What are "twisting morphims"?

Discussion with Micah Miller

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From Vallette's talk yesterday:

(A, μ, d_A) a dga (diff. graded alg.) $|d_A| = -1$

(C, Δ, d_C) a dg-coalg $|d_A| = -1$.

Get $(\mathrm{Hom}(C, A), *, \partial)$, where

$$\partial f = d_A \circ f - (-1)^{|f|} f \circ d_C$$

MC equation (Maurer-Cartan)

in degree -1: $\partial \alpha + \alpha * \alpha$

The space of sol'ns is $Tw(C, A)$,

"twisting morphisms $C \to A$"

it's a bifunctor.

We want to represent Tw.

Given a principal G bundle over X,

$C = C_\bullet(X)$ is a dgca

$A = C_\bullet(G)$ is a dga

One may get a twisting morphism $\alpha \in Tw(C, A)$, so that

$$(C \otimes A,\ \partial_1 + \partial_2)$$

models the homology of the bundle, where

$$\partial_2 : C \otimes A \xrightarrow{\Delta \times I} C \otimes C \times A \xrightarrow{I \otimes \alpha \otimes I} C \otimes A \otimes A \xrightarrow{I \otimes m} C \otimes A$$