$$
\begin{tikzcd}
c_1 = \langle X^*, & & Y \rangle \arrow[rrr, "\mathrm{Hom}_{\mathbf{C}}"] & & & \mathrm{Hom}_{\mathbf{C}}(X;Y) \arrow[ddd, "\mathrm{Hom}_{\mathbf{C}}(g)"] \\
& & & & & \\
& & & & & \\
c_2 = \langle Z^*, & & U \rangle \arrow[rrr, "\mathrm{Hom}_{\mathbf{C}}"] & & & \mathrm{Hom}_{\mathbf{C}}(Z;U)
\arrow[from=1-1, to=4-1, "f"']
\arrow[from=1-2, to=4-2, "f_1^*"']
\arrow[from=1-3, to=4-3, "f_2"]
\end{tikzcd}
$$