Benchmarking Linear Logic Encoding Petri Nets

03 October 2018

Abstract

Here we present the results for the petri-nets benchamrks in https://github.com/carlosolarte/Linear-Logic-Prover-in-Maude.

1 General Information

- Test run on a QEMU Virtual CPU, 2GHz, 64 bits, 2GB of RAM running Ubuntu.
- Timeout: 2min.
- Maude version: 2.7.1 built: Oct 2 2017.
- The search procedure considers proofs using up to 101 times the copy rule (focusing on one of the formulas of the classical context).
- For the sake of readability, the classical context containing the encoding of transition rules is depicted as Γ Moreover, Δ represents the hypothesis of the conjecture that, in all the cases, include the encoding of the rules and the initial marking.

• Number of files: 2.073

• Proved sequents: 183

file: MCC/Angiogenesis_angiogenesis-01_100_1.p (2699 ms)

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file: MCC/Angiogenesis_angiogenesis-01_1_1.p (2426 ms)
                                                                                                                                                                                                                                                                     \frac{\overline{\Gamma: Akt \vdash Akt} \quad \overline{\Gamma: Enz \vdash Enz}}{\Gamma: Akt, Enz \vdash Akt \otimes Enz} \otimes \frac{\overline{\Gamma: Gab1 \vdash Gab1}}{} \otimes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              \overline{\Gamma : KdStarPg \vdash KdStarPg} \otimes
                                                                                                                                                                                                                                                                                                                       \Gamma: Akt, Enz, Gab1 \vdash Akt \otimes Enz \otimes Gab1
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     \overline{\Gamma:\ P3'\underline{k}\vdash P3'\underline{k}}\ \otimes
                                                                                                                                                                                                                                                                                                                                                                                         Akt, Enz, Gab1, KdStarPq \vdash Akt \otimes Enz \otimes Gab1 \otimes KdStarPq
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         \frac{\overline{\Gamma : Pip2 \vdash Pip2}}{\overline{\Gamma : Pten \vdash Pten}} \otimes \overline{\underline{\Gamma : Pten \vdash Pten}}
                                                                                                                                                                                                                                                                                                                                                                                                              \Gamma:\ Akt, Enz, Gab1, KdStarPg, P3'k \vdash Akt \otimes Enz \otimes Gab1 \otimes KdStarPg \otimes P3'k
       \Gamma: KdStar \vdash KdStar \quad \overline{\Gamma}: Pg \vdash Pg \otimes
                                                                                                                                                                                                                                                                                                                                                                                                                                                            \Gamma:\ Akt, Enz, Gab1, KdStarPg, P3'k, Pip2 \vdash Akt \otimes Enz \otimes Gab1 \otimes KdStarPg \otimes P3'k \otimes Pip2
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         \frac{\Gamma : Akt, Enz, Gab1, KdStarPg, P3'k, Pip2, Pten \vdash Akt \otimes Enz \otimes Gab1 \otimes KdStarPg \otimes P3'k \otimes Pip2 \otimes Pten}{} - \frac{\Gamma : Akt, Enz, Gab1, KdStarPg, P3'k, Pip2, Pten \vdash Akt \otimes Enz \otimes Gab1 \otimes KdStarPg \otimes P3'k \otimes Pip2 \otimes Pten}{} - \frac{\Gamma : Akt, Enz, Gab1, KdStarPg, P3'k, Pip2, Pten \vdash Akt \otimes Enz \otimes Gab1 \otimes KdStarPg \otimes P3'k \otimes Pip2 \otimes Pten}{} - \frac{\Gamma : Akt, Enz, Gab1, KdStarPg, P3'k, Pip2, Pten \vdash Akt \otimes Enz \otimes Gab1 \otimes KdStarPg \otimes P3'k \otimes Pip2 \otimes Pten}{} - \frac{\Gamma : Akt, Enz, Gab1, KdStarPg, P3'k, Pip2, Pten \vdash Akt \otimes Enz \otimes Gab1 \otimes KdStarPg \otimes P3'k \otimes Pip2 \otimes Pten}{} - \frac{\Gamma : Akt, Enz, Gab1, KdStarPg, P3'k, Pip2, Pten \vdash Akt \otimes Enz \otimes Gab1 \otimes KdStarPg \otimes P3'k \otimes Pip2 \otimes Pten}{} - \frac{\Gamma : Akt, Enz, Gab1, KdStarPg, P3'k, Pip2, Pten \vdash Akt \otimes Enz \otimes Gab1 \otimes KdStarPg \otimes P3'k \otimes Pip2 \otimes Pten}{} - \frac{\Gamma : Akt, Enz, Gab1, KdStarPg, P3'k, Pip2, Pten \vdash Akt \otimes Enz \otimes Gab1 \otimes KdStarPg \otimes P3'k \otimes Pip2 \otimes Pten}{} - \frac{\Gamma : Akt, Enz, Gab1, KdStarPg, P3'k, Pip2, Pten}{} - \frac{\Gamma : Akt, Enz, Gab1, KdStarPg, P3'k, Pip2, Pten}{} - \frac{\Gamma : Akt, Enz, Gab1, KdStarPg, P3'k, Pip2, Pten}{} - \frac{\Gamma : Akt, Enz, Gab1, KdStarPg, P3'k, Pip2, Pten}{} - \frac{\Gamma : Akt, Enz, Gab1, KdStarPg, P3'k, Pip2, Pten}{} - \frac{\Gamma : Akt, Enz, Gab1, KdStarPg, P3'k, P1P2, Pten}{} - \frac{\Gamma : Akt, Enz, Gab1, KdStarPg, P3'k, P1P2, Pten}{} - \frac{\Gamma : Akt, Enz, Gab1, KdStarPg, P3'k, P1P2, Pten}{} - \frac{\Gamma : Akt, Enz, Gab1, KdStarPg, P3'k, P1P2, P1
                         \Gamma: KdStar, Pg \vdash KdStar \otimes Pg
                                                                                                                                                                    \frac{1}{\Gamma}: \textit{Akt}, \textit{Enz}, \textit{Gab1}, \textit{KdStar}, \textit{P3'k}, \textit{Pg}, \textit{Pip2}, \textit{Pten}, \textit{KdStar} \otimes \textit{Pg} \rightarrow \textit{KdStarPg} \vdash \textit{Akt} \otimes \textit{Enz} \otimes \textit{Gab1} \otimes \textit{KdStarPg} \otimes \textit{P3'k} \otimes \textit{Pip2} \otimes \textit{Pten} \\ D_{C} = \frac{1}{\Gamma} \frac{1
                                                                                                                                                                                                                                                             \Gamma:\ Akt, Enz, Gab1, KdStar, P3'k, Pg, Pip2, Pten \vdash Akt \otimes Enz \otimes Gab1 \otimes KdStarPg \otimes P3'k \otimes Pip2 \otimes Pten
                                                                                                                                                                                                                                                                                                                                                                                                \underline{\Gamma}: \ \Delta \vdash Akt \otimes Enz \otimes Gab1 \otimes KdStarPg \otimes P3'k \otimes Pip2 \otimes Pten
         file: MCC/Angiogenesis_angiogenesis-01_20_1.p (2740 ms)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \Gamma: DAG \vdash DAG \Gamma: Enz \vdash DAG \otimes Enz
       file: MCC/Angiogenesis_angiogenesis-01_50_1.p (2775 ms)
           file: MCC/Angiogenesis_angiogenesis-01_5_1.p (1469 ms)
       file: MCC/AutoFlight_afcs_01_a_100_1.p (31901 ms)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             \underline{\Gamma}: \ p1, p10, p17, p23, p29, p30, p4, p7 \vdash p1 \otimes p10 \otimes p17 \otimes p23 \otimes p29 \otimes p30 \otimes p4 \otimes p7
                                                                                                                                                                                                                                                                                                                                                                                                                                   \frac{-p_1,p_1,p_1,p_2,p_3,p_4,p_5,p_6,p_6,p_6,p_6,p_6,p_6}{\Gamma\colon p_1,p_10,p_17,p_2,p_2,p_6,p_6} = p_1,p_10,p_17,p_23,p_23,p_30,p_4,p_7,p_8 - p_10,p_10 + p_100,p_17,p_23,p_23,p_30,p_4,p_7,p_8 - p_8}{\Gamma\colon p_1,p_10,p_17,p_23,p_29,p_30,p_4,p_7,p_8,p_9} = p_8 \vdash p_10 \ni p_10 \ni p_17 \ni p_23 \ni p_23 \ni p_33 \ni p_4 \ni p_7 \ni p_8}{\Gamma\colon p_10,p_17,p_23,p_29,p_30,p_4,p_7,p_8,p_9} = p_8 \vdash p_10 \ni p_17 \ni p_23 \ni p_23 \ni p_33 \ni p_4 \ni p_7 \ni p_8}{\Gamma\colon p_10,p_17,p_23,p_29,p_30,p_4,p_7,p_8,p_9} = p_8 \vdash p_10 \ni p_17 \ni p_23 \ni p_23 \ni p_33 \ni p_4 \ni p_7 \ni p_8}{\Gamma\colon p_10,p_17,p_23,p_29,p_30,p_4,p_7,p_8} = p_8 \vdash p_10 \ni p_17 \ni p_23 \ni p_23 \ni p_33 \ni p_4 \ni p_7 \ni p_8}{\Gamma\colon p_10,p_17,p_23,p_29,p_30 \ni p_4 \ni p_7 \ni p_8} = p_8 \vdash p_10 \ni p_17 
                                                                                                                                                                                                                                                               Γ : p9 ⊢ p9
                                                                                                                                                                                              \begin{array}{c} : p6 \vdash p6 \\ : p6 \vdash p6 \\ \hline \\ E : p1, p10, p17, p23, p29, p30, p4, p1, p1, p3, p3 - p6 - p1 & p10 & p17 & p23 & p29 & p30 & p4 & p7 & p8 \\ \hline \\ E : p1, p10, p17, p23, p29, p30, p4, p7, p9 + p1 & p10 & p10 & p17 & p23 & p29 & p30 & p4 & p7 & p8 \\ \hline \\ E : p1, p10, p17, p23, p29, p30, p6, p7, p9, p6 - p4 \vdash p1 & p10 & p17 & p23 & p29 & p30 & p4 & p7 & p8 \\ \hline \\ E : p10, p17, p23, p29, p30, p6, p7, p9 + p1 & p10 & p17 & p23 & p29 & p30 & p4 & p7 & p8 \\ \hline \\ E : p10, p17, p23, p29, p3, p30, p6, p7, p9 + p1 & p10 & p17 & p23 & p29 & p30 & p4 & p7 & p8 \\ \hline \\ E : p10, p17, p23, p29, p3, p30, p6, p7, p9 + p1 & p10 & p17 & p23 & p29 & p30 & p4 & p7 & p8 \\ \hline \\ E : p10, p17, p23, p29, p3, p30, p6, p7, p9 + p1 & p10 & p17 & p23 & p29 & p30 & p4 & p7 & p8 \\ \hline \\ E : p10, p17, p23, p29, p3, p30, p6, p7, p9 + p1 & p10 & p17 & p23 & p29 & p30 & p4 & p7 & p8 \\ \hline \\ E : p10, p17, p23, p29, p3, p30, p6, p7, p9 + p1 & p10 & p17 & p23 & p29 & p30 & p4 & p7 & p8 \\ \hline \\ E : p10, p17, p23, p29, p3, p30, p6, p7, p9 + p1 & p10 & p17 & p23 & p29 & p30 & p4 & p7 & p8 \\ \hline \\ E : p10, p17, p23, p20, p3, p30, p6, p7, p9 + p1 & p10 & p17 & p23 & p29 & p30 & p4 & p7 & p8 \\ \hline \\ E : p10, p17, p23, p20, p3, p30, p6, p7, p9 + p1 & p10 & p17 & p23 & p29 & p30 & p4 & p7 & p8 \\ \hline \\ E : p10, p17, p23, p20, p3, p30, p6, p7, p9 + p1 & p10 & p17 & p23 & p29 & p30 & p4 & p7 & p8 \\ \hline \\ E : p10, p17, p23, p20, p3, p30, p6, p7, p9 + p1 & p10 & p17 & p23 & p29 & p30 & p4 & p7 & p8 \\ \hline \\ E : p10, p17, p23, p20, p3, p30, p6, p7, p9 + p1 & p10 & p17 & p23 & p29 & p30 & p4 & p7 & p8 \\ \hline \\ E : p10, p17, p23, p20, p3, p30, p6, p7, p9 + p1 & p10 & p17 & p23 & p29 & p30 & p4 & p7 & p8 \\ \hline \\ E : p10, p17, p23, p20, p3, p30, p6, p7, p9 + p1 & p10 & p17 & p23 & p29 & p30 & p4 & p7 & p8 \\ \hline \\ E : p10, p17, p23, p20, p3, p30, p6, p7, p9 + p1 & p10 & p17 & p23 & p20 & p30 & p4 & p7 & p8 \\ \hline \\ E : p10, p17, p23, p20, p3, p30, p6, p7, p9 + p1 & p10 & p17 & p23 & p20 & p30 & p4 & p7 & p8 \\ \hline \\ E : p10, p17, p23, p20, p3, p30, p6, p7, p9 + p1 & p10 & p17 & p23 & p20 & p30 & p4 & 
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 \frac{ \frac{\Gamma \colon p10 \vdash p10}{\Gamma \colon p10, p17 \vdash p17}}{\frac{\Gamma \colon p10, p17 \vdash p10}{\Gamma \colon p10, p17 \vdash p10}} \otimes \frac{\Gamma \colon p23 \vdash p23}{\Gamma \colon p23 \vdash p23} \otimes \frac{\Gamma \colon p29 \vdash p29}{\Gamma \colon p29 \vdash p29} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p30 \vdash p30} \otimes \frac{\Gamma \colon p30 \vdash p30}{\Gamma \colon p30 \vdash p30} \otimes \frac{\Gamma \colon p30 \vdash p30}{\Gamma \colon p30 \vdash p30} \otimes \frac{\Gamma \colon p30 \vdash p30}{\Gamma \colon p30 \vdash p30} \otimes \frac{\Gamma \colon p50 \vdash p6}{\Gamma \colon p7 \vdash p7} \otimes \frac{\Gamma \colon p7 \vdash p7}{\Gamma \colon p7 \vdash p7} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}
                                                                                                                                                                                                                                                                                                                                                 \underline{\Gamma:\ p10,p17,p23,p29,p3,p30,p6,p7,p9 \vdash p10\otimes p17\otimes p23\otimes p29\otimes p3\otimes p30\otimes p6\otimes p7\otimes p9}_{\bullet,\bullet}
                                                                                                                                                                                                                                                                                                                                                                                                                                 \frac{\Gamma: \Delta \vdash p10 \otimes p17 \otimes p23 \otimes p29 \otimes p3 \otimes p30 \otimes p6 \otimes p7 \otimes p9}{\Gamma: \Delta \vdash p10 \otimes p17 \otimes p23 \otimes p29 \otimes p3 \otimes p30 \otimes p6 \otimes p7 \otimes p9} \rightarrow
         \Gamma: p0 \vdash p0
                                                                               \Gamma: \ p0, p0 \multimap p30 \otimes p29 \otimes p23 \otimes p17 \otimes p10 \underline{\otimes p9 \otimes p7 \otimes p6 \otimes p3} \vdash p10 \otimes p17 \otimes p23 \otimes p29 \otimes p3 \otimes p30 \otimes p6 \otimes p7 \otimes p9 \underline{\qquad } D_{C}
                                                                                                                                                                                                                    \frac{\Gamma: \ p0 \vdash p10 \otimes p17 \otimes p23 \otimes p29 \otimes p3 \otimes p30 \otimes p6 \otimes p7 \otimes p9}{\star} \ \star
                                                                                                                                                                                                                     \Gamma: \ \Delta \vdash p10 \otimes p17 \otimes p23 \otimes p29 \otimes p3 \otimes p30 \otimes p6 \otimes p7 \otimes p9
             file: MCC/AutoFlight_afcs_01_a_20_1.p (32941 ms)
     file: MCC/AutoFlight_afcs_01_a_5_1.p (40702 ms)
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\frac{1: p106 \vdash p106}{\Gamma: p105 \vdash p110} = \frac{1: p105 \vdash p110}{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\Gamma: p3 \vdash p3}{\Gamma: p105 \lor p110 \lor p33} \otimes \frac{\Gamma: p65 \vdash p1}{\Gamma: p105 \lor p110 \lor p33} \otimes \frac{\Gamma: p65 \vdash p1}{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\Gamma: p65 \vdash p1}{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\Gamma: p65 \vdash p1}{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\Gamma: p65 \vdash p1}{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p110 \lor p3} \otimes \frac{\rho65}{\rho65} \otimes \frac{\Gamma: p105 \lor p105} \otimes \frac{\rho65}{\rho65} \otimes \frac{\rho65}{\rho6
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                                                                                                                                                                                                                                                                                                                                                                                  Γ: p3, p63, p63
                                                                                                                                                                                                         file: MCC/AutoFlight_afcs_01_b_1_1.p (101 ms)
\Gamma: p0 \vdash p0 \quad \Gamma: p2 \vdash p2
                          \frac{\Gamma: p0, p0 \multimap p2 \vdash p2}{\Gamma: p0, p0 \multimap p2 \vdash p2} D_C
                                                                                   \frac{\Gamma: p0 \vdash p2}{\Gamma: \Delta \vdash p2} \star
          file: MCC/AutoFlight_afcs_01_b_5_1.p (451 ms)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              \Gamma: p110, p3, p65, p93 \vdash p110 \otimes p3 \otimes p65 \otimes p93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     \Gamma: \ \Delta \vdash p110 \otimes p3 \otimes p65 \otimes p93
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               \frac{\Gamma: p110, p3, p64, p64 \multimap p93 \otimes p65 \vdash p110 \otimes p3 \otimes p65 \otimes p93}{\Gamma: p110, p3, p64, p64 \multimap p93 \otimes p65 \vdash p110 \otimes p3 \otimes p65 \otimes p93} \ D_C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   \Gamma: p110, p3, p64 \vdash p110 \otimes p3 \otimes p65 \otimes p93
                                                                                                                                                                                                                                                                                                                                                                                                          \Gamma: p63 \vdash p63
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 \Gamma: \ \Delta \vdash p110 \otimes p3 \otimes p65 \otimes p93
                                                                                                                                                                                                                                                                                                                                                                                                                                                             \frac{1}{\Gamma} : p3, p63, p63 \multimap p110 \otimes p64 \vdash p110 \otimes p3 \otimes p65 \otimes p93}{PC}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    \underline{\Gamma:\ p3, p63 \vdash p110 \otimes p3 \otimes p65 \otimes p93}_{\star} \ \star
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 \frac{: p_3, p_{03} : p_{110} \otimes p_3 \otimes p_{65} \otimes p_{93}}{\Gamma : \Delta \vdash p_{110} \otimes p_3 \otimes p_{65} \otimes p_{93}} \xrightarrow{\circ}
                                                                                                                                                                                                                                                                                                                                             \Gamma: p1 \vdash p110 \otimes p3 \otimes p65 \otimes p93
                                                                                                                                   \overline{\Gamma: p2 \vdash p2}
                                                                                                                                                                                                                                 \frac{\Gamma: \ p2, p2 \multimap p1 \vdash p110 \otimes p3 \otimes p65 \otimes p93}{C: \ p2, p2 \multimap p1 \vdash p110 \otimes p3 \otimes p65 \otimes p93} \ D_C
                                                                                                                                                                                                                                                                       \frac{\Gamma: p2 \vdash p110 \otimes p3 \otimes p65 \otimes p93}{} \longrightarrow
\overline{{\color{red}\Gamma}:\ p0\vdash p0}
                                                                                         \frac{p0}{\Gamma}: \ \underline{p0, p0} \multimap \underline{p2} \vdash \underline{p110} \otimes \underline{p3} \otimes \underline{p65} \otimes \underline{p93} \\ \underline{a} \supseteq \underline{b} \supseteq \underline{
                                                                                                                                     \frac{\Gamma: p0 \vdash p110 \otimes p3 \otimes p65 \otimes p93}{\Gamma: p0 \vdash p110 \otimes p3 \otimes p65 \otimes p93} \star
                                                                                                                                       \overline{\Gamma: \ \Delta \vdash p110 \otimes p3 \otimes p65 \otimes p93}
      file: MCC/AutoFlight_afcs_02_b_10_1.p (52225 ms)
```

```
file: MCC/AutoFlight_afcs_02_b_1_1.p (258 ms)
\overline{\Gamma: p0 \vdash p0} \quad \overline{\Gamma: p2 \vdash p2}
      \frac{\Gamma: p0, p0 \multimap p2 \vdash p2}{\Gamma: p0 \vdash p2} \stackrel{}{\sim} D_C
  file: MCC/AutoFlight_afcs_02_b_5_1.p (1037 ms)
                                                                                                                                                      \frac{\overline{\Gamma:\ p120\vdash p120} \quad \overline{\Gamma:\ p125\vdash p125}}{\Gamma:\ p120, p125\vdash p120\otimes p125} \otimes \quad \overline{\Gamma:\ p202\vdash p202}
                                                                                                                                                                       \Gamma: p120, p125, p202 \vdash p120 \otimes p125 \otimes p202
                                                                                                                                                                                    \frac{\Gamma: \ p120, p125, p202, p4 \vdash p120 \otimes p125 \otimes p202 \otimes p4}{\star} \ \star
                                                                                                                          \Gamma: p3 \vdash p3
                                                                                                                                                                                                     \Gamma: \ \Delta \vdash p120 \otimes p125 \otimes p202 \otimes p4
                                                                                                                                    \frac{\Gamma: \ p125, p202, p3, p3 \multimap p120 \otimes p4 \vdash p120 \otimes p125 \otimes p202 \otimes p4}{\Gamma: \ p125, p202, p3 \vdash p120 \otimes p125 \otimes p202 \otimes p4} \ D_C
                                                                                                                                                                \Gamma: \Delta \vdash p120 \otimes \underline{p125} \otimes p202 \otimes \underline{p4} _{-\circ}
                                                                                     \Gamma: p124 \vdash p124
                                                                                               \frac{\Gamma: \ p124, p3, p124 - \circ p202 \otimes p125 + p120 \otimes p125 \otimes p202 \otimes p4}{\Gamma: \ p124, p3, p124 - \circ p202 \otimes p125 + p120 \otimes p125 \otimes p202 \otimes p4} \ D_C
                                                                                                                     \Gamma: p124, p3 \vdash p120 \otimes p125 \otimes p202 \otimes p4
                                                         \overline{\Gamma: p1 \vdash p1}
                                                                                                                          \Gamma: \Delta \vdash p120 \otimes p125 \otimes p202 \otimes p4
                                                                        \frac{\Gamma \colon p1, p1 \multimap p124 \otimes p3 \vdash p120 \otimes p125 \otimes p202 \otimes p4}{\Gamma \colon p1 \vdash p120 \otimes p125 \otimes p202 \otimes p4} \ D_C
                             \Gamma: p2 \vdash p2
                                                  \frac{\Gamma: p2, p2 \multimap p1 \vdash p120 \otimes p125 \otimes p202 \otimes p4}{C: p2, p2 \multimap p1 \vdash p120 \otimes p125 \otimes p202 \otimes p4} D_C
                                                          \frac{\Gamma: p2 \vdash p120 \otimes p125 \otimes p202 \otimes p4}{} - \circ
\Gamma: p0 \vdash p0
                    \frac{po}{\Gamma}: \ \underline{p0, p0 \multimap p2 \vdash p120 \otimes p125 \otimes p202 \otimes p4} \ D_C
                             \frac{\Gamma: \ p0 \vdash p120 \otimes p125 \otimes p202 \otimes p4}{\Gamma: \ \Delta \vdash p120 \otimes p125 \otimes p202 \otimes p4} \ \star
  file: MCC/AutoFlight_afcs_03_b_1_1.p (621 ms)
\frac{\overline{\Gamma:\ p0\vdash p0}\quad \overline{\Gamma:\ p2\vdash p2}}{\frac{\Gamma:\ p0\vdash p0}{\Gamma:\ p0\vdash p2}} \xrightarrow{\frac{\Gamma:\ p0\vdash p2}{\Gamma:\ \Delta\vdash p2}} D_C
  file: MCC/AutoFlight_afcs_03_b_5_1.p (2215 ms)
```

```
\frac{\overline{\Gamma : p181 \vdash p181} \quad \overline{\Gamma : p186 \vdash p186}}{\underline{\Gamma : p181, p186 \vdash p181} \otimes p186} \otimes \frac{\overline{\Gamma : p294 \vdash p294}}{\underline{\Gamma : p294 \vdash p294}} \otimes
                                                                                                                                                                    \Gamma: p181, p186, p294 \vdash p181 \otimes p186 \otimes p294
                                                                                                                                                                                 \Gamma: p181, p186, p294, p4 \vdash p181 \otimes p186 \otimes p294 \otimes p4
                                                                                                                        \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p186, p294, p3, p3 \multimap p181 \otimes p181 \otimes p186 \otimes p294 \otimes p4} \xrightarrow{\Gamma \colon p186, p294, p3, p3 \multimap p181 \otimes p4 \vdash p181 \otimes p186 \otimes p294 \otimes p4} \xrightarrow{\Gamma \colon p186, p294, p3 \vdash p181 \otimes p186 \otimes p294 \otimes p4} D_C
                                                                                                                                                             \frac{180, p294, p3 + p286 \otimes p294 \otimes p4}{\Gamma : \Delta \vdash p181 \otimes p186 \otimes p294 \otimes p4} \rightarrow
                                                                                             \Gamma: \underbrace{p185, p3, p185 \multimap p294 \otimes p186 \vdash p181 \otimes p186 \otimes p294 \otimes p4}_{D_C} \ D_C
                                                                                                                  \Gamma: p185, p3 \vdash p181 \otimes p186 \otimes p294 \otimes p4
                                                       \Gamma: p1 \vdash p1
                                                                                                                        \Gamma: \ \Delta \vdash p181 \otimes p186 \otimes p294 \otimes p4
                                                                       \Gamma: p1 \vdash \underline{p181 \otimes p186 \otimes p294 \otimes p4}
                           \overline{\Gamma:\ p2\vdash p2}
                                                \frac{p_2}{\Gamma: p_2, p_2 \multimap p_1 \vdash p_181 \otimes p_186 \otimes p_294 \otimes p_4} D_C
                                                         \frac{\Gamma: p2 \vdash p181 \otimes p186 \otimes p294 \otimes p4}{\Gamma: p2 \vdash p181 \otimes p186 \otimes p294 \otimes p4} \  \, - \circ
\boxed{ \underline{\Gamma}: \ p0 \vdash p0}
                   \frac{p_0}{\Gamma: p_0, p_0 \multimap p_2 \vdash p_181 \otimes p_186 \otimes p_294 \otimes p_4} D_C
                            \frac{\Gamma: \ p0 \vdash p181 \otimes p186 \otimes p294 \otimes p4}{\Gamma: \ \Delta \vdash p181 \otimes p186 \otimes p294 \otimes p4}
 file: MCC/AutoFlight_afcs_04_b_10_1.p (117074 ms)
 file: MCC/AutoFlight_afcs_04_b_1_1.p (1086 ms)
\overline{\Gamma: p0 \vdash p0} \quad \overline{\Gamma: p2 \vdash p2}
     \frac{\Gamma: p0, p0 \multimap p2 \vdash p2}{\Gamma: p0 \vdash p2} \star
  file: MCC/AutoFlight_afcs_04_b_5_1.p (4650 ms)
```

