Organized Play Database

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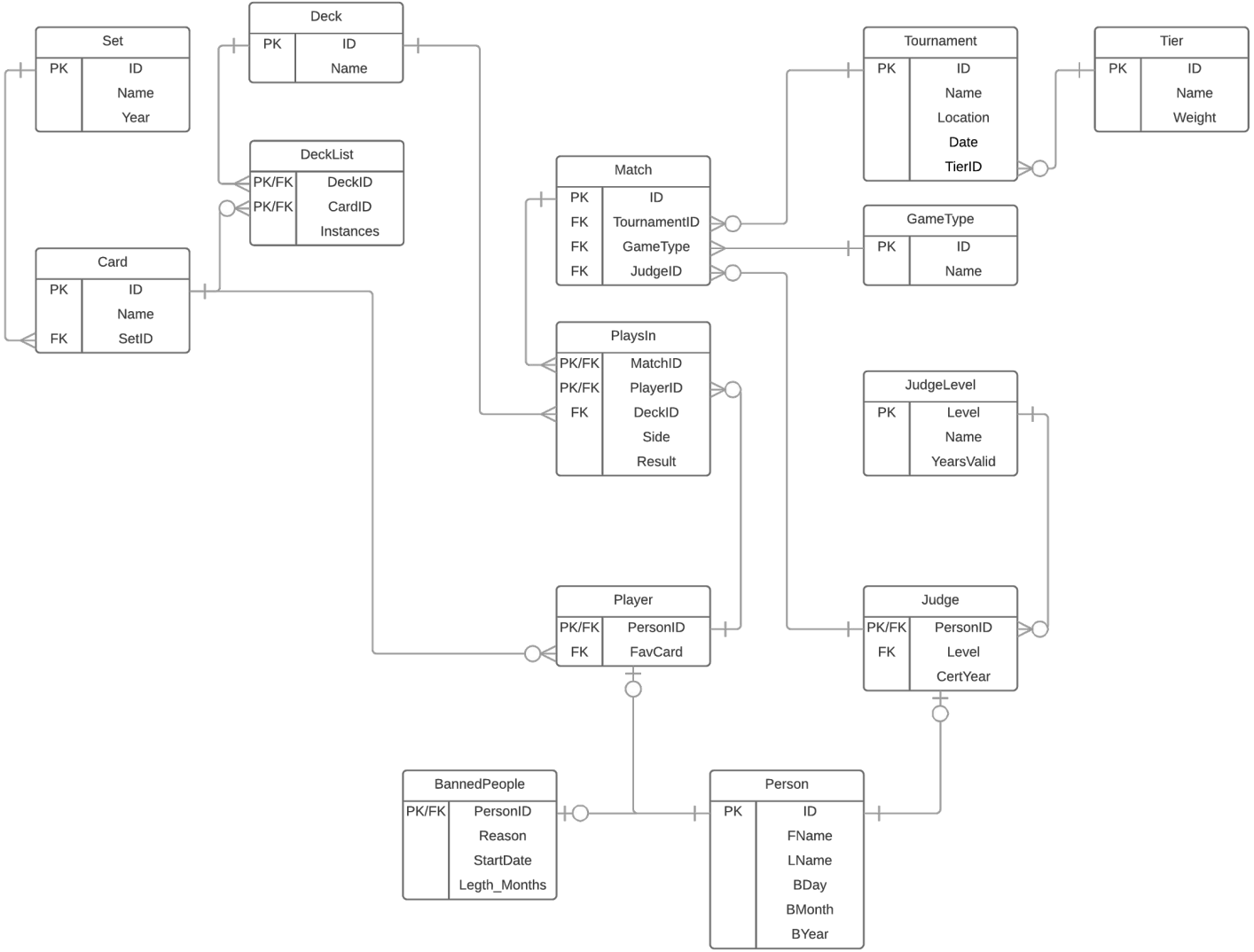
Executive Summary

The Magic the Gathering Organized Play database was created to help Wizards of the Coast, tournament organizers, and most importantly players organize officially sanctioned Magic the Gathering events. To this end, information on players, tournaments, judges and popular decks are all easily available. This allows players to view their matches, judges to rule on those matches, and tournament organizers to schedule their events and matches. This will allow Wizards of the Coast to more easily calculate player season points to determine invites to their high level tournaments around the world.

Entity-Relationship Diagram


Set
PK ID
Name
Year
Deck
PK ID
Name
DeckList
PK/FK DeckID
PK/FK CardID
Instances
Card
PK ID
Name
FK SetID
Tournament
PK ID
Name
Location
Date
TierID
Tier
PK ID
Name
Weight
Match
PK ID
FK TournamentID
FK GameType
FK JudgeID
GameType
PK ID
Name
PlaysIn
PK/FK MatchID
PK/FK PlayerID
FK DeckID
Side
Result
JudgeLevel
PK Level
Name
YearsValid
Player
PK/FK PersonID
FK FavCard
Judge
PK/FK PersonID
FK Level
CertYear
BannedPeople
PK/FK PersonID
Reason
StartDate
Legth_Months
Person
PK ID
FName
LName
BDay
BMonth
BYear

