Mid's Guide on Damage Maximization

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1 GENERAL

1.1 Introduction

This is the guide I wish I had some years ago when I first started playing DQ. In the following sections I will unfold everything you need to know about damage calculation and maximization - I'll explain and simplify the formulas for you as much as possible, lay out how to theorycraft your char, have a short word on defensive affixes and split the considerations up into PvE and PvP.

1.2 Acronyms

APS	Attacks per Second
AR	Armor Rating
ASpd	Attack Speed
AT	Attack Time
av	average
BWD	Base Weapon Damage
CB	Crushing Blow
CC	Critical Chance
CD	Cooldown
CH	Critical Hit
conv	converse
CrD	Critical Damage
CRIT	Critical Damage Multiplier
DIPS	Damage Increase per Slot
DM	Damage Multiplier
DMG	Damage
DoT	Damage/Debuff over Time
DPS	Damage per Second
DQ	Dungeon Quest
DS	Deadly Strike

EAC	Extra Attack Chance
EC	Elemental Critical
ECD	Elemental Critical Damage
ED	Elemental DMG
FWD	Full Weapon Damage
HP	Hit/Health Point(s)
iLvl	Item Level
LOHKO	Lucky One Hit Knockout
GG	Green Garden
MA	Multi Attack
MH	Main Hand
MOD	Modifier
MP	Mana/Magic Point(s)
PTL	Push the Limit
PvE	Player vs. Enemy
PvP	Player vs. Player
RCD	Reduced Cooldown
Regen	Regeneration
WD	Weapon DMG
WIQ	Weapon's Item Quality

2 MATHEMATICS

I know you probably don't like it, but it is essential that you understand what actually happens behind the curtains. We start by presenting the almighty damage formula and split it up into subparts which we can work with.

2.1 The Formula

$$\mathrm{DMG_{av}} = \left(\overbrace{\left[\mathrm{BWD_{av}} \cdot (1 + \mathrm{WIQ_\%}) \cdot (1 + \mathrm{WD_\%}) + \mathrm{Power} \cdot 25 + \mathrm{WD_+} \right] \cdot (1 + \mathrm{ED_\%}) + \mathrm{ED_+}}^{\mathrm{FWD_{av}}} \right) \cdot \underline{\mathrm{Skill_\%}} \tag{1}$$
$$\cdot (1 + \mathrm{HeroLvl_\%}) \cdot \mathrm{CRIT_{av}} \cdot (1 + \mathrm{MOD_{1,\,\%}}) \cdot (1 + \mathrm{MOD_{2,\,\%}}) \cdot \ldots$$

$\mathrm{DMG_{av}}$:	Damage (average)	$\mathrm{WD_\%}$:	Weapon DMG %
$\mathrm{BWD_{av}}$:	Base Weapon Damage (average)	$\mathrm{WD_+}$:	Weapon DMG +
$\mathrm{FWD_{av}}$:	Full Weapon Damage (average)	$\mathrm{ED_\%}$:	Elemental DMG %
$\mathrm{CRIT_{av}}$:	Critical Damage Multiplier (average)	$\mathrm{ED_+}$:	Elemental DMG +
$\mathrm{WIQ_\%}$:	Weapon's Item Quality %	$\mathrm{MOD_{i,\,\%}}$:	Modifier %

So this is it, the formula in all its beauty. So there's a few things to be noted here, first of all that all % enhancements come in the form $(1 + \mathrm{MOD_\%})$ except $\underline{\mathrm{Skill_\%}}$ (Blast, Orb, Torrent % etc.), that's why I underlined it. There are other exceptions, but those result in more complicated subparts like Druidic and CRIT for example (see subsections 2.5 and 2.6).

Then I introduced the abbreviation Full Weapon Damage (FWD), so I can properly talk about it later on. $\mathrm{MOD_\%}$ stands for the damage percentages from set affixes like Defiant, Identity, etc. and other affixes like Push the Limit, Barbarian, Glasscannon etc.

2.2 A Word on %

An important thing to know is that "%" is a simple replacement for "$\cdot\, 0.01$", same as "k" and "M" stand for "$\cdot\, 1,000$" and "$\cdot\, 1,000,000$", respectively. So $100\,\% = 100 \cdot 0.01 = 1$.

<u>Increase damage by $25\,\%$</u> actually means $(1 + \mathrm{MOD_\%})$ with a $\mathrm{MOD_\%}$ of $25\,\%$ and is calculated as $(1 + 25\,\%) = (1 + 25 \cdot 0.01) = (1 + 0.25) = 1.25$ - or in other words: if you increase your damage by $25\,\%$, you actually multiply your old damage with 1.25 to get your new damage.

2.3 Additive Damage vs. Multiplicative Damage

This is very important. In a general manner of speaking, damage from the *same* source is **additive** and damage from *different* sources is **multiplicative**. An example (2x $50\,\%$ Push the Limit (PTL) vs. $50\,\%$ PTL and $50\,\%$ Barbarian):

- 2x PTL: $1 + 50\,\% + 50\,\% = 2$

- PTL and Barb.: $(1 + 50\%) \cdot (1 + 50\%) = 2.25$

So multiplicative » additive, wherever possible get different damage sources! This generalization is of course only true if your damage source is not embedded in a more difficult subpart of the formula like FWD, CRIT or Druidic etc.