```
\frac{\overline{\Gamma: p248 \vdash p248} \quad \overline{\Gamma: p3 \vdash p3}}{\underline{\Gamma: p248, p3 \vdash p248 \otimes p3}} \otimes \frac{\overline{\Gamma: p369 \vdash p369}}{\overline{\Gamma: p248, p3, p369 \vdash p248 \otimes p3 \otimes p369}} \otimes \frac{\overline{\Gamma: p386 \vdash p386}}{\overline{\Gamma: p386 \vdash p386}} \otimes \frac{\overline{\Gamma: p386 \vdash p386}}{\overline{
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       \Gamma: \ p248, p3, p369, p386 \vdash p248 \otimes p3 \otimes p369 \otimes p386 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           \Gamma: \ \underline{\Delta \vdash p248 \otimes p3 \otimes p369 \otimes p386} \ \_\circ
                                                                                                                                                                                                                                                                                                                                                  \Gamma: p247 \vdash p247
                                                                                                                                                                                                                                                                                                                                                                          \begin{array}{c} p241 + p241 \\ \hline \Gamma : p247, p3, p386, p247 \multimap p369 \otimes p248 \vdash p248 \otimes p389 \otimes p386 \\ \hline \end{array} \\ \begin{array}{c} D_C \\ \hline \end{array} 
                                                                                                                                                                                                                                                                                                                                                                                                                                      \Gamma: p247, p3, p386 \vdash p248 \otimes p3 \otimes p369 \otimes p386
                                                                                                                                                                                                                                                                                                                                                                                                                                                                     \Gamma : \Delta \vdash p248 \otimes p3 \otimes p369 \otimes p386 \longrightarrow
                                                                                                                                                                                                                                            \Gamma: p246 \vdash p246
                                                                                                                                                                                                                                                                             \frac{1}{\Gamma} : p246, p3, p246 - p386 \otimes p247 \vdash p248 \otimes p3 \otimes p369 \otimes p386} D_C
                                                                                                                                                                                                                                                                                                                                        \Gamma: p246, p3 \vdash p248 \otimes p3 \otimes p369 \otimes p386
                                                                                                                                                                                                                                                                                                                                                      \Gamma: \Delta \vdash \underline{p248 \otimes p3 \otimes p369 \otimes p386} \rightarrow
                                                                                                                                                             \Gamma: p1 \vdash p1
                                                                                                                                                                                                           \frac{\Gamma \colon p1, p1 \multimap p246 \otimes p3 \vdash p248 \otimes p3 \otimes p369 \otimes p386}{\Gamma \colon p1, p1 \multimap p246 \otimes p3 \vdash p248 \otimes p3 \otimes p369 \otimes p386} D_C
                                                                                                                                                                                                                                                    \Gamma: p1 \vdash p248 \otimes p3 \otimes p369 \otimes p386
                                                                                                                                          \frac{\overline{\Gamma}: \ p2, p2 \multimap p1 \vdash p248 \otimes p3 \otimes p369 \otimes p386}}{\underline{\Gamma}: \ p2 \vdash p248 \otimes p3 \otimes p369 \otimes p386}} \ D_C
                                                        \frac{\Gamma: p0, p0 \multimap p2 \vdash p248 \otimes p3 \otimes p369 \otimes p386}{\square} D_C
                                                                                    \Gamma: p0 \vdash p248 \otimes p3 \otimes p369 \otimes p386
                                                                                    \overline{\Gamma: \ \Delta \vdash p248 \otimes p3 \otimes p369 \otimes p386}
        file: MCC/AutoFlight_afcs_05_b_1_1.p (1814 ms)
\frac{\overline{\Gamma:\ p0\vdash p0}\quad \overline{\Gamma:\ p2\vdash p2}}{\frac{\Gamma:\ p0\vdash p0 - op2\vdash p2}{\Gamma:\ p0\vdash p2}} \stackrel{\frown}{\longrightarrow} D_C
         file: MCC/AutoFlight_afcs_05_b_5_1.p (7526 ms)
                                                                                                                                                                                                                                                                                                                                                                                                                                                         \frac{ \frac{\Gamma : \ p3 \vdash p3}{\Gamma : \ p3.09 \vdash p3.09} \quad \otimes \quad }{ \frac{\Gamma : \ p3.0909 \vdash p3 \otimes p309}{\Gamma : \ p3.0309, p461 \vdash p3 \otimes p309 \otimes p461} } \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p3.0309, p461 \vdash p3 \otimes p309 \otimes p461}{\Gamma : \ p4.781 \vdash p4.781}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}}} \otimes \frac{ \Gamma : \ p4.781 \vdash p4.781}{ \frac{\Gamma : \ p4.781 \vdash p4.781}{\Gamma : \ p4.781 \vdash p4.781}}} \otimes \frac{ \Gamma : \ p4.781 \vdash p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       \Gamma: p3, p309, p461, p478 \vdash p3 \otimes p309 \otimes p461 \otimes p478 \star \star
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       \frac{\Gamma: \ \Delta \vdash p3 \otimes p309 \otimes p461 \otimes p478}{\square} \rightarrow
                                                                                                                                                                                                                                                                                                                                                  \Gamma: p308 \vdash p308
                                                                                                                                                                                                                                                                                                                                                                           \Gamma: \ \underline{p3, p308, p478, p308} \multimap \underline{p461} \otimes \underline{p309} \vdash \underline{p3} \otimes \underline{p309} \otimes \underline{p461} \otimes \underline{p478} \ \underline{D_C}
                                                                                                                                                                                                                                                                                                                                                                                                                                     \Gamma: p3, p308, p478 \vdash p3 \otimes p309 \otimes p461 \otimes p478
                                                                                                                                                                                                                                                                                                                                                                                                                                                                  \Gamma: \Delta \vdash p3 \otimes p309 \otimes p461 \otimes p478
                                                                                                                                                                                                                                            \Gamma: p307 \vdash p307
                                                                                                                                                                                                                                                                           \frac{301}{\Gamma} : p307, p307, p307 \multimap p478 \otimes p308 \vdash p3 \otimes p309 \otimes p461 \otimes p478}{D_C}
                                                                                                                                                                                                                                                                                                                                      \Gamma: p3, p307 \vdash p3 \otimes p309 \otimes p461 \otimes p478
                                                                                                                                                                                                                                                                                                                                                   \Gamma: \Delta \vdash p3 \otimes p309 \otimes p461 \otimes p478
                                                                                                                                                                                                        \Gamma: p1, p1 \multimap p307 \otimes p3 \vdash p3 \otimes p309 \otimes p461 \otimes p478
                                                                                                                                                                                                                                   \frac{\Gamma: p1 \vdash p3 \otimes p309 \otimes p461 \otimes p478}{\Gamma: p1 \vdash p3 \otimes p309 \otimes p461 \otimes p478} \rightarrow
                                                                                \Gamma: p2 \vdash p2
                                                                                                                                          \frac{\Gamma : \ p2, p2 \multimap p1 \vdash p3 \otimes p309 \otimes p461 \otimes p478}{\Gamma : \ p2 \vdash p3 \otimes p309 \otimes p461 \otimes p478} \ D_C
  \Gamma: p0 \vdash p0
                                                          \frac{1}{\Gamma}: \ \underline{p0,p0} - \underline{p2} \vdash \underline{p3} \otimes \underline{p309} \otimes \underline{p461} \otimes \underline{p478} \\ \underline{D_C}
                                                                                  \frac{\Gamma: p0 \vdash p3 \otimes p309 \otimes p461 \otimes p478}{1 \otimes p478} \star
                                                                                    \overline{\Gamma: \ \Delta \vdash p3 \otimes p309 \otimes p461 \otimes p478}
      file: MCC/AutoFlight_afcs_06_b_1_1.p (2507 ms)
 \frac{\overline{\Gamma:\ p0\vdash p0}\quad \overline{\Gamma:\ p2\vdash p2}}{\frac{\Gamma:\ p0\vdash p0 - \circ p2\vdash p2}{\Gamma:\ p0\vdash p2}} \stackrel{-\circ}{D_C}
         file: MCC/AutoFlight_afcs_06_b_5_1.p (10496 ms)
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\frac{\overline{\Gamma: p3\vdash p3} \quad \overline{\Gamma: p370\vdash p370}}{\underline{\Gamma: p3, p370\vdash p38\otimes p370}} \otimes \frac{\overline{\Gamma: p553\vdash p553}}{\underline{\Gamma: p570\vdash p570\vdash p570}} \otimes \frac{\overline{\Gamma: p570\vdash p570}}{\underline{\Gamma: p570\vdash p570\vdash p570}} \otimes \frac{\overline{\Gamma: p570\vdash p570}}{\underline{\Gamma: p570\vdash p570\vdash p570}} \otimes \frac{\overline{\Gamma: p570\vdash p570\vdash p570}}{\underline{\Gamma: p570\vdash p570\vdash p570\vdash p570}} \otimes \frac{\overline{\Gamma: p570\vdash p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        \Gamma: p3, p370, p553, p570 \vdash p3 \otimes p370 \otimes p553 \otimes p570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \Gamma: \Delta \vdash p3 \otimes p370 \otimes p553 \otimes p570  \multimap
                                                                                                                                                                                                                                                                                                                                                                                                                                            \overline{\Gamma: p369 \vdash p369}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                           \begin{array}{c} p_{009} + p_{009} \\ \hline \Gamma : p_3, p_{369}, p_{570}, p_{369} \multimap p_{553} \otimes p_{370} \vdash p_3 \otimes p_{370} \otimes p_{553} \otimes p_{570} \\ \hline D_C \\ \end{array} 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       \Gamma: p3, p369, p570 \vdash p3 \otimes p370 \otimes p553 \otimes p570
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              \Gamma: p368 \vdash p368
                                                                                                                                                                                                                                                                                                                                                   \frac{1}{\Gamma} : \ p3, \underline{p368}, \underline{p368}, \underline{p368} - \underline{p570} \otimes \underline{p369} \vdash \underline{p3} \otimes \underline{p370} \otimes \underline{p553} \otimes \underline{p570} \ D_C
                                                                                                                                                                                                                                                                                                                                                                                                                                \Gamma: p3, p368 \vdash p3 \otimes p370 \otimes p553 \otimes p570
                                                                                                                                                                                                                                                                                                                                                                                                                                                   \Gamma: \ \Delta \vdash p3 \underline{\otimes p370 \otimes p553 \otimes p570} \ \_ 
                                                                                                                                                                                                      \Gamma: p1 \vdash p1
                                                                                                                                                                                                                                                                \frac{-p1}{\Gamma} : \underbrace{p1, p1 \multimap p368 \otimes p3 \vdash p3 \otimes p370 \otimes p553 \otimes p570}_{C} D_{C}
                                                                                                                                                                                                                                                                                                                        \Gamma: p1 \vdash p3 \otimes p370 \otimes p553 \otimes p570
                                                                                                                                                                               \frac{\Gamma:\ p2,p2\multimap p1\vdash p3\otimes p370\otimes p553\otimes p570}{\Gamma:\ p2\vdash p3\otimes p370\otimes p553\otimes p570}\ _{-\circ}D_{C}
                                                                      \frac{\Gamma: p0, p0 \multimap p2 \vdash p3 \otimes p370 \otimes p553 \otimes p570}{\Gamma: p0, p0 \multimap p2 \vdash p3 \otimes p370 \otimes p553 \otimes p570} D_C
                                                                                                       \frac{p_0, p_0 \multimap p_2 + p_0 \circledcirc p_0 }{\Gamma : p_0 \vdash p_3 \otimes p_3 70 \otimes p_5 53 \otimes p_5 70} \star
                                                                                                         \overline{\Gamma:\ \Delta \vdash p3 \otimes p370 \otimes p553 \otimes p570}
        file: MCC/AutoFlight_afcs_12_b_1_1.p (10975 ms)
\overline{\Gamma: p0 \vdash \underline{p0}} \quad \overline{\Gamma: p2 \vdash \underline{p2}} \quad _{-\circ}
                      \frac{\Gamma: p0, p0 \multimap p2 \vdash p2}{\Gamma: p0 \vdash p2} \star D_C
          file: MCC/AutoFlight_afcs_12_b_5_1.p (43171 ms)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    \frac{\overline{\Gamma: p1122 \vdash p1122} \quad \overline{\Gamma: p4 \vdash p4}}{\underline{\Gamma: p1122, p4 \vdash p1122 \otimes p4}} \otimes \frac{\overline{\Gamma: p730 \vdash p730}}{\underline{\Gamma: p1122, p4, p730 \vdash p1122 \otimes p4 \otimes p730}} \otimes \frac{\overline{\Gamma: p735 \vdash p735}}{\underline{\Gamma: p735 \vdash p735}} \otimes \frac{\overline{\Gamma: p735 \vdash p73
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 \Gamma: p1122, p4, p730, p735 \vdash p1122 \otimes p4 \otimes p730 \otimes p735
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \frac{\Gamma: \ \Delta \vdash p1122 \otimes p4 \otimes p730 \otimes p735}{\square} \rightarrow
                                                                                                                                                                                                                                                                                                                                                                                                                    \Gamma: p734 \vdash p734
                                                                                                                                                                                                                                                                                                                                                                                                                                                 \begin{array}{l} p_1 \\ \hline \Gamma: \\ p_4, p_7 \\ \hline 30, p_7 \\ \hline 34, p_7 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               \Gamma: p4, p730, p734 \vdash p1122 \otimes p4 \otimes p730 \otimes p735
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \Gamma: \Delta \vdash \underline{p1122 \otimes p4 \otimes p730 \otimes p735}_{-0}
                                                                                                                                                                                                                                                                                                                                                        \frac{1}{\Gamma}: p3, p734, p3 \multimap p730 \otimes p4 \vdash p1122 \otimes p4 \otimes p730 \otimes p735} D_C
                                                                                                                                                                                                                                                                                                                                                                                                                    \Gamma: \ p3, p734 \vdash p1122 \otimes p4 \otimes p730 \otimes p735 \\ \star
                                                                                                                                                                                                                                                                                                                                                                                                                                         \Gamma: \Delta \vdash p1122 \otimes p4 \otimes p730 \otimes p735
                                                                                                                                                                                                                                                         \frac{\Gamma : \ p1, p1 \multimap p734 \otimes p3 \vdash p1122 \otimes p4 \otimes p730 \otimes p735}{\Gamma : \ p1 \vdash p1122 \otimes p4 \otimes p730 \otimes p735} \ D_C
                                                                                                                                                                            \frac{\Gamma: \ p2, p2 \multimap p1 \vdash p1122 \otimes p4 \otimes p730 \otimes p735}{\Gamma: \ p2, p2 \multimap p1 \vdash p1122 \otimes p4 \otimes p730 \otimes p735} \ D_C
                                                                                                                                                                                                           \frac{p_2, p_2 \multimap p_1 + p_1 122 \odot p_2 \odot p_3}{\Gamma : p_2 \vdash p_1 122 \otimes p_4 \otimes p_7 30 \otimes p_7 35} \multimap
 \Gamma: p0 \vdash p0
                                                                        \frac{\Gamma: p0, p0 \multimap p2 \vdash p1122 \otimes p4 \otimes p730 \otimes p735}{200 - p2} D_C
                                                                                                           \Gamma: p0 \vdash p1122 \otimes p4 \otimes p730 \otimes p735 \star
                                                                                                         \Gamma: \Delta \vdash p1122 \otimes p4 \otimes p730 \otimes p735
          file: MCC/CSRepetitions_cs_repetitions-2-unfolded_1_1.p (5378 ms)
       file: MCC/CSRepetitions_cs_repetitions-2-unfolded_5_1.p (17933 ms)
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file: MCC/CircadianClock_circadian_clock-000001_100_1.p (1553 ms) $\frac{\Gamma \colon a \vdash a}{\Gamma \colon a, c_{cap} \vdash c_{cap}} \otimes \frac{\Gamma \colon da \vdash da}{\Gamma \colon a, c_{cap} \vdash a \otimes e_{cap}} \otimes \frac{\Gamma \colon da \vdash da}{\Gamma \colon dr \vdash dr} \otimes \frac{\Gamma \colon ma \vdash ma}{\Gamma \colon mr_{cap} \vdash mr_{cap}} \otimes \frac{\Gamma \colon r_{cap} \vdash r_{cap}}{\Gamma \colon r_{cap} \vdash r_{cap}} \otimes \frac{\Gamma \colon r_{cap} \vdash r_{cap}}{\Gamma \colon r_{cap} \vdash r_{cap}} \otimes \frac{\Gamma \colon r_{cap} \vdash r_{cap}}{\Gamma \colon r_{cap} \vdash r_{cap}} \otimes \frac{\Gamma \colon r_{cap} \vdash r_{cap}}{\Gamma \colon r_{cap} \vdash r_{cap}} \otimes \frac{\Gamma \colon r_{cap} \vdash r_{cap}}{\Gamma \colon r_{cap} \vdash r_{cap}} \otimes \frac{\Gamma \colon r_{cap} \vdash r_{cap}}{\Gamma \colon r_{cap} \vdash r_{cap}} \otimes \frac{\Gamma \colon r_{cap} \vdash r_{cap}}{\Gamma \colon r_{cap} \vdash r_{cap}} \otimes \frac{\Gamma \colon r_{cap} \vdash r_{cap}}{\Gamma \colon r_{cap}} \otimes \frac{\Gamma \colon r_{cap}}{\Gamma \colon r_{cap}} \times \frac{\Gamma \colon r_{cap}}{\Gamma \colon r_{cap}} \otimes \frac{\Gamma \colon r_{cap}}{\Gamma \colon r_{cap}} \otimes \frac{\Gamma$ $\overline{\Gamma : \ ma \vdash ma} \quad \overline{\Gamma : \ a_'cap \vdash a_'cap} \ \otimes$ $\Gamma: da \vdash da \quad \overline{\Gamma}: ma_'cap \vdash ma_'cap \otimes$ Γ : $da, ma_'cap \vdash da \otimes ma_'cap$ $\frac{\Gamma: \ a_' cap, c_' cap, da, dr, ma_' cap, mr_' cap, r_' cap \vdash a \otimes c_' cap \otimes da \otimes dr \otimes ma \otimes mr_' cap \otimes r_' cap}{\Gamma: \ \Delta \vdash a \otimes c_' cap \otimes da \otimes dr \otimes ma \otimes mr_' cap \otimes r_' cap} \star$ file: MCC/CircadianClock_circadian_clock-000001_10_1.p (1522 ms) $\frac{\Gamma\colon a\vdash a\quad \Gamma\colon c_'cap\vdash c_'cap}{\Gamma\colon a,c_'cap, da\land d \Rightarrow c_'cap\otimes da} \otimes \frac{\Gamma\colon da\vdash da}{\Gamma\colon a,c_'cap, da\land d \Rightarrow c_'cap\otimes da} \otimes \frac{\Gamma\colon dr\vdash dr}{\Gamma\colon a,c_'cap, da\land d \Rightarrow c_'cap\otimes da\otimes dr} \otimes \frac{\Gamma\colon dr\vdash dr}{\Gamma\colon a,c_'cap, da\land dr\vdash a\otimes c_'cap\otimes da\otimes dr} \otimes \frac{\Gamma\colon ma\vdash ma}{\Gamma\colon a,c_'cap, da, dr, ma\vdash a\otimes c_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon mr_'cap\vdash mr_'cap}{\Gamma\colon a,c_'cap, da, dr, ma, mr_'cap\vdash a\otimes c_'cap\otimes da\otimes dr\otimes ma\otimes mr_'cap} \otimes \frac{\Gamma\colon r_'cap\vdash r_'cap}{\Gamma\colon a_'cap\vdash a_'cap\otimes a\otimes dr\otimes dr\otimes ma\otimes mr_'cap\otimes r_'cap} \otimes \frac{\Gamma\colon a_'cap\vdash a_'cap\otimes a\otimes dr\otimes dr\otimes ma\otimes mr_'cap\otimes r_'cap}{\Gamma\colon a_'cap, ma\vdash ma\otimes a_'cap} \otimes \frac{\Gamma\colon a_'cap\land da, dr, ma, mr_'cap, r_'cap\vdash a\otimes c_'cap\otimes da\otimes dr\otimes ma\otimes mr_'cap\otimes r_'cap}{\Gamma\colon a_'cap, da, dr, ma, mr_'cap, r_'cap\vdash a\otimes c_'cap\otimes da\otimes dr\otimes ma\otimes mr_'cap\otimes r_'cap} \otimes \frac{\Gamma\colon a_'cap, da, dr, ma, mr_'cap, r_'cap\vdash a\otimes c_'cap\otimes da\otimes dr\otimes ma\otimes mr_'cap\otimes r_'cap}{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap\vdash a\otimes c_'cap\otimes da\otimes dr\otimes ma\otimes mr_'cap\otimes r_'cap} \otimes \frac{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap\vdash a\otimes c_'cap\otimes da\otimes dr\otimes ma\otimes mr_'cap\otimes r_'cap}{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap\vdash a\otimes c_'cap\otimes da\otimes dr\otimes ma\otimes mr_'cap\otimes r_'cap} \otimes \frac{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap\vdash a\otimes c_'cap\otimes da\otimes dr\otimes ma\otimes mr_'cap\otimes r_'cap}{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap\vdash a\otimes c_'cap\otimes da\otimes dr\otimes ma\otimes mr_'cap\otimes r_'cap} \otimes \frac{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap}{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap} \otimes \frac{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap}{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap} \otimes \frac{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap}{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap} \otimes \frac{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap}{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap} \otimes \frac{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap}{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap} \otimes \frac{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap}{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap} \otimes \frac{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap}{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap} \otimes \frac{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap}{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap} \otimes \frac{\Gamma\colon a_'cap, c_'ca$ $\Gamma: da \vdash da \quad \overline{\Gamma}: ma_'cap \vdash ma_'cap$ \otimes $\underline{\Gamma}: \ a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap \vdash a \otimes c_'cap \otimes da \otimes dr \otimes ma \otimes mr_'cap \otimes r_'cap \xrightarrow{\star} \underline{}$ $\Gamma: \Delta \vdash a \otimes c_'cap \otimes da \otimes dr \otimes ma \otimes mr_'cap \otimes r_'cap$ Γ : $da, ma_'cap \vdash da \otimes ma_'cap$ $\begin{array}{c} n_a = cap + aa \otimes ma = cap \\ \hline \Gamma : a = (cap, e, cap, da, dr, ma = (cap, mr = cap, r = cap + a \otimes e = cap \otimes da \otimes dr \otimes ma \otimes mr = cap \otimes r = cap$: $\Delta \vdash a \otimes c_'cap \otimes da \otimes dr \otimes ma \otimes mr_'cap \otimes r_'cap$ file: MCC/CircadianClock_circadian_clock-000001_1_1.p (1499 ms) $\frac{\Gamma\colon a_'cap\vdash a_'cap}{\Gamma\colon a_'cap\vdash a_'cap} \frac{\Gamma\colon c_'cap\vdash c_'cap}{\Gamma\colon a_'cap, c_'cap\vdash a_'cap\otimes c_'cap} \otimes \frac{\Gamma\colon da\vdash da}{\Gamma\colon a_'cap, c_'cap, da\vdash a_'cap\otimes c_'cap\otimes da} \otimes \frac{\Gamma\colon dr\vdash dr}{\Gamma\colon a_'cap, c_'cap, da\vdash a_'cap\otimes c_'cap\otimes da\otimes dr} \otimes \frac{\Gamma\colon ma\vdash ma}{\Gamma\colon ma\vdash ma} \otimes \frac{\Gamma\colon a_'cap, c_'cap, da, dr\vdash a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma}{\Gamma\colon a_'cap, c_'cap, da, dr, ma\vdash a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon mr_'cap\vdash mr_'cap}{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap\vdash a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma\otimes mr_'cap} \otimes \frac{\Gamma\colon r_'cap\vdash r_'cap}{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap\vdash a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma\otimes mr_'cap} \otimes \frac{\Gamma\colon r_'cap\vdash r_'cap}{\Gamma\colon a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap\vdash a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon r_'cap\vdash r_'cap}{\Gamma\colon r_'cap\vdash r_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma\otimes mr_'cap\otimes r_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon r_'cap\vdash r_'cap}{\Gamma\colon r_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap\vdash a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon r_'cap\vdash r_'cap}{\Gamma\colon r_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap\vdash a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon r_'cap\vdash r_'cap}{\Gamma\colon r_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap\vdash a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon r_'cap\vdash r_'cap}{\Gamma\colon r_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap\vdash a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon r_'cap\vdash r_'cap}{\Gamma\colon r_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap\vdash a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon r_'cap\vdash r_'cap}{\Gamma\colon r_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap\vdash a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon r_'cap\vdash r_'cap}{\Gamma\colon r_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap\vdash a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon r_'cap\vdash r_'cap}{\Gamma\colon r_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap\vdash a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon r_'cap\vdash r_'cap}{\Gamma\colon r_'cap, a_'cap, a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon r_'cap\vdash r_'cap}{\Gamma\colon r_'cap, a_'cap, a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon r_'cap\vdash r_'cap}{\Gamma\colon r_'cap, a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon r_'cap\vdash r_'cap}{\Gamma\colon r_'cap, a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon r_'cap}{\Gamma\colon r_'cap, a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon r_'cap}{\Gamma\colon r_'cap, a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon r_'cap}{\Gamma\colon r_'cap, a_'cap\otimes c_'cap\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon r_'cap}{\Gamma\colon r_'cap} \otimes \frac{\Gamma\colon r_'cap}{\Gamma\colon r_'cap} \otimes \frac{\Gamma\colon r_'cap}{\Gamma\colon r_'c$ $\overline{\Gamma: da \vdash da} \quad \overline{\Gamma: ma_'cap \vdash ma_'cap} _{\otimes}$ $\begin{array}{c} \Gamma\colon a \ 'cap, c \ 'cap, d_a, dr, ma, mr \ 'cap, r \ 'cap \ b \ a \ 'cap \otimes da \otimes dr \otimes ma \otimes mr \ 'cap \otimes r \ 'cap \otimes r$ Γ : $da, ma_'cap \vdash da \otimes ma_'cap$ $\Gamma: a_' cap, c_' cap, da, dr, ma_' cap, mr_' cap, r_' cap, da \otimes ma_' cap \rightarrow ma \otimes da \vdash a_' cap \otimes c_' cap \otimes da \otimes dr \otimes ma \otimes mr_' cap \otimes r_' cap \\ \Gamma: a_' cap, c_' cap, da, dr, ma_' cap, mr_' cap, r_' cap \vdash a_' cap \otimes c_' cap \otimes da \otimes dr \otimes ma \otimes mr_' cap \otimes r_' cap \\ \longrightarrow \Gamma: a_' cap, c_' cap, da, dr, ma_' cap, mr_' cap, r_' cap \vdash a_' cap \otimes c_' cap \otimes da \otimes dr \otimes ma \otimes mr_' cap \otimes r_' cap \\ \longrightarrow \Gamma: a_' cap, c_' cap, da, dr, ma_' cap, mr_' cap, mr_' cap, r_' cap \vdash a_' cap \otimes c_' cap \otimes da \otimes dr \otimes ma \otimes mr_' cap \otimes r_' cap \\ \longrightarrow \Gamma: a_' cap, c_' cap, da, dr, ma_' cap, mr_' cap, mr_' cap, r_' cap \vdash a_' cap \otimes c_' cap \otimes da \otimes dr \otimes ma \otimes mr_' cap \otimes r_' cap \\ \longrightarrow \Gamma: a_' cap, c_' cap, da, dr, ma_' cap, mr_' cap, r_' cap \vdash a_' cap \otimes c_' cap \otimes da \otimes dr \otimes ma \otimes mr_' cap \otimes r_' cap \\ \longrightarrow \Gamma: a_' cap, c_' cap, da, dr, ma_' cap, mr_' cap,$ $\Gamma: \ \Delta \vdash a_'cap \otimes c_'cap \otimes da \otimes dr \otimes ma \otimes mr_'cap \otimes r_'cap$ file: MCC/CircadianClock_circadian_clock-000001_20_1.p (1555 ms) $\frac{\Gamma \colon a \vdash a}{\Gamma \colon a, c \underline{-cap} \vdash c \underline{-cap}} \otimes \frac{\Gamma \colon da \vdash da}{\Gamma \colon a, c \underline{-cap} \vdash a \otimes c \underline{-cap}} \otimes \frac{\Gamma \colon da \vdash da}{\Gamma \colon dr \vdash dr} \otimes \frac{\Gamma \colon ma \vdash ma}{\Gamma \colon mr \underline{-cap} \vdash mr \underline{-cap}} \otimes \frac{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}}{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}} \otimes \frac{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}}{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}} \otimes \frac{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}}{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}} \otimes \frac{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}}{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}} \otimes \frac{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}}{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}} \otimes \frac{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}}{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}} \otimes \frac{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}}{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}} \otimes \frac{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}}{\Gamma \colon r \underline{-cap}} \otimes \frac{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}}{\Gamma \colon r \underline{-cap}} \otimes \frac{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}}{\Gamma \colon r \underline{-cap}} \otimes \frac{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}}{\Gamma \colon r \underline{-cap}} \otimes \frac{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}}{\Gamma \colon r \underline{-cap}} \otimes \frac{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}}{\Gamma \colon r \underline{-cap}} \otimes \frac{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}}{\Gamma \colon r \underline{-cap}} \otimes \frac{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}}{\Gamma \colon r \underline{-cap}} \otimes \frac{\Gamma \colon r \underline{-cap}}{\Gamma \colon r \underline{-cap}} \otimes \frac{\Gamma \colon r \underline{-cap} \vdash r \underline{-cap}}{\Gamma \colon r \underline{-cap}} \otimes \frac{\Gamma \colon r \underline{-cap}}{\Gamma \colon r \underline{-cap}}$ $\Gamma: ma \vdash ma \qquad \overline{\Gamma: a_'cap \vdash a_'cap} \otimes$ $\frac{\Gamma: a_'cap, ma \vdash ma \otimes a_'cap}{\Gamma: a_'cap, ma \vdash ma \otimes a_'cap} = \frac{\Gamma: a_'cap, da, dr, ma, mr_'cap, r_'cap, ma \otimes a_'cap \multimap a \otimes mr_'cap \otimes r_'cap \otimes da \otimes dr \otimes ma \otimes mr_'cap \otimes r_'cap}{\Gamma: a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap, ma \otimes a_'cap \multimap a \otimes ma \vdash a \otimes c_'cap \otimes da \otimes dr \otimes ma \otimes mr_'cap \otimes r_'cap} Dc}{\Gamma: a_'cap, c_'cap, da \otimes ma_'cap} \times \frac{\Gamma: a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap}{\Gamma: a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap} + \alpha \otimes c_'cap \otimes da \otimes dr \otimes ma \otimes mr_'cap \otimes r_'cap \otimes r_'cap \otimes r_'cap} \times \frac{\Gamma: a_'cap, c_'cap, da \otimes ma_'cap}{\Gamma: a_'cap, c_'cap, da \otimes ma_'cap} \times \frac{\Gamma: a_'cap, c_'cap, da \otimes ma_'cap}{\Gamma: a_'cap, c_'cap, da \otimes dr \otimes ma \otimes mr_'cap \otimes r_'cap} \times \frac{\Gamma: a_'cap, c_'cap, da \otimes ma_'cap}{\Gamma: a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap} \times \frac{\Gamma: a_'cap, c_'cap, da \otimes ma_'cap}{\Gamma: a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap} \times \frac{\Gamma: a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap}{\Gamma: a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap} \times \frac{\Gamma: a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap}{\Gamma: a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap} \times \frac{\Gamma: a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap}{\Gamma: a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap} \times \frac{\Gamma: a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap}{\Gamma: a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap} \times \frac{\Gamma: a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap}{\Gamma: a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap} \times \frac{\Gamma: a_'cap, c_'cap, da, dr, ma, mr_'cap, r_'cap, a_'cap, a_'cap$ $: a_'cap, ma \vdash ma \otimes a_'cap$

file: MCC/CircadianClock_circadian_clock-000001_50_1.p (1591 ms)

