

The transition functions  $g_{\alpha\beta} : U_\alpha \cap U_\beta \rightarrow G$  satisfy the cocycle condition:

$$g_{\alpha\beta} \cdot g_{\beta\gamma} = g_{\alpha\gamma}.$$

Given a cocycle  $\{g_{\alpha\beta}\}$  with values in  $G$  we can construct a fiber bundle  $E$  having  $\{g_{\alpha\beta}\}$  as its transition functions by setting

$$E = (\coprod U_\alpha \times F) / (x, y) \sim (x, g_{\alpha\beta}(x)y)$$

for  $(x, y)$  in  $U_\beta \times F$  and  $(x, g_{\alpha\beta}(x)y)$  in  $U_\alpha \times F$

My question is: Why the fiber bundle  $E$  having  $\{g_{\alpha\beta}\}$  as its transition functions?

Thank you!