2.4 Generalization and Damage Increase Comparison

If you look closely, you'll see that the formula is very simple, really:

$$\begin{aligned} \mathrm{DMG_{av}} &= \mathrm{FWD_{av}} \cdot \mathrm{Skill_{\%}} \cdot (1 + \mathrm{HeroLvl_{\%}}) \cdot \mathrm{CRIT_{av}} \cdot \ldots \\ &\,\hat{=}\, \mathrm{DM_1} \cdot \mathrm{DM_2} \cdot \mathrm{DM_3} \cdot \mathrm{DM_4} \cdot \ldots \end{aligned} \tag{2}$$

That is great! Normally you don't want to calculate your whole damage (albeit interesting), you just want to know: What increases my damage more?

Say you have 50 % PTL on your equipment, and you want to know: Is it better to get another PTL, or is Barbarian the better choice? What you do now is:

- You don't care about all the other irrelevant Damage Multipliers (DMs) for your problem, they stay the same!

- You introduce a new DM for both options and compare them, and you're done.

This is how you do it:

$$\mathrm{DM_{PTL:\ 50 \to 100}} = \frac{\mathrm{DM_{PTL:\ 100}}}{\mathrm{DM_{PTL:\ 50}}} = \frac{1 + 100\%}{1 + 50\%} = \frac{2}{1.5} \qquad = 1.\bar{3} \tag{3}$$

$$\mathrm{DM_{Barb.:\ 50}} = 1 + 50\% \qquad\qquad\qquad\qquad\qquad = 1.5 \tag{4}$$

Voilà, adding another 50 % PTL gives you 33.3 % more damage, Barbarian gives you 50 % more damage: Barbarian is better. You can even calculate how much better: (4)/(3) = 1.125, so Barbarian gives you 12.5 % more damage than a second PTL.

This works for everything. Say you want to know if it's better to add 5000 WD$_+$ or Glasscannon: You divide FWD$_\mathrm{new}$/FWD$_\mathrm{old}$ and compare it to the 50 % from Glasscannon. This of course means that you sometimes have to calculate more complicated subparts of the damage formula, but there are solutions:

- Use Excel, LibreOffice Calc or comparable for the more complicated parts. Most comparisons are easy and fast to calculate with a calculator (app) though, I rarely use LibreOffice Calc for this.

- Read on, because I'm still gonna simplify some things for you.

2.5 Damage Increase per Slot (DIPS)

You are reading this because you want to maximize the damage of your build. In order to do that, it is good to think in terms of *How much damage do I get from this slot/each slot of this combination?*
Your available slots are limited, and you can divide them into subcategories:

- Damage slot,

- defensive/survival slot,

- both.

If you're lucky, you can use things that boost both, your damage *and* your survivability (like Defiant for instance). In most cases though it's either or. It makes absolute sense to analyze the damage of each slot, even those which also give defensive bonuses.

We already calculated the Damage Increase per Slot (DIPS) for one slot in subsection 2.4, where we derived the DM/DIPS for a second PTL and compared it to Barbarian. I personally like more to think in terms of Damage Multipliers since they directly enter the formula. DM and DIPS do mean the same though, and are interchangeable with $DIPS = DM - 1$.

In the following two subsections I'll categorize the DIPS for both PvE and PvP on the basis of my experience for you.

2.5.1 PvE DIPS Categorization

- $> 50\%$: Great! Definitely get this.

- $> 30\%$: Very good! Definitely get this as well.

- $> 20\%$: Good! Get this too.

- $> 15\%$: Okay! Get this if you run out of those above.

- $> 10\%$: Grey zone! Take only if really nothing else can push your damage. I bet you either didn't spend enough slots on defense or you oversaw a better boost.

- $< 10\%$: Ouch! Use this slot for something defensive rather than wasting it with this.

2.5.2 PvP DIPS Categorization

- $> 30\%$: Insane! Not many of these out there.

- $> 15\%$: Very good! Take it.

- $> 10\%$: Good! Fill up with these.

- $< 10\%$: Nah! You need defense too, you know? Especially in PvP.

2.5.3 DIPS for Slot Combinations

Sometimes you come across damage increases which only work because you use several slots for them. This means you cannot easily calculate how much each slot contributes. Either you calculate it step by step (as laid out for CRIT in subsection 2.6) or you say this is a *slot combination*.

You can still calculate a DIPS value for a slot combination, and I'll show you how to do it. Let's use a Green Garden (GG) derived combination as an example:

- Druidic (5): Increases HP and MP Regen by 125 % and increases DoT damage by (HP + MP Regen)/4000.

- Cosmic Power (5): Increases MP Regen by 125 %.

- 1000 Regeneration (legend): Crystal 1500 MP Regen gives 281 more HP + MP Regen in this combination, but legend Regeneration saves a crystal slot while also giving some HP Regen.