 $\frac{\Gamma : \ a_'cap, e_'cap, da, dr, ma_'cap, mr_'cap, r_'cap \vdash a \otimes e_'cap \otimes da \otimes dr \otimes ma \otimes mr_'cap \otimes r_'cap}{\Gamma : \ \Delta \vdash a \otimes e_'cap \otimes da \otimes dr \otimes ma \otimes mr_'cap \otimes r_'cap} \ \star$

 $\Gamma: da \vdash da \quad \overline{\Gamma}: ma_'cap \vdash ma_'cap \otimes$ Γ : $da, ma_'cap \vdash da \otimes ma_'cap$

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 \frac{\overline{\Gamma \colon a \vdash a} \quad \overline{\Gamma \colon c\_' cap \vdash c\_' cap}}{\Gamma \colon a\_c\_' cap \vdash a \otimes c\_' cap \otimes da} \otimes \frac{\overline{\Gamma \colon dr \vdash dr}}{\Gamma \colon dr \vdash dr} \otimes \frac{\overline{\Gamma \colon ma \vdash ma}}{\Gamma \colon ma \vdash ma} \otimes \frac{\overline{\Gamma \colon mr\_' cap} \vdash mr\_' cap}{\Gamma \colon r\_' cap \vdash r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \otimes \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \cong \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' cap} \cong \frac{\overline{\Gamma \colon r\_' cap} \vdash r\_' cap}{\Gamma \colon r\_' c
                                                                                                                                                                                                                                                                                                                                                                                                                             \Gamma: ma \vdash ma \quad \overline{\Gamma: a\_'cap \vdash a\_'cap} \otimes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              \Gamma: \Delta \vdash a \otimes c\_'cap \otimes da \otimes dr \otimes ma \otimes mr\_'cap \otimes r\_'cap \multimap
                                                                                                                                                                                                                                                                                                                                                                                                                                                        \Gamma: a\_'cap, ma \vdash ma \otimes a\_'cap
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          \begin{array}{c} a \cdot ma \otimes a \cdot cap \\ \hline \Gamma : a \cdot (cap, c, -(cap, da, dr, ma, mr_-'cap, r_-'cap, ma \otimes a_-'cap - o \otimes ma \vdash a \otimes c_-'cap \otimes da \otimes dr \otimes ma \otimes m_-'cap \otimes r_-'cap \\ \hline \Gamma : a \cdot (cap, c, -(cap, da, dr, ma, mr_-'cap, r_-'cap \vdash a \otimes c_-'cap \otimes da \otimes dr \otimes ma \otimes mr_-'cap \otimes r_-'cap \\ \hline \Gamma : \Delta \vdash a \otimes c_-'cap \otimes da \otimes dr \otimes ma \otimes mr_-'cap \otimes r_-'cap \\ \hline \Gamma : \Delta \vdash a \otimes c_-'cap \otimes da \otimes dr \otimes ma \otimes mr_-'cap \otimes r_-'cap \\ \end{array} \begin{array}{c} \bullet \\ \bullet \\ \bullet \end{array}
\Gamma: da \vdash da \Gamma: ma\_'cap \vdash ma\_'cap \otimes
                           \Gamma: da, ma\_'cap \vdash da \otimes ma\_'cap
                                                                                                                \frac{1}{\Gamma} : \underline{a'} cap, \underline{c'} cap, \underline{da}, \underline{dr}, \underline{ma'} cap, \underline{mr'} cap, \underline{r'} cap, \underline{da} \otimes \underline{ma'} cap - 0 \underline{ma} \otimes \underline{da} \vdash \underline{a} \otimes \underline{c'} cap \otimes \underline{da} \otimes \underline{dr} \otimes \underline{ma} \otimes \underline{mr'} cap \otimes \underline{r'} cap \underbrace{D_C}
                                                                                                                                                                                                                                    \frac{\Gamma \colon a\_'cap, c\_'cap, da, dr, ma\_'cap, mr\_'cap, r\_'cap \vdash a \otimes c\_'cap \otimes da \otimes dr \otimes ma \otimes mr\_'cap \otimes r\_'cap}{\Gamma \colon \Delta \vdash a \otimes c\_'cap \otimes da \otimes dr \otimes ma \otimes mr\_'cap \otimes r\_'cap} \star
             file: MCC/CircadianClock_circadian_clock-000001_5_1.p (1510 ms)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                            \frac{\Gamma\colon a\_{cap}\vdash a\_{cap}}{\Gamma\colon a\_{cap}\vdash a\_{cap}} \frac{\Gamma\colon c\_{cap}\vdash c\_{cap}}{\Gamma\colon a\_{cap}, c\_{cap}\vdash a\_{cap}\otimes c\_{cap}} \otimes \frac{\Gamma\colon da\vdash da}{\Gamma\colon a\_{cap}, c\_{cap}\vdash a\_{cap}\otimes c\_{cap}\otimes da} \otimes \frac{\Gamma\colon dr\vdash dr}{\Gamma\colon a\_{cap}, c\_{cap}, da\vdash a\_{cap}\otimes c\_{cap}\otimes da} \otimes \frac{\Gamma\colon dr\vdash dr}{\Gamma\colon a\_{cap}, c\_{cap}, da\vdash a\_{cap}\otimes c\_{cap}\otimes da\otimes dr} \otimes \frac{\Gamma\colon ma\vdash ma}{\Gamma\colon a\_{cap}, c\_{cap}, da\vdash a\_{cap}\otimes c\_{cap}\otimes da\otimes dr\otimes ma} \otimes \frac{\Gamma\colon mr\_{cap}\vdash mr\_{cap}}{\Gamma\colon a\_{cap}, c\_{cap}, da\vdash a\_{cap}\otimes c\_{cap}\otimes da\otimes dr\otimes ma\otimes mr\_{cap}} \otimes \frac{\Gamma\colon r\_{cap}\vdash r\_{cap}}{\Gamma\colon a\_{cap}, c\_{cap}, da\vdash a\_{cap}\otimes c\_{cap}\otimes da\otimes dr\otimes ma\otimes mr\_{cap}\otimes r\_{cap}\otimes r\_{cap
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \frac{\Gamma \colon a\_' cap, c\_' cap, da, dr, ma, mr\_' cap, r\_' cap \vdash a\_' cap \otimes c\_' cap \otimes da \otimes dr \otimes ma \otimes mr\_' cap \otimes r\_' cap}{\Gamma \colon \Delta \vdash a\_' cap \otimes c\_' cap \otimes da \otimes dr \otimes ma \otimes mr\_' cap \otimes r\_' cap} \star \frac{\Gamma \colon \Delta \vdash a\_' cap \otimes c\_' cap \otimes da \otimes dr \otimes ma \otimes mr\_' cap \otimes r\_' cap}{\Gamma \colon \Delta \vdash a\_' cap \otimes c\_' cap \otimes da \otimes dr \otimes ma \otimes mr\_' cap \otimes r\_' cap} \star \frac{\Gamma \colon \Delta \vdash a\_' cap \otimes c\_' cap \otimes da \otimes dr \otimes ma \otimes mr\_' cap \otimes r\_' cap}{\Gamma \colon \Delta \vdash a\_' cap \otimes c\_' cap \otimes da \otimes dr \otimes ma \otimes mr\_' cap \otimes r\_' cap} \star \frac{\Gamma \colon \Delta \vdash a\_' cap \otimes c\_' cap \otimes da \otimes dr \otimes ma \otimes mr\_' cap \otimes r\_' cap}{\Gamma \colon \Delta \vdash a\_' cap \otimes c\_' cap \otimes da \otimes dr \otimes ma \otimes mr\_' cap \otimes r\_' cap} \star \frac{\Gamma \colon \Delta \vdash a\_' cap \otimes c\_' cap \otimes da \otimes dr \otimes ma \otimes mr\_' cap \otimes r\_' cap}{\Gamma \colon \Delta \vdash a\_' cap \otimes c\_' cap \otimes da \otimes dr \otimes ma \otimes mr\_' cap \otimes r\_' cap} \star \frac{\Gamma \colon \Delta \vdash a\_' cap \otimes c\_' cap \otimes da \otimes dr \otimes ma \otimes mr\_' cap \otimes r\_' cap}{\Gamma \colon \Delta \vdash a\_' cap \otimes c\_' cap \otimes da \otimes dr \otimes ma \otimes mr\_' cap \otimes r\_' cap} \star \frac{\Gamma \colon \Delta \vdash a\_' cap \otimes c\_' cap \otimes da \otimes dr \otimes ma \otimes mr\_' cap \otimes r\_' cap}{\Gamma \colon \Delta \vdash a\_' cap \otimes c\_' cap \otimes da \otimes dr \otimes ma \otimes mr\_' cap \otimes r\_' cap} \star \frac{\Gamma \colon \Delta \vdash a\_' cap \otimes c\_' cap 
\Gamma: da \vdash da \Gamma: ma\_'cap \vdash ma\_'cap \otimes
                                  \Gamma : da, ma\_'cap \vdash da \otimes ma\_'cap
                                                                                                                                                                   \frac{\Gamma \colon a\_' cap, c\_' cap, da, dr, ma\_' cap, mr\_' cap, r\_' cap, da \otimes ma\_' cap \multimap ma \otimes da \vdash a\_' cap \otimes c\_' cap \otimes da \otimes dr \otimes ma \otimes mr\_' cap \otimes r\_' cap}{\Gamma \colon a\_' cap, c\_' cap, da, dr, ma\_' cap, mr\_' cap, r\_' cap \vdash a\_' cap \otimes c\_' cap \otimes da \otimes dr \otimes ma \otimes mr\_' cap \otimes r\_' cap} \xrightarrow{\star} D_C
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \Gamma: \Delta \vdash a\_'cap \otimes c\_'cap \otimes da \otimes dr \otimes ma \otimes mr\_'cap \otimes r\_'cap
             file: MCC/CloudDeployment_deploy_2_a_100_1.p (73332 ms)
                                                                                                                                                       \frac{ \frac{\Gamma \colon p2 \vdash p2}{\Gamma \colon p28 \vdash p28} }{ \frac{\Gamma \colon p2, p28 \vdash p28}{\Gamma \colon p30 \vdash p30}} \otimes \frac{\Gamma \colon p30 \vdash p30}{\Gamma \colon p32 \vdash p32} \otimes \frac{\Gamma \colon p32 \vdash p32}{\Gamma \colon p2, p28, p30 \vdash p2 \otimes p28 \otimes p30} \otimes \frac{\Gamma \colon p32 \vdash p32}{\Gamma \colon p4 \vdash p4} \otimes \frac{\Gamma \colon p56 \vdash p56}{\Gamma \colon p56 \vdash p56} \otimes \frac{\Gamma \colon p65 \vdash p65}{\Gamma \colon p65 \vdash p65} \otimes \frac{\Gamma \colon p65 \vdash p65}{\Gamma \colon p65 \vdash p65} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash p67}{\Gamma \colon p67 \vdash p67} \otimes \frac{\Gamma \colon p67 \vdash 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \Gamma: \ \underline{\Delta \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67}_{-\circ}
\Gamma: p0 \vdash p0
                                                                                                                                                                          \Gamma: \ p0, \underline{p0} \multimap p67 \otimes p63 \otimes p65 \otimes p56 \otimes p32 \otimes p30 \otimes p28 \otimes p4 \otimes p2 \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ D_{G} \longrightarrow p67 \otimes p
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      \frac{\Gamma: p0 \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67}{\Gamma: \Delta \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67} \star
             file: MCC/CloudDeployment_deploy_2_a_10_1.p (73172 ms)
                                                                                                                                                                                               \Gamma: p2 \vdash p2 \quad \overline{\Gamma}: p28 \vdash p28
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   \frac{\Gamma: \ p2, p28, p30, p32, p4, p56, p63, p65 \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65}{\Gamma: \ p2, p28, p30, p32, p4, p56, p63, p65, p67, p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65}{\Gamma: \ p2, p28, p30, p32, p4, p56, p63, p65, p67, p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67} \times \frac{\Gamma: \ p67 \vdash p67 \vdash p67 \mid 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \Gamma: \ \Delta \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67
\Gamma: p0 \vdash p0
                                                                                                                                                                          \Gamma: \ p0, p0 \multimap p67 \otimes p63 \underline{\otimes} p65 \otimes p56 \otimes p32 \otimes p30 \otimes p28 \otimes p4 \otimes p2 \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ D_{C} = p0, p0 \multimap p67 \otimes p63 \underline{\otimes} p65 \otimes p56 \otimes p32 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ D_{C} = p0, p0 \multimap p67 \otimes p63 \underline{\otimes} p65 \otimes p56 \otimes p32 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ D_{C} = p0, p0 \multimap p67 \otimes p63 \underline{\otimes} p65 \otimes p56 \otimes p32 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ D_{C} = p0, p0 \multimap p67 \otimes p63 \underline{\otimes} p65 \otimes p56 \otimes p32 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ D_{C} = p0, p0 \multimap p67 \otimes p63 \underline{\otimes} p65 \otimes p56 \otimes p56
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      \Gamma:\ p0 \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      \frac{ }{\Gamma : \ \Delta \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67} }{ \Gamma : \ \Delta \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67} } \ \star
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\frac{\overline{\Gamma\colon p2\vdash p2}}{\Gamma\colon p2} \frac{\overline{\Gamma\colon p28\vdash p28}}{\Gamma\colon p28\vdash p2} \otimes \frac{\overline{\Gamma\colon p30\vdash p30}}{\Gamma\colon p30\vdash p30} \otimes \frac{\overline{\Gamma\colon p32\vdash p32}}{\Gamma\colon p30\vdash p30} \otimes \frac{\overline{\Gamma\colon p32\vdash p32}}{\Gamma\colon p4\vdash p4} \otimes \frac{\overline{\Gamma\colon p56\vdash p56}}{\Gamma\colon p56\vdash p56} \otimes \frac{\overline{\Gamma\colon p65\vdash p65}}{\Gamma\colon p65\vdash p65} \otimes \frac{\overline{\Gamma\colon p65\vdash
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    \frac{\Gamma : \ p2, p28, p30, p32, p4, p56, p63, p65, p67 \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67}{\Gamma : \ \Delta \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67} \star
   \Gamma: p0 \vdash p0
                                                                                                                                                              \Gamma: \ p0, p0 \multimap p67 \otimes p63 \otimes p65 \otimes p56 \otimes p32 \otimes p30 \otimes p28 \otimes p4 \otimes p2 \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        \Gamma: p0 \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     \frac{1}{\Gamma: \ \Delta \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67} \star
         file: MCC/CloudDeployment_deploy_2_a_20_1.p (73694 ms)
                                                                                                                                            \frac{\overline{\Gamma: p2 \vdash p2} \quad \overline{\Gamma: p28 \vdash p28}}{\Gamma: p2} \otimes \frac{\overline{\Gamma: p30 \vdash p30}}{\Gamma: p30 \vdash p30} \otimes \frac{\overline{\Gamma: p32 \vdash p32}}{\Gamma: p30 \vdash p30} \otimes \frac{\overline{\Gamma: p32 \vdash p32}}{\Gamma: p4 \vdash p4} \otimes \frac{\overline{\Gamma: p56 \vdash p56}}{\Gamma: p56 \lor p56} \otimes \frac{\overline{\Gamma: p65 \vdash p65}}{\Gamma: p65 \vdash p65} \otimes \frac{\overline{\Gamma: p67 \vdash p67}}{\Gamma: p67 \vdash p67} \otimes \frac{\overline{\Gamma: p67 \vdash p67}}{\Gamma: p67 \vdash p67}} \otimes \frac{\overline{\Gamma: p67 \vdash p67}}{\Gamma: p67 \vdash p67} \otimes \frac{\overline{\Gamma: p67 \vdash p67}}{\Gamma: p67 \vdash p67} \otimes \frac{\overline{\Gamma: p67 \vdash p67}}{\Gamma: p67 \vdash p67}} \otimes \frac{\overline{\Gamma: p67 \vdash p67}}{\Gamma: p67 \vdash p67} \otimes \frac{\overline{\Gamma
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       \Gamma: \ p2, p28, p30, p32, p4, p56, p63, p65, p67 \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p3 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p67 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p67 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p67 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p67 \otimes p67 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p67 \otimes p67 \otimes p67 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p67 \otimes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          \Gamma: \Delta \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67
\Gamma: p0 \vdash p0
                                                                                                                                                        \Gamma: \ p0, p0 \multimap p67 \otimes p63 \otimes p65 \otimes \underline{p56} \otimes \underline{p36} \otimes p32 \otimes p30 \otimes \underline{p28} \otimes p4 \otimes p2 \vdash \underline{p2} \otimes \underline{p28} \otimes \underline{p30} \otimes \underline{p32} \otimes \underline{p4} \otimes \underline{p56} \otimes \underline{p63} \otimes \underline{p65} \otimes \underline{p67} \ D_{G}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     \Gamma: p0 \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 \frac{1}{\Gamma:\ \Delta \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67} \star
         file: MCC/CloudDeployment_deploy_2_a_50_1.p (74096 ms)
                                                                                                                                         \frac{\overline{\Gamma\colon p2\vdash p2} \quad \overline{\Gamma\colon p28\vdash p28}}{\underline{\Gamma\colon p2, p28\vdash p28} \quad p28} \otimes \frac{\overline{\Gamma\colon p30\vdash p30}}{\underline{\Gamma\colon p30\vdash p30}} \otimes \frac{\overline{\Gamma\colon p32\vdash p32}}{\underline{\Gamma\colon p4\vdash p4}} \otimes \frac{\overline{\Gamma\colon p4\vdash p4}}{\underline{\Gamma\colon p56\vdash p56}} \otimes \frac{\overline{\Gamma\colon p65\vdash p65}}{\underline{\Gamma\colon p65\vdash p65}} \otimes \frac{\overline{\Gamma\colon p65\vdash p65}}{\underline{\Gamma\colon p65\vdash p65}}} \otimes \frac{\overline{\Gamma\colon p65\vdash p65}}{\underline{\Gamma\colon p65\vdash p65}} \otimes \frac{\overline{\Gamma\colon
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          \Gamma: \ p2, p28, p30, p32, p4, p56, p63, p65, p67 \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             \frac{\Gamma: \ \Delta \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67}{}_{-\circ}
                                                                                                                                                           \Gamma: \ p0, p0 \multimap p67 \otimes p63 \underline{\otimes p65 \otimes p56 \otimes p32 \otimes p30 \otimes p28 \otimes p4 \otimes p2 \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67} \ D_{C}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     \Gamma: p0 \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 \frac{1}{\Gamma:\ \Delta \vdash p2\otimes p28\otimes p30\otimes p32\otimes p4\otimes p56\otimes p63\otimes p65\otimes p61}\star
         file: MCC/CloudDeployment_deploy_2_a_5_1.p (74148 ms)
                                                                                                                                            \frac{\overline{\Gamma: p2 \vdash p2} \quad \overline{\Gamma: p28 \vdash p28} \quad \otimes \quad \overline{\Gamma: p30 \vdash p30}}{\Gamma: p30 \vdash p30} \otimes \frac{\overline{\Gamma: p32 \vdash p32}}{\Gamma: p30 \vdash p30} \otimes \frac{\overline{\Gamma: p32 \vdash p32}}{\Gamma: p4 \vdash p4} \otimes \frac{\overline{\Gamma: p56 \vdash p56}}{\Gamma: p56 \vdash p56} \otimes \frac{\overline{\Gamma: p65 \vdash p65}}{\Gamma: p65 \vdash p65} \otimes \frac{\overline{\Gamma: p67 \vdash p67}}{\Gamma: p67 \vdash p67} \otimes \frac{\overline{\Gamma: p67 \vdash p67}}{\Gamma: p67 \vdash p67}}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       \Gamma: \ p2, p28, p30, p32, p4, p56, p63, p65, p67 \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p3 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p67 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p67 \otimes p67 \otimes p67 \\ + p4 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p67 \otimes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   \Gamma: \Delta \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 
                                                                                                                                                              \Gamma: \ p0, p0 \ \_{\circ} \ p67 \otimes p63 \otimes p65 \otimes p56 \otimes p32 \otimes p30 \otimes p28 \otimes p4 \otimes p2 \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67 \ D_{C}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        \Gamma: p0 \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 \overline{\Gamma: \ \Delta \vdash p2 \otimes p28 \otimes p30 \otimes p32 \otimes p4 \otimes p56 \otimes p63 \otimes p65 \otimes p67}
         file: MCC/CloudDeployment_deploy_2_b_1_1.p (4920 ms)
```

```
\Gamma: p1 \vdash p1 \quad \overline{\Gamma}: p552 \vdash p552
                                       \Gamma: p1, p552 \vdash p1 \otimes p552
                                          \Gamma: \Delta \vdash p1 \otimes p552
\Gamma: p0 \vdash p0
  \Gamma: \ p0, p0 \multimap p552 \otimes p1 \vdash p1 \otimes p552
                      \Gamma: p0 \vdash p1 \otimes p552
                       \overline{\Gamma: \Delta \vdash p1 \otimes p552} *
 file: MCC/CloudDeployment_deploy_2_b_5_1.p (14653 ms)
                                                                                                                                     \frac{\overline{\Gamma:\ p266\vdash p266}\quad \overline{\Gamma:\ p3\vdash p3}}{\underline{\Gamma:\ p266,p3\vdash p266\otimes p3}}\otimes \frac{\overline{\Gamma:\ p547\vdash p547}}{\overline{\Gamma:\ p547\vdash p547}}\otimes \frac{\overline{\Gamma:\ p554\vdash p554}}{\overline{\Gamma:\ p554\vdash p554}}\otimes
                                                                                                                                                    \Gamma: p266, p3, p547, p554 \vdash p266 \otimes p3 \otimes p547 \otimes p554
                                                                                                      \Gamma: p552 \vdash p552
                                                                                                                      \frac{\Gamma: \ p266, p3, p547, p552, p552 - p554 \vdash p266 \otimes p3 \otimes p547 \otimes p554}{\Gamma: \ p366, p3, p547, p552, p552 - p554 \vdash p366 \otimes p3 \otimes p547 \otimes p554} \ D_C
                                                                                                                            \Gamma: p266, p3, p547, p552 \vdash p266 \otimes p3 \otimes p547 \otimes p554
                                                                       \Gamma: p529 \vdash p529
                                                                                         \begin{array}{c} 1 - p_{229} & 1 - p_{220}, p_{22}, p_{222}, p_{222} \\ \hline \Gamma: & p_{266}, p_{3}, p_{529}, p_{552}, p_{529} - p_{547} + p_{266} \otimes p_{3} \otimes p_{547} \otimes p_{554} \\ \hline D_C & \\ \end{array} 
                                                                                                   \Gamma: p266, p3, p529, p552 \vdash p266 \otimes p3 \otimes p547 \otimes p554
                                                                                                     \Gamma: \Delta \vdash p266 \otimes p3 \otimes p547 \otimes p554
                                               \Gamma: p2 \vdash p2
                                                        \Gamma: p2, p529, p552, p2 \longrightarrow p266 \otimes p3 \vdash p266 \otimes p3 \otimes p547 \otimes p554 \ D_C
                                                                       \Gamma: p2, p529, p552 \vdash p266 \otimes p3 \otimes p547 \otimes p554
                                                                               \Gamma: \Delta \vdash \underline{p266 \otimes p3 \otimes p547 \otimes p554}_{-\circ}
                                \frac{1 \vdash p1}{\Gamma : p1, p552, p1 \multimap p529 \otimes p2 \vdash p266 \otimes p3 \otimes p347 \otimes p554} D_C
                                              \Gamma: \ p1, p552 \vdash p266 \otimes p3 \otimes p547 \otimes p554 
                                                 \Gamma: \Delta \vdash p266 \otimes p3 \otimes p547 \otimes p554 \longrightarrow
\Gamma: p0 \vdash p0
           \Gamma: p0, p0 \multimap p552 \otimes p1 \vdash p266 \otimes p3 \otimes p547 \otimes p554 D_C
                         \Gamma: p0 \vdash p266 \otimes p3 \otimes p547 \otimes p554
                         \Gamma: \Delta \vdash p266 \otimes p3 \otimes p547 \otimes p554 \star
 file: MCC/CloudDeployment_deploy_3_b_1_1.p (14630 ms)
      \frac{\overline{\Gamma: p1 \vdash p1} \quad \overline{\Gamma: p855 \vdash p855}}{\overline{\Gamma: p1 \vdash p0} \quad \overline{\Gamma: p1, p855 \vdash p1 \otimes p855}} \star \\ \overline{\Gamma: p0 \vdash p0} \quad \overline{\Gamma: \Delta \vdash p1 \otimes p855} \to \\ \overline{\Gamma: p0, p0 \multimap p855 \otimes p1 \vdash p1 \otimes p855} \quad \overline{D_{C}}
                                                     \Gamma: p0 \vdash p1 \otimes p855
                                                      \frac{1}{\Gamma: \Delta \vdash p1 \otimes p855} \star
```

file: MCC/CloudDeployment_deploy_3_b_5_1.p (47945 ms)

```
\Gamma: p276, p4, p548, p820, p857 \vdash p276 \otimes p4 \otimes p548 \otimes p820 \otimes p857 
                                                                                                                                                                           \Gamma: p855 \vdash p855
                                                                                                                                                                                                                      \frac{\Gamma: \ p276, p4, p548, p820, p855, p855 \multimap p857 \vdash p276 \bowtie p4 \otimes p548 \otimes p820 \otimes p857}{DC} \xrightarrow{DC}
                                                                                                                                                                                                                                           \Gamma: p276, p4, p548, p820, p855 \vdash p276 \otimes p4 \otimes p548 \otimes p820 \otimes p857
                                                                                                                                                                                                                                                                              \Gamma: \Delta \vdash p276 \otimes p4 \otimes p548 \otimes p820 \otimes p857 \circ
                                                                                                                                 \Gamma: p3 \vdash p3
                                                                                                                                                   \frac{1}{\Gamma}: p3, p548, p820, p855, p3 - p276 \otimes p4 \vdash p276 \otimes p4 \otimes p548 \otimes p820 \otimes p857
                                                                                                                                                                            \Gamma: p3, p548, p820, p855 \vdash p276 \otimes p4 \otimes p548 \otimes p820 \otimes p857
                                                                                                                                                                                                   \Gamma: \ \Delta \vdash p276 \otimes p4 \underline{\otimes p548 \otimes p820 \otimes p857}
                                                                                     \Gamma: p2 \vdash p2
                                                                                                   \frac{p2 + p2}{\Gamma} : \underbrace{p2, p820, p855, p2 \multimap p548 \otimes p3 \vdash p276 \otimes p4 \otimes p548 \otimes p820 \otimes p857}_{GC} D_{C} 
                                                                                                                            \Gamma: p2, p820, p855 \vdash p276 \otimes p4 \otimes p548 \otimes p820 \otimes p857
                                                                                                                                           \Gamma: \Delta \vdash p276 \otimes p4 \otimes p548 \otimes p820 \otimes p857  \multimap
                                                          \frac{1}{\Gamma}: p1, p855, \underline{p1} \multimap p820 \otimes p2 \vdash p276 \otimes p4 \otimes p548 \otimes p820 \otimes p857}_{C}
                                                                                    \Gamma: p1, p855 \vdash p276 \otimes p4 \otimes p548 \otimes p820 \otimes p857
                                                                                          \Gamma: \ \Delta \vdash p276 \otimes p4 \otimes p548 \otimes p820 \otimes p857 \ \_ \circ
\Gamma: p0 \vdash p0
                    \frac{\Gamma}{\Gamma}: \ p0, p0 - p855 \otimes p1 \vdash p276 \otimes p4 \otimes p548 \otimes p820 \otimes p857} \ D_C
                                             \underline{\Gamma}:\ p0\vdash p276\otimes p4\otimes p548\otimes p820\otimes p857
                                                        \Delta \vdash p276 \otimes p4 \otimes p548 \otimes p820 \otimes p857
  file: MCC/DES_des_00_b_1_1.p (699 ms)
                                                                   \overline{\Gamma}: p1 \vdash p1 \quad \overline{\Gamma}: p118 \vdash p118
                                                                               \Gamma: p1, p118 \vdash p1 \otimes p118
                                                                              \Gamma: \Delta \vdash p1 \otimes p118
\Gamma: p0 \vdash p0
    \frac{\Gamma: \ p0 \vdash p1 \otimes p118}{\Gamma: \ \Delta \vdash p1 \otimes p118}
   file: MCC/DES_des_00_b_5_1.p (3290 ms)
                                                                                                                                                                                                                                                  \frac{\overline{\Gamma\colon p117\vdash p117}\quad \overline{\Gamma\colon p119\vdash p119}}{\Gamma\colon p119\vdash p119}\otimes \frac{\overline{\Gamma\colon p2\vdash p2}}{\Gamma\colon p117, p119\vdash p117\otimes p119}\otimes \frac{\overline{\Gamma\colon p2\vdash p2}}{\Gamma\colon p263\vdash p263}\otimes \frac{\overline{\Gamma\colon p263\vdash p263}}{\Gamma\colon p263\vdash p263}\otimes \frac{\overline{\Gamma\colon p60\vdash p60}}{\Gamma\colon p60\vdash p60}\otimes \frac{\overline{\Gamma\colon p60\vdash p60}}{\Gamma\colon p60\vdash p60}
                                                                                                                                                                                           \Gamma: p115 \vdash p115
                                                                                                                                                                                                                                                                                                                   \Gamma: p117, p119, p2, p263, p60 \vdash p117 \otimes p119 \otimes p2 \otimes p263 \otimes p60
                                                                                                                                                                                                                                     \frac{\Gamma: \ p115, p119, p2, p263, p60, p115 \multimap p117 \vdash p117 \otimes p119 \otimes p2 \otimes p263 \otimes p60}{D_{C}} \ D_{C}
                                                                                                                                                                                                                                                         \Gamma: \ p115, p119, p2, p263, p60 \vdash p117 \otimes p119 \otimes p2 \otimes p263 \otimes p60
                                                                                                                                                                                                                                                                                          \Gamma: \Delta \vdash p117 \otimes p119 \otimes p2 \otimes p263 \otimes p60
                                                                                                                                           \Gamma: p59 \vdash p59
                                                                                                                                                              \frac{\Gamma: \ p119, p2, p263, p59, p59 \multimap p115 \otimes p60 \vdash p117 \otimes p119 \otimes p2 \otimes p263 \otimes p60}{D_C} D_C
                                                                                                                                                                                          \Gamma: p119, p2, p263, p59 \vdash p117 \otimes p119 \otimes p2 \otimes p263 \otimes p60
                                                                                                                                                                                                                \frac{\Gamma: \ \Delta \vdash p117 \otimes p119 \otimes p2 \otimes p263 \otimes p60}{}{} - \circ
                                                                                                    \frac{1}{\Gamma} : \ p118, p2, p59, p\underline{118} - p\underline{263} \otimes p119 \vdash p117 \otimes p119 \otimes p2 \otimes p263 \otimes p60 \\ D_{G}
                                                                                                                                  \Gamma: \ p118, p2, p59 \vdash p117 \otimes p119 \otimes p2 \otimes p263 \otimes p60
                                                                                                                                                 \Gamma: \Delta \vdash p117 \otimes p119 \otimes p2 \otimes p263 \otimes p60
                                                              \frac{\Gamma: \ p1, p118, p1 \multimap p59 \otimes p2 \vdash p117 \otimes p119 \otimes p2 \otimes p263 \otimes p60}{D_C} \ D_C
                                                                                    \underline{\Gamma:\ p1,p118 \vdash p117 \otimes p119 \otimes p2 \otimes p263 \otimes p60} \ \star
                                                                                              \Gamma: \Delta \vdash p117 \otimes p119 \otimes p2 \otimes p263 \otimes p60
\Gamma: p0 \vdash p0
                      \frac{\Gamma:}{\Gamma:} \frac{p0, p0 \multimap p118 \otimes p1 \vdash p117 \otimes p119 \otimes p2 \otimes p263 \otimes p60}{p118 \otimes p1} D_C
                                                \Gamma: p0 \vdash p117 \otimes p119 \otimes p2 \otimes p263 \otimes p60
                                              \Gamma: \ \Delta \vdash p117 \otimes p119 \otimes p2 \otimes p263 \otimes p60
   file: MCC/DES_des_01_b_1_1.p (755 ms)
                                                                   \overline{\Gamma: p1 \vdash p1} \quad \overline{\Gamma: p13 \vdash p13}
                                                                              \Gamma: p1, p13 \vdash p1 \otimes p13 \star
                                                                  \Gamma: \Delta \vdash p1 \otimes p13
\Gamma: p0 \vdash p0
     \frac{\Gamma: p0, p0 \multimap p13 \otimes p1 \vdash p1 \otimes p13}{\Gamma: p0, p0 \multimap p13 \otimes p1 \vdash p1 \otimes p13} D_C
                                           \frac{\Gamma:\ p0 \vdash p1 \otimes p13}{\Gamma:\ \Delta \vdash p1 \otimes p13} \ \star
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file: MCC/DES_des_01_b_5_1.p (4583 ms)

