$$\frac{s(PC_p) = \langle fork\ an \rangle \quad |\tau(an)| = k}{\langle Exec_s^a(PC_a, PC'_a, w_a, \pi_a, P_a)\ ||...|| } [Fork]$$

$$Exec_s^p(PC_p, PC'_p, w_p, \pi_p, P_p)\ ||...||$$
$$Exec_s^z(PC_z, PC'_z, w_z, \pi_z, P_z), \sigma, \rho, \xi, \tau, \phi, \alpha\rangle$$

$$\rightarrow \langle Exec_s^a(PC_a, PC'_a, w_a, \pi_a, P_a)\ ||...||$$
$$Exec_s^{p.1}(\tau(an, 1), PC_p, \epsilon, \pi_p, p)\ ||$$
$$Exec_s^{p.2}(\tau(an, 2), PC_p, \epsilon, \pi_p, p)\ ||...||$$
$$Exec_s^{p.k}(\tau(an, k), PC_p, \epsilon, \pi_p, p)\ ||...||$$
$$Exec_s^z(PC_z, PC'_z, w_z, \pi_z, P_z), \sigma, \rho, \xi, \tau, \phi, (p, an)\alpha\rangle$$

$$\frac{(PC_p^1, PC_p^{'1}, w_p, \pi_p, P_p, \rho, \xi)_{(\sigma,\tau,\phi)} \xrightarrow{s(PC_p^1)(\neq\langle par\ 1\rangle)}_{(p,N)} (PC_p^2, PC_p^{'2}, w'_p, \pi'_p, P_p, \rho', \xi')_{(\sigma',\tau,\phi)}}{\langle Exec_s^a(PC_a, PC'_a, w_a, \pi_a, P_a)\ ||...||} [Par]$$

$$Exec_s^p(PC_p^1, PC_p^{'1}, w_p, \pi_p, P_p)\ ||...||$$
$$Exec_s^z(PC_z, PC'_z, w_z, \pi_z, P_z), \sigma, \rho, \xi, \tau, \phi, \alpha\rangle$$

$$\rightarrow \langle Exec_s^a(PC_a, PC'_a, w_a, \pi_a, P_a)\ ||...||$$
$$Exec_s^p(PC_p^2, PC_p^{'2}, w'_p, \pi'_p, P_p)\ ||...||$$
$$Exec_s^z(PC_z, PC'_z, w_z, \pi_z, P_z), \sigma', \rho', \xi', \tau, \phi, \alpha\rangle$$

$$\frac{\wedge_i(s(PC_p.i) = \langle par\ 1\rangle) \quad \wedge_i (P_{p.i} = p) \quad |\tau(\alpha(p))| = k}{\langle Exec_s^a(PC_a, PC'_a, w_a, \pi_a, P_a)\ ||...||} [merge]$$

$$Exec_s^{p.1}(PC_{p.1}, PC'_{p.1}, w_{p.1}, \pi_{p.1}, P_{p.1})\ ||...||$$
$$Exec_s^{p.k}(PC_{p.k}, PC'_{p.k}, w_{p.k}, \pi_{p.k}, P_{p.k})\ ||...||$$
$$Exec_s^z(PC_z, PC'_z, w_z, \pi_z, P_z), \sigma, \rho, \xi, \tau, \phi, \alpha\rangle$$

$$\rightarrow \langle Exec_s^a(PC_a, PC'_a, w_a, \pi_a, P_a)\ ||...||$$
$$Exec_s^p(PC_p, PC'_p, w_p, \pi_p, P_p)\ ||...||$$
$$Exec_s^z(PC_z, PC'_z, w_z, \pi_z, P_z), \sigma, \rho, \xi, \tau, \phi, \alpha\rangle$$

$$\frac{s(PC_p) = \langle proc\ pn\rangle}{\langle Exec_s^p(PC_p, PC'_p, w_p, \pi_p, P_p), \sigma, \rho, \xi, \tau, \phi, \alpha\rangle} [Proc]$$

$$\rightarrow \langle Exec_s^p(PC_p + 1, PC_p, (PC'_P + 1)w_p, (pn)\pi_p, P_p), \sigma, (N + 1 -$$
$$PC'_p, (p)\pi_p)\rho, \xi, \tau, \phi, \alpha\rangle$$

$$\frac{s(PC_p) = \langle return\ pn \rangle}{\langle Exec_s^p(PC_p, PC'_p, (a)w_p, (pn)\pi_p, P_p), \sigma, \rho, \xi, \tau, \phi, \alpha \rangle} [Return]$$

$$\rightarrow \langle Exec_s^p(a, PC_p, w_p, \pi_p, P_p), \sigma, \rho, \xi, \tau, \phi, \alpha \rangle$$

$$\frac{s(PC_p) = \langle call\ cn \rangle \quad \phi(cn) = a}{\langle Exec_s^p(PC_p, PC'_p, w_p, \pi_p, P_p), \sigma, \rho, \xi, \tau, \phi, \alpha \rangle} [Call]$$

$$\rightarrow \langle Exec_s^p(a, PC_p, w_p, (cn)\pi_p, P_p), \sigma, \rho, \xi, \tau, \phi, \alpha \rangle$$

$$\frac{s(PC_p) = \langle return\_label\ cn \rangle}{\langle Exec_s^p(PC_p, PC'_p, w_p, (pn)\pi_p, P_p), \sigma, \rho, \xi, \tau, \phi, \alpha \rangle} [Return\_label]$$

$$\rightarrow \langle Exec_s^p(PC_p + 1, PC_p, w_p, \pi_p, P_p), \sigma, (N + 1 - PC'_p, (p)\pi_p)\rho, \xi, \tau, \phi, \alpha \rangle$$