# Languages details - draft

June 28, 2012

## 1 Labeled language

### 1.1 Statics

**Note 1** *This is just current, not final implementation of labeled language. Planned changes include using locally nameless instead of de Bruijn indices for variables and replacing current implementation of $\Omega$ (using fsets from Metatheory library) with one using lists and their permutations.*
*Both changes are due to compatibility in translation with label-free language.*

$$\mathrm{hyp_L}\frac{w \in \Omega \quad \Gamma[n] = (A, w)}{\Omega; \Gamma \vdash \mathrm{hyp_L} n : A@w}$$

$$\mathrm{lam_L}\frac{\Omega; (A, w) :: \Gamma \vdash M : A'@w}{\Omega; \Gamma \vdash \lambda_L A, M : A \to A'@w}$$

$$\mathrm{appl_L}\frac{\Omega; \Gamma \vdash M : A \to A'@w \quad \Omega; \Gamma \vdash N : A@w}{\Omega; \Gamma \vdash \mathrm{appl_L} M N : A'@w}$$

$$\mathrm{box_L}\frac{w \in \Omega \quad \forall_w w \notin \mathrm{L} \to w' \cup \Omega; \Gamma \vdash M^{w'} : A@w'}{\Omega; \Gamma \vdash \mathrm{box_L} M : \Box A@w}$$

$$\mathrm{unbox_L}\frac{\Omega; \Gamma \vdash M : \Box A@w}{\Omega; \Gamma \vdash \mathrm{unbox_L} M : A@w}$$

$$\mathrm{here_L}\frac{\Omega; \Gamma \vdash M : A@w}{\Omega; \Gamma \vdash \mathrm{here_L} M : \Diamond A@w}$$

$$\mathrm{letd_L}\frac{w \in \Omega \quad \Omega; \Gamma \vdash M : \Diamond A@w \quad \forall_{w'} w' \notin \mathrm{L} \to w' \cup \Omega; (A, w') :: \Gamma \vdash N^{w'} : B@w}{\Omega; \Gamma \vdash \mathrm{letdia_L} M \mathrm{in} N : B@w}$$

$$\mathrm{fetch_L}\frac{w \in \Omega \quad \Omega; \Gamma \vdash M : \Box A@w'}{\Omega; \Gamma \vdash \mathrm{fetch_L} w' M : \Box A@w'}$$

$$\mathrm{get_L}\frac{w \in \Omega \quad \Omega; \Gamma \vdash M : \Diamond A@w'}{\Omega; \Gamma \vdash \mathrm{get_L} w' M : \Diamond A@w'}$$