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\frac{\Gamma \colon p11, p132, p14, p276, p4 \vdash p11 \otimes p132 \otimes p14 \otimes p276 \otimes p4}{\Gamma \colon p11, p132, p14, p276, p4, p9 \vdash p11 \otimes p132 \otimes p14 \otimes p276 \otimes p4 \otimes p9} \frac{\Gamma \colon p6}{\nabla \colon p11, p132, p14, p276, p4, p9 \vdash p11 \otimes p132 \otimes p14 \otimes p276 \otimes p4 \otimes p9}
                                                                                                                                                                                                                  \Gamma: p3 \vdash p3
                                                                                                                                                                                                                                                                                                                                                                                                            \Gamma: \Delta \vdash p11 \otimes p132 \otimes p14 \otimes p276 \otimes p4 \otimes p9
                                                                                                                                                                                                                                                      \frac{5}{\Gamma: \ p11, p132, p14, p276, p3, p3 \multimap p9 \otimes p4 \vdash p11 \otimes p132 \otimes p14 \otimes p276 \otimes p4 \otimes p9} \ D_{C}
                                                                                                                                                                                                                                                                            \frac{\Gamma \colon p11, p132, p14, p276, p3 \vdash p11 \otimes p132 \otimes p14 \otimes p276 \otimes p4 \otimes p9}{\Gamma \colon \Delta \vdash p11 \otimes p132 \otimes p14 \otimes p276 \otimes p4 \otimes p9} \star
                                                                                                                                                    \Gamma: p131 \vdash p131
                                                                                                                                                                    \frac{\Gamma \colon p11, p131, p14, p3 \vdash p11 \otimes p132 \otimes p14 \otimes p276 \otimes p4 \otimes p9}{\Gamma \colon \Delta \vdash p11 \otimes p132 \otimes p14 \otimes p276 \otimes p4 \otimes p9} \star
                                                                                             \overline{\Gamma:\ p13 \vdash p13}
                                                                                                                \frac{1}{\Gamma}: \ p11, p13, p3, p13 \multimap p131 \otimes p14 \vdash p11 \otimes p132 \otimes p14 \otimes p276 \otimes p4 \otimes p9}{D_{C}}
                                                                                                                                               \Gamma: \ p11, p13, p3 \vdash p11 \otimes p132 \otimes p14 \otimes p276 \otimes p4 \otimes p9 
                                                                                                                                                                \Gamma: \Delta \vdash p11 \otimes p132 \otimes p14 \otimes p276 \otimes p4 \otimes p9
                                               \Gamma: p1 \vdash p1
                                                                       \Gamma: \ \underline{p1,p13,p1} \multimap \underline{p11} \otimes \underline{p3} \vdash \underline{p11} \otimes \underline{p132} \otimes \underline{p14} \otimes \underline{p276} \otimes \underline{p4} \otimes \underline{p9} \ \underline{D_C}
                                                                                               \frac{\Gamma: \ p1, p13 \vdash p11 \otimes p132 \otimes p14 \otimes p276 \otimes p4 \otimes p9}{} \star
                                                                                                       \Gamma: \Delta \vdash p11 \otimes p132 \otimes p14 \otimes p276 \otimes p4 \otimes p9
                         \frac{p}{\Gamma} : \underbrace{p0, p0 -\circ p13 \otimes p1 \vdash p11 \otimes p132 \otimes p14 \otimes p276 \otimes p4 \otimes p9}_{C} \ D_{C}
                                                    \Gamma: p0 \vdash p11 \otimes p132 \otimes p14 \otimes p276 \otimes p4 \otimes p9
                                                   \overline{\Gamma:\ \Delta \vdash p11 \otimes p132 \otimes p14 \otimes p276 \otimes p4 \otimes p9}
    file: MCC/DES_des_02_b_1_1.p (800 ms)
                                                                               \Gamma: p1 \vdash p1 \quad \overline{\Gamma}: p17 \vdash p17
                                                                                            \Gamma: p1, p17 \vdash p1 \otimes p17
                                                                                          \Gamma: \Delta \vdash p1 \otimes p17
\Gamma: p0 \vdash p0
        \Gamma: p0, p0 \multimap p17 \otimes p1 \vdash p1 \otimes p17
                                                    \overline{\Gamma:\ p0\vdash p1}\otimes p17
                                                     \overline{\Gamma: \Delta \vdash p1 \otimes p17}
     file: MCC/DES_des_02_b_5_1.p (4673 ms)
                                                                                                                                                                                                                                                            \frac{\Gamma: \ p11, p136, p14, p18, p280, p4 \vdash p11 \otimes p136 \otimes p14 \otimes p18 \otimes p280 \otimes p4}{\star}
                                                                                                                                                                                                                                                                                                                                                                                                            \Gamma: p3 \vdash p3
                                                                                                                                                                                                                                                   \Gamma: p136, p14, p18, p280, p3, p3 \multimap p11 \otimes p4 \vdash p11 \otimes p136 \otimes p14 \otimes p18 \otimes p280 \otimes p4
                                                                                                                                                                                                                                                                           \frac{\Gamma:\ p136,p14,p18,p280,p3\vdash p11\otimes p136\otimes p14\otimes p18\otimes p280\otimes p4}{\star}\ \star
                                                                                                                                                                                                                                                                                                                \Gamma: \Delta \vdash \underline{p11} \otimes \underline{p136} \otimes \underline{p14} \otimes \underline{p18} \otimes \underline{p280} \otimes \underline{p4}
                                                                                                                                                  \Gamma: p135 \vdash p135
                                                                                                                                                                  \frac{\Gamma \colon p135 \vdash p135}{\Gamma \colon p135, p14, p18, p3, p135} \multimap p280 \otimes p136 \vdash p11 \otimes p136 \otimes p14 \otimes p18 \otimes p280 \otimes p4}{D_C}
                                                                                                                                                                                                       \Gamma: \ p135, p14, p18, p3 \vdash p11 \otimes p136 \otimes p14 \otimes p18 \otimes p280 \otimes p4 \\ \star
                                                                                                               \frac{1 \cdot p \log_2 p \cdot p \log_2 p \cdot p}{\Gamma \colon p \cdot 14, p \cdot 17, p \cdot 3, p \cdot 17 - o p \cdot 135 \otimes p \cdot 18 + p \cdot 11 \otimes p \cdot 136 \otimes p \cdot 14 \otimes p \cdot 18 \otimes p \cdot 280 \otimes p \cdot 4}{\Gamma \colon p \cdot 14, p \cdot 17, p \cdot 3, p \cdot 17 - o p \cdot 135 \otimes p \cdot 18 + p \cdot 11 \otimes p \cdot 136 \otimes p \cdot 14 \otimes p \cdot 18 \otimes p \cdot 280 \otimes p \cdot 4} \cap_{D_C} \longrightarrow
                                                                                             \Gamma: p17 \vdash p17
                                                                                                                                            \frac{\Gamma \colon p14, p17, p3 \vdash p11 \otimes p136 \otimes p14 \otimes p18 \otimes p280 \otimes p4}{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p18 \otimes p280 \otimes p4} \star \\ \frac{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p180 \otimes p280 \otimes p4}{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p180 \otimes p280 \otimes p4} \to \\ \frac{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p180 \otimes p280 \otimes p4}{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p180 \otimes p280 \otimes p4} \to \\ \frac{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p136 \otimes p280 \otimes p4}{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p180 \otimes p280 \otimes p4} \to \\ \frac{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p136 \otimes p14 \otimes p180 \otimes p280 \otimes p4}{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p180 \otimes p280 \otimes p4} \to \\ \frac{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p180 \otimes p280 \otimes p4}{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p180 \otimes p280 \otimes p4} \to \\ \frac{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p180 \otimes p280 \otimes p4}{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p180 \otimes p280 \otimes p4} \to \\ \frac{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p180 \otimes p280 \otimes p4}{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p180 \otimes p280 \otimes p4} \to \\ \frac{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p180 \otimes p280 \otimes p4}{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p180 \otimes p280 \otimes p4} \to \\ \frac{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p180 \otimes p280 \otimes p4}{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p180 \otimes p280 \otimes p4} \to \\ \frac{\Gamma \colon \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p180 \otimes p14 \otimes p180 \otimes p280 \otimes p4}{\Gamma \colon \Delta \vdash p11 \otimes p140 \otimes p180 \otimes p
                                               \Gamma: p1 \vdash p1
                                                                     \Gamma: \ p1, p17, p1 \multimap \underline{p14 \otimes p3 \vdash p11 \otimes p136 \otimes p14 \otimes p18 \otimes p280 \otimes p4} \ D_C
                                                                                               \Gamma: p1, p17 \vdash p11 \otimes p136 \otimes p14 \otimes p18 \otimes p280 \otimes p4
                                                                                                   \Gamma: \Delta \vdash \underline{p11} \otimes \underline{p136} \otimes \underline{p14} \otimes \underline{p18} \otimes \underline{p280} \otimes \underline{p4}
                        \frac{\Gamma:}{\Gamma:} \frac{p0, p0 \multimap p17 \otimes p1 \vdash p11 \otimes p136 \otimes p14 \otimes p18 \otimes p280 \otimes p4}{200 \circ p17 \otimes p1} D_C
                                                  \frac{\Gamma: \ p0 \vdash p11 \otimes p136 \otimes p14 \otimes p18 \otimes p280 \otimes p4}{\Gamma: \ \Delta \vdash p11 \otimes p136 \otimes p14 \otimes p18 \otimes p280 \otimes p4} \star
```

file: MCC/DES_des_05_b_1_1.p (877 ms)

```
\overline{\Gamma: p1 \vdash p1} \quad \overline{\Gamma: p29 \vdash p29}
                                          \Gamma: p1, p29 \vdash p1 \otimes p29
                                              \Gamma: \Delta \vdash p1 \otimes p29
\Gamma: p0 \vdash p0
   \Gamma: p0, p0 \multimap p29 \otimes p1 \vdash p1 \otimes p29
                       \Gamma: p0 \vdash p1 \otimes p29
                       \Gamma: \Delta \vdash p1 \otimes p29 *
 file: MCC/DES_des_05_b_5_1.p (5271 ms)
                                                                                                                \frac{\Gamma: \ p148, p17, p23, p292, p30, p4 \vdash p148 \otimes p17 \otimes p23 \otimes p292 \otimes p30 \otimes p4}{} \star
                                                                                                                                                                                  \Gamma: \Delta \vdash p148 \otimes p17 \otimes p23 \otimes p292 \otimes p30 \otimes p4 \longrightarrow
                                                                                             \Gamma: p3 \vdash p3
                                                                                                            \Gamma: p148, p23, p292, p3, p30 \vdash p148 \otimes p17 \otimes p23 \otimes p292 \otimes p30 \otimes p4
                                                                 \Gamma: p147 \vdash p147
                                                                                                                                       \Gamma: \Delta \vdash p148 \otimes p17 \otimes p23 \otimes p292 \otimes p30 \otimes p4
                                                                         \Gamma: \ p147, p23, p3, p30, p147 \multimap p292 \otimes p148 \vdash p148 \otimes p17 \otimes p23 \otimes p292 \otimes p30 \otimes p4 \\ D_C
                                                                                        \frac{\Gamma : p147, p23, p3, p30 \vdash p148 \otimes p17 \otimes p23 \otimes p292 \otimes p30 \otimes p4}{\Gamma : \Delta \vdash p148 \otimes p17 \otimes p23 \otimes p292 \otimes p30 \otimes p4} \star
                                         \Gamma: p29 \vdash p29
                                                 \frac{\Gamma: \ p23, p29, p3, p29}{p3, p29} \multimap p147 \otimes p30 \vdash p148 \otimes p17 \otimes p23 \otimes p292 \otimes p30 \otimes p4} \ D_C
                                                               \Gamma: p23, p29, p3 \vdash p148 \otimes p17 \otimes p23 \otimes p292 \otimes p30 \otimes p4
                                                                       \Gamma: \Delta \vdash p148 \otimes p17 \otimes p23 \otimes p292 \otimes p30 \otimes p4
                               \underline{\Gamma:\ p1,p29 \vdash p148 \otimes p17 \otimes p23 \otimes p292 \otimes p30 \otimes p4}_{\bigstar}
\Gamma: p0 \vdash p0
                                              \Gamma: \Delta \vdash p148 \otimes p17 \otimes p23 \otimes p292 \otimes p30 \otimes p4
             : p0, p0 \multimap p29 \otimes p1 \vdash p148 \otimes p17 \otimes p23 \otimes p292 \otimes p30 \otimes p4 \atop D_{G}
                      \frac{\Gamma:\ p0 \vdash p148 \otimes p17 \otimes p23 \otimes p292 \otimes p30 \otimes p4}{\Gamma:\ \Delta \vdash p148 \otimes p17 \otimes p23 \otimes p292 \otimes p30 \otimes p4} \ \star
  file: MCC/DES_des_10_b_1_1.p (1171 ms)
                                   \Gamma: p1 \vdash p1 \quad \Gamma: p49 \vdash p49
                                          \Gamma: p1, p49 \vdash p1 \otimes p49
\Gamma: p0 \vdash p0
                                   \Gamma: \Delta \vdash p1 \otimes p49
   \Gamma: \ p0, p0 \multimap p49 \otimes p1 \vdash p1 \otimes p49
                       \frac{\Gamma: \ p0 \vdash p1 \otimes p49}{\Gamma: \ \Delta \vdash p1 \otimes p49} \ \star
 file: MCC/DES_des_10_b_5_1.p (6703 ms)
                                                                                                                \underline{\Gamma}: \ p168, p27, p312, p38, p4, p50 \vdash p168 \otimes p27 \otimes p312 \otimes p38 \otimes p4 \otimes p50
                                                                                      \Gamma: p167 \vdash p167
                                                                                                                                                                                 \Gamma: \Delta \vdash p168 \otimes p27 \otimes p312 \otimes p38 \otimes p4 \otimes p50
                                                                                                     \Gamma: \ p167, p27, p38, p4, p50 \vdash p168 \otimes p27 \otimes p312 \otimes p38 \otimes p4 \otimes p50 
                                                              \Gamma: p49 \vdash p49
                                                                                                                                   \Gamma: \Delta \vdash p168 \otimes p27 \otimes p312 \otimes p38 \otimes p4 \otimes p50
                                                                        \frac{\Gamma: \ p27, p38, p4, p49, p49 \multimap p167 \otimes p50 \vdash p168 \otimes p27 \otimes p312 \otimes p38 \otimes p4 \otimes p50}{\Gamma: \ p27, p38, p4, p49 \vdash p168 \otimes p27 \otimes p312 \otimes p38 \otimes p4 \otimes p50} \underbrace{D_C}_{b}
                                                   \frac{1 \cdot p_{21}, p_{30}, p_{3}, p_{49} + p_{40} \otimes p_{-1} \otimes p_{40} \otimes p_{4} \otimes p_{50}}{\Gamma : p_{3}, p_{38}, p_{49}, p_{3} - p_{27} \otimes p_{4} + p_{168} \otimes p_{27} \otimes p_{312} \otimes p_{38} \otimes p_{4} \otimes p_{50}}{\Gamma : p_{3}, p_{38}, p_{49}, p_{3} - p_{27} \otimes p_{4} + p_{168} \otimes p_{27} \otimes p_{312} \otimes p_{38} \otimes p_{4} \otimes p_{50}} \xrightarrow{O}
                                                              \frac{\Gamma:\ p3,p38,p49 \vdash p168 \otimes p27 \otimes p312 \otimes p38 \otimes p4 \otimes p50}{\star}
                                                                     \Gamma:\ \Delta \vdash p168 \otimes p27 \otimes p312 \otimes p38 \otimes p4 \otimes p50
                             \frac{\Gamma: \ p1, p49, p1 \multimap p38 \otimes p3 \vdash p168 \otimes p27 \otimes p312 \otimes p38 \otimes p4 \otimes p50}{D_C}
                                        \Gamma: \ p1, p49 \vdash p168 \otimes p27 \otimes p312 \otimes p38 \otimes p4 \otimes p50 \\ \star
                                            \Gamma: \Delta \vdash p168 \otimes p27 \otimes p312 \otimes p38 \otimes p4 \otimes p50
          \frac{1}{\Gamma}: p0, p0 - p49 \otimes p1 \vdash p168 \otimes p27 \otimes p312 \otimes p38 \otimes p4 \otimes p50} D_C
                      \frac{\Gamma:\ p0 \vdash p168 \otimes p27 \otimes p312 \otimes p38 \otimes p4 \otimes p50}{\Gamma:\ \Delta \vdash p168 \otimes p27 \otimes p312 \otimes p38 \otimes p4 \otimes p50} \star
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file: MCC/DES_des_20_b_1_1.p (1653 ms)
                                                                                                                                     \Gamma: p1 \vdash p1 \quad \overline{\Gamma}: p89 \vdash p89
                                                                                                                                                         \Gamma: p1, p89 \vdash p1 \otimes p89
                                                                                                                                     \Gamma: \Delta \vdash p1 \otimes p89
\Gamma: p0 \vdash p0
           \frac{\Gamma: p0, p0 \multimap p89 \otimes p1 \vdash p1 \otimes p89}{\square} D_C
                                                                                      \frac{\Gamma: \ p0 \vdash p1 \otimes p89}{\Gamma: \ \Delta \vdash p1 \otimes p89} \ \star
     file: MCC/DES_des_20_b_5_1.p (8575 ms)
                                                                                                                                                                                                                                                                                                                                                                                                                                         \frac{\overline{\Gamma : p208 \vdash p208} \quad \overline{\Gamma : p352 \vdash p352}}{\Gamma : p208, p352 \vdash p208 \otimes p352} \otimes \frac{\overline{\Gamma : p4 \vdash p4}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p208, p352, p4 \vdash p208} \otimes p352 \otimes p4} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : p47 \vdash p47}} \otimes \frac{\overline{\Gamma : p47 \vdash p47}}{\overline{\Gamma : 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  \Gamma: p208, p352, p4, p47, p68, p90 \vdash p208 \otimes p352 \otimes p4 \otimes p47 \otimes p68 \otimes p90
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           \Gamma: \Delta \vdash p208 \otimes p352 \otimes p4 \otimes p47 \otimes p68 \otimes p90 -\circ
                                                                                                                                                                                                                                                                                                                                    \Gamma: p207 \vdash p207
                                                                                                                                                                                                                                                                                                                                                                                              \frac{\Gamma : p207, p4, p47, p68, p90, p207 \multimap p352 \otimes p208 \vdash p208 \otimes p352 \otimes p4 \otimes p47 \otimes p68 \otimes p30}{\Gamma : p207, p4, p47, p68, p90, p207 \multimap p352 \otimes p208 \vdash p208 \otimes p352 \otimes p4 \otimes p47 \otimes p68 \otimes p90} \underbrace{\Gamma : p207, p4, p47, p68, p90 \vdash p208 \otimes p352 \otimes p4 \otimes p47 \otimes p68 \otimes p90}_{\Gamma : \Lambda \vdash p2018 \otimes p252 \otimes p4 \otimes p47 \otimes p68 \otimes p90} \star \\ \frac{\Gamma : \Lambda \vdash p2018 \otimes p252 \otimes p4 \otimes p47 \otimes p68 \otimes p90}{\Gamma : \Lambda \vdash p2018 \otimes p252 \otimes p4 \otimes p47 \otimes p68 \otimes p90} \star
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             \Gamma: \Delta \vdash p208 \otimes p352 \otimes p4 \otimes p47 \otimes p68 \otimes p90
                                                                                                                                                                                                                                         \Gamma: p89 \vdash p89
                                                                                                                                                                                                                                                                                \frac{\Gamma: p4, p47, p68, p89, p89 \multimap p207 \otimes p90 \vdash p208 \otimes p352 \otimes p4 \otimes p47 \otimes p68 \otimes p90}{D_C} D_C
                                                                                                                                                                                                                                                                                                                                 \frac{\Gamma \colon p4, p46, p68, p89 \vdash p208 \otimes p352 \otimes p4 \otimes p47 \otimes p68 \otimes p90}{\Gamma \colon \Delta \vdash p208 \otimes p352 \otimes p4 \otimes p47 \otimes p68 \otimes p90} \star
                                                                                                                                                                                           \frac{3 + p3}{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p4 + p208 \otimes p352 \otimes p4 \otimes p47 \otimes p47 \otimes p4} = \frac{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p4 + p208 \otimes p352 \otimes p4 \otimes p47 \otimes p48 \otimes p90}{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p4 + p208 \otimes p352 \otimes p4 \otimes p47 \otimes p48 \otimes p90} = \frac{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p4 + p208 \otimes p352 \otimes p4 \otimes p47 \otimes p47 \otimes p48}{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p4 + p208 \otimes p352 \otimes p4 \otimes p47 \otimes p47 \otimes p48} = \frac{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p4 + p208 \otimes p352 \otimes p4 \otimes p47 \otimes p47 \otimes p48}{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p4 + p208 \otimes p352 \otimes p4 \otimes p47 \otimes p47 \otimes p48} = \frac{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p4 + p208 \otimes p352 \otimes p4 \otimes p47 \otimes p47 \otimes p48}{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p4 + p208 \otimes p352 \otimes p4 \otimes p47 \otimes p48} = \frac{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p4 + p208 \otimes p352 \otimes p4 \otimes p47 \otimes p47 \otimes p48}{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p4 + p208 \otimes p352 \otimes p4 \otimes p47 \otimes p48} = \frac{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p4 + p208 \otimes p352 \otimes p4 \otimes p47 \otimes p48}{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p4} = \frac{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p47 \otimes p48}{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p48} = \frac{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p48}{\Gamma : p3, p68, p89} = \frac{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p47 \otimes p48}{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p48} = \frac{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p48}{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p48} = \frac{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p48}{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p48} = \frac{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p48}{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p48} = \frac{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p48}{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p48} = \frac{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p48}{\Gamma : p3, p68, p89} = \frac{\Gamma : p3, p68, p89, p3 \multimap p47 \otimes p48}{\Gamma : p3, p68, p89} = \frac{\Gamma : p3, p68, p89}{\Gamma : p3, p68, p89} = \frac{\Gamma : p3, p68, p89}{\Gamma : p3, p68, p89} = \frac{\Gamma : p3, p68, p89}{\Gamma : p3, p68, p89} = \frac{\Gamma : p3, p68, p89}{\Gamma : p3, p68, p89} = \frac{\Gamma : p3, p68, p89}{\Gamma : p3, p68, p89} = \frac{\Gamma : p3, p68, p89}{\Gamma : p3, p68, p89} = \frac{\Gamma : p3, p68, p89}{\Gamma : p3, p68, p89} = \frac{\Gamma : p3, p68, p89}{\Gamma : p3, p68, p89} = \frac{\Gamma : p3, p68, p89}{\Gamma : p3, p68, p89} = \frac{\Gamma : p3, p68, p89}{\Gamma : p3, p68, p89} = \frac{\Gamma : p3, p68, p89}{\Gamma : p3, p68, p89} = \frac{\Gamma : p3, p68, p89}{\Gamma : p3, p68, p89} = \frac{\Gamma : p3, p68, p89}{\Gamma : p3, p68, p89} = \frac{\Gamma : p3, p68, p89}{\Gamma 
                                                                                                                                                                                                    \frac{\Gamma:\ p3, p68, p89 \vdash p208 \otimes p352 \otimes p4 \otimes p47 \otimes p68 \otimes p90}{} \star
                                                                                                                 \underline{\Gamma:\ p1,p89 \vdash p208 \otimes p352 \otimes p4 \otimes p47 \otimes p68 \otimes p90} \ \star
                                                                                                                                                                     \Gamma: \Delta \vdash p208 \otimes p352 \otimes p4 \otimes p47 \otimes p68 \otimes p90
\Gamma: p0 \vdash p0
                                        \Gamma: p0, p0 \multimap p89 \otimes p1 \vdash p208 \otimes p352 \otimes p4 \otimes p47 \otimes p68 \otimes p90
                                                                                  \frac{\Gamma: \ p0 \vdash p208 \otimes p352 \otimes p4 \otimes p47 \otimes p68 \otimes p90}{\Gamma: \ \Delta \vdash p208 \otimes p352 \otimes p4 \otimes p47 \otimes p68 \otimes p90} \star
     file: MCC/DES_des_30_b_1_1.p (2247 ms)
                                                                                                                                     \overline{\Gamma}: p1 \vdash p1 \quad \overline{\Gamma}: p128 \vdash p128
                                                                                                                                                           \Gamma: p1, p128 \vdash p1 \otimes p128
                                                                                                                                                                   \Gamma: \ \Delta \vdash p1 \otimes p128
\Gamma: p0 \vdash p0
        \Gamma: p0, p0 \multimap p128 \otimes p1 \vdash p1 \otimes p128 
D_C
                                                                                         \frac{\Gamma: \ p0 \vdash p1 \otimes p128}{\Gamma: \ \Delta \vdash p1 \otimes p128} \ \star
        file: MCC/DES_des_30_b_5_1.p (10376 ms)
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\Gamma: \ p129, p246, p35, p5, p66, p97 \vdash p129 \otimes p246 \otimes p35 \otimes p5 \otimes p66 \otimes p97
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               \Gamma: \Delta \vdash \underline{p129 \otimes p246 \otimes p35 \otimes p5 \otimes p66 \otimes p97}_{-\circ}
                                                                                                                                                                                                                                                               \Gamma: p4 \vdash p4
                                                                                                                                                                                                                                                                                                            \Gamma: \ p129, p246, p4, p66, p97, p4 \multimap p35 \otimes p5 \vdash p129 \otimes p246 \otimes p35 \otimes p5 \otimes p66 \otimes p97
D_{C}
                                                                                                                                                                                                                                                                                                                                           \Gamma: p129, p246, p4, p66, p97 \vdash p129 \otimes p246 \otimes p35 \otimes p5 \otimes p66 \otimes p97
                                                                                                                                                                                                                                                                                                                                                                                      \Gamma: \ \Delta \vdash p129 \otimes p246 \otimes p35 \otimes p5 \otimes p66 \otimes p97
                                                                                                                                                                                                                           \frac{1}{\Gamma}: \frac{p129, p246, p3, p97, p3 \multimap p66 \otimes p4 \vdash p129 \otimes p246 \otimes p35 \otimes p5 \otimes p66 \otimes p97}{p36 \otimes p46 \otimes p36 \otimes p46 \otimes p36 \otimes p5} D_{C}
                                                                                                                                                                                                                                                          \Gamma: \ p129, p246, p3, p97 \vdash p129 \otimes p246 \otimes p35 \otimes p5 \otimes p66 \otimes p97
                                                                                                                                    \Gamma: p128 \vdash p128
                                                                                                                                                                                   \Gamma: p128, p3, p97 \vdash p129 \otimes p246 \otimes p35 \otimes p5 \otimes p66 \otimes p97 \\ \star
                                                                                    \begin{array}{c|c} \Gamma: \ p128, p3, p94 \vdash p129 \otimes p240 \otimes p30 
                                                          \Gamma: p1 \vdash p1
                                                                                                                    \frac{\Gamma: \ p1, p128 \vdash p129 \otimes p246 \otimes p35 \otimes p5 \otimes p66 \otimes p97}{\star} \ \star
                                                                                                                                  \Gamma: \Delta \vdash p129 \otimes p246 \otimes p35 \otimes p5 \otimes p66 \otimes p97
 \Gamma: p0 \vdash p0
                              \frac{1}{\Gamma}: \underbrace{p0, p0 - op128 \otimes p1 \vdash p129 \otimes p246 \otimes p35 \otimes p5 \otimes p66 \otimes p97}_{D_C} D_C
                                                                 \Gamma: p0 \vdash p129 \otimes p246 \otimes p35 \otimes p5 \otimes p66 \otimes p97
                                                                 \frac{\Gamma: \Delta \vdash p129 \otimes p246 \otimes p35 \otimes p5 \otimes p66 \otimes p97}{\Gamma: \Delta \vdash p129 \otimes p246 \otimes p35 \otimes p5 \otimes p66 \otimes p97} \star
      file: MCC/DES_des_40_b_1_1.p (2595 ms)
                                                                                                    \Gamma: p1 \vdash p1 \quad \Gamma: p168 \vdash p168
                                                                                                                       \Gamma: p1, p168 \vdash p1 \otimes p168
                                                                                                                               \Gamma: \ \Delta \vdash p1 \otimes p168
      \frac{\Gamma: p0 + p0}{\Gamma: p0, p0 - p168 \otimes p1 \vdash p1 \otimes p168} \longrightarrow D_C
                                                                    \Gamma: p0 \vdash p1 \otimes p168
                                                                    \Gamma: \Delta \vdash p1 \otimes p168 
   file: MCC/DES_des_40_b_5_1.p (13025 ms)
                                                                                                                                                                                                                                                                                                                    \frac{ \frac{\Gamma \colon p127 \vdash p127}{\Gamma \colon p127, p169 \vdash p169}}{ \frac{\Gamma \colon p127, p169 \vdash p127 \otimes p169}{\Gamma \colon p127, p169, p286 \vdash p127 \otimes p169 \otimes p286}} \otimes \frac{\Gamma \colon p45 \vdash p45}{\Gamma \colon p45 \vdash p45} \otimes \frac{\Gamma \colon p5 \vdash p5}{\Gamma \colon p5 \vdash p5} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma \colon p86 \vdash p86} \otimes \frac{\Gamma \colon p86 \vdash p86}{\Gamma
                                                                                                                                                                                                                                                                                                       \Gamma: p4 \vdash p4
                                                                                                                                                                                                                                                                                                                                     \underline{\Gamma}: \ p127, p169, p286, p4, p86 \vdash p127 \otimes p169 \otimes p286 \otimes p45 \otimes p5 \otimes p86
                                                                                                                                                                                                                                                                                                                                                                                    \Gamma: \Delta \vdash p127 \otimes p169 \otimes p286 \otimes p45 \otimes p5 \otimes p86 
                                                                                                                                                                                                                      \frac{\Gamma: \ p127, p169, p286, p3, p3 \multimap p86 \otimes p4 \vdash p127 \otimes p169 \otimes p286 \otimes p45 \otimes p5 \otimes p86}{D_{C}}
                                                                                                                                                                                                                                                     \Gamma: \ p127, p169, p286, p3 \vdash p127 \otimes p169 \otimes p286 \otimes p45 \otimes p5 \otimes p86 
                                                                                                                                                                                                                                                                                         \Gamma: \Delta \vdash p127 \otimes p169 \otimes p286 \otimes p45 \otimes p5 \otimes p86
                                                                                                                                  \frac{\Gamma: \ p127, p168, p3, p168 - p286 \otimes p169 \vdash p127 \otimes p169 \otimes p286 \otimes p45 \otimes p5 \otimes p86}{\Gamma: \ p127, p168, p3 \vdash p127 \otimes p169 \otimes p286 \otimes p45 \otimes p5 \otimes p86} D_C}
                                                                                  \Gamma: p1 \vdash p1
                                                                                                                   \frac{\Gamma \colon p_1, p_168 \vdash p_127 \otimes p_169 \otimes p_286 \otimes p_45 \otimes p_5 \otimes p_86}{\Gamma \colon \Delta \vdash p_127 \otimes p_169 \otimes p_286 \otimes p_45 \otimes p_5 \otimes p_86} \star
                              \frac{1}{\Gamma}: p0, p0 \xrightarrow{} p168 \otimes p1 \vdash p127 \otimes p169 \otimes p286 \otimes p45 \otimes p5 \otimes p86 \xrightarrow{} D_C
                                                                \Gamma: p0 \vdash p127 \otimes p169 \otimes p286 \otimes p45 \otimes p5 \otimes p86
                                                               \overline{\Gamma:\ \Delta \vdash p127 \otimes p169 \otimes p286 \otimes p45 \otimes p5 \otimes p86}
   file: MCC/DES_des_50_b_1_1.p (3177 ms)
                                                                                                    \overline{\Gamma: p1 \vdash p1} \quad \overline{\Gamma: p208 \vdash p208}
                                                                                                                       \Gamma: p1, p208 \vdash p1 \otimes p208
\Gamma: p0 \vdash p0
                                                                                                                             \Gamma: \Delta \vdash p1 \otimes p208
       \Gamma: p0, p0 \multimap p208 \otimes p1 \vdash p1 \otimes p208
                                                                    \Gamma: p0 \vdash p1 \otimes p208
                                                                    \frac{1}{\Gamma: \ \Delta \vdash p1 \otimes p208} \ \star
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file: MCC/DES_des_50_b_5_1.p (14970 ms)
                                                                                                                                                                                                                                                                                                                                                        \frac{\overline{\Gamma \colon p106 \vdash p106} \quad \overline{\Gamma \colon p157 \vdash p157}}{\underline{\Gamma \colon p106, p157 \vdash p106 \otimes p157}} \otimes \frac{\overline{\Gamma \colon p209 \vdash p209}}{\overline{\Gamma \colon p209 \vdash p209}} \otimes \frac{\overline{\Gamma \colon p326 \vdash p326}}{\overline{\Gamma \colon p326 \vdash p326}} \otimes \frac{\overline{\Gamma \colon p55 \vdash p55}}{\overline{\Gamma \colon p55 \vdash p55}} \otimes \frac{\overline{\Gamma \colon p55 \vdash p55}}{\overline{\Gamma \colon p55 \vdash p55}} \otimes \frac{\overline{\Gamma \colon p55 \vdash p55}}{\overline{\Gamma \colon p55 \vdash p55}} \otimes 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        \frac{\Gamma : p106, p157, p209, p326, p5, p55 \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55}{\Gamma : \Delta \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55} \star \\ \frac{\Gamma : \Delta \vdash p106, p157, p209, p326, p5, p55}{\Gamma : \Delta \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55} \\ \xrightarrow{\bullet}
                                                                                                                                                                                                                                                                                         \Gamma: p4 \vdash p4
                                                                                                                                                                                                                                                                                                                                                        p106, p157, p209, p326, p4, p4 \multimap p55 \otimes p5 \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55 \\ D_C
                                                                                                                                                                                                                                                                                                                                                                           \Gamma: p106, p157, p209, p326, p4 \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55
                                                                                                                                                                                                                                                                                                                                                                                                                                 \Gamma: \underbrace{\Delta \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55}_{-\circ} \stackrel{-\circ}{\longrightarrow}
                                                                                                                                                                                                                         \Gamma: p3 \vdash p3
                                                                                                                                                                                                                                               \frac{\Gamma: \ p157, p209, p3, p326, p3 \multimap p106 \otimes p4 \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55}{DC}
                                                                                                                                                   \frac{\Gamma: \ p157, p209, p3, p326 \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55}{\Gamma: \ p157, p209, p3, p326 \otimes p509 \otimes p326 \otimes p5 \otimes p55} \star \\ \Gamma: \ D \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55} \\ \Gamma: \ p157, p208, p3, p208 \multimap p326 \otimes p209 \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55} \\ D_{C}
                                                                                                                                     Γ : p208 ⊢ p208
                                                                                                                                                                                                     \Gamma: \ p157, p208, p3 \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55 
                                                                                                                                                                                                                               \frac{\Gamma: \ \Delta \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55}{} \ \bigcirc
                                                                 \Gamma: p1 \vdash p1
                                                                                          \frac{\Gamma : p1, p208, p1 \multimap p157 \otimes p3 \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55}{\Gamma : p1, p208, p1 \multimap p157 \otimes p3 \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55} D_C
                                                                                                                                  \frac{\Gamma: \ p1, p208 \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55}{} \star
                                                                                                                                                        \stackrel{F \to F}{:} \Delta \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55 
\Gamma: p0 \vdash p0
                               \Gamma: p0, p0 \multimap p208 \otimes p1 \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55 
                                                                          \Gamma: p0 \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55
                                                                       \frac{\Gamma : \Delta \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55}{\Gamma : \Delta \vdash p106 \otimes p157 \otimes p209 \otimes p326 \otimes p5 \otimes p55} \star
    file: MCC/DES des 60 b 1 1.p (3800 ms)
                                                                                                                 \overline{\Gamma}: p1 \vdash p1 \quad \overline{\Gamma}: p248 \vdash p248
                                                                                                                                     \Gamma: p1, p248 \vdash p1 \otimes p248
                                                                                                                                             \Gamma: \Delta \vdash p1 \otimes p248
 \Gamma: p0 \vdash p0
        \Gamma: p0, p0 \multimap p248 \otimes p1 \vdash p1 \otimes p248
                                                                             \frac{\Gamma: p0 \vdash p1 \otimes p248}{\Gamma: \Delta \vdash p1 \otimes p248}
       file: MCC/DES_des_60_b_5_1.p (17502 ms)
                                                                                                                                                                                                                                                                                                                                                       \frac{\overline{\Gamma \colon p126 \vdash p126 \mid \Gamma \colon p187 \vdash p187}}{\Gamma \colon p126, p187 \vdash p126 \otimes p187} \otimes \frac{\overline{\Gamma \colon p249 \vdash p249}}{\overline{\Gamma \colon p126, p187, p249 \vdash p126 \otimes p187 \otimes p249}} \otimes \frac{\overline{\Gamma \colon p366 \vdash p366}}{\overline{\Gamma \colon p366 \vdash p366}} \otimes \frac{\overline{\Gamma \colon p5 \vdash p5}}{\overline{\Gamma \colon p5 \vdash p5}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon 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\frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}} \otimes \frac{\overline{\Gamma \colon p65 \vdash p65}}{\overline{\Gamma \colon p65 \vdash p65}}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        \frac{\Gamma : \ p126, p187, p249, p366, p5, p65 \vdash p126 \otimes p187 \otimes p249 \otimes p366 \otimes p5 \otimes p65}{\Gamma : \ \Delta \vdash p126 \otimes p187 \otimes p249 \otimes p366 \otimes p5 \otimes p65} \ \star
                                                                                                                                                                                                                                                                                            \Gamma: p4 \vdash p4
                                                                                                                                                                                                                                                                                                                                             \begin{array}{c} 4 \\ \hline : \ p126, p187, p249, p366, p4, p4 - \circ p65 \otimes p5 \vdash p126 \otimes p187 \otimes p249 \otimes p366 \otimes p5 \otimes p65 \\ \hline \end{array} \begin{array}{c} D_C \\ \hline \end{array}
                                                                                                                                                                                                                                                                                                                                                                           \frac{\Gamma: \ p126, p187, p249, p366, p4 \vdash p126 \otimes p187 \otimes p249 \otimes p366 \otimes p5 \otimes p65}{\star}
                                                                                                                                                                                                                                                                                                                                                                                                                                \frac{\Gamma: \ p187, p249, p3, p366, p3 \multimap p126 \otimes p4 \vdash p126 \otimes p187 \otimes p249 \otimes p366 \otimes p5 \otimes p65}{D_C} \ D_C
                                                                                                                                                                                                                                                                                    \Gamma: \ p187, p249, p3, p366 \vdash p126 \otimes p187 \otimes p249 \otimes p366 \otimes p5 \otimes p65 \\ \star
                                                                                                                                                   \Gamma: p248 \vdash p248
                                                                                                                                                                                                    \Gamma: p187, p248, p3 \vdash p126 \otimes p187 \otimes p249 \otimes p366 \otimes p5 \otimes p65
                                                                                                                                                                                                                                \Gamma: \Delta \vdash p126 \otimes p187 \otimes p249 \otimes p366 \otimes p5 \otimes p65
                                                                 \Gamma: p1 \vdash p1
                                                                                             \frac{1 \vdash p1}{\Gamma : p1, p248, p1 \multimap p187 \otimes p3 \vdash p126 \otimes p187 \otimes p249 \otimes p366 \otimes p5 \otimes p65}}{D_C}
                                                                                                                                   \Gamma: p1, p248 \vdash p126 \otimes p187 \otimes p249 \otimes p366 \otimes p5 \otimes p65 \\ \star
                                                                                                                                                \Gamma : p0 \vdash p0
                                  \frac{\Gamma: p0, p0 \multimap p248 \otimes p1 \vdash p126 \otimes p187 \otimes p249 \otimes p366 \otimes p5 \otimes p65}{D_C} D_C
                                                                          \Gamma: p0 \vdash p126 \otimes p187 \otimes p249 \otimes p366 \otimes p5 \otimes p65
                                                                       \Gamma: \Delta \vdash p126 \otimes p187 \otimes p249 \otimes p366 \otimes p5 \otimes p65
    file: MCC/DatabaseWithMutex_database2UNFOLD_100_1.p (732 ms)
     file: MCC/DatabaseWithMutex_database2UNFOLD_10_1.p (248 ms)
```

