 runs, 1 user

Failure & Success (next slide)

Tests with Citilabs fix, Ver. 2.3.57

Failure

1. Multiple runs with walkshed, no delay betw. runs
3. Multiple users (2, 3), multiple runs (3, 5)



Success

2. One user with 4 model runs, 45-min. delay betw. runs

So…

Source: Internet

Tests without the Citilabs fix

Without the fix

Ver. 2.3.57

Failure

- Multiple users (2, 3), multiple runs (2, 3, 4, 5), with or without walkshed process

Success

- One user with 4 model runs, no walkshed, no delay betw. runs

Conclusions

- The Citilabs fix: NOT helpful
- With ArcPy walkshed: Must stagger runs by 45 min.
- One user: 4 concurrent runs
- Two or more users: NOT reliable
- The cause: NOT clear

Next steps

- Citilabs is investigating our findings; No news yet
- We have also contacted Esri
- **Interim Solution?** Coordination!
- On the horizon: New version of Cube due in Jan.
  - Will this resolve our problems?

Questions?

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