Freeciv - Feature #865084
Scramble combat bonus
2020-03-15 04:17 PM - Alexandro Ignatiev

Description
A way to better CivII compatibility that seems to be not so difficult to make: introduce a combat bonus that works like "DefenseMultiplier[Pct]" but only in cities. Apply it to civ2 [Stealth] Fighters (defense x4 against bombers, x2 against other fighters).

Problems left: CivII fighters don't profit from SAM battery unless against missiles.

Related discussion: http://forum.freeciv.org/t/viewtopic.php?t=318

Related issues:
- Related to Freeciv - Bug #865085: civ2 ruleset: give Fighters defense bonus against bombers added
- Related to Freeciv - Feature #865086: Specific IgWalls combat bonus
- Blocked by Freeciv - Bug #922007: Give more space for unit type bonus value i...
- Blocks Freeciv - Feature #923193: civ2 ruleset: give fighters scramble bonuses

History
#1 - 2020-03-15 04:28 PM - Alexandro Ignatiev
- Related to Bug #865085: civ2 ruleset: give Fighters defense bonus against bombers added

#2 - 2020-03-15 05:01 PM - Alexandro Ignatiev
- Related to Feature #865086: Specific IgWalls combat bonus

#3 - 2021-03-06 02:49 PM - Alexandro Ignatiev
- File scramble.patch added

Made a patch, seems to work. "CityDefensePct" is the name of the percentage bonus. Patch for civ* rulesets coming.

#4 - 2021-03-06 04:21 PM - Marko Lindqvist
- Blocked by Freeciv - Bug #922007: Give more space for unit type bonus value in the protocol added

#5 - 2021-03-06 04:25 PM - Marko Lindqvist
- Category set to General
- Status changed from New to In Progress

I like the basic idea. Will try to comment the implementation in a couple of days.

#6 - 2021-03-07 09:36 PM - Alexandro Ignatiev
Maybe the idea would be good for v.2.5 but as we are at 3.1 stage it should be more general...
Like: "Attack" action result launches a selector for best "Defense" auto-performer among affected units, the auto-performers take in their reqs the attack action:

- a.-p. "Scramble 2x" requires action "Fighter attack" (that requires actor flag "Fighter") and performer's flag "Fighter"
- a.-p. "Scramble 4x" requires "Bomber attack" (actor flag "Bomber") and performer's flag "Fighter"
- a.-p. "Ground defense" requires action "Ground attack" (actor class "Land") and performer's class "Land"
- a.-p. "Unbonused defense" is used against action "Attack" (requires negated all aforementioned) and requires any of the following: performer has no "Unreachable" flag, performer is in a city, performer is in a native base, special auto-performer enabler considering performer and trigger is active (insto targets list);
- if nothing of it fired, the attack action is rendered not possible even if it has a valid enabler (you can't strike a stack of unreachable units),

Auto-performer with a result "Defense" is the thing that activates the combat itself, and it is passed as an action (or a separate parameter we don't
have yet) to "Defend_Bonus" effect.  
But I don't understand the developers' plans for actions and whatever-looks-like-an-action-but-is-not-player-initiateds well enough, neither do I have concrete ideas how to write the code.

#7 - 2021-03-08 05:39 AM - Marko Lindqvist  
First comment: Is that addition of get_unittype_bonus(pplayer, ptile, att, EFT_DEFEND_BONUS); in aitech.c to be considered some kind of bugfix? It affects CBONUS_DEFENSE_MULTIPLIER and not the new CBONUS_SCRAMBLES_PCT. If so, it should go to a bug ticket of its own, targeted to all relevant branches. (I haven't yet reviewed in context to see if it's a right thing to do or not)

#8 - 2021-03-08 02:54 PM - Alexandro Ignatiev  
No, it's not a bugfix. The defend bonus was out before because all units had equal one, now we need to compare it to scramble bonus. The variables we change this way are only compared to each other, so rulesets without scrambling units should not be affected.
A bugfix probably needed back in 2.6 is that the algorithm does not take into account that not all units can fortify, but it's really anoter ticket.

#9 - 2021-03-14 12:34 PM - Sveinung Kvilhaugsvik  
Alexandro Ignatiev wrote:

But I don't understand the developers' plans for actions and whatever-looks-like-an-action-but-is-not-player-initiateds well enough, neither do I have concrete ideas how to write the code.

A possible small comfort: You personally have forced many items from my private notes to the issue tracker.

#10 - 2021-03-14 02:40 PM - Marko Lindqvist  
- defender_type_handled[utype_index(utype)] = FALSE;  
+ defender_type_handled[idx] = 0;

Why changing FALSE to 0? The type is still bool.