```
file: MCC/DatabaseWithMutex_database2UNFOLD_1_1.p (510 ms)
                                        ll\_'passive\_1, all\_'passive\_2 \vdash Mutex\_1 \otimes Mutex\_2 \otimes We

\_1 \otimes Mutex\_2 \otimes WaitMutex\_1\_2 \otimes all\_'active\_2 \otimes all\_'p
file: MCC/DatabaseWithMutex_database2UNFOLD_20_1.p (701 ms)
file: MCC/DatabaseWithMutex_database2UNFOLD_50_1.p (263 ms)
file: MCC/DatabaseWithMutex_database2UNFOLD_5_1.p (861 ms)
file: MCC/Diffusion2D_2D8_gradient_10x10_10_1_1.p (17383 ms)
file: MCC/Diffusion2D_2D8_gradient_10x10_10_5_1.p (21486 ms)
file: MCC/Diffusion2D_2D8_gradient_5x5_10_1_1.p (3563 ms)
file: MCC/ERK_erk-000001_100_1.p (161 ms)
```

```
\frac{\overline{\Gamma : ERK \vdash ERK} \quad \overline{\Gamma : MEKPP \vdash MEKPP}}{\Gamma : ERK, MEKPP \vdash ERK \otimes MEKPP} \otimes \quad \overline{\Gamma : RKIP \vdash RKIP}
                                              \frac{\Gamma \colon \mathit{ERK}, \mathit{MEKPP}, \mathit{RKIP} \vdash \mathit{ERK} \otimes \mathit{MEKPP} \otimes \mathit{RKIP}}{\Gamma \colon \mathit{RP} \vdash \mathit{RP}} \otimes \frac{\Gamma \colon \mathit{RP} \vdash \mathit{RP}}{\Gamma}
                                                                                      \frac{RK, MEKPP, RKIP \vdash ERK \otimes MEKPP \otimes RKIP}{\Gamma \colon ERK, MEKPP, RKIP, RP \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP} \otimes \frac{\Gamma \colon Raf1'Star \vdash Raf1'Star}{\Gamma \colon Raf1'Star \vdash Raf1'Star} \otimes \frac{RK, MEKPP, RKIP, RP \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP}{\Gamma \colon Raf1'Star \vdash Raf1'Star} \otimes \frac{RK, MEKPP, RKIP, RP \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP}{\Gamma \colon Raf1'Star \vdash Raf1'Star} \otimes \frac{RK, MEKPP, RKIP, RP \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP}{\Gamma \colon Raf1'Star \vdash Raf1'Star} \otimes \frac{RK, MEKPP, RKIP, RP \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP}{\Gamma \colon Raf1'Star \vdash Raf1'Star} \otimes \frac{RK, MEKPP, RKIP, RP \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP}{\Gamma \colon Raf1'Star} \otimes \frac{RK, MEKPP, RKIP, RRAf1'Star}{\Gamma \colon RAf1'Star} \otimes \frac{RK, MEKPP, RKIP, RKIP, RRAf1'Star}{\Gamma \colon RAf1'Star} \otimes \frac{RK, MEKPP, RKIP, RRAf1'Star}{\Gamma \colon RAf1'Star} \otimes \frac{RK, MEKPP, RKIP, RRAf1'Star}{\Gamma \colon RAf1'Star} \otimes \frac{RK, MEKPP, RKIP, R
                                                                                                                                    \Gamma: ERK, MEKPP, RKIP, RP, Raf1'Star \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP \otimes Raf1'Star
                                                                                                                                                                                                                                                \Gamma: \ \Delta \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP \otimes Raf1'Star
       file: MCC/ERK_erk-000001_10_1.p (147 ms)
 \underline{\Gamma : ERK \vdash ERK} \quad \underline{\Gamma : MEKPP \vdash MEKPP} \\ \otimes \quad \underline{\Gamma : RKIP \vdash RKIP}
                                             \Gamma: ERK, MEKPP, RKIP \vdash ERK \otimes MEKPP \otimes RKIP \otimes \Gamma: RP \vdash RP
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 \otimes \quad \overline{\Gamma: \ Raf1'Star \vdash Raf1'Star} \ \otimes
                                                                                       \Gamma: ERK, MEKPP, RKIP, RP \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP
                                                                                                                                    \Gamma: ERK, MEKPP, RKIP, RP, Raf1'Star \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP \otimes Raf1'Star
                                                                                                                                                                                                                                               \Gamma: \Delta \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP \otimes Raf1'Star
       file: MCC/ERK_erk-000001_1_1.p (111 ms)
                                                                                                                                                                                                                                         \frac{\overline{\Gamma \colon ERK \vdash ERK} \quad \overline{\Gamma \colon MEKPP \vdash MEKPP}}{\underline{\Gamma \colon ERK, MEKPP \vdash ERK \otimes MEKPP}} \otimes \frac{\overline{\Gamma \colon RP \vdash RP}}{\underline{\Gamma \colon ERK, MEKPP, RP \vdash ERK \otimes MEKPP \otimes RP}} \otimes \frac{\overline{\Gamma \colon Raf1'Star\_'RKIP \vdash Raf1'Star\_'RKIP}}{\underline{\Gamma \colon Raf1'Star\_'RKIP \vdash Raf1'Star\_'RKIP}} \otimes \frac{\overline{\Gamma \colon Raf1'Star\_'RKIP \vdash Raf1'Star\_'RKIP}}{\underline{\Gamma \colon Raf1'Star\_'RKIP \vdash Raf1'Star\_'RKIP}} \otimes \frac{\overline{\Gamma \colon Raf1'Star\_'RKIP}}{\underline{\Gamma \colon Raf1'Star\_'RKIP \vdash Raf1'Star\_'RKIP}} \otimes \frac{\overline{\Gamma \colon Raf1'Star\_'RKIP}}{\underline{\Gamma \colon Raf1'Star\_'RKI
 \overline{\Gamma: Raf1'Star \vdash Raf1'Star} \quad \overline{\Gamma: RKIP \vdash RKIP} \otimes
                                                                                                                                                                                                                                                                                               \Gamma: ERK, MEKPP, RP, Raf1'Star\_'RKIP \vdash ERK \otimes MEKPP \otimes RP \otimes Raf1'Star\_'RKIP
              \Gamma: RKIP, Raf1'Star \vdash Raf1'Star \otimes RKIP
                                                                 \Gamma : ERK, MEKPP, RKIP, RP, Raf1'Star, Raf1'Star \otimes RKIP - \circ Raf1'Star\_'RKIP \vdash ERK \otimes MEKPP \otimes RP \otimes Raf1'Star\_'RKIP - D_{C}
                                                                                                                                                             \Gamma: \ ERK, MEKPP, RKIP, RP, Raf1'Star \vdash ERK \otimes MEKPP \otimes RP \otimes Raf1'Star\_'RKIP
                                                                                                                                                                                                                                        \Gamma: \Delta \vdash ERK \otimes MEKPP \otimes RP \otimes Raf1'Star\_'RKIP
     file: MCC/ERK erk-000001 20 1.p (146 ms)
  \overline{\Gamma: ERK \vdash ERK} \quad \overline{\Gamma: MEKPP \vdash MEKPP}
                                                                                                                                                                                                                                                                             \Gamma \otimes \overline{\Gamma : RKIP \vdash RKIP}
                 \Gamma: ERK, MEKPP \vdash ERK \otimes MEKPP
                                              \Gamma: ERK, MEKPP, RKIP \vdash ERK \otimes MEKPP \otimes RKIP \otimes \Gamma: RP \vdash RP
                                                                                      \frac{RK, MEKPP, RKIP \vdash ERK \otimes MEKII \otimes RKII}{\Gamma \colon ERK, MEKPP, RKIP, RP \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP} \otimes \frac{\Gamma \colon Raf1'Star \vdash Raf1'Star}{\otimes R}
                                                                                                                                    \Gamma: ERK, MEKPP, RKIP, RP, Raf1'Star \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP \otimes Raf1'Star
                                                                                                                                                                                                                                               \Gamma: \Delta \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP \otimes Raf1'Star
    file: MCC/ERK_erk-000001_50_1.p (151 ms)
  \Gamma: ERK \vdash ERK  \Gamma: MEKPP \vdash MEKPF
                                                                                                                                                                                                                                                                          \frac{S}{\Gamma} \otimes \frac{\Gamma}{\Gamma} : RKIP \vdash RKIP
                 \Gamma: ERK, \overline{MEKPP} \vdash ERK \otimes MEKPP
                                                \frac{ERK, MEKTI + ERK \otimes MEKTI}{\Gamma : ERK, MEKPP, RKIP \vdash ERK \otimes MEKPP \otimes RKIP} \otimes \frac{\Gamma : RP \vdash RP}{\Gamma : RP \vdash RP}
                                                                                       \frac{RK, MEKPP, RKIP \vdash EKK \otimes MEKPP \otimes RKIP}{\Gamma \colon ERK, MEKPP, RKIP, RP \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP} \otimes \frac{\Gamma \colon Raf1'Star \vdash Raf1'Star}{\Gamma \colon Raf1'Star \vdash Raf1'Star} \otimes \frac{RK, MEKPP, RKIP, RP \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP}{\Gamma \colon Raf1'Star \vdash Raf1'Star} \otimes \frac{RK, MEKPP, RKIP, RP \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP}{\Gamma \colon Raf1'Star \vdash Raf1'Star} \otimes \frac{RK, MEKPP, RKIP, RP \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP}{\Gamma \colon Raf1'Star \vdash Raf1'Star} \otimes \frac{RK, MEKPP, RKIP, RP \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP}{\Gamma \colon Raf1'Star \vdash Raf1'Star} \otimes \frac{RK, MEKPP, RKIP, RP \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP}{\Gamma \colon Raf1'Star \vdash Raf1'Star} \otimes \frac{RK, MEKPP, RKIP, RP \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP}{\Gamma \colon Raf1'Star \vdash Raf1'Star} \otimes \frac{RK, MEKPP, RKIP, RP \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP}{\Gamma \colon Raf1'Star} \otimes \frac{RK, MEKPP, RKIP, RP \vdash RAf1'Star}{\Gamma \colon RF \vdash RAf1'Star} \otimes \frac{RK, MEKPP, RKIP, RP \vdash RAf1'Star}{\Gamma \colon RF \vdash RAf1'Star} \otimes \frac{RK, MEKPP, RKIP, RP \vdash RAf1'Star}{\Gamma \colon RF \vdash RAf1'Star} \otimes \frac{RK, MEKPP, RKIP, RP \vdash RAf1'Star}{\Gamma \colon RF \vdash RAf1'Star} \otimes \frac{RK, MEKPP, RKIP, RP \vdash RK, RKIP, RR \vdash RK, RKIP, RR \vdash RK, RKIP, RKIP
                                                                                                                                    \Gamma: ERK, MEKPP, RKIP, RP, Raf1'Star \vdash ERK \otimes MEKPP \otimes RKIP \otimes RP \otimes Raf1'Star
                                                                                                                                                                                                                                               \overline{\Gamma:\ \Delta \vdash ERK} \otimes MEKPP \otimes RKIP \otimes RP \otimes Raf1'Star
    file: MCC/ERK erk-000001 5 1.p (103 ms)
                                                                                                                                                                                                                                        \frac{\Gamma \colon ERK \vdash ERK \quad \Gamma \colon MEKPP \vdash MEKPP}{\Gamma \colon ERK, MEKPP \vdash ERK \otimes MEKPP} \otimes \frac{\Gamma \colon RP \vdash RP}{\Gamma \colon ERK, MEKPP, RP \vdash ERK \otimes MEKPP \otimes RP} \otimes \frac{\Gamma \colon Raf1'Star\_'RKIP \vdash Raf1'Star\_'RKIP}{\Gamma \colon ERK, MEKPP, RP, Raf1'Star\_'RKIP \vdash RAf1'Star\_'RKIP} \xrightarrow{\bullet} \frac{\Gamma \colon ERK, MEKPP, RP, Raf1'Star\_'RKIP}{\Gamma \colon ERK, MEKPP, RP, Raf1'Star\_'RKIP} \xrightarrow{\bullet} \frac{\Gamma \colon RAf1'Star\_'RKIP}{\Gamma \colon RAf1'Star\_'RKIP} \xrightarrow{\bullet} \frac{\Gamma \colon RAf1'Star\_'RKIP}
\overline{\Gamma \colon Raf1'Star \vdash Raf1'Star} \quad \overline{\Gamma \colon RKIP \vdash RKIP} \otimes
               \Gamma: RKIP, Raf1'Star \vdash Raf1'Star \otimes RKIP
                                                                 \Gamma : ERK, MEKPP, RKIP, RP, Raf1'Star, \underbrace{Raf1'Star \otimes RKIP \multimap Raf1'Star\_'RKIP \vdash ERK \otimes MEKPP \otimes RP \otimes Raf1'Star\_'RKIP}_{DG}
                                                                                                                                                              \Gamma: ERK, MEKPP, RKIP, RP, Raf1'Star \vdash ERK \otimes MEKPP \otimes RP \otimes Raf1'Star\_'RKIP
                                                                                                                                                                                                                                             \Gamma: \Delta \vdash ERK \otimes MEKPP \otimes RP \otimes Raf1'Star\_'RKIP
```

file: MCC/Eratosthenes_eratosthenes-010_1_1.p (21361 ms)