- 500 HP Regen (Strength) + 500 MP Regen (Intelligence): Both don't take any slots.

That makes 3 slots in total. The corresponding Green Garden DoT Damage Multiplier is:

$$\text{DM}_{\text{GG, 3 slots}} = 1 + \frac{2.25 \cdot (1500 + 2.25 \cdot 1500)}{4000} \qquad = 3.742 \qquad (5)$$

$$\text{DM}_{\text{GG, per slot}} = \sqrt[3]{\text{DM}_{\text{GG, 3 slots}}} = (\text{DM}_{\text{GG, 3 slots}})^{\frac{1}{3}} \qquad = 1.553 \qquad (6)$$

This means these 3 slots give an equivalent of 55.3 % DoT damage increase per slot - that result in a total of 274 % DoT damage increase for all 3 slots combined. Hence in this case, all 3 slots fall into the category "Great".

What you do here is you calculate the total Damage Multiplier for all n slots, and then take the n-th root of that to get the DM per slot and thus the DIPS of the slot combination.

2.6 The Critical Damage Multiplier (CRIT) Part

Most players manage to calculate FWDs quite accurately, but this is the part where I see numbers flipping over wildly in this forum, most of the time not only wrong, but very, very wrong.

So let me put this bluntly before I talk about chances here:

There is no such thing as Lucky One Hit Knockout (LOHKO). Well there is actually, but it's a stupid concept. Nobody cares if your char *can* deal a gazillion damage with one hit - what counts is how much damage your char deals *on average* (per second of course, but see subsection 2.7 for that).

In PvE, more average damage is more damage. The only exception where LOHKO actually could be a viable concept is in PvP if your opponent regenerates so much that you need to apply lethal damage at once in order to win. But since HP values are high and regeneration values are low in the arena nowadays you never gonna one-hit anyone.

There is the effect of Defiant however, but it's negligible. If you needed 10 hits on average to trigger your LOHKO, the damage of this hit equaled exactly the opponent's HP and the other 9 hits before didn't deal any damage, you would need 9 % higher DPS with 10 hits of even damage to kill the same opponent.

In reality, the effect is of course a lot less distinct since hits before LOHKO deal damage (thereby increasing Defiant's absorption) and you deal excess damage.

In other words:

- Maximize your *average* damage.

- If you deal a gazillion damage every 100 hits, it looks fancy on pictures but nothing else. You gain naught from pushing spike damage for its own sake - it might come naturally from maximizing your overall damage. In most cases though Deadly Strike (DS) for instance is not optimal.

I'm emphasizing this because it is tempting to think: "Brutal + Deadly: Woahh, **three** times the damage!!" while this is far from true. Different from the rest of the formula where the modifiers apply always, we look at chances here.

An average damage increase from Critical Hits (CHs) must therefore correctly take into account what happens if Critical hits, and what happens if Critical does not hit. Further things to know about CHs are:

- CHs have a base Critical Chance (CC) of 10 %.

- CHs have a base Critical Damage (CrD) of 50 %. This is additive with CrD from crystal/epic affixes.

Let's cut to the chase:

$$\mathrm{CC_{conv}} = 1 - \mathrm{CC_\%} \tag{7}$$

$$\mathrm{DS_{conv}} = 1 - \mathrm{DS_\%} \tag{8}$$

$$\mathrm{CRIT_{av}} = \mathrm{CC_\%} \cdot (1 + 50\,\% + \mathrm{CrD_\%}) \cdot \left(\mathrm{DS_\%} \cdot \begin{cases} 3 & \text{with Brutal} \\ 2 & \text{w/o Brutal} \end{cases} + \mathrm{DS_{conv}} \right) + \mathrm{CC_{conv}} \Bigg|_{(7),(8)} \tag{9}$$

$$= \mathrm{CC_\%} \cdot (1.5 + \mathrm{CrD_\%}) \cdot \left(\mathrm{DS_\%} \cdot \begin{cases} 3 & \text{with Brutal} \\ 2 & \text{w/o Brutal} \end{cases} + 1 - \mathrm{DS_\%} \right) + 1 - \mathrm{CC_\%}$$

$$= 1 + \mathrm{CC_\%} \cdot \left[(1.5 + \mathrm{CrD_\%}) \cdot \left(\mathrm{DS_\%} \cdot \begin{cases} 2 & \text{with Brutal} \\ 1 & \text{w/o Brutal} \end{cases} + 1 \right) - 1 \right] \tag{10}$$

Equations (7) and (8) give you the converse probability to CC and DS (i.e. the miss chance for CH and DS), respectively.

Equation (9) reads as follows (in human words): "If Critical hits, your damage will be increased by 50 % plus the increase from all Critical Damage affixes. If Deadly Strike hits hereupon, this damage will be doubled; in case you have Brutal, it will be tripled instead. If Critical misses, your damage stays the same."

Equation (10) just simplifies this as much as possible. Damn it, this looks complicated! But don't worry, I'll break it down for you in the subsections 3.4 and 4.2.