--

daimilitary.c changes are mostly within "def->cache.max_defense_mp_pct > 0" so scrambling are only considered if the unit also has multiplier bonuses (that the cache variable name does not indicate it's only the bonus part is another matter -> should open a separate ticket). That multiplier bonus doesn't even have any effect, it just needs to exist!

--

if (coeff && best_non_scramble[idx] >= 0) {  
  best_non_scramble[idx] = defense_bonuses_pct[idx];
}

That doesn't seem right. defense_bonuses_pct might be scramble value. In fact, I don't see what the point of this assignment is in general, as best_non_scramble is set when ever there is non scramble case handled.

--

Documentation in rulesets missing

#11 - 2021-03-14 02:55 PM - Marko Lindqvist  
Marko Lindqvist wrote:

that the cache variable name does not indicate it's only the bonus part is another matter

-> Feature #922840

#12 - 2021-03-14 07:41 PM - Alexandro Ignatiev  
Marko Lindqvist wrote:

- defender_type_handled[utype_index(utype)] = FALSE;  
+ defender_type_handled[idx] = 0;

Why changing FALSE to 0? The type is still bool.

Truly, I should not.

daimilitary.c changes are mostly within "def->cache.max_defense_mp_pct > 0" so scrambling are only considered if the unit also has multiplier bonuses (that the cache variable name does not indicate it's only the bonus part is another matter -> should open a separate ticket). That
multiplier bonus doesn't even have any effect, it just needs to exist!

I thought I put max of scrambling OR regular type bonus into this cache... but don't. Ah, I seemingly did it in unittype.c. Surely one can set regular bonus -50 and scramble bonus +100 and deceive it, it's said that negative bonuses are not handled by AI correctly, but let's correct it.

```c
if (coeff && best_non_scramble[idx] >= 0) {
    best_non_scramble[idx] = defense_bonuses_pct[idx];
}
```

That doesn't seem right. defense_bonuses_pct might be scramble value. In fact, I don't see what the point of this assignment is in general, as best_non_scramble is set when ever there is non scramble case handled.

Neither do I... Likely, we delete it...

Documentation in rulesets missing

Yup. I considered all ruleset changes another patch.
Will correct soon.

#13 - 2021-03-19 09:03 PM - Alexandro Ignatiev
Edited. I slightly changed how it calculates cache.max_defense_mp_pct for a sensible work of dai_unit_defence_desirability(). I edited comments in rulesets, the civ2 edit itself needs a separate patch.

#14 - 2021-03-19 09:04 PM - Alexandro Ignatiev
- File 3.1-scramble-bonuses.patch added

#15 - 2021-03-19 09:21 PM - Alexandro Ignatiev
- Blocks Feature #923193: civ2 ruleset: give fighters scramble bonuses added

#16 - 2021-03-20 11:13 PM - Marko Lindqvist
- In combat.c it seems like scramble_bonus variable could be declared within the "if (NULL != att_type) {" -block.
  I were sure CodingStyle says that variables should be declared within the innermost block possible, like we have been doing in practice, but it seems not -> I'll open a new ticket about CodingStyle update. Given that it was not in CodingStyle, I would let this pass if you don't want to fix it.

  - unittype.c: missing empty line between int emax declaration and following code line

  - Isn't ruleset comment "In a city, instead of "Defend_Bonus" effect uses this bonus." wrong? The Defend_Bonus effect applies like usually, but it's the DefenseMultiplier and DefenseMultiplierPct combat bonuses that do not.

  - Ruleset comment is missing at least for granularity ruleset

  - Ruleset comment should be updated also in ruledit/comments-3.1 / ruledit/comments-3.2

#17 - 2021-03-20 11:16 PM - Marko Lindqvist

  I were sure CodingStyle says that variables should be declared within the innermost block possible, like we have been doing in practice, but it seems not -> I'll open a new ticket about CodingStyle update.

  -> Feature #923438

#18 - 2021-03-20 11:29 PM - Alexandro Ignatiev
Marko Lindqvist wrote:

  - Isn't ruleset comment "In a city, instead of "Defend_Bonus" effect uses this bonus." wrong? The Defend_Bonus effect applies like usually, but it's the DefenseMultiplier and DefenseMultiplierPct combat bonuses that do not.

No. The thing this bonus do is overriding common "Defend_Bonus". The multipliers are multiplicative with it.

#19 - 2021-03-20 11:38 PM - Marko Lindqvist
Alexandro Ignatiev wrote:

  Marko Lindqvist wrote:
Isn't ruleset comment "In a city, instead of "Defend_Bonus" effect uses this bonus." wrong? The Defend_Bonus effect applies like usually, but it's the DefenseMultiplier and DefenseMultiplierPct combat bonuses that do not.

No. The thing this bonus do is overriding common "Defend_Bonus". The multipliers are multiplicative with it.