```
\Gamma: p2 \vdash p2 \quad \overline{\Gamma: p6 \vdash p6} \otimes
             \Gamma: p2, p6 \vdash p2 \otimes p6
                                                                                                                                                                                                                                                                                                                      \Gamma: p10, p2, p3, p4, p5, p7, p8, p9 \vdash p10 \otimes p2 \otimes p3 \otimes p4 \otimes p5 \otimes p7 \otimes p8 \otimes p9
                                                                                                                              \Gamma: \ \underline{p10,p2,p3,p4,p5,p6,p7,p8,p9,p2 \otimes p6 \multimap p2 \vdash p10 \otimes p2 \otimes p3 \otimes p4 \otimes p5 \otimes p7 \otimes p8 \otimes p9} \ D_{C}
                                                                                                                                                           \Gamma: \ p10, p2, p3, p4, p5, p6, p7, p8, p9 \vdash p10 \otimes p2 \otimes p3 \otimes p4 \otimes p5 \otimes p7 \otimes p8 \otimes p9
                                                                                                                                                                                                                   \Gamma: \ \Delta \vdash p10 \otimes p2 \otimes p3 \otimes p4 \otimes p5 \otimes p7 \otimes p8 \otimes p9
      file: MCC/Eratosthenes_eratosthenes-010_5_1.p (6028 ms)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                               \frac{\overline{\Gamma:\ p9 \vdash p9} \quad \overline{\Gamma:\ p3 \vdash p3}}{\underline{\Gamma:\ p3, p9 \vdash p9 \otimes p3}}
                                                                                                                                                                                                                                                                                                                                                  \Gamma: p4 \vdash p4 \quad \Gamma: p2 \vdash p2 \otimes
                                                                                                                                                                                                                                                                                                   \Gamma: p2, p4 \vdash p4 \otimes p2
                                                                                                                                                                                               \Gamma: p2 \vdash p2 \quad \overline{\Gamma: p8 \vdash p8} \otimes
                                                                                                                                                                                                                                                            \frac{\Gamma: \ p2, p3, p4, p5, p7, p8, p9, p2 \otimes p8 \multimap p2 \vdash p2 \otimes p3 \otimes p5 \otimes p7}{\Gamma: \ p2, p3, p4, p5, p7, p8, p9 \vdash p2 \otimes p3 \otimes p5 \otimes p7} \ D_C
                                                                                                                                                                     \frac{\Gamma: \ pz, po, pri, po, pri, po, po}{\Gamma: \ pz, p3, p4, p5, p6, p7, p8, p9, p2 \otimes p6 - op2 \vdash p2 \otimes p3 \otimes p5 \otimes p7} D_C
  \Gamma: p2 \vdash p2 \quad \overline{\Gamma}: p10 \vdash p10
          \Gamma: p10, p2 \vdash p2 \otimes p10
                                                                      10 1: p2, p3, p4, p5, p6, p7, p8, p9, p2 \otimes p10 \rightarrow p2 \vdash p2 \otimes p3 \otimes p5 \otimes p7
 C: p10, p2, p3, p4, p5, p6, p7, p8, p9, p2 \otimes p10 \rightarrow p2 \vdash p2 \otimes p3 \otimes p5 \otimes p7
 C: p10, p2, p3, p4, p5, p6, p7, p8, p9 \vdash p2 \otimes p3 \otimes p5 \otimes p7 \star
 D_{C}
                                                                                                                                           : Δ ⊢ p2 ⊗ p3 ⊗ p5 ⊗ p7
     file: MCC/FlexibleBarrier_flexbar_04_a_100_1.p (86923 ms)
                                                                                                                                                                                                                                                                                                               \frac{\overline{\Gamma \colon p11 \vdash p11}}{\Gamma \colon p11, p24 \vdash p14} \underbrace{\frac{\overline{\Gamma \colon p34 \vdash p34}}{\Gamma \colon p11, p24 \vdash p11 \otimes p24}} \otimes \underbrace{\frac{\overline{\Gamma \colon p34 \vdash p34}}{\Gamma \colon p46 \vdash p46}} \otimes \underbrace{\frac{\overline{\Gamma \colon p46 \vdash p46}}{\Gamma \colon p46 \vdash p46}} \otimes \underbrace{\frac{\overline{\Gamma \colon p49 \vdash p49}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash p50}} \otimes \underbrace{\frac{\overline{\Gamma \colon p50 \vdash p50}}{\Gamma \colon p50 \vdash 
                                                                                                                                                                                                                                                                                                                                                                                                              \Gamma: p11, p24, p34, p46, p49, p50 \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50
                                                                                                                                                                                                                                                           \Gamma: p47 \vdash p47
                                                                                                                                                                                                                                                   \frac{\Gamma \colon p47 \vdash p47}{\Gamma \colon p11, p24, p34, p47, p49, p50, p47 - p46 \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50}{\Gamma \colon p11, p24, p34, p47, p49, p50, p47 - p46 \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50} D_C
\frac{\Gamma \colon p11, p24, p34, p48, p49, p50, p48 - p47 \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50}{\Gamma \colon p11, p24, p34, p48, p49, p50 \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50} D_C
                                                                                                                                                                                                      Γ : p48 ⊢ p48
                                                                                                                                                   \overline{\Gamma:\ p35 \vdash p35}
                                                                                                                                                                                           \begin{array}{c} \frac{1}{p_{33}} \cdot \frac{p_{11}}{p_{24}} \underbrace{p_{24}}_{p_{35}} \underbrace{p_{48}}_{p_{49}} \underbrace{p_{48}}_{p_{49}} \underbrace{p_{50}}_{p_{11}} \underbrace{p_{24}}_{p_{34}} \underbrace{p_{34}}_{p_{49}} \underbrace{p_{46}}_{p_{49}} \underbrace{p_{50}}_{p_{50}} \\ \Gamma \colon p_{11}, p_{24}, p_{36}, p_{48}, p_{49}, p_{50}, p_{36}}_{p_{35}} - p_{35} \vdash p_{11} \underbrace{p_{24}}_{p_{34}} \underbrace{p_{34}}_{p_{46}} \underbrace{p_{46}}_{p_{49}} \underbrace{p_{46}}_{p_{50}} \underbrace{p_{50}}_{p_{60}} \\ D_{C} \end{array}
                                                                                                Γ : p36 ⊢ p36
                                            \boxed{ \underline{\Gamma}: \ p12 \vdash p12 }
                                                                                                                                                      \Gamma: \ p11, p24, p36, p48, p49, p50 \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50 \\ -\circ
                                                                                \frac{\Gamma: p12, p24, p36, p48, p49, p50, p12 \sim p11 \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50}{\Gamma: p12, p24, p36, p48, p49, p50, p12 \sim p11 \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50} D_C
\frac{\Gamma: p12, p24, p36, p48, p49, p50 \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50}{\Gamma: \Delta \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50} \star
  <u>Γ</u>: p0 ⊢ p0
 \begin{array}{c|c} \hline \Gamma \colon p0,p0 \multimap p50 \otimes p49 \otimes p48 \otimes p36 \otimes p24 \otimes p12 \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50} \\ \hline \Gamma \colon p0 \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50 \\ \hline \Gamma \colon \Delta \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50 \\ \hline \end{array} \star 
      file: MCC/FlexibleBarrier_flexbar_04_a_10_1.p (88452 ms)
                                                                                                                                                                                                                                                                                                             \Gamma: p47 \vdash p47
                                                                                                                                                                                                        \Gamma: p48 \vdash p48
                                                                                                                                                                                                                                                   \frac{\Gamma: \ p11, p24, p34, p48, p49, p50, p48 \multimap p47 \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50}{D_{G}} \ D_{G}
                                                                                                                                                                                          \Gamma: p35 \vdash p35
                                                                                                                                     \frac{\Gamma : p11, p24, p36, p48, p49, p50, p36 - p35 \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50}{\Gamma : p11, p24, p36, p48, p49, p50 \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50} D_C
                                             \Gamma: p12 \vdash p12
                                                                                 \Gamma: p12, p24, p36, p48, p49, p50, p12 <math>\rightarrow p11 \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50
                                                                                                \Gamma: \ p12, p24, p36, p48, p49, p50 \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50 \\ \star
 \Gamma: p0 \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50
                                                                    \Gamma: \Delta \vdash p11 \otimes p24 \otimes p34 \otimes p46 \otimes p49 \otimes p50
```

file: MCC/FlexibleBarrier_flexbar_04_a_1_1.p (800 ms)

```
\frac{\overline{\Gamma: \ p12 \vdash p12} \quad \overline{\Gamma: \ p24 \vdash p24}}{\Gamma: \ p12, p24 \vdash p12 \otimes p24} \ \otimes \quad \overline{\Gamma: \ p36 \vdash p36}
                                                                                                                                                                                                                                                                                                                                                                              \overline{\Gamma: p48} \vdash p48
                                                                                                                       \Gamma: p12, p24, p36 \vdash p12 \otimes p24 \otimes p36
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      \overline{\Gamma: p49 \vdash p49}
                                                                                                                                                            \Gamma: p12, p24, p36, p48 \vdash p12 \otimes p24 \otimes p36 \otimes p48
                                                                                                                                                                                                     \Gamma: p12, p24, p36, p48, p49 \vdash p12 \otimes p24 \otimes p36 \otimes p48 \otimes p49
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               \Gamma: p50 \vdash p50
                                                                                                                                                                                                                                                \Gamma: p12, p24, p36, p48, p49, p50 \vdash p12 \otimes p24 \otimes p36 \otimes p48 \otimes p49 \otimes p50
\Gamma: p0 \vdash p0
                                                                                                                                                                                                                                                                                                                \Gamma: \Delta \vdash p12 \otimes p24 \otimes p36 \otimes p48 \otimes p49 \otimes p50
                                      \Gamma:\ p0,p0\multimap p50\otimes p49\otimes p48\otimes p36\otimes p24\otimes p12\vdash p12\otimes p24\otimes p36\otimes p48\otimes p49\otimes p50
                                                                                                                                                      \Gamma: p0 \vdash p12 \otimes p24 \otimes p36 \otimes p48 \otimes p49 \otimes p50 \\ \star
                                                                                                                                                       \Gamma: \Delta \vdash p12 \otimes p24 \otimes p36 \otimes p48 \otimes p49 \otimes p50
     file: MCC/FlexibleBarrier_flexbar_04_a_20_1.p (2209 ms)
                                                                                                                                                                                                                                               \frac{\overline{\Gamma \colon p11\vdash p11} \quad \overline{\Gamma \colon p24\vdash p24}}{\Gamma \colon n11, p24\vdash p11\otimes p24} \otimes \frac{\Gamma \colon p34\vdash p34}{\Gamma \colon p34\vdash p34} \otimes \frac{\Gamma \colon p48\vdash p48}{\Gamma \colon p48\vdash p48} \otimes \frac{\Gamma \colon p49\vdash p49}{\Gamma \colon p49\vdash p49} \otimes \frac{\Gamma \colon p50\vdash p50}{\Gamma \colon p50\vdash p50} \otimes \frac{\Gamma \colon p50\vdash p50}{\Gamma \colon p50\vdash p50}
                                                                                                                                                                                                                                                                                                                                                                       \Gamma: p11, p24, p34, p48, p49, p50 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50
                                                                                                                                                                                    \Gamma: p35 \vdash p35
                                                                                                                                                                                                                                                        \Gamma: \ p11, p24, p35, p48, p49, p50, p35 - \circ p34 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50 \\ D_{G}
                                                                                                                                                                                                                                                                            \Gamma: p11, p24, p35, p48, p49, p50 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50
                                                                                                                     \Gamma: p36 \vdash p36
                                                                                                                                                                                : p11, p24, p36, p48, p49, p50, p36 \rightarrow p35 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50
                                                                                                                                                                                               \Gamma: \ p11, p24, p36, p48, p49, p50 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50 \\ - \circ
                                                     \overline{\Gamma}:\ p12 \vdash p12
                                                                                                      \Gamma : \ p12, p24, p36, p48, p49, p50, p12 - \circ p11 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50 \\ D_C
                                                                                                                           \Gamma: p12, p24, p36, p48, p49, p50 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50
 \Gamma: p0 \vdash p0
                                                                                                                                                                        \Gamma: \Delta \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50
   \frac{\Gamma: \ p0 \vdash p0}{\Gamma: \ p0, p0 \multimap p50 \otimes p49 \otimes p48 \otimes p36 \otimes p24 \otimes p12 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50} \ D_C
                                                                                    \Gamma: p0 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50
                                                                                    \overline{\Gamma:\ \Delta \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50} \ \star
    file: MCC/FlexibleBarrier_flexbar_04_a_50_1.p (2205 ms)
                                                                                                                                                                                                                                               \frac{\overline{\Gamma\colon p11\vdash p11}\quad \overline{\Gamma\colon p24\vdash p24}}{\underline{\Gamma\colon p11, p24\vdash p11\otimes p24}}\otimes \frac{\overline{\Gamma\colon p34\vdash p34}}{\overline{\Gamma\colon p11, p24\vdash p34}}\otimes \frac{\overline{\Gamma\colon p34\vdash p34}}{\overline{\Gamma\colon p48\vdash p48}}\otimes \frac{\overline{\Gamma\colon p49\vdash p49}}{\overline{\Gamma\colon p49\vdash p49}}\otimes \frac{\overline{\Gamma\colon p50\vdash p50}}{\overline{\Gamma\colon p50\vdash p50}}\otimes \frac{\overline{\Gamma\colon p50\vdash p50}}{\overline{\Gamma\colon p50\vdash p50}}
                                                                                                                                                                                   \Gamma: p35 \vdash p35
                                                                                                                                                                                                                                                                                                                                                                     \Gamma: \ p11, p24, p34, p48, p49, p50 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50
                                                                                                                                                                                                                                                        \Gamma: p11, p24, p35, p48, p49, p50 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50
                                                                                                                     \Gamma: p36 \vdash p36
                                                                                                                                                                          \Gamma: \ \underline{p11, p24, p36, p48, p49, p50, p36} \ \neg \ \underline{p35} \vdash \underline{p11} \otimes \underline{p24} \otimes \underline{p34} \otimes \underline{p48} \otimes \underline{p49} \otimes \underline{p50} \ \underline{D_C}
                                                                                                                                                                                                \Gamma: p11, p24, p36, p48, p49, p50 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50
                                                      \Gamma: p12 \vdash p12
                                                                                                     \frac{\Gamma: \ p12, p24, p36, p48, p49, p50, p12 - p11 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50}{D_C}
                                                                                                                           \Gamma: \ p12, p24, p36, p48, p49, p50 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50 \\ \star
 \Gamma: p0 \vdash p0
                                                                                                                                                                         \Gamma:\ \Delta \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50
   \Gamma: \ \underline{p0,p0-\circ p50} \otimes p49 \otimes p48 \otimes p36 \otimes p24 \otimes p12 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50} \ D_{G}
                                                                                     \Gamma: \ p0 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50
                                                                                     \frac{1}{\Gamma: \ \Delta \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50} \star
     file: MCC/FlexibleBarrier_flexbar_04_a_5_1.p (2219 ms)
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\frac{\overline{\Gamma\colon p11\vdash p11}\quad \overline{\Gamma\colon p24\vdash p24}}{\underline{\Gamma\colon p11, p24\vdash p11\otimes p24}}\otimes \frac{}{\Gamma\colon p34\vdash p34}\otimes \frac{}{\Gamma\colon p34\vdash p34}\otimes \frac{}{\Gamma\colon p48\vdash p48}\otimes \frac{}{\Gamma\colon p49\vdash p49}\otimes \frac{}{\Gamma\colon p49\vdash p49}\otimes \frac{}{\Gamma\colon p50\vdash p50}\otimes \frac{}{\Gamma\colon p50\vdash p50}
                                                                                                                                                                                                                                                                                                                                                                                                                             \Gamma: \ p11, p24, p34, p48, p49, p50 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50
                                                                                                                                                                                                               \Gamma: p35 \vdash p35
                                                                                                                                                                                                                                                                                           \frac{\Gamma: \ p11, p24, p35, p48, p49, p50, p35 \multimap p34 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50}{\Gamma: \ p11, p24, p35, p48, p49, p50 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50} \ D_C
                                                                                                                                     \Gamma: p36 \vdash p36
                                                                                                                                                                                                     \Gamma: \ p11, p24, p36, p48, p49, p50, p36 - \circ \ p35 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50 \\ D_C
                                                                                                                                                                                                                               \Gamma: p11, p24, p36, p48, p49, p50 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50
                                                              \Gamma: p12 \vdash p12
                                                                                                                    \Gamma: \ p12, p24, p36, p48, p49, p50, p12 - p11 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50 \\ D_{G}
                                                                                                                                             \Gamma: \ p12, p24, p36, p48, p49, p50 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50 \\ \star
                                                                                                                                                                                                \Gamma: \Delta \vdash \underline{p11} \otimes \underline{p24} \otimes \underline{p34} \otimes \underline{p48} \otimes \underline{p49} \otimes \underline{p50} \multimap
\Gamma: p0 \vdash p0
   \Gamma: p0, p0 \multimap p50 \otimes p49 \otimes p48 \otimes p36 \otimes p24 \otimes p12 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50
D_{C}
                                                                                                  \frac{\Gamma:\ p0 \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50}{\Gamma:\ \Delta \vdash p11 \otimes p24 \otimes p34 \otimes p48 \otimes p49 \otimes p50} \star
      file: MCC/FlexibleBarrier_flexbar_04_b_1_1.p (873 ms)
                                                                                                 \Gamma: p1 \vdash p1 \quad \Gamma: p203 \vdash p203
                                                                                                                   \Gamma: p1, p203 \vdash p1 \otimes p203
                                                                                                                        \Gamma: \ \Delta \vdash p1 \otimes p203
\Gamma: p0 \vdash p0
       \Gamma: p0, p0 \multimap p203 \otimes p1 \vdash p1 \otimes p203
                                                                  \Gamma: p0 \vdash p1 \otimes p203
                                                                  \Gamma: \Delta \vdash p1 \otimes p203
   file: MCC/FlexibleBarrier_flexbar_04_b_5_1.p (2722 ms)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         \frac{\overline{\Gamma: p1 \vdash p1} \quad \overline{\Gamma: p255 \vdash p255}}{\underline{\Gamma: p1, p255 \vdash p1 \otimes p255}} \otimes \quad \frac{\overline{\Gamma: p266 \vdash p266}}{\underline{\Gamma: p266 \vdash p266}} \otimes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    \Gamma: p1, p255, p266 \vdash p1 \otimes p255 \otimes p266
                                                                                                                                                                                                                                                                                                                                                                                                                        \frac{\Gamma: \ p1, p255, p267, p267 \multimap p266 \vdash p1 \otimes p255 \otimes p266}{p266} \ D_C
                                                                                                                                                                                                                                                                                  \Gamma: p256 \vdash p256
                                                                                                                                                                                                                                                                                                                                                                                                                                                        \Gamma: p1, p255, p267 \vdash p1 \otimes p255 \otimes p266
                                                                                                                                                                                                                                                                                                                                  \frac{\Gamma: p1, p255, p256, p256 \multimap p267 \vdash p1 \otimes p255 \otimes p266}{D_C} D_C
                                                                                                                                                                              \overline{\Gamma}: p204 \vdash p204
                                                                                                                                                                                                                                                                                                                                                                    \Gamma:\ p1, p255, p256 \vdash p1 \otimes p255 \otimes p266
                                                                                                                                                                                                                                    \frac{\Gamma: p1, p204, p256, p204 \multimap p255 \vdash p1 \otimes p255 \otimes p266}{\Gamma: p1, p204, p256, p204 \multimap p255 \vdash p1 \otimes p255 \otimes p266} \ D_C
                                                                                                                                                                                                                                                                           \Gamma: p1, p204, p256 \vdash p1 \otimes p255 \otimes p266
                                                                          \Gamma: p203 \vdash p203
                                                                                                                                                                                                                                                                                                       \Gamma: \ \Delta \vdash p1 \otimes p255 \otimes p266
                                                                                                               \frac{103 + p203}{\Gamma : p1, p203, p203 \multimap p256 \otimes p204 \vdash p1 \otimes p255 \otimes p266}} D_C
                                                                                                                                                                          \Gamma: p1, p203 \vdash \underline{p1 \otimes p255} \otimes p266
                                                                                                                                                                                          \Gamma: \ \Delta \vdash p1 \otimes p255 \otimes p266
 \Gamma: p0 \vdash p0
                                               \frac{po}{\Gamma: p0, p0 \multimap p203 \otimes p1 \vdash p1 \otimes p255 \otimes p266} D_C
                                                                                             \Gamma: \ p0 \vdash p1 \otimes p255 \otimes p266
                                                                                             \Gamma: \Delta \vdash p1 \otimes p255 \otimes p266
      file: MCC/FlexibleBarrier_flexbar_06_a_1_1.p (14357 ms)
                                                               \frac{\overline{\Gamma : p12 \vdash p12} \quad \overline{\Gamma : p24 \vdash p24}}{\Gamma : p12, p24 \vdash p12 \otimes p24} \otimes \frac{\overline{\Gamma : p36 \vdash p36}}{\Gamma : p36 \vdash p36} \otimes \frac{\overline{\Gamma : p48 \vdash p48}}{\overline{\Gamma : p48 \vdash p48}} \otimes \frac{\overline{\Gamma : p48 \vdash p48}}{\overline{\Gamma : p48 \vdash p48}} \otimes \frac{\overline{\Gamma : p60 \vdash p60}}{\overline{\Gamma : p48 \vdash p48}} \otimes \frac{\overline{\Gamma : p60 \vdash p60}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}{\overline{\Gamma : p72 \vdash p72}} \otimes \frac{\overline{\Gamma : p72 \vdash p72}}
                                                                                                                                                                                                                   \Gamma: p12, p24, p36, p48, p60, p72 \vdash p12 \otimes p24 \otimes p36 \otimes p48 \otimes p60 \otimes p72
                                                                                                                                                                                                                                                         \Gamma: \ p12, p24, p36, p48, p60, p72, p73 \vdash p12 \otimes p24 \otimes p36 \otimes p48 \otimes p60 \otimes p72 \otimes p73
                                                                                                                                                                                                                                                                                                \Gamma: \ p12, p24, p36, p48, p60, p72, p73, p74 \vdash p12 \otimes p24 \otimes p36 \otimes p48 \otimes p60 \otimes p72 \otimes p73 \otimes p74 
                                                                                                                                                                                                                                                                                                                                                                         \Gamma: \Delta \vdash p12 \otimes p24 \otimes p36 \otimes p48 \otimes p60 \otimes p72 \otimes p73 \otimes p74
 \Gamma: p0 \vdash p0
                                                     \overbrace{\Gamma : p0,\underline{p0} - \circ p74 \otimes p73 \otimes p72 \otimes p60 \otimes p48 \otimes p36 \otimes p24 \otimes p12 \vdash p12 \otimes p24 \otimes p36 \otimes p48 \otimes p60 \otimes p72 \otimes p73 \otimes p74}^{\phantom{\uparrow}} \ D_{C} 
                                                                                                                                                                                        \Gamma: p0 \vdash p12 \otimes p24 \otimes p36 \otimes p48 \otimes p60 \otimes p72 \otimes p73 \otimes p74
                                                                                                                                                                                     \frac{1}{\Gamma:\ \Delta \vdash p12\otimes p24\otimes p36\otimes p48\otimes p60\otimes p72\otimes p73\otimes p74} \star\\
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file: MCC/FlexibleBarrier_flexbar_06_a_5_1.p (33351 ms)

