

## Doomsday Engine - Bug #919

### [Doom] Blast damage algorithm

2010-06-10 08:56 - gobhuo

|   |                    |                    |            |
|---|--------------------|--------------------|------------|
| <b>Status:</b>  | New                | <b>Start date:</b> | 2010-06-10 |
| <b>Priority:</b>  | Normal             | <b>% Done:</b>     | 0%         |
| <b>Assignee:</b>  |                    |                    |            |
| <b>Category:</b>  | Vanilla emulation  |                    |            |
| <b>Target version:</b>  | Vanilla / Gameplay |                    |            |
| <b>Description</b>  |                    |                    |            |
| Responding to your last comment in <a href="http://sourceforge.net/tracker/?func=detail&amp;aid=2929822&amp;group_id=74815&amp;atid=542099">http://sourceforge.net/tracker/?func=detail&amp;aid=2929822&amp;group_id=74815&amp;atid=542099</a> ; I think that the new method is still incorrect, as it treats z-axis differently from x and y. In effect, to calculate damage, you calculate distance from a blast to a "concentric" horizontal square. This violates the rule: if explosion happens on object's bounding box, it deals full damage. I think you should use the distance from bounding box instead. |                    |                    |            |
| I just thought that arch-vile's attack damage could be incorrect because of this. And indeed: with "server-game-radiusattack-nomaxz 1" damage is usually 82 (practically correct), with "server-game-radiusattack-nomaxz 0" it's usually 78. In PrBoom+, v1.9 compatibility, it's 84. Tested on MAP11 @ doom2.wad, standing still.  |                    |                    |            |
| <b>Labels:</b> Gameplay   |                    |                    |            |

#### History

##### #1 - 2010-06-06 19:02 - vermil

One should test in the original Doom2.exe and not PrBoom+ or any other source port.

##### #2 - 2010-06-11 10:38 - vermil

Indeed, I've just tested in Doom2.exe and Doom95 and got 83 every time.

Hence PrBoom+ 's 84 is wrong as well.

##### #3 - 2010-06-11 10:43 - danij

The world up axis is treated the same as the other axes it just depends on the value of server-game-radius-attack-nomaxz as to how many axes are involved in the distance calculation.

Vanilla DOOM does it in 2D (same as server-game-radius-attack-nomaxz=1) whereas we do it in 3D by default.

Here is the actual code in question:

```
dx = fabs(thing->pos[VX] - bombSpot->pos[VX]);
dy = fabs(thing->pos[VY] - bombSpot->pos[VY]);
dz = fabs((thing->pos[VZ] + thing->height / 2) - bombSpot->pos[VZ]);
```

```
dist = (dx > dy? dx : dy);
```

```
if(!cfg.netNoMaxZRadiusAttack) // "server-game-radiusattack-nomaxz"
    dist = (dz > dist? dz : dist);
```

```
dist = (dist - thing->radius);
```

The dist value is then fed into the damage equation:

```
damage = (bombDamage * (bombDistance - dist) / bombDistance) + 1;
```

##### #4 - 2010-07-20 19:34 - gobhuo

```
dx = fabs(thing->pos[VX] - bombSpot->pos[VX]);
dy = fabs(thing->pos[VY] - bombSpot->pos[VY]);
```

```
dist = (dx > dy? dx : dy);
```

```
dist = (dist - thing->radius); //subtract thing's radius here instead of in dx and dy expressions as an optimisation;
//hence it must precede z-related modification of dist.
```

```
dz = fabs((thing->pos[VZ] + thing->height / 2) - bombSpot->pos[VZ]) - thing->height / 2; //it was wrong here and in the location of dist = (dist - thing->radius) expression
```

```
if(!cfg.netNoMaxZRadiusAttack) // "server-game-radiusattack-nomaxz"  
dist = (dz > dist? dz : dist);
```

//This should truly treat all axes the same.

**#5 - 2010-07-20 21:07 - danij**

I can see the radius subtraction is incorrectly placed but your other changes don't make sense to me.

**#6 - 2010-07-20 21:37 - danij**

Got it now, dunno why I didn't see it earlier.

...comment formatting here at sf is pretty awful however.

**#7 - 2010-07-20 21:52 - skyjake**

Anything happened to this?

**#8 - 2012-03-02 12:01 - danij**

Not as yet no, this still needs addressing.

**#9 - 2013-10-22 19:44 - skyjake**

- *Tags set to PlaySim, Physics, Doom*

- *Category set to Vanilla emulation*

- *Target version deleted (1.9.0-beta6)*

**#10 - 2017-04-03 15:01 - skyjake**

- *Target version set to Modding*

**#11 - 2017-04-03 18:34 - skyjake**

- *Target version changed from Modding to Vanilla / Gameplay*