2.7 The Damage per Second (DPS) Part

Of course what you actually wanna be doing is maximizing your Damage per Second (DPS). Until now I pretty much ignored this part, also because normally you spend around 30-35 slots on damage, 4-6 on survivability and 1-2 on Attacks per Second (APS). In PvP it's more on survivability, but even less (or none) on APS.

The formulas for this part are:

$$\text{DPS} = \text{DMG}_{\text{av}} \cdot \text{APS} \tag{11}$$

$$\text{APS} = \frac{1}{\text{AT}} = \begin{cases} (a) & \text{if } 1/(a) > (b) \\ 1/(b) & \text{if } 1/(a) < (b), \text{ where} \end{cases} \tag{12}$$

$$(a) = \text{APS}_{\text{base}} \cdot \left(1 + \text{ASpd}_{\%,\text{ weapon base}}\right) \cdot \left(1 + \text{ASpd}_{\%,\text{ affix}}\right) \cdot \left(1 + \text{ASpd}_{\%,\text{ Hunger}}\right) \cdot \ldots$$

$$(b) = \text{CD}_{\text{base}} \cdot \left(1 - \text{RCD}_{\%,\text{ affix}}\right) \cdot \left(1 - \text{RCD}_{\%,\text{ Hunger}}\right) \cdot \ldots$$

The remaining abbreviations are Attack Time (AT), Attack Speed (ASpd), Cooldown (CD) and Reduced Cooldown (RCD), respectively. So you also have to see if $\text{APS}_{\text{new}}/\text{APS}_{\text{old}}$ for each consecutive slot spent on APS (the same categorizations from subsection 2.5 apply) increases your damage more than another DM would - but I'm not going to dive into the details here.

On the one hand, everything you've read so far gives you the tools to do so and I believe in you, and on the other hand @Clogon wrote a great post about that (better than I could ever do):

http://forums.dungeon-quest.com/t/aps-vs-cd-what-is-more-important/13667/

3 PvE SIMPLIFICATIONS AND AIDS

3.1 General Approach for Damage Maximization

The general approach to maximize your damage is straightforward:

- Compile a hierarchical DM/DIPS list,

- take affixes from the top until you run out of slots.

Of course there are affixes that cannot be obtained via crystals hence there are going to be some limitations, but that's part of the fun designing your char ;). Here's a list on crystal crafting restrictions by @Emman:

http://forums.dungeon-quest.com/t/crystal-crafting-restrictions/3694/

And then there are the affixes whose Damage Multiplier (DM) depend on other affixes like the ones in FWD, CRIT and Druidic for example. You can compile sublists for those, starting with what gives you the biggest initial damage boost, what gives you the greatest damage increase after that and so forth.

But because I'm really nice, I'll even do it for you in the following (sub)sections! (Okay to be honest I tend to forget a lot, and I'm doing this for myself so I don't have to do it over and over again.)

3.2 FWD Simplification (PvE)

Consider this table:

Orb (3249.5 BWD, iLvl 100, 25 % WIQ)		
Slot	Slot Affix (continuous)	DM[a]
1	5000 WD$_+$[b]	2.194
2	100 ED$_\%$	2.000
3	200 ED$_\%$	1.500
4	100 WD$_\%$	1.442
5	300 ED$_\%$	1.333
6	150 WD$_\%$ (Endow)	1.153
x	5000 ED$_+$	1.082

Table 1: FWD Damage Multipliers (DMs) with ED$_\%$ and ED$_+$ for a weapon with low BWD.
[a]DM after all previous slots have been set.
[b]WD$_+$ chosen over ED$_+$ here because it gets multiplied by ED$_\%$.

As you can see in table 1, ED_+ hardly increases the damage at all - and this is for a low BWD weapon where it has the largest effect. 3x 100 $\text{ED}_\%$ is a realistic value; the more $\text{ED}_\%$ you have the worse it gets.

We conclude:

- **Don't use ED_+ for PvE.**

- We can therefore scratch ED_+ from the formula.

- Because we scratch ED_+, $\text{ED}_\%$ becomes a normal Damage Multiplier (DM).

We rewrite equation (1) as:

$$\text{DMG}_{\text{av, PvE}} = \Big(\overbrace{\text{BWD}_{\text{av}} \cdot (1 + \text{WIQ}_\%) \cdot (1 + \text{WD}_\%) + \text{Power} \cdot 25 + \text{WD}_+}^{\text{FWD}_{\text{av, PvE}}} \Big) \cdot (1 + \text{ED}_\%) \cdot \underline{\text{Skill}_\%} \cdot \ldots \quad (13)$$

3.3   FWD DM Lists (PvE)

According to equation (13), we only have to consider BWD_{av}, $WD_\%$, Power and WD_+ for the FWD multiplier. Examples are given for high and low BWD weapon representatives with base/299 Power.

