Dominion Protocol v1

February 8, 2012

In the grammar in figure 1, italicized names are non-terminals, text starting with a semi-colon is a comment about the grammar (i.e., not part of the grammar), and other non-italicized text is literal. Ellipses indicate zero or more repetitions of the preceding non-terminal. Extra whitespace may appear between any parenthesis, non-terminal, and other literal sequence (but not in the middle of a literal sequence that contains no parentheses).

Each player program runs as a process that receives *notification*s from its stdin and sometimes writes *play*s to its stdout. Each player is either in **wait** or **move** mode, starting out in **wait** mode:

- When a player receives a (move *state*) message, then it shifts to **move** mode and replies with a *play*; if the *play* is (clean) or (clean *card*), then the player shifts to **wait** mode; otherwise, the player receives another (move *state*) message and continues its turn in **move** mode.

- When a player receives a (moved *name* *play*) message, then it stays in the **wait** mode without sending a reply.

For the most part, the constraints on *play*s should be clear based on the game rules. To clarify, here are some specific constraints:

- (act mine *treasure* *treasure*) — The *state* must have a actions value of 1 or more, the first *treasure* must be in the hand part of *state*, the second *treasure* must be in the supply, and the second *treasure* must have a cost no more than the first *treasure*'s value plus three.

- (add *treasure*) — The *treasure* card must be in the hand part of *state*, and its value is added to the number of available coins that can be used for a later buy in the same turn. No actions are allowed after this play; that is, the next (move *state*) message will include an actions value of zero.

- (buy *card*) — The *state* must have a buys value of 1 or more, and the cost of *card* must be no more than the coins values in *state*. No actions are allowed after this play.

- (clean *card*) — Ends a turn by moving all played cards and all hand cards to the discard pile. The Dominion rules specify that a player does not have to show

hand cards as they are moved to the discard pile, except that one of the cards will be visible, and `card` is the card that is visible to other players. If the current `state` includes an empty `hand`, then end a turn with `(clean)`, instead.

- `(clean)` — Ends a turn in the case that the current `state` includes an empty `hand`.

Whenever a player reports a legal `play` message, it is broadcast to all other players through a `(moved name play)` notification, where `name` indicates the player who moved. In principle, many parts of `state` report information that players could track on their own via notifications, but `state` provides a basically complete snapshot of the game to support simpler player programs. More to the point, `state` reflects the information that a game controller needs to drive the game (but the controller needs a separate instance of the player-specific information in `state` for each player).

For now, the following elements of Dominion have been omitted from the player protocol: curse cards and all kingdom cards except `mine`. Expect future versions of the protocol to add additional kingdom cards and other player states (to respond to player actions, such as `militia`).

```
      state = ((players name ...)  ;  in order, current first
               (supply card ...)
               (trash card ...)  ;  in order, top to bottom

               (actions number)  ;  actions remaining in turn
               (buys number)  ;  buys remaining in turn
               (coins number)  ;  coins available for buys

               (deck card ...)  ;  not in draw order
               (hand card ...)
               (plays card ...)
               (discards card ...))

       card = treasure
            | victory
            | action

   treasure = copper
            | gold
            | silver

    victory = estate
            | duchy
            | province

     action = mine

       play = (act mine treasure treasure)
            | (add treasure)  ;  adds coins
            | (buy card)
            | (clean)  ;  ending a turn with an empty hand
            | (clean card)  ;  card in hand is exposed

notification = (move state)
            | (moved name play)

       name = a sequence of letters

     number = a sequence of decimal digits
```

Figure 1: Dominion protocol, version 1