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 \frac{\overline{\Gamma \colon p10 \vdash p10} \quad \overline{\Gamma \colon p24 \vdash p24}}{\Gamma \colon p10, p24 \vdash p10 \otimes p24} \otimes \frac{\overline{\Gamma \colon p36 \vdash p36}}{\Gamma \colon p36 \vdash p36} \otimes \frac{\overline{\Gamma \colon p48 \vdash p48}}{\Gamma \colon p48 \vdash p48} \otimes \frac{\overline{\Gamma \colon p59 \vdash p59}}{\Gamma \colon p59 \vdash p59} \otimes \frac{\overline{\Gamma \colon p72 \vdash p72}}{\Gamma \colon p72 \vdash p72} \otimes \frac{\overline{\Gamma \colon p73 \vdash p73}}{\Gamma \colon p73 \vdash p74} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash p74}} \otimes \frac{\overline{\Gamma \colon p74 \vdash p74}}{\overline{\Gamma \colon p74 \vdash
                                                                                                                                                                                                                                                                                          \begin{array}{c} \Gamma: \ p10, p24, p36, p48, p59 + p10 \otimes p24 \otimes p30 \otimes p48 \otimes p99 \\ \hline \Gamma: \ p10, p24, p36, p48, p59, p72 + p10 \otimes p24 \otimes p36 \otimes p48 \otimes p59 \otimes p72 \\ \hline \Gamma: \ p10, p24, p36, p48, p59, p72, p73 + p10 \otimes p24 \otimes p36 \otimes p48 \otimes p59 \otimes p72 \otimes p73 \\ \hline \Gamma: \ p10, p24, p36, p48, p59, p72, p73 + p10 \otimes p24 \otimes p36 \otimes p48 \otimes p59 \otimes p72 \otimes p73 \\ \hline \Gamma: \ p10, p24, p36, p48, p59, p72, p73, p74 + p10 \otimes p24 \otimes p36 \otimes p48 \otimes p59 \otimes p72 \otimes p73 \otimes p74 \\ \hline \end{array}
                                                                                                                                               \Gamma: p60 \vdash p60
                                                                                                                                                       \Gamma: p11 \vdash p11
                                                                                            \begin{array}{c} \Gamma: p11, p24, p36, p48, p60, p72, p73, p74+p10 \otimes p24 \otimes p36 \otimes p48 \otimes p59 \otimes p72 \otimes p73 \otimes p74 \\ \hline \Gamma: p12, p24, p36, p48, p60, p72, p73, p74+p10 \otimes p24 \otimes p36 \otimes p48 \otimes p59 \otimes p72 \otimes p73 \otimes p74 \\ \hline \Gamma: p12, p24, p36, p48, p60, p72, p73, p74, p12 - op11+p10 \otimes p24 \otimes p36 \otimes p48 \otimes p59 \otimes p72 \otimes p73 \otimes p74 \\ \hline \Gamma: p12, p24, p36, p48, p60, p72, p73, p74+p10 \otimes p24 \otimes p36 \otimes p48 \otimes p59 \otimes p72 \otimes p73 \otimes p74 \\ \hline \Gamma: \Delta \vdash p10 \otimes p24 \otimes p36 \otimes p48 \otimes p59 \otimes p72 \otimes p73 \otimes p74 \\ \hline \Gamma: \Delta \vdash p10 \otimes p24 \otimes p36 \otimes p48 \otimes p59 \otimes p72 \otimes p73 \otimes p74 \\ \hline \end{array} \right) 
                                               \Gamma: p12 \vdash p12
file: MCC/FlexibleBarrier_flexbar_06_b_1_1.p (4345 ms)
                                                                               \overline{\Gamma: p1 \vdash p1} \quad \overline{\Gamma: p397 \vdash p397}
                                                                                                \Gamma: p1, p397 \vdash p1 \otimes p397
                                                                                                      \Gamma: \ \Delta \vdash p1 \otimes p397
\Gamma: p0 \overline{\vdash p0}
    \Gamma: p0, p0 \multimap p397 \otimes p1 \vdash p1 \otimes p397
                                                      \Gamma: p0 \vdash p1 \otimes p397
                                                      \Gamma: \Delta \vdash p1 \otimes p397
    file: MCC/FlexibleBarrier_flexbar_06_b_5_1.p (14439 ms)
                                                                                                                                                                                                                                                                                                                                 \frac{\overline{\Gamma:\ p278 \vdash p278} \quad \overline{\Gamma:\ p3 \vdash p3}}{\overline{\Gamma:\ p278, p3 \vdash p278 \otimes p3}} \otimes \quad \overline{\Gamma:\ p395 \vdash p395}
                                                                                                                                                                                                                                                                                                                                                                  \Gamma:\ p278, p3, p395 \vdash p278 \otimes p3 \otimes p395
                                                                                                                                                                                                                                                                                                                                                                                         \Gamma: p278, p3, p395, p397 \vdash p278 \otimes p3 \otimes p395 \otimes p397 
                                                                                                                                                                                                                                                     \Gamma: p396 \vdash p396
                                                                                                                                                                                                                                                                                            \frac{\Gamma: p278, p3, p396, p397, p396 - p395 + p278 \otimes p3 \otimes p395 \otimes p397}{\Gamma: p278, p3, p396, p397, p396 - p395 + p278 \otimes p3 \otimes p395 \otimes p397} D_C
                                                                                                                                                                                                                                                                                                                  \Gamma: \ p278, p3, p396, p397 \vdash p278 \otimes p3 \otimes p395 \otimes p397 \xrightarrow{} \neg
                                                                                                                                                                          \Gamma: p346 \vdash p346
                                                                                                                                                                                                                     \frac{p_{340}}{\Gamma:\ p278,p3,p346,p397,p346-\circ p396\vdash p278\otimes p3\otimes p395\otimes p397}} D_C
                                                                                                                                                                                                                                                \Gamma: p278, p3, p346, p397 \vdash p278 \otimes p3 \otimes p395 \otimes p397
                                                                                                                                                                                                                                                                                \Gamma: \Delta \vdash p278 \otimes p3 \otimes p395 \otimes p397
                                                                                                                                         \begin{array}{c} \Gamma: p2, p346, p397, p2 - \circ p278 \otimes p3 \vdash p278 \otimes p3 \otimes p395 \otimes p397 \\ \hline D_C \end{array} 
                                                                                                                                                                         \Gamma: p2, p346, p397 \vdash p278 \otimes p3 \otimes p395 \otimes p397 \star
                                                                                                                                                                                                 \Gamma: \Delta \vdash p278 \otimes p3 \otimes p395 \otimes p397
                                                                             \frac{1}{\Gamma} : p1, p397, p1 \multimap p346 \otimes p2 \vdash p278 \otimes p3 \otimes p395 \otimes p397} D_{C}
                                                                                                                 \Gamma: p1, p397 \vdash p278 \otimes p3 \otimes p395 \otimes p397
                                                                                                                         \frac{: p_1, p_3g_1 + p_2r_0 \otimes p_3 \otimes p_3g_5}{\Gamma : \Delta \vdash p_2r_0 \otimes p_3 \otimes p_3g_5 \otimes p_3g_7} \xrightarrow{} \circ
\Gamma: p0 \vdash p0
                           \frac{\Gamma : p0, p0 \multimap p397 \otimes p1 \vdash p278 \otimes p395 \otimes p397}{\Gamma : p0, p0 \multimap p397 \otimes p1 \vdash p278 \otimes p395 \otimes p397} D_C
                                                             \Gamma: \ p0 \vdash p278 \otimes p3 \otimes p395 \otimes p397
                                                             \frac{1}{\Gamma: \ \Delta \vdash p278 \otimes p3 \otimes p395 \otimes p397} \ \star
     file: MCC/FlexibleBarrier_flexbar_08_b_1_1.p (13618 ms)
                                                                               \overline{\Gamma: p1 \vdash p1} \quad \overline{\Gamma: p655 \vdash p655}
                                                                                               \Gamma: p1, p655 \vdash p1 \otimes p655
                                                                                                       \Gamma: \ \Delta \vdash p1 \otimes p655
\Gamma: p0 \vdash p0
     \frac{\Gamma: p0, p0 \multimap p655 \otimes p1 \vdash p1 \otimes p655}{\Gamma: p0, p0 \multimap p655 \otimes p1 \vdash p1 \otimes p655} D_C
                                                      \Gamma: p0 \vdash p1 \otimes p655
                                                       \Gamma: \Delta \vdash p1 \otimes p655
   file: MCC/FlexibleBarrier_flexbar_08_b_5_1.p (38236 ms)
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\frac{\Gamma: \ p1 \vdash p1}{\Gamma: \ p1, p656 \vdash p1 \otimes p656} \otimes \frac{\Gamma: \ p917 \vdash p917}{\Gamma: \ p1, p656 \vdash p1 \otimes p656} \otimes \frac{\Gamma: \ p917 \vdash p917}{\Gamma: \ p917 \vdash p917} \otimes
                                                                                                                                                                                \Gamma: p1, p656, p917 \vdash p1 \otimes p656 \otimes p917
                                                                                                                                  \Gamma: p918 \vdash p918
                                                                                                                                             \frac{\Gamma: \ p1, p656, p918, p918 \multimap p917 \vdash p1 \otimes p656 \otimes p917}{\Gamma: \ p1, p656, p918 \vdash p1 \otimes p656 \otimes p917} \ D_C
                                                                                               \Gamma: p919 \vdash p919
                                                                                                               \frac{\Gamma: \ p1, p656, p919, p919 \multimap p918 \vdash p1 \otimes p656 \otimes p917}{\Gamma: \ p1, p656, p919, p919 \multimap p918 \vdash p1 \otimes p656 \otimes p917} \ D_C
                                                                                                                          \Gamma: p1, p656, p919 \vdash p1 \otimes p656 \otimes p917
                                                            \Gamma: p908 \vdash p908
                                                                               \Gamma: p1, p656, p908, p908 \rightarrow p919 \vdash p1 \otimes p656 \otimes p917 \atop \bigcirc D_C
                                                                                            \Gamma: p1, p656, p908 \vdash p1 \otimes p656 \otimes p917
                                                                                                     \Gamma: \Delta \vdash p1 \otimes p656 \otimes p917
                           \overline{\Gamma: p655 \vdash p655}
                                       \frac{1}{\Gamma} : p1, p655, p655 \multimap p908 \otimes p656 \vdash p1 \otimes p656 \otimes p917} D_C
                                                           \Gamma: p1, p655 \vdash p1 \otimes p656 \otimes p917
                                                                 \Gamma: \ \Delta \vdash p1 \otimes p656 \otimes p917
 \Gamma: p0 \vdash p0
                 \frac{\Gamma:\ p0,p0\multimap p655\otimes p1\vdash p1\otimes p656\otimes p917}{\Gamma:\ p0\vdash p1\otimes p656\otimes p917}\ D_C
                                \frac{\Gamma: \Delta \vdash p1 \otimes p656 \otimes p917}{\Gamma: \Delta \vdash p1 \otimes p656 \otimes p917} \star
   file: MCC/FlexibleBarrier_flexbar_10_b_1_1.p (34087 ms)
                                  \Gamma: p1 \vdash p1 \quad \overline{\Gamma: p977 \vdash p977}
                                         \Gamma: p1, p977 \vdash p1 \otimes p977
 \Gamma: p0 \vdash p0
                                              \Gamma: \Delta \vdash p1 \otimes p977
   \Gamma: p0, p0 \multimap p977 \otimes p1 \vdash p1 \otimes p977
                        \frac{\Gamma: \ p0 \vdash p1 \otimes p977}{\Gamma: \ \Delta \vdash p1 \otimes p977} \ \star
   file: MCC/HouseConstruction-002_10_1.p (10044 ms)
  file: MCC/HouseConstruction-002_1_1.p (58 ms)
                                 \frac{\Gamma: \ p1 \vdash p1}{\Gamma: \ p2 \vdash p2} \otimes
\frac{\Gamma \colon p1 \vdash p1}{\Gamma \colon p1, p2 \vdash p1 \otimes p2} \frac{\Gamma \colon p1, p2 \vdash p1 \otimes p2}{\Gamma \colon p1, p1 \vdash p1 \otimes p2} \frac{\Gamma \colon p1, p1 \vdash p1 \otimes p2}{\Gamma \colon p1, p1 \vdash p1 \otimes p2} \star
  file: MCC/HouseConstruction-002_5_1.p (210 ms)
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\frac{\overline{\Gamma: p3 \vdash p3} \quad \overline{\Gamma: p4 \vdash p4}}{\frac{\Gamma: p3, p4 \vdash p3 \otimes p4}{\underline{\Gamma: p3, p4, p5 \vdash p3 \otimes p4 \otimes p5}} \otimes \frac{\overline{\Gamma: p5 \vdash p5}}{\underline{\Gamma: p6 \vdash p6}} \otimes \frac{\overline{\Gamma: p6 \vdash p6}}{\underline{\Gamma: p6 \vdash p6}}
                                                                                                                                                                                                                                        \frac{7}{\Gamma}: p3, p4, p5, p6 \vdash p3 \otimes p4 \otimes p5 \otimes p6 
                                                                                                                                                                                                                                               \Gamma: \ \Delta \vdash p3 \otimes p4 \otimes p5 \otimes p6 \ _{-\circ}
                                                                                                                                                          \overline{\Gamma: p3 \vdash p3}
                                                                                                                                                                      \frac{\Gamma \colon p3, p3, p3 \multimap p6 \otimes p4 \otimes p5 \vdash p3 \otimes p4 \otimes p5 \otimes p6}{\Gamma \colon p3, p3 \vdash p3 \otimes p4 \otimes p5 \otimes p6} \supset_{\sim} D_C
                                                                                                                    \Gamma: p2 \vdash p2
                                                                                                                                             \frac{\Gamma: p2, p3, p2 \multimap p3 \vdash p3 \otimes p4 \otimes p5 \otimes p6}{\Gamma: p2, p3, p2 \multimap p3 \vdash p3 \otimes p4 \otimes p5 \otimes p6} D_C
                                                                                                                                          \Gamma: p2, p3 \vdash p3 \otimes p4 \otimes p5 \otimes p6
                                                                                  \frac{\Gamma: \ p2, p2, p2 \multimap p3 \vdash p3 \otimes p4 \otimes p5 \otimes p6}{\Gamma: \ p2, p2 \vdash p3 \otimes p4 \otimes p5 \otimes p6} \ D_C
                                                \frac{\Gamma:\ p1, p2, p1 \multimap p2 \vdash p3 \otimes p4 \otimes p5 \otimes p6}{\Gamma:\ p1, p2 \vdash p3 \otimes p4 \otimes p5 \otimes p6}\ D_C
\Gamma: p1 \vdash p1
                         \frac{\Gamma}{\Gamma}: p1, p1, p1 \multimap p2 \vdash p3 \otimes p4 \otimes p5 \otimes p6} D_C
                                      \frac{\Gamma : p1, p1 \vdash p3 \otimes p4 \otimes p5 \otimes p6}{\Gamma : \Delta \vdash p3 \otimes p4 \otimes p5 \otimes p6} \star
  file: MCC/HouseConstruction-005_1_1.p (126 ms)
                                                      \frac{\overline{\Gamma:\ p1\vdash p1}\quad \overline{\Gamma:\ p1\vdash p1}}{\frac{\Gamma:\ p1,p1\vdash p1\otimes p1}{\Gamma:\ p1,p1\vdash p1\otimes p1}\otimes \frac{\overline{\Gamma:\ p1\vdash p1}\quad \overline{\Gamma:\ p1\vdash p1}}{\Gamma:\ p1,p1\vdash p1\otimes p1\otimes p1\otimes p1}\otimes}
                                                                                                                           \Gamma: p1 \vdash p1
                                              \Gamma: \ p1, p1, p1, p1, p1, p1 \xrightarrow{} p2 \vdash p1 \otimes p1 \otimes p1 \otimes p1 \otimes p2
                                                                \frac{\Gamma: \ p1, p1, p1, p1, p1 \vdash p1 \otimes p1 \otimes p1 \otimes p1 \otimes p2}{\Gamma: \ \Delta \vdash p1 \otimes p1 \otimes p1 \otimes p1 \otimes p2} \ \star
  file: MCC/HouseConstruction-005 5 1.p (266 ms)
                                                                                                                                                                          \begin{array}{c|c} \hline \Gamma \colon p1 \vdash p1 & \overline{\Gamma} \colon p1 \vdash p1 \\ \hline \hline \Gamma \colon p1, p1 \vdash p1 \otimes p1 & \otimes & \overline{\Gamma} \colon p2 \vdash p2 \\ \hline \hline \Gamma \colon p1, p1, p2 \vdash p1 \otimes p1 \otimes p2 & \otimes & \overline{\Gamma} \colon p3 \vdash p3 \\ \hline \hline \Gamma \colon p1, p1, p2, p3 \vdash p1 \otimes p1 \otimes p2 \otimes p3 & \overline{\Gamma} \colon p3 \vdash p3 \\ \hline \hline \Gamma \colon p1, p1, p2, p3, p3 \vdash p1 \otimes p1 \otimes p2 \otimes p3 \otimes p3 \\ \hline \hline \Gamma \colon p1, p1, p2, p3, p3 \vdash p1 \otimes p1 \otimes p2 \otimes p3 \otimes p3 \\ \hline \hline \end{array} \otimes 
                                                                                                                                                                         \frac{\Gamma:\ p1,p1,p2,p2,p3,p2\multimap p3\vdash p1\otimes p1\otimes p2\otimes p3\otimes p3}{\Gamma:\ p1,p1,p2,p2,p3\vdash p1\otimes p1\otimes p1\otimes p2\otimes p3\otimes p3}\ D_C
                                                                                                                                  \frac{\Gamma: \ p1, p1, p2, p2, p2, p2 \multimap p3 \vdash p1 \otimes p1 \otimes p2 \otimes p3 \otimes p3}{\Gamma: \ p1, p1, p2, p2, p2, p2 \multimap p3 \vdash p1 \otimes p1 \otimes p2 \otimes p3 \otimes p3} \ D_C
                                                                                                                                          \Gamma: p1, p1, p2, p2, p2 \vdash p1 \otimes p1 \otimes p2 \otimes p3 \otimes p3
                                                                                             \Gamma: p1, p1, \underline{p1}, \underline{p2}, p2, \underline{p1} \multimap \underline{p2} \vdash \underline{p1} \otimes \underline{p1} \otimes \underline{p2} \otimes \underline{p3} \otimes \underline{p3}
                                                                                                  \frac{\Gamma: p1, p1, p1, p2, p2 \vdash p1 \otimes p1 \otimes p2 \otimes p3 \otimes p3}{\Gamma: p1, p1, p1, p2, p2 \vdash p1 \otimes p1 \otimes p2 \otimes p3 \otimes p3} \rightarrow
                                   \Gamma: p1 \vdash p1
                                                          \frac{\Gamma:\ p1,p1,p1,p1,p2,p1\multimap p2\vdash p1\otimes p1\otimes p2\otimes p3\otimes p3}{\Gamma:\ p1,p1,p1,p1,p2,p1\multimap p2\vdash p1\otimes p1\otimes p2\otimes p3\otimes p3}\ D_C
\Gamma: p1 \vdash p1
                                                                    \Gamma: p1, p1, p1, p1, p2 \vdash p1 \otimes p1 \otimes p2 \otimes p3 \otimes p3
                       \Gamma: p1, p1, \underline{p1}, \underline{p1}, p1, \underline{p1}, \underline{p1} \circ \underline{p2} \vdash \underline{p1} \otimes \underline{p1} \otimes \underline{p2} \otimes \underline{p3} \otimes \underline{p3}
                                  \Gamma: p1, p1, p1, p1, p1 \vdash p1 \otimes p1 \otimes p2 \otimes p3 \otimes p3
                                                   \Gamma: \ \Delta \vdash p1 \otimes p1 \otimes p2 \otimes p3 \otimes p3
  file: MCC/HouseConstruction-010_1_1.p (1583 ms)
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\frac{\overline{\Gamma\colon p1\vdash p1} \ \overline{\Gamma\colon p1\vdash p1}}{\Gamma\colon \underline{p1\vdash p1}} \otimes \frac{\overline{\Gamma\colon p1\vdash p1} \ \overline{\Gamma\colon p1\vdash p1}}{\Gamma\colon \underline{p1\vdash p1}} \otimes \frac{\overline{\Gamma\colon \underline{p1\vdash p1}}}{\Gamma\colon \underline{p1\vdash p1}}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  \Gamma: p1 \vdash p1
                                                                                                                                                                                                                                     \underline{\Gamma:\ p1,p1,p1,p1,p1,p1,p1,p1,p1,p1,p1,p1}\ D_C
                                                                                                                                                                                                                                                                      file: MCC/HouseConstruction-010_5_1.p (4276 ms)
                                                                                                                                                                                                                                                                                                                                                                                                                                 \frac{\overline{p_1} \ \overline{\Gamma} \colon p_1 \vdash p_1}{\Gamma \colon p_1 \vdash p_1} \otimes \frac{\overline{\Gamma} \colon p_1 \vdash p_1}{\Gamma \colon p_1 \vdash p_1} \otimes \frac{\overline{\Gamma} \colon p_1 \vdash p_1}{\Gamma \colon p_1 \vdash p_1 \otimes p_1} \otimes \frac{\overline{\Gamma} \colon p_1 \vdash p_1}{\Gamma \colon p_1 \vdash p_1 \otimes p_1 \otimes p_1 \otimes p_1} \otimes \frac{\overline{\Gamma} \colon p_1 \vdash p_1}{\Gamma \colon p_1 \vdash p_1 \otimes p_1 \otimes p_1 \otimes p_1 \otimes p_1} \otimes \frac{\overline{\Gamma} \colon p_1 \vdash p_1}{\Gamma \colon p_1 \vdash p_1 \otimes p_1} \otimes \frac{\overline{\Gamma} \colon p_1 \vdash p_1}{\Gamma \colon p_1 \vdash p_1 \otimes p_1} \otimes \frac{\overline{\Gamma} \colon p_1 \vdash p_1}{\Gamma \colon p_2 \vdash p_2} \otimes \frac{\overline{\Gamma} \colon p_2 \vdash p_2}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon p_3 \vdash p_3}{\Gamma \colon p_3 \vdash p_3} \otimes \frac{\overline{\Gamma} \colon 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        \frac{\Gamma\colon p1,p1,p1,p1,p1,p1,p2}{\Gamma\colon p1,p1,p1,p1,p1,p1,p1,p3,p3\vdash p1\otimes p1\otimes p1\otimes p1\otimes p1\otimes p1\otimes p1\otimes p1\otimes p1\otimes p2}\otimes\frac{\Gamma\colon p3\vdash p3}{\Gamma\colon p3\vdash p3}\otimes\frac{\Gamma\colon p3\vdash p3}{\Gamma\colon p1,p1,p1,p1,p1,p1,p1,p2,p3\vdash p1\otimes p1\otimes p1\otimes p1\otimes p1\otimes p1\otimes p2\otimes p3}\otimes\frac{\Gamma\colon p1,p1,p1,p1,p1,p1,p1,p2,p3\vdash p1\otimes p1\otimes p1\otimes p1\otimes p1\otimes p2\otimes p3}{\Gamma\colon p1,p1,p1,p1,p1,p1,p1,p1,p2,p3,p3\vdash p1\otimes p1\otimes p1\otimes p1\otimes p1\otimes p1\otimes p1\otimes p1\otimes p2\otimes p3\otimes p3}
                                                                                                                                                                                                                                                                                                     \Gamma: p2 \vdash p2
                                                                                                                                                                                                                                   \Gamma: \Delta \vdash p1 \otimes p2 \otimes p3 \otimes p3
         file: MCC/IBM319 10 1.p (3156 ms)
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         file: MCC/IBM319_5_1.p (1841 ms)
       file: MCC/IBM5964 1 1.p (73502 ms)
         file: MCC/IBM703_10_1.p (2283 ms)
       file: MCC/IBM703_1_1.p (483 ms)
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                                                                           \_'s00000703\_'input\_'s00000263 D_C
                         \frac{\Gamma: \ alpha \vdash process\_'s00000030\_'s00000703\_'input\_'s00000263}{\Gamma: \ \Delta \vdash process\_'s00000030\_'s00000703\_'input\_'s00000263} \ \star
file: MCC/IBM703_20_1.p (8056 ms)
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file: MCC/IBM703_5_1.p (1230 ms)
file: MCC/LamportFastMutEx_lamport_fmea-2_10_1.p (10449 ms)
file: MCC/LamportFastMutEx_lamport_fmea-2_1_1.p (1103 ms)
file: MCC/LamportFastMutEx_lamport_fmea-2_5_1.p (1940 ms)
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file: MCC/LamportFastMutEx_lamport_fmea-3_5_1.p (24078 ms)
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\Gamma: p_1_0 \vdash p_1_0
file: MCC/Peterson-2_1_1.p (14394 ms)
file: MCC/Peterson-2_5_1.p (17659 ms)
file: MCC/Philosophers-5_100_1.p (30876 ms)
file: MCC/Philosophers-5_10_1.p (29996 ms)
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file: MCC/PhilosophersDyn_philo_dyn-3-unfolded_5_1.p (23829 ms)
file: MCC/Raft_raft_02_100_1.p (1169 ms)
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 \frac{ \frac{\Gamma \colon p15 \vdash p15}{\Gamma \colon p15, p20 \vdash p15 \otimes p20} \otimes \frac{\Gamma \colon p21 \vdash p21}{\Gamma \colon p15, p20, p21 \vdash p15 \otimes p20 \otimes p21} \otimes \frac{\Gamma \colon p27 \vdash p27}{\Gamma \colon p15, p20, p21, p27 \vdash p15 \otimes p20 \otimes p21 \otimes p27} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p15, p20, p21, p27 \vdash p15 \otimes p20 \otimes p21 \otimes p27} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p
                                                                                                                                                                                                                                                                              \frac{\overline{\Gamma:\ p20\vdash p20}\quad \overline{\Gamma:\ p10\vdash p10}}{\overline{\Gamma:\ p10\vdash p10}}\otimes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         \underline{\Gamma:\ p15,p20,p21,p27,p3,p9}\vdash p15\otimes p20\otimes p21\otimes p27\otimes p3\otimes p9
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         \Gamma: \Delta \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9 \multimap
                                                                                                                                                                                                                                                                                                \Gamma: p10, p20 \vdash p20 \otimes p10
                                                                                                                                                                                                                                                                                                                                                                                \overline{\Gamma:\ p15 \vdash \underline{p15}} \quad \overline{\Gamma:\ p5 \vdash p5} \otimes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  \Gamma: \Delta \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9
                                                                                                 \Gamma: p15, p5 \vdash p15 \otimes p5
                                                                                                                                                                        \frac{\Gamma : p10, p15, p20, p21, p27, p5, p15 \otimes p5 \multimap p3 \otimes p15 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}{\Gamma : p10, p15, p20, p21, p27, p5 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9} D_C
                                                                                                                                                                                                                                                                                                       \Gamma: \Delta \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9
 \Gamma: p0 \vdash p0
                           \frac{1}{\Gamma}: p0, p0 \rightarrow p21 \otimes p27 \otimes p20 \otimes p15 \otimes p10 \otimes p5 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}{D_{C}}
                                                                                                                                                       \Gamma: p0 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9
                                                                                                                                                       \frac{\Gamma: \ \Delta \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}{\Gamma: \ \Delta \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9} \ \star
     file: MCC/Raft_raft_02_10_1.p (1148 ms)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           \frac{\Gamma \colon p15 \vdash p15}{\Gamma \colon p15 \vdash p15} \frac{\Gamma \colon p20 \vdash p20}{\Gamma \colon p15 \otimes p20} \otimes \frac{\Gamma \colon p21 \vdash p21}{\Gamma \colon p21 \vdash p21} \otimes \frac{\Gamma \colon p27 \vdash p27}{\Gamma \colon p27 \vdash p27} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 \vdash p9}{\Gamma \colon p9 \vdash p9} \otimes \frac{\Gamma \colon p9 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    \frac{\overline{\Gamma: p20 \vdash p20} \quad \overline{\Gamma: p10 \vdash p10}}{\Gamma: p20 \vdash p20} \otimes
                                                                                                                                                                                                                                                                                                \Gamma: p10, p20 \vdash p20 \otimes p10
                                                                                                                                                                                                                                                                                                                                                                                \frac{\Gamma : p10, p15, p20, p21, p27, p3, p20 \otimes p10 \longrightarrow p9 \otimes p20 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}{\Gamma : p10, p15, p20, p21, p27, p3 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9} \ D_C
                                                                               \overline{\Gamma:\ p15 \vdash p15} \quad \overline{\Gamma:\ p5 \vdash p5} \ \otimes
                                                                                                 \Gamma: p15, p5 \vdash p15 \otimes p5
                                                                                                                                                                        \frac{\Gamma: \ p10, p15, p20, p21, p27, p5, p15 \otimes p5 \multimap p3 \otimes p15 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}{\Gamma: \ p10, p15, p20, p21, p27, p5, p15 \otimes p5 \multimap p3 \otimes p15 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}{\Gamma: \ p10, p15, p20, p21, p27, p5, p15 \otimes p5 \multimap p3 \otimes p15 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9} \ D_{C}
                                                                                                                                                                                                                                       \Gamma: p10, p15, p20, p21, p27, p5 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9
                                                                                                                                                                                                                                                                                                          \Gamma: \Delta \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9
                           \frac{\Gamma:\ p0,p0 -\circ p21\otimes p27\otimes p20\otimes p15\otimes p10\otimes p5 \vdash p15\otimes p20\otimes p21\otimes p27\otimes p3\otimes p9}{D_{G}}
                                                                                                                                                     \frac{\Gamma:\ p0 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}{\Gamma:\ \Delta \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9} \star
     file: MCC/Raft_raft_02_1_1.p (641 ms)
                                                                                                                           \frac{\overline{\Gamma: p10 \vdash p10} \quad \overline{\Gamma: p15 \vdash p15}}{\Gamma: p10, p15 \vdash p10 \otimes p15} \otimes \quad \overline{\Gamma: p20 \vdash p20}
                                                                                                                                                                                                    \frac{\Gamma: p10, p15 + p10 \otimes p10}{\Gamma: p10, p15, p20 \vdash p10 \otimes p15 \otimes p20} \otimes \frac{\Gamma: p20 \vdash p20}{\Gamma: p21 \vdash p21}
                                                                                                                                                                                                                                                                 \frac{\Gamma: \ p10, p15, p20, p21 \vdash p10 \otimes p15 \otimes p20 \otimes p21}{\Gamma: \ p10, p15, p20, p21 \vdash p10 \otimes p15 \otimes p20 \otimes p21} \otimes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        \overline{\Gamma}: p27 \vdash p27
                                                                                                                                                                                                                                                                                                                                      \Gamma: p10, p15, p20, p21, p27 \vdash p10 \otimes p15 \otimes p20 \otimes p21 \otimes p27
                                                                                                                                                                                                                                                                                                                                                                                                             \Gamma: p10, p15, p20, p21, p27, p5 \vdash p10 \otimes p15 \otimes p20 \otimes p21 \otimes p27 \otimes p5
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \Gamma: \ \Delta \vdash p10 \otimes p15 \otimes p20 \otimes p21 \otimes p27 \otimes p5
\Gamma: p0 \vdash p0
                                                                  \frac{\vdash po}{\Gamma}: \ p0, p0 \multimap p21 \otimes p27 \otimes p20 \otimes \underline{p15} \otimes p10 \otimes p5 \vdash p10 \otimes \underline{p15} \otimes \underline{p20} \otimes \underline{p21} \otimes \underline{p27} \otimes \underline{p5} \ D_{C}
                                                                                                                                                                                                                                                          \Gamma: p0 \vdash p10 \otimes p15 \otimes p20 \otimes p21 \otimes p27 \otimes p5
                                                                                                                                                                                                                                                          \Gamma: \Delta \vdash p10 \otimes p15 \otimes p20 \otimes p21 \otimes p27 \otimes p5
     file: MCC/Raft_raft_02_20_1.p (1155 ms)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           \frac{\overline{\Gamma \colon p15 \vdash p15} \quad \overline{\Gamma \colon p20 \vdash p20}}{\Gamma \colon n15, p20 \vdash p15 \otimes p20} \otimes \frac{\overline{\Gamma \colon p21 \vdash p21}}{\Gamma \colon n15 \otimes p20 \otimes \underline{p21}} \otimes \frac{\overline{\Gamma \colon p27 \vdash p27}}{\Gamma \colon p27 \vdash p27} \otimes \frac{\overline{\Gamma \colon p3 \vdash p3}}{\Gamma \colon p3 \vdash p3} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon p9 \vdash p9}} \otimes \frac{\overline{\Gamma \colon p9 \vdash p9}}{\overline{\Gamma \colon 
                                                                                                                                                                                                                                                                              \frac{\Gamma:\ p15, p20, p21, p27, p3, p9 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}{\star}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           \Gamma: p10, p20 \vdash p20 \otimes p10
                                                                                                                                                                                                                                                                                                                                                                              \frac{\Gamma: p10, p15, p20, p21, p27, p3, p20 \otimes p10 \longrightarrow p9 \otimes p20 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}{\Gamma: p10, p15, p20, p21, p27, p3, p20 \otimes p10 \longrightarrow p9 \otimes p20 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9} D_{C}
                                                                               \frac{\overline{\Gamma:\ p15\vdash p15} \quad \overline{\Gamma:\ p5\vdash p5}}{\Gamma:\ p15,p5\vdash p15\otimes p5} \ \otimes
                                                                                                                                                                                                                                                                                                                                                                                                                                                  \frac{\Gamma:\ p10,p15,p20,p21,p27,p3 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}{\star} \ \star
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  \Gamma: \Delta \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9
                                                                                                                                                                        \frac{\Gamma : p10, p15, p20, p21, p27, p5, p15 \otimes p5 - p3 \otimes p15 + p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}{\Gamma : p10, p15, p20, p21, p27, p5 + p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9} \  \, \frac{D_C}{\star}
                                                                                                                                                                                                                                                                                                     \Gamma: \Delta \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9
 \Gamma: p0 \vdash p0
                             \begin{array}{c} p_0 \vdash p_0 \\ \hline \Gamma : p_0, p_0 \multimap p_2 \underline{1} \otimes p_2 \underline{7} \otimes p_2 \underline{0} \otimes p_1 \underline{5} \otimes p_1 \underline{0} \otimes p_5 \vdash p_1 \underline{5} \otimes p_2 \underline{0} \otimes p_2 \underline{1} \otimes p_2 \underline{7} \otimes p_3 \otimes p_9 \\ \hline D_C \end{array}
                                                                                                                                                     \Gamma: p0 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9
                                                                                                                                                     \Gamma: \ \Delta \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9
     file: MCC/Raft_raft_02_50_1.p (1144 ms)
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\frac{\overline{\Gamma\colon p15\vdash p15} \quad \overline{\Gamma\colon p20\vdash p20}}{\frac{\Gamma\colon p15, p20\vdash p15\otimes p20}{\Gamma\colon p15, p20\vdash p15\otimes p20}} \otimes \frac{\overline{\Gamma\colon p21\vdash p21}}{\Gamma\colon p15, p20\vdash p15\otimes p20\otimes p21} \otimes \frac{\overline{\Gamma\colon p27\vdash p27}}{\Gamma\colon p27\vdash p27} \otimes \frac{\overline{\Gamma\colon p3\vdash p3}}{\Gamma\colon p3\vdash p3} \otimes \frac{\overline{\Gamma\colon p9\vdash p9}}{\Gamma\colon p9\vdash p9} \otimes \frac{\overline{\Gamma\colon p9\vdash p9}}{\mathbb{F}\colon p9\vdash p9} \otimes \mathbb{F}\colon p9\vdash p9} \otimes \mathbb{F}\colon p9\vdash p9\vdash p9}
                                                                                                                                                                                                     \frac{\Gamma: \ p20 \vdash p20}{\Gamma: \ p10 \vdash p10} \otimes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            \frac{\Gamma:\ p15, p20, p21, p27, p3, p9 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}{\star}
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          \Gamma: \ \Delta \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9  \rightarrow
                                                                                                                                                                                                                  \Gamma: p10, p20 \vdash p20 \otimes p10
                                                                                                                                                                                                                                                                            \frac{\Gamma : p10, p15, p20, p21, p27, p3, p20 \otimes p10 \rightarrow p9 \otimes p20 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}{\Gamma : p10, p15, p20, p21, p27, p3 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9} \ D_{C}
                                                         \overline{\Gamma: p15 \vdash p15} \quad \overline{\Gamma: p5 \vdash p5} \otimes
                                                                                                                                                                                                                                                                                                                                                                             \Gamma: \Delta \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9___
                                                                      \Gamma: p15, p5 \vdash p15 \otimes p5
                                                                                                                          \frac{\Gamma : p10, p15, p20, p21, p27, p5, p15 \otimes p5 \multimap p3 \otimes p15 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}{\Gamma : p10, p15, p20, p21, p27, p5 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9} \ \underline{\star}
                                                                                                                                                                                                                        \Gamma: \Delta \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9
\Gamma: p0 \vdash p0
                     \frac{r}{\Gamma}: p0, \underline{p0} - p21 \otimes p27 \otimes p20 \otimes p15 \otimes p10 \otimes p5 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}_{DC}
                                                                                                             \Gamma: p0 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9
                                                                                                             \frac{\Gamma: \ \Delta \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}{\Gamma: \ \Delta \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9} \ \star
  file: MCC/Raft_raft_02_5_1.p (1160 ms)
                                                                                                                                                                                                                                                                                                                                                          \frac{\Gamma \colon p15 \vdash p15 \quad \overline{\Gamma} \colon p20 \vdash p20}{\Gamma \colon p15, p20 \vdash p15 \otimes p20} \otimes \frac{\Gamma \colon p21 \vdash p21}{\Gamma \colon p15, p20, p21 \vdash p15 \otimes p20 \otimes p21} \otimes \frac{\Gamma \colon p27 \vdash p27}{\Gamma \colon p15, p20, p21 \vdash p15 \otimes p20 \otimes p21} \otimes \frac{\Gamma \colon p27 \vdash p27}{\Gamma \colon p3 \vdash p3} \otimes \frac{\Gamma \colon p3 \vdash p3}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p9 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p9 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p9 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p9 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon p3 \vdash p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma 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p0}{\Gamma \colon p3 \vdash p0} \otimes \frac{\Gamma \colon
                                                                                                                                                                                                     \frac{\overline{\Gamma: p20 \vdash p20}}{\Gamma: p10 \vdash p10} \otimes 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            \frac{\Gamma:\ p15,p20,p21,p27,p3,p9 \vdash p15\otimes p20\otimes p21\otimes p27\otimes p3\otimes p9}{\star} \ \star
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          \Gamma: \Delta \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9
                                                                                                                                                                                                                  \Gamma: p10, p20 \vdash p20 \otimes p10
                                                                                                                                                                                                                                                                           \frac{\Gamma: \ p10, p15, p20, p21, p27, p3, p20 \otimes p10 \rightarrow p9 \otimes p20 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}{\Gamma: \ p10, p15, p20, p21, p27, p3 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9} \ D_{C}
                                                         \overline{\Gamma:\ p15\vdash p15}\quad \overline{\Gamma:\ p5\vdash p5}_{\otimes}
                                                                                                                                                                                                                                                                                                                                                                             \Gamma: \ \underline{\Delta \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9} \ \_ \circ
                                                                      \Gamma: p15, p5 \vdash p15 \otimes p5
                                                                                                                         \frac{\Gamma: \ p0, p0 \multimap p21 \otimes p27 \otimes p20 \otimes p15 \otimes p10 \otimes p5 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}{D_{C}}
                                                                                                         \frac{\Gamma: \ p0 \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9}{\Gamma: \ \Delta \vdash p15 \otimes p20 \otimes p21 \otimes p27 \otimes p3 \otimes p9} \star
  file: MCC/ResAllocation_RAS-C-3_100_1.p (1804 ms)
     file: MCC/ResAllocation_RAS-C-3_10_1.p (1661 ms)
     file: MCC/ResAllocation_RAS-C-3_1_1.p (5894 ms)
  file: MCC/ResAllocation_RAS-C-3_20_1.p (1758 ms)
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file: MCC/ResAllocation_RAS-C-3_50_1.p (1653 ms)
     file: MCC/ResAllocation_RAS-C-3_5_1.p (2088 ms)
   file: MCC/ResAllocation_RAS-R-2_100_1.p (92 ms)
                                                                                                                                                                                                                                                                                 \frac{\overline{\Gamma \colon p\_1\_1 \vdash p\_1\_1} \quad \overline{\Gamma \colon r\_0\_0 \vdash r\_0\_0}}{\underline{\Gamma \colon p\_1\_1, r\_0\_0 \vdash p\_1\_1 \otimes r\_0\_0}} \otimes \frac{\overline{\Gamma \colon r\_1\_0 \vdash r\_1\_0}}{\underline{\Gamma \colon p\_1\_1, r\_0\_0, r\_1\_0 \vdash p\_1\_1 \otimes r\_0\_0 \otimes r\_1\_0}} \otimes
\Gamma: r_0_1 \vdash r_0_1 \overline{\Gamma}: r_1_1 \vdash r_1_1
             \frac{\cdot \ r_{-0} - 1 + r_{-0} - 1 - 1 \cdot r_{-1} - 1 + r_{-1} - 1}{\Gamma \colon r_{-0} - 1, r_{-1} - 1 \vdash r_{-0} - 1 \otimes r_{-1} - 1} \otimes
                                                                  \frac{-1}{\Gamma}: \ r\_0\_0, r\_0\_1, r\_1\_0, r\_1\_1, r\_0\_1 \otimes r\_1\_1 - \circ p\_1\_1 \vdash p\_1\_1 \otimes r\_0\_0 \otimes r\_1\_0}{\Gamma} \ D_{CC}
                                                                                                                                                    \underline{\Gamma}: \ r\_0\_0, r\_0\_1, r\_1\_0, r\_1\_1 \vdash p\_1\_1 \otimes r\_0\_0 \otimes r\_1\_0
                                                                                                                                                                                                                                     \Gamma: \Delta \vdash p\_1\_1 \otimes r\_0\_0 \otimes r\_1\_0
    file: MCC/ResAllocation_RAS-R-2_10_1.p (88 ms)
            \frac{ \begin{array}{c} \Gamma: \ r\_0\_1 \vdash r\_0\_1 \\ \hline \Gamma: \ r\_0\_1, r\_1\_1 \vdash r\_0\_1 \\ \hline \hline \Gamma: \ r\_0\_0, r\_0\_1, r\_1\_0, r\_1\_1, r\_0\_1 \otimes r\_1\_1 \\ \hline \end{array}}{ \begin{array}{c} \Gamma: \ r\_0\_1, r\_1\_1 \vdash r\_0\_1 \\ \hline \hline \Gamma: \ r\_0\_0, r\_0\_1, r\_1\_0, r\_1\_1, r\_0\_1 \otimes r\_1\_1 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_1 \vdash r\_1\_1 \\ \hline \Gamma: \ r\_1\_1, r\_0\_0 \vdash r\_1\_1 \otimes r\_0\_0 \\ \hline \hline \Gamma: \ r\_1\_1, r\_0\_0, r\_1\_0 \vdash r\_1\_1 \otimes r\_0\_0 \otimes r\_1\_0 \\ \hline \hline \hline \Gamma: \ r\_0\_0, r\_0\_1, r\_1\_0, r\_1\_1, r\_0\_1 \otimes r\_1\_1 \vdash r\_1\_1 \otimes r\_0\_0 \otimes r\_1\_0 \\ \hline \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \hline \hline \Gamma: \ r\_0\_0, r\_0\_1, r\_1\_0, r\_1\_1, r\_0\_1 \otimes r\_1\_1 \vdash r\_1\_1 \otimes r\_0\_0 \otimes r\_1\_0 \\ \hline \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \hline \hline \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \hline \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \hline \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \hline \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 \vdash r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 + r\_1\_0 \\ \hline \end{array}} \otimes \frac{ \begin{array}{c} \Gamma: \ r\_1\_0 + r\_1\_0 \\ \hline \end{array}} \otimes 
\Gamma: r_0_1 \vdash r_0_1 \quad \overline{\Gamma}: r_1_1 \vdash r_1_1
                                                                                                                                                    \Gamma: \ r\_0\_0, r\_0\_1, r\_1\_0, r\_1\_1 \vdash p\_1\_1 \otimes r\_0\_0 \otimes r\_1\_0
                                                                                                                                                                                                                                      \Gamma: \Delta \vdash p\_1\_1 \otimes r\_0\_0 \otimes r\_1\_0
     file: MCC/ResAllocation_RAS-R-2_1_1.p (79 ms)
             \frac{\Gamma: \ p\_1\_1\vdash p\_1\_1 \ \ \overline{\Gamma: \ r\_0\_0\vdash r\_0\_0}}{\Gamma: \ r\_0\_1, r\_1\_1\vdash r\_0\_1 \otimes r\_1\_1} \otimes \frac{\overline{\Gamma: \ p\_1\_1\vdash p\_1\_1} \ \overline{\Gamma: \ r\_0\_0\vdash p\_1\_1 \otimes r\_0\_0}}{\Gamma: \ p\_1\_1, r\_0\_0, r\_1\_0\vdash p\_1\_1 \otimes r\_0\_0 \otimes r\_1\_0} \otimes \frac{\Gamma: \ r\_1\_0\vdash r\_1\_0}{\Gamma: \ p\_1\_1, r\_0\_0, r\_1\_0\vdash p\_1\_1 \otimes r\_0\_0 \otimes r\_1\_0} \otimes \frac{\Gamma: \ r\_1\_0\vdash r\_1\_0}{\Gamma: \ p\_1\_1, r\_0\_0, r\_1\_0\vdash p\_1\_1 \otimes r\_0\_0 \otimes r\_1\_0}
\Gamma: r\_0\_1 \vdash r\_0\_1 \quad \overline{\Gamma}: r\_1\_1 \vdash r\_1
                                                                  \frac{\Gamma : \ r\_0\_0, r\_0\_1, r\_1\_0, r\_1\_1, r\_0\_1 \otimes r\_1\_1 \multimap p\_1\_1 \vdash p\_1\_1 \otimes r\_0\_0 \otimes r\_1\_0}{\Gamma : \ r\_0\_0, r\_0\_1, r\_1\_0, r\_1\_1 \vdash p\_1\_1 \otimes r\_0\_0 \otimes r\_1\_0} \ D_C
                                                                                                                                                                                                                                     \Gamma: \ \Delta \vdash p\_1 \overline{\_1 \otimes r\_0\_0 \otimes r\_1\_0}
```

file: MCC/ResAllocation_RAS-R-2_20_1.p (132 ms)