Gauntlet (8320 BWD, iLvl 100, 25 % WIQ)				
Slot	Affix (continuous)	DM[a]	Affix (continuous)	DM[a]
0	base Power		+294 Power	1.698
1	100 $WD_\%$	1.988	100 $WD_\%$	1.582
2	150 $WD_\%$ (Endow)	1.249	150 $WD_\%$ (Endow)	1.184
3	5000 WD_+	1.191	5000 WD_+	1.149

Table 2: FWD Damage Multipliers (DMs) with base/299 power for a weapon with high BWD (Gauntlet as example). [a]DM after all previous slots have been set.

Orb (3249.5 BWD, iLvl 100, 25 % WIQ)				
Slot	Affix (continuous)	DM[a]	Affix (continuous)	DM[a]
0	base Power		+294 Power	2.755
1	5000 WD_+	2.194	5000 WD_+	1.433
2	100 $WD_\%$	1.442	100 $WD_\%$	1.246
3	150 $WD_\%$ (Endow)	1.153	150 $WD_\%$ (Endow)	1.099

Table 3: FWD Damage Multipliers (DMs) with base/299 power for a weapon with low BWD (Orb as example). [a]DM after all previous slots have been set.

These (sub)lists give you an idea on how much the different FWD contributors increase you damage in case you use a high/low BWD weapon with base/299 Power.

   If you use a weapon with very different BWD, cannot obtain 100 $WD_\%$ or put some intermediate amount of points in Power, you will have to calculate your own list, but it's a rather fast exercise. This list you can then merge with the values/lists/suggestions given in subsections 3.4 to 3.6.

3.4 CRIT Flowchart (PvE)

As we've seen in subsection 2.6, the formula for $CRIT_{av}$ is rather difficult. That's why a DM calculation for a slot combination only makes sense for the first two slots. After that you need to look at the full tree to decide which path is best, and whether it's worth it to invest more slots in the $CRIT_{av}$ part or if it's more rewarding getting legend affixes instead.

Figure 1 shows you a flowchart with the corresponding paths. A few observations:

- 45 % CC and 225 % CrD together give an equivalent of 54.7 % DIPS. That is huge! I can't think of a PvE char that could use two crystal slots better than this.

- All subsequent slots give you DMs deep in the range of legend affixes already (subsection 3.5). Since only 6 crystal slots at most are available and normally 2-3 are used for Block/Dodge/RCD/ASpd, the amount of slots left for the $CRIT_{av}$ path are limited - normally you won't spend many more than the first two on it (also because they don't add *that* much damage, mostly below 30 %).

- You can max out CrD with epic 75 % CrD + 5x Strength Nature, but keep in mind that the six Natures you have act together as roughly one epic slot equivalent - which you normally use for "one" thing only (9 % Dodge or 15 % ASpd or 50 % CrD + 2.5 % CC or 150 % Luck or . . .).

- If you already have 30 % DS at any point, it makes no difference in average damage if you take Brutal or another 30 % DS as your next DS-related slot. Brutal gives you spike damage and doesn't occupy a crystal slot, 60 % DS distributes the damage a bit more evenly.

- If you use 3-4 Slots on $CRIT_{av}$ it makes sense to max out CrD (first). In case you use 5 slots it is slightly better to go for 60 % DS and Brutal. At 6 slots it doesn't matter (obviously).