Right, so it seems when I reread the code. Maybe we should still list also those multiplier combat bonuses as replaced things in those ruleset comments? Their own documentation does not mention that they apply specifically via Defend_Bonus.

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#20 - 2021-03-21 11:57 AM - Alexandro Ignatiev

Marko Lindqvist wrote:

Maybe we should still list also those multiplier combat bonuses as replaced things in those ruleset comments? Their own documentation does not mention that they apply specifically via Defend_Bonus.

Sorry, hard to understand. DefenseMultiplier[Pct] multiplies the defense, so does the "Defend_Bonus" effect, it's guessable they are multiplicative, no?

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#21 - 2021-03-21 12:01 PM - Marko Lindqvist

Alexandro Ignatiev wrote:

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Maybe we should still list also those multiplier combat bonuses as replaced things in those ruleset comments? Their own documentation does not mention that they apply specifically via Defend_Bonus.

Sorry, hard to understand. DefenseMultiplier[Pct] multiplies the defense, so does the "Defend_Bonus" effect, it's guessable they are multiplicative, no?

Yes, but there is a non-zero defense value even when there is no (Defend_Bonus) bonuses to it, and it's not clear that DefenseMultiplier does not multiply that.

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#22 - 2021-03-21 12:28 PM - Alexandro Ignatiev

Marko Lindqvist wrote:

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Maybe we should still list also those multiplier combat bonuses as replaced things in those ruleset comments? Their own documentation does not mention that they apply specifically via Defend_Bonus.

Sorry, hard to understand. DefenseMultiplier[Pct] multiplies the defense, so does the "Defend_Bonus" effect, it's guessable they are multiplicative, no?

Yes, but there is a non-zero defense value even when there is no (Defend_Bonus) bonuses to it, and it's not clear that DefenseMultiplier does not multiply that.

Again, I can't clearly understand. The comments speak about multiplying "defense", or "defense value", not defense bonus. So, a fortified pikeman (def=3, bonus against horses +200%) has 1.5x3x3x1=13.5 defense against Horsemen in open plain or unwalled plain city and 1.5x3x3x3=40.5 in a walled plain city, if there is a "berserk pikeman" unit with the same stats but CityDefensePct=100 for horses, he will have the same def in open plain but in any plain city 1.5x3x3x2=27. What you think needs clarification?

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#23 - 2021-03-21 01:11 PM - Marko Lindqvist

I read the code again. Then I wrote a comment explaining what's wrong with it. Then I read the code n:th time, and finally saw how it works. So my mistake. The documentation and implementation match.

Maybe add comments that multipliers are already included in the scramble specific variables in

```c
int def = deftype->defense_strength * (scramble ? scramble : defbonus * mp_pct) / div_bonus_pct;
and
```
if (scramble_bonus) {
    defensepower = defensepower * scramble_bonus / 10000;
    defensepower = MAX(0, defensepower);
} else {
    int defense_multiplier_pct = 100
    + def_type->cache.defense_mp_bonuses_pct[utype_index(att_type)];
}

#24 - 2021-03-22 10:18 PM - Alexandro Ignatiev
- File 3.1-scramble.patch added
- File 3.2-scramble.patch added

Edited, send patches. Added more comments in the definition of cache.scramble_coeff[] and in other places, hope it is more comprehensive now.

#25 - 2021-03-22 10:28 PM - Marko Lindqvist
../../src/ai/default/daimilitary.c: In function 'assess_danger':
../../src/ai/default/daimilitary.c:576:14: error: declaration of 'i' shadows a previous local [-Werror=shadow]
  576 |     for (int i = 0; i < U_LAST; i++) {
      |              ^
../../src/ai/default/daimilitary.c:490:7: note: shadowed declaration is here
  490 |   int i;

#26 - 2021-03-22 10:40 PM - Marko Lindqvist
- File 0024-Add-CityDefensePct-combat-bonus-type.patch added
- File 0025-Add-CityDefensePct-combat-bonus-type.patch added
- Status changed from In Progress to Resolved
- Assignee set to Marko Lindqvist
- Fixed --enable-debug compile

#27 - 2021-03-22 10:46 PM - Marko Lindqvist
Needs also network capstr bump when committing.

#28 - 2021-03-23 09:39 AM - Alexandro Ignatiev
And need to adapt effect_cumulative_max() syntax to new HEAD.

#29 - 2021-03-23 10:08 PM - Marko Lindqvist
- File 0019-Add-CityDefensePct-combat-bonus-type.patch added
- File 0020-Add-CityDefensePct-combat-bonus-type.patch added
- Rebased against git HEAD

#30 - 2021-03-25 12:22 PM - Marko Lindqvist
- Status changed from Resolved to Closed

Files

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