```
\frac{\Gamma\colon p\_\_0\vdash p\_\_0}{\Gamma\colon p\_\_0,r\_0\_1\vdash p\_\_0\otimes r\_0\_1}\otimes \frac{\Gamma\colon r\_\_1\vdash r\_1\_1}{\Gamma\colon p\_\_0,r\_0\_1\vdash p\_\_0\otimes r\_0\_1}\otimes \frac{\Gamma\colon r\_\_1\vdash r\_1\_1}{\Gamma\colon p\_\_0,r\_0\_1,r\_1\_1\vdash p\_\_0\otimes r\_0\_1\otimes r\_1\_1}\times \\ \frac{\Gamma\colon p\_\_0,r\_0\_1,r\_1\_1\vdash p\_\_0\otimes r\_0\_1\otimes r\_1\_1}{\Gamma\colon \Delta\vdash p\_\_0\otimes r\_0\_1\otimes r\_1\_1} \to
                                                                                                                                                                                                                                                                                                                                                                                                                                                              \frac{\overline{\Gamma\colon r\_0\_0\vdash r\_0\_0}}{\Gamma\colon r\_0\_0, r\_1\_0\vdash r\_0\_0 \otimes r\_1\_0} \otimes \frac{\overline{\Gamma\colon p\_1\_1\vdash p\_1\_1}}{\Gamma\colon p\_1\_1, r\_0\_0, r\_1\_0\vdash r\_0\_0 \otimes r\_1\_0 \otimes r\_1\_0 \otimes p\_1\_1} \otimes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             \frac{r}{\Gamma} : p\_1\_1, r\_0\_0, r\_1\_0, r\_0\_0 \otimes r\_1\_0 \otimes p\_1\_1 \multimap r\_0\_1 \otimes p\_1\_0 \otimes r\_1\_1 \vdash p\_1\_0 \otimes r\_0\_1 \otimes r\_1\_1 } D_C 
  \Gamma: r\_0\_1 \vdash r\_0\_1 \quad \overline{\Gamma: r\_1\_1 \vdash r\_1\_1} \otimes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  \frac{\Gamma: \ p\_1\_1, r\_0\_0, r\_1\_0 \vdash p\_1\_0 \otimes r\_0\_1 \otimes r\_1\_1}{\circ} \to
                            \Gamma: r_0_1, r_1_1 \vdash r_0_1 \otimes r_1_1
                                                                                                                                                                                                                                                                   \Gamma : \ r\_{\underbrace{0\_0,r\_0\_1,r\_1\_0,r\_1\_1,r\_0\_1\otimes r\_1\_1}_{C}} \to p\_{\underbrace{1\_1}\vdash p\_1\_0\otimes r\_0\_1\otimes r\_1\_1}} \ D_G
                                                                                                                                                                                                                                                                                                                                                                                               \frac{\Gamma: \ r\_0\_0, r\_0\_1, r\_1\_0, r\_1\_1 \vdash p\_1\_0 \otimes r\_0\_1 \otimes r\_1\_1}{\Gamma: \ \Delta \vdash p\_1\_0 \otimes r\_0\_1 \otimes r\_1\_1} \ \star
              file: MCC/ResAllocation_RAS-R-2_50_1.p (125 ms)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         \frac{\overline{\Gamma\colon p\_1\_0\vdash p\_1\_0} \ \overline{\Gamma\colon r\_0\_1\vdash r\_0\_1}}{\underline{\Gamma\colon p\_1\_0,r\_0\_1\vdash p\_1\_0\otimes r\_0\_1}} \otimes \frac{\overline{\Gamma\colon r\_1\_1\vdash r\_1\_1}}{\underline{\Gamma\colon p\_1\_0,r\_0\_1,r\_1\_1\vdash p\_1\_0\otimes r\_0\_1\otimes r\_1\_1}} \times
                                                                                                                                                                                                                                                                                                                                                                                                                                                           \frac{\overline{\Gamma\colon r\_0\_0\vdash r\_0\_0}}{\underline{\Gamma\colon r\_0\_0,r\_1\_0\vdash r\_0\_0\otimes r\_1\_0}}\otimes \frac{\overline{\Gamma\colon r\_1\_0\vdash r\_1\_0}}{\overline{\Gamma\colon p\_1\_1\vdash p\_1\_1}}\otimes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         \Gamma: p\_1\_1, r\_0\_0, r\_1\_0 \vdash r\_0\_0 \otimes r\_1\_0 \otimes p\_1\_1
  \frac{\Gamma\colon r\_0\_1 \vdash r\_0\_1}{\Gamma\colon r\_0\_1, r\_1\_1 \vdash r\_0\_1 \otimes r\_1\_1} \otimes
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               \Gamma: p_1_1, r_0_0, r_1_0 \vdash p_1_0 \otimes r_0_1 \otimes r_1_1
                                                                                                                                                                                                                                                                   \frac{\Gamma \colon r\_0\_0, r\_0\_1, r\_1\_0, r\_1\_1 \vdash p\_1\_0 \otimes r\_0\_1 \otimes r\_1\_1}{} \star
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   \Delta \vdash p\_1\_0 \otimes r\_0\_1 \otimes r\_1\_
              file: MCC/ResAllocation_RAS-R-2_5_1.p (125 ms)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            \frac{\overline{\Gamma\colon p\_1\_0\vdash p\_1\_0} \quad \overline{\Gamma\colon r\_0\_1\vdash r\_0\_1}}{\underline{\Gamma\colon p\_1\_0,r\_0\_1\vdash p\_1\_0\otimes r\_0\_1}} \otimes \frac{\overline{\Gamma\colon r\_1\_1\vdash r\_1\_1}}{\overline{\Gamma\colon p\_1\_0,r\_0\_1,r\_1\_1\vdash p\_1\_0\otimes r\_0\_1\otimes r\_1\_1}} \times
                                                                                                                                                                                                                                                                                                                                                                                                                                                              \frac{\overline{\Gamma\colon r\_0\_0\vdash r\_0\_0} \quad \overline{\Gamma\colon r\_1\_0\vdash r\_1\_0}}{\overset{\frown}{\square} \quad \overset{\frown}{\square} \quad \overset
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         \frac{\overline{\Gamma\colon r\_0\_1\vdash r\_0\_1} \ \overline{\Gamma\colon r\_1\_1\vdash r\_1\_1}}{\Gamma\colon r\_0\_1, r\_1\_1\vdash r\_0\_1\otimes r\_1\_1}\otimes
                                                                                                                                                                                                                                                             \frac{\Gamma \colon r = 0.0, r = 0.1, r = 1.0, r = 1.1, r = 0.1 \otimes r = 1.1 \otimes r = 0.1 \otimes r 
                                                                                                                                                                                                                                                                                                                                                                                                     \Gamma: r_0 = 0, r_0 = 1, r_1 = 0, r_1 = 1, r_1 = 0, r_1 = 1, r_2 = 0, r_3 = 0, r_4 = 0, r_5 = 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 \Gamma: \Delta \vdash p \ 1 \ 0 \otimes r \ 0 \ 1 \otimes r \ 1 \ 1
           file: MCC/ResAllocation_RAS-R-3_100_1.p (227 ms)
              file: MCC/ResAllocation_RAS-R-3_10_1.p (230 ms)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                \frac{\overline{\Gamma\colon p\_1\_1\vdash p\_1\_1} \quad \overline{\Gamma\colon r\_0\_0\vdash r\_0\_0}}{\Gamma\colon p\_1\_1, r\_0\_0\vdash p\_1\_1\otimes r\_0\_0} \otimes \frac{\overline{\Gamma\colon r\_0\_2\vdash r\_0\_2}}{\Gamma\colon r\_1\_1, r\_0\_0\vdash p\_1\_1\otimes r\_0} \otimes \frac{\overline{\Gamma\colon r\_0\_2\vdash r\_0\_2}}{\Gamma\colon p\_1\_1, r\_0\_0, r\_0\_2\vdash p\_1\_1\otimes r\_0\_0\otimes r\_0\_2} \otimes \frac{\overline{\Gamma\colon r\_1\_0\vdash r\_1\_0}}{\Gamma\colon p\_1\_1, r\_0\_0, r\_0\_2\vdash r\_1\_0} \otimes \frac{\overline{\Gamma\colon r\_1\_0\vdash r\_1\_0}}{\Gamma\colon p\_1\_1, r\_0\_0, r\_0\_2\vdash r\_1\_0} \otimes \frac{\overline{\Gamma\colon r\_1\_2\vdash r\_1\_2}}{\Gamma\colon p\_1\_1, r\_0\_0, r\_0\_2\vdash r\_1\_0\vdash r\_1\_2} \otimes \frac{\overline{\Gamma\colon r\_1\_2\vdash r\_1\_2}}{\Gamma\colon p\_1\_1, r\_0\_0, r\_0\_2\vdash r\_1\_0\vdash r\_1\_2\vdash p\_1\_1_1\otimes r\_0\_0\otimes r\_0\_2\otimes r\_1\_0\otimes r\_1\_2}} \otimes \frac{\overline{\Gamma\colon r\_1\_2\vdash r\_1\_2}}{\Gamma\colon p\_1\_1, r\_0\_0, r\_0\_2\vdash r\_1\_0\vdash r\_1\_2}} \otimes \frac{\overline{\Gamma\colon r\_1\_2\vdash r\_1\_2}}{\Gamma\colon p\_1\_1, r\_0\_0, r\_0\_2\vdash r\_1\_0\vdash r\_1\_2}} \otimes \frac{\overline{\Gamma\colon r\_1\_2\vdash r\_1\_2}}{\Gamma\colon p\_1\_1, r\_0\_0, r\_0\_2\vdash r\_1\_0\ni r\_1\_2}} \otimes \frac{\overline{\Gamma\colon r\_1\_2\vdash r\_1\_2}}{\Gamma\colon p\_1\_1, r\_0\_0, r\_0\_2\vdash r\_1\_0}} \otimes \frac{\overline{\Gamma\colon r\_1\_2\vdash r\_1\_2}}{\P$
                                                         \frac{\frac{\Gamma\colon r_1 \cup 1, r_1 \cup 1 \vdash r_1 \cup 1 \lor r_1 \cup 1}{\Gamma\colon p_1 \cup 1 \vdash r_1 \cup 1 \lor r_1 \cup 1} \overset{\Gamma\colon p_1 \cup 1 \vdash p_1 \cup 2}{\Gamma\colon p_1 \cup 1 \lor r_1 \cup 1 \lor r_1 \cup 1} \overset{\Gamma\colon p_1 \cup 1 \vdash p_1 \cup 2}{\circ} \overset{\circ}{\circ} \overset{\circ}{\circ}} \overset{\circ}{\circ} \overset{\circ
           file: MCC/ResAllocation_RAS-R-3_1_1.p (168 ms)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         \frac{\overline{\Gamma \colon p\_1\_2 \vdash p\_1\_2} \quad \overline{\Gamma \colon r\_0\_0 \vdash r\_0\_0}}{\overline{\Gamma \colon r\_1\_2 \otimes r\_0\_0}} \otimes \frac{\overline{\Gamma \colon r\_0\_1 \vdash r\_0\_1}}{\overline{\Gamma \colon r\_0\_1} \otimes \overline{\Gamma \colon r\_1\_0 \vdash r\_1\_0}} \otimes \frac{\overline{\Gamma \colon r\_1\_0 \vdash r\_1\_0}}{\overline{\Gamma \colon r\_1\_0 \vdash r\_1\_0}} \otimes \frac{\overline{\Gamma \colon r\_1\_1 \vdash r\_1\_1}}{\overline{\Gamma \colon r\_1\_1 \vdash r\_1\_1}} \otimes \frac{\overline{\Gamma \colon r\_1\_1 \vdash r\_1\_1}}{\overline{\Gamma \colon r\_1\_1 \vdash r\_1\_1}} \otimes \frac{\overline{\Gamma \colon r\_1\_1 \vdash r\_1\_1}}{\overline{\Gamma \colon r\_1\_1 \vdash r\_1\_1}} \otimes \frac{\overline{\Gamma \colon r\_1\_1 \vdash r\_1\_1}}{\overline{\Gamma \colon r\_1\_1}} \otimes \frac{\overline{\Gamma \colon r\_1\_1}}{\overline{\Gamma \colon r\_1}} \otimes \frac{\overline{\Gamma \colon r\_1\_1}}{\overline{\Gamma \colon r\_1}} \otimes \frac{\overline{\Gamma \colon r\_1}}{\overline{\Gamma \colon r\_1}} \otimes \frac{\overline{\Gamma \colon r
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   \frac{\Gamma \colon p\_1\_2, r\_0\_0, r\_0\_1, r\_1\_0 \vdash p\_1\_2 \otimes r\_0\_0 \otimes r\_0\_1 \otimes r\_1\_0}{\Gamma \colon p\_1\_2, r\_0\_0, r\_0\_1, r\_1\_0 \vdash p\_1\_2 \otimes r\_0\_0 \otimes r\_0\_1 \otimes r\_1\_0} \otimes \frac{\Gamma \colon r\_1\_1 \vdash r\_1}{\Gamma \colon p\_1\_2, r\_0\_0, r\_0\_1, r\_1\_0, r\_1\_1 \vdash p\_1\_2 \otimes r\_0\_0 \otimes r\_0\_1 \otimes r\_1\_0 \otimes r\_1\_1} \circ
\frac{\overline{\Gamma: \ r\_0\_2 \vdash r\_0\_2} \ \overline{\Gamma: \ r\_1\_2 \vdash r\_1\_2}}{\Gamma: \ r\_0\_2, r\_1\_2 \vdash r\_0\_2 \otimes r\_1\_2} \otimes
                                                                                                                                                                                                    \begin{array}{c} -2 + r - 2 - 2 \otimes r - 2 \\ \hline \Gamma : r - 0 - 0, r - 0 - 1, r - 0 - 2, r - 1 - 0, r - 1 - 1, r - 1 - 2, r - 0 - 2 \otimes r - 1 - 2 - p - 1 - 2 + p - 1 - 2 \otimes r - 0 - 0 \otimes r - 0 - 1 \otimes r - 1 - 0 \otimes r - 1 - 1 \\ \hline D_C : \end{array} 
                                                                                                                                                                                                                                                                                                                                                            \frac{\Gamma}{\Gamma}: r\_0\_0, r\_0\_1, r\_0\_2, r\_1\_0, r\_1\_1, r\_1\_2 \vdash p\_1\_2 \otimes r\_0\_0 \otimes r\_0\_1 \otimes r\_1\_0 \otimes r\_1\_1 \\ \star
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   \Gamma: \Delta \vdash p\_1\_2 \otimes r\_0\_0 \otimes r\_0\_1 \otimes r\_1\_0 \otimes r\_1\_1
        file: MCC/ResAllocation_RAS-R-3_20_1.p (227 ms)
```

```
file: MCC/ResAllocation_RAS-R-3_50_1.p (219 ms)
   file: MCC/ResAllocation_RAS-R-3_5_1.p (180 ms)
\Gamma: \underline{r\_0\_2 \vdash r\_0\_2} \quad \overline{\Gamma: \ r\_1\_2 \vdash r\_1\_2} \otimes
                    : \ r\_0\_2, r\_1\_2 \vdash r\_0\_2 \otimes r\_1\_2
                                                                                      \Gamma: \ r\_0\_0, r\_0\_1, r\_0\_2, r\_1\_0, r\_1\_1, r\_1\_2 \vdash p\_1\_2 \otimes r\_0\_0 \otimes r\_0\_1 \otimes r\_1\_0 \otimes r\_1\_1 \\ + r\_1\_1 \otimes r\_
                                                                                                                                                                                                                                                            \Gamma: \Delta \vdash p\_1\_2 \otimes r\_0\_0 \otimes r\_0\_1 \otimes r\_1\_0 \otimes r\_1\_1
   file: MCC/ResAllocation_RAS-R-5_100_1.p (7489 ms)
   file: MCC/ResAllocation_RAS-R-5_10_1.p (7495 ms)
     file: MCC/ResAllocation_RAS-R-5_1_1.p (25745 ms)
   file: MCC/ResAllocation_RAS-R-5_20_1.p (4288 ms)
   file: MCC/ResAllocation_RAS-R-5_50_1.p (4306 ms)
```

```
file: MCC/ResAllocation_RAS-R-5_5_1.p (6631 ms)
file: MCC/RobotManipulation_robot-manipulation-1_100_1.p (432 ms)
file: MCC/RobotManipulation_robot-manipulation-1_10_1.p (426 ms)
file: MCC/RobotManipulation_robot-manipulation-1_1_1.p (2206 ms)
file: MCC/RobotManipulation_robot-manipulation-1_20_1.p (1543 ms)
file: MCC/RobotManipulation_robot-manipulation-1_50_1.p (1560 ms)
```

```
file: MCC/RobotManipulation_robot-manipulation-1_5_1.p (1217 ms)
file: MCC/RobotManipulation_robot-manipulation-2_100_1.p (95949 ms)
file: MCC/RobotManipulation_robot-manipulation-2_10_1.p (94414 ms)
file: MCC/SimpleLoadBal_simple_lbs-2_100_1.p (70864 ms)
file: MCC/SimpleLoadBal_simple_lbs-2_10_1.p (70801 ms)
file: MCC/SimpleLoadBal_simple_lbs-2_1_1.p (9358 ms)
```

file: MCC/SimpleLoadBal_simple_lbs-2_50_1.p (2881 ms)

```
file: MCC/SimpleLoadBal_simple_lbs-2_5_1.p (2937 ms)
 file: MCC/TCPcondis_tcp5_1_1.p (21504 ms)
 file: MCC/TokenRing-5-unfolded_10_1.p (64817 ms)
 file: MCC/TokenRing-5-unfolded_1_1.p (1749 ms)
 file: MCC/TokenRing-5-unfolded_5_1.p (6735 ms)
 file: MCC/UtahNoC_1_1.p (75438 ms)
                 \frac{\overline{\Gamma:\ p133\vdash p133}\quad \overline{\Gamma:\ p162\vdash p162}}{\Gamma:\ p133,p162\vdash p133\otimes p162}\ \otimes
                                                                                               \Gamma: p215 \vdash p215
                            \Gamma: p133, p162, p191 \vdash p133 \otimes p162 \otimes p191
                                    \Gamma: p133, p162, p191, p215 \vdash p133 \otimes p162 \otimes p191 \otimes p215
                                              \Gamma: p133, p162, p191, p215, p3 \vdash p133 \otimes p162 \otimes p191 \otimes p215 \otimes p3
                                                                                                                                                                     \frac{\overline{\Gamma: p47 \vdash p47}}{\overline{}} \otimes \overline{\Gamma: p90 \vdash p90} \otimes
                                                         \Gamma: \ p133, p162, p191, p215, p3, p4, p47, p90 \vdash p133 \otimes p162 \otimes p191 \otimes p215 \otimes p3 \otimes p4 \otimes p47 \otimes p90 
                                                                                                   \frac{\Gamma : \Delta \vdash p133 \otimes p162 \otimes p191 \otimes p215 \otimes p3 \otimes p4 \otimes p47 \otimes p90}{} - \circ
\Gamma: p0 \vdash p0
             \frac{\Gamma : p0, p0 \multimap p3 \otimes p4 \otimes p47 \otimes p90 \otimes p133 \otimes p162 \otimes p191 \otimes p215 \vdash p133 \otimes p162 \otimes p191 \otimes p215 \otimes p3 \otimes p4 \otimes p47 \otimes p90}{\Gamma : p0 \vdash p133 \otimes p162 \otimes p191 \otimes p215 \otimes p3 \otimes p4 \otimes p47 \otimes p90} D_C
                                                  \overline{\Gamma:\ \Delta \vdash p133 \otimes p162 \otimes p191 \otimes p215 \otimes p3 \otimes p4 \otimes p47 \otimes p90}\ \star
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