- Brutal **does not** triple your damage. It increases your damage by $\sim 20\,\%$ if added upon 30 % DS and by $\sim 33\,\%$ with 60 % DS.
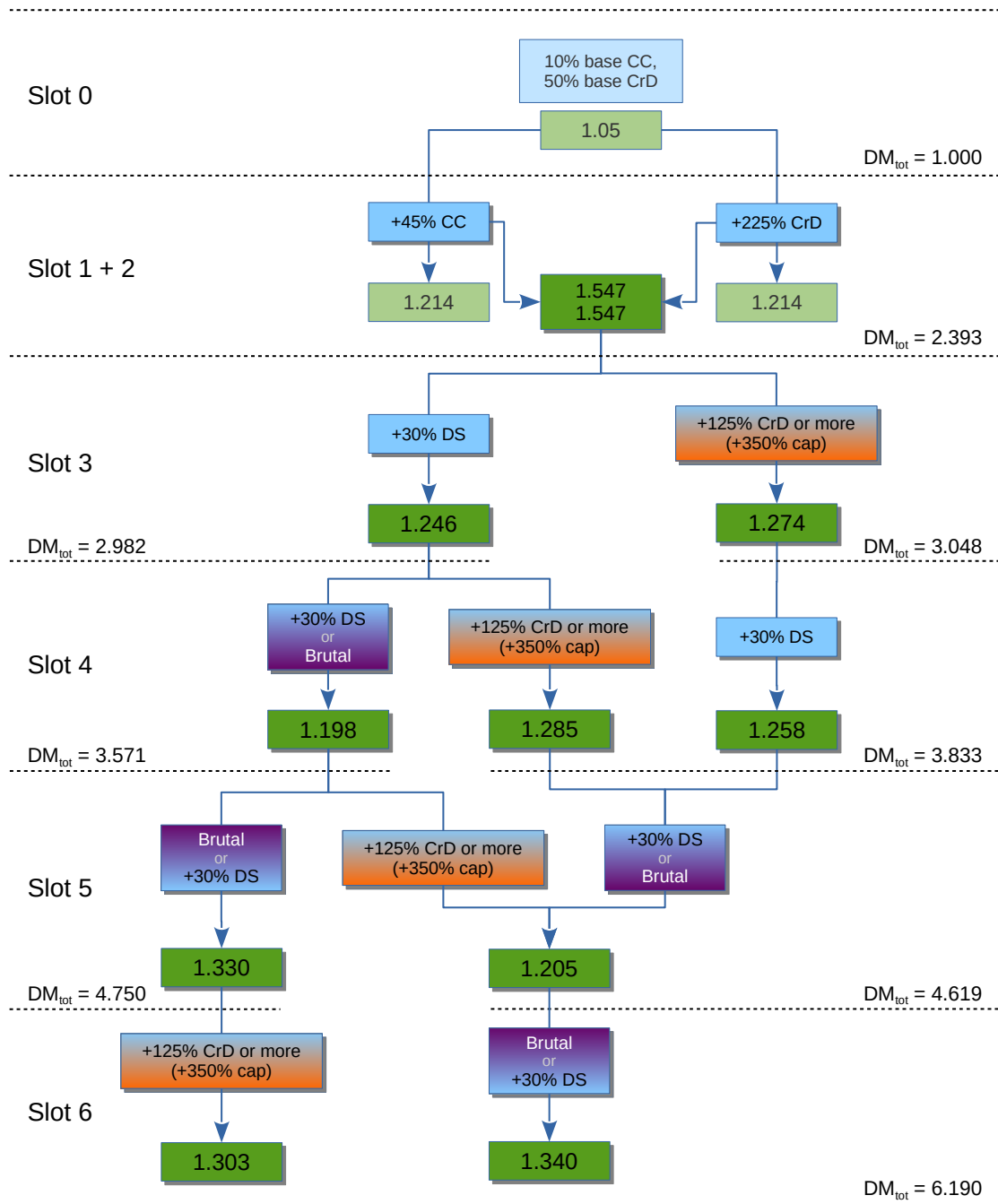
Figure 1: PvE CRIT$_{av}$ flowchart. The green boxes show the DMs obtained by adding the affix from the preceding box.

3.5 DM List of important Affixes (legend and below) (PvE)

Affix (continuous)	DM[a]	Affix (continuous)	DM[a]
100 ED$_\%$	2.000	400 ED$_\%$	1.250
100 ECD$_\%$[b]	2.000	25 DMG to Elites$_\%$	1.250
20 HeroLvl[c],[d]	2.000	400 ECD$_\%$[b]	1.250
2 MA[e]	2.000	30 HeroLvl[c]	1.250
50 PTL$_\%$	1.500	500 ED$_\%$	1.200
50 Barbarian$_\%$	1.500	50 DMG to Elites$_\%$	1.200
50 Glasscannon$_\%$	1.500	500 ECD$_\%$[b]	1.200
200 ED$_\%$	1.500	40 HeroLvl[c]	1.200
200 ECD$_\%$[b]	1.500	600 ED$_\%$	$1.16\bar{6}$
4 MA[e]	1.500	$\vdots$	$\vdots$
100 PTL$_\%$	$1.33\bar{3}$		
100 Barbarian$_\%$	$1.33\bar{3}$		
100 Glasscannon$_\%$	$1.33\bar{3}$		
300 ED$_\%$	$1.33\bar{3}$		
300 ECD$_\%$[b]	$1.33\bar{3}$		
4 EAC (Zenith)[e],[f]	1.313		

Table 4: DM List of important Affixes (legend and below) (PvE).
[a]DM after all previous dependent affixes have been set.
[b]Assuming Elemental Critical (EC) has hit or it's effect is active.
[c]Only increases DMG of the corresponding skill, but better than the DM shown as it gives additional (damage increasing) bonuses like Hit Frequency, Spell Size etc.
[d]Doesn't occupy a slot (hard set Hero Points).
[e]Only for MH Primary (or MH Special with Discordance).
[f]Extra Attack Chance (EAC) - after 4 Multi Attack (MA) have been set.

3.6 Set and Mythic Affixes (PvE)

This is where things get really complicated, because Sets and Mythics can give insane damage but normally only in combination with other affixes. You can calculate DMs for them as shown for Druidic in paragraph 2.5.3 for example, or determine your gain in damage for adding single slots as shown in subsections 2.4 and 3.4.

If you want to visit really high floors (1000+) at M3 difficulty, you normally need one (or a combination) of the big three:

- Plagued,

- Frozen,

- Arcanist + Ascendent.

Then there are a few Sets that are good on almost every char like Defiant and Adventurer for instance. Others can give a huge damage boost with some restrictions like the Sets Living Force, Identity and Masochism or the Mythics Skilled, Exposed, Ruptured etc.

This is where the beauty of DQ lies, you can freely combine anything you want with each other and I highly encourage you to try things out - you might come up with a new char idea/killer combo that is unique and your own.

Therefore I'm gonna leave you to it - you gonna find your way ;).

4 PvP SIMPLIFICATIONS AND AIDS

4.1 FWD Simplification (PvP)

Consider this table:

Slot	Slot Affix (continuous)	DM[a]	Affix (continuous)	DM[a]
Chakram (360 BWD, iLvl 20, 25 % WIQ)				
0	base Power		+57 Power	3.478
1	1040 ED_+[b]	2.809	1040 ED_+[b]	1.520
2	2080 ED_+[b]	1.644	2080 ED_+[b]	1.342
3	3120 ED_+[b]	1.392	3120 ED_+[b]	1.255
4	4160 ED_+[b]	1.281	4160 ED_+[b]	1.203
5	5200 ED_+[b]	1.220	5200 ED_+[b]	1.169
6	6240 ED_+[b]	1.180	6240 ED_+[b]	1.144
7	1040 WD_+	1.153	1040 WD_+	1.126
x	24 $ED_\%$	1.049	24 $ED_\%$	1.079
y	24 $WD_\%$	1.016	24 $WD_\%$	1.013

Table 5: FWD Damage Multipliers (DMs) for a weapon in PvE (Chakram as example).
[a]DM after all previous slots have been set.
[b]ED_+ chosen over WD_+ here because it increases damage from all sources.

As you can see in table 5, $WD_\%$ and $ED_\%$ are totally useless - and this is for a high BWD weapon where they have the greatest effect. A comparison between BWD and the damage added from the slots also shows that difference in BWD hardly matters.

We conclude:

- **Don't use $WD_\%$ or $ED_\%$ for PvP.** We can therefore scratch them from the formula.

- ED_+ » WD_+ **because it boosts all attacks.**

- **Put as much ED_+ as you can. When you are done with ED_+, you may add WD_+.**

- **You can freely choose whichever weapon is best for your build.** You don't need to take the one which has the highest BWD because you'll add as much ED_+ as you can ;).

We rewrite equation (1) as:

$$\text{DMG}_{\text{av, PvP}} = \left(\overbrace{\text{BWD}_{\text{av}} \cdot (1 + \text{WIQ}_\%) + \text{Power} \cdot 25 + \text{WD}_+ + \text{ED}_+}^{\text{FWD}_{\text{av, PvP}}} \right) \cdot \underline{\text{Skill}_\%} \cdot \ldots \quad (14)$$
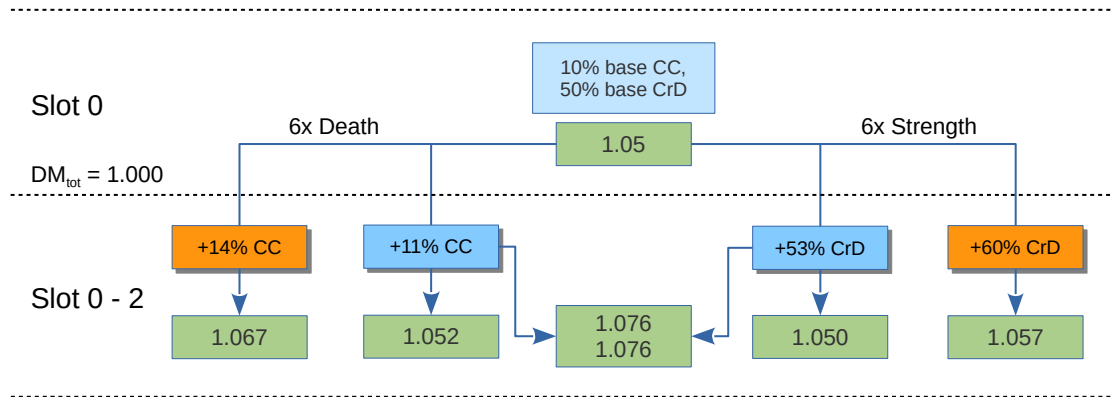
4.2 CRIT Flowchart (PvP)

Figure 2: PvP CRIT$_{\text{av}}$ flowchart. The green boxes show the DMs obtained by adding the affix from the preceding box.

As you can see in figure 2, CHs is very ineffective in PvP. Regardless of what you do, you gain less than 8% damage per slot. With subsequent slots (DS etc.) it gets only worse, that is why I didn't even bother showing them here.

To make matters miserable, there's Flawless Trophy. Although it is currently bugged, chances are it will be fixed in the upcoming patch: An eternal version will then reduce CC by 10% and thus render the CRIT$_{\text{av}}$ tree completely useless. We conclude:

- **Don't use CC/CrD/DS/Brutal in PvP.** They are a waste of slots.

I know you like big damage numbers, but be smart and make your char better will you? Take a look at subsection 4.3 for an idea on what to add instead.

4.3   DM List of important Affixes (legend and below) (PvP)

Affix (continuous)	DM[a]	Affix (continuous)	DM[a]
2 MA[b]	2.000	3 HeroLvl[d]	1.150
2 EAC (Zenith)[b],[c]	1.375	6 HeroLvl[d]	1.130
18 PTL$_\%$	1.180	9 HeroLvl[d]	1.115
18 Barbarian$_\%$	1.180	12 HeroLvl[d]	1.103
18 Glasscannon$_\%$	1.180	15 HeroLvl[d]	1.094
36 PTL$_\%$	1.153	9 DMG to Elites$_\%$	1.090
36 Barbarian$_\%$	1.153	$\vdots$	$\vdots$
36 Glasscannon$_\%$	1.153		

Table 6: DM List of important Affixes (legend and below) (PvP).
[a] DM after all previous dependent affixes have been set.
[b] Only for MH Primary (or MH Special with Discordance).
[c] Extra Attack Chance (EAC) - after 2 Multi Attack (MA) has been set.
[d] Only increases DMG of the corresponding skill, but better than the DM shown as it gives additional (damage increasing) bonuses like Hit Frequency, Spell Size etc.

As you may have noticed, Elemental Critical Damage (ECD) is missing in table 6. There is a reason for that: It is ineffective. Let me give you an example:

- You have 10 % EC and 2x 28 % ECD - so 3 slots in total.

- You deal ice/shock damage. We take 20 % as a rough estimate you manage to deal ECD (enemy is sometimes frozen/paralyzed so you get some consecutive hits with higher damage).

- Your increase in damage thus becomes: $(0.2 \cdot 1.56 + 0.8)^{\frac{1}{3}} = 1.036$ per slot

And this is disregarding Flawless Trophy, which will make ECD completely useless once fixed (see subsection 4.2).

There is another thing completely left out in table 6, and that is Procs/MirrorCast/Specialist. These can be very rewarding and make your AI incredibly hard to predict, but this also depends a lot on your build. I've heard rumors that there will be changes in this area in the upcoming patch, so watch out :).

4.4   Set and Mythic Affixes (PvP)

Sets and Mythics are your main damage source in PvP (apart from ED$_+$) and can give huge boosts. You define your char here. I'm just gonna throw a list of good possibilities at you, but don't forget to look at the ones that are not mentioned ;).

Offense

- Angelic (Set)
- Cerebral Vortex (high HP builds) (Set)
- Defiant (Set)
- Demonic (Set)
- Hunger (Set)
- Identity (Set)
- Living Force (Set)
- Terrashaper (high HP builds) (Set)
- . . .
- Discordance (with MA and EAC) (Mythic)
- Exposed (Mythic)
- Ruptured (Mythic)
- Skilled (Mythic)
- . . .

Defense

- Battle Mage (HP + AR) (Set)
- Defiant (Set)
- Faun's Gift (HP + Resist, with tons of Luck obviously) (Set)
- Plagued (HP + AR) (Set)
- Satyr's Spirit (AR, with tons of Gold Find obviously - would go nicely with Buccaneer) (Set)
- Vampiric Touch (HP) (Set)
- . . .
- Sanctuary (Mythic)
- . . .

5 PvE EXAMPLE

This section will host one of my chars as an example when I find time to write it.

6 WHAT I LEFT OUT

Of course I could write ages and ages here, but my time is limited. Maybe I will elaborate on some of the following things in the future.

6.1 Ignore Resist vs. Weaken & Effective

It seems like 2x crystal Weaken + Effective can give you an enormous gain in damage and are better than Ignore Resist. I've started testing this here:

http://forums.dungeon-quest.com/t/13076

Still waiting for an answer on some questions in the Developer Q&A though, to be rock solid about this.

6.2 Elemental Critical Hits

The mechanics behind this make it kind of difficult to determine how much you increase your average damage with Elemental Critical Hits, so I didn't.

- **Orbit:** Triggers with a chance, rather simple to calculate.

- **Freeze/Paralysis:** When the effect is active, you deal higher damage. When not active, you have the chance to activate it. Hmm. Don't know for instance if you can "reapply" Freeze/Paralysis while the effect is active (I guess not). Many difficult, much mathematics.

- **Toxic:** Triggers almost always because you have monsters in groups.

- **Immolate:** Triggers with a chance. Applies Bleed, which I also left out.

Basically you want to use the EC tree and max ECD unless you use Arcanist/Ascendent/ Prismatic/Elements.

6.3 Bleed

Well kind of not so hard to understand. Triggers with a chance which is low (epic affix) if not granted by a skill. Some Sets give bonuses (Inferno, Vampiric Touch and maybe others I forget right now) and 50 % increases can also be obtained from epic affixes. Short info:

http://forums.dungeon-quest.com/t/1859/2

You may do the calculations yourself with what you've learned in chapter 2; don't forget to include the converse probability (miss chance).

6.4   Crushing Blow (CB)

Well I didn't touch this because opting for high damage is better. CB could be used with skills that have very high Hit Frequencies (i.e. Orb) in conjunction with Demonic, but even there it takes away big slots (2x crystal + 1x set). After a rough estimation of mine it is better to increase the damage by other means with the crystal slots since CB is way more ineffective for the enemies you'd need it for, i.e. epic/legend/eternal enemies. If you want to know more about the mechanics, take a read here:

http://forums.dungeon-quest.com/t/crushing-blow/3897

Maybe I'll add an example on why not to use it later.