Tables

Table: Set

This is a table stores the sets released for Magic the Gathering as well as the year they were released.

```
CREATE TABLE Set (
      id    SERIAL,
      name  text not null,
      year  integer not null,
  primary key (id)
);
```

Dependencies: id -> name, year

	id	name	year
1	1	Ixalan	2017
2	2	Hour of Devastation	2017
3	3	Amonkhet	2017
4	4	Aether Revolt	2017
5	5	Kaladesh	2016
6	6	Eldritch Moon	2016
7	7	Shadows over Innistrad	2016
8	8	Oath of the GateWatch	2016
9	9	Battle For Zendikar	2015

Table: Card

This is a table stores the name and set id of cards.

```
CREATE TABLE Card (
      id    SERIAL,
      name  text NOT NULL,
      setID INTEGER NOT NULL REFERENCES Set(id),
  PRIMARY KEY (id)
);
```

Dependencies: id -> name, setid

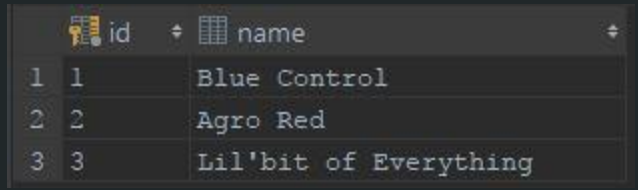
	id	name	setid
1	1	Adanto Vanguard	1
2	2	Ashes of the Abhorrent	1
3	3	Axis of Mortality	1
4	4	Bellowing Aegisaur	1
5	5	Bishop of Rebirth	1
6	6	Bishop's Soldier	1
7	7	Bright Reprisal	1
8	8	Demystify	1
9	9	Duskborne Skymarcher	1
10	10	Emissary of Sunrise	1
11	11	Encampment Keeper	1
12	12	Glorifier of Dusk	1
13	13	Goring Ceratops	1
14	14	Imperial Aerosaur	1
15	15	Imperial Lancer	1
16	16	Inspiring Cleric	1
17	17	Ixalan's Binding	1
18	18	Kinjalli's Caller	1
19	19	Kinjalli's Sunwing	1
20	20	Legion Conquistador	1
21	21	Legion's Judgment	1
22	22	Looming Altisaur	1
23	23	Mavren Fein, Dusk Apostle	1
24	24	Paladin of the Bloodstained	1
25	25	Pious Interdiction	1
26	26	Priest of the Wakening Sun	1
27	27	Pterodon Knight	1
28	28	Queen's Commission	1

Table: Deck

In this table the name and set id of decks are stored.

```
CREATE TABLE Deck (
      id SERIAL,
      name text,
  PRIMARY KEY (id)
);
```

Dependencies: id -> name



	id	name
1	1	Blue Control
2	2	Agro Red
3	3	Lil'bit of Everything

Table: DeckList

This table lists all the cards that make up a predefined deck. Instances refer to the number of times a given card is in a deck. Because the rules for Magic the Gathering limit a player to 4 copies of the same card per deck, instance must be a number between 1 and 4.

```
CREATE TABLE DeckList (
      id          INTEGER REFERENCES Deck(id),
      cardID      INTEGER NOT NULL REFERENCES
Card(id),
      instances INTEGER NOT NULL DEFAULT 1 CHECK
(instances >= 1 AND instances <= 4),
  PRIMARY KEY (id, cardID)
);
```

Dependencies: id -> cardid, instances

	id	cardid	instances
1	1	1	4
2	1	5	4
3	1	2	4
4	1	3	4
5	1	4	4
6	1	6	4
7	1	7	4
8	1	8	4
9	1	9	4
10	1	10	4
11	1	11	4
12	1	12	4
13	1	13	4
14	1	14	4
15	1	15	4
16	2	15	4

Table: JudgeLevel

This table contains information on the judge levels for sanctioned Magic the Gathering events. The level, name of the level, and the how long the licence is valid before needing to be renewed are stored here.

```
CREATE TABLE JudgeLevel (
     level      INTEGER NOT NULL,
     name       text  NOT NULL,
     yearsValid INTEGER NOT NULL,
  PRIMARY KEY (level)
);
```

Dependencies: level -> name, yearsValid

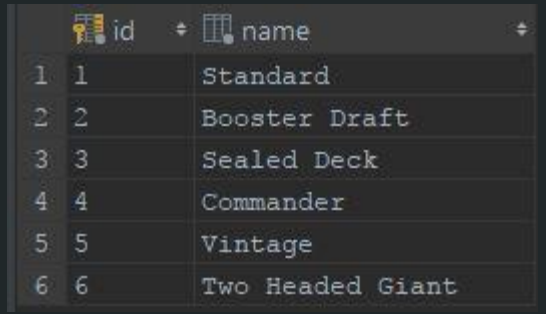
	level	name	yearsvalid
1	1	Regular REL Judge	1
2	2	Competitive REL Judge	1
3	3	Premier Judge	1

Table: GameType

The GameType table stores the current sanctioned game types for competitive Magic the Gathering.

```
CREATE TABLE GameType (
      id   SERIAL,
      name text  NOT NULL,
  PRIMARY KEY (id)
);
```

Dependencies: id -> name



	id	name
1	1	Standard
2	2	Booster Draft
3	3	Sealed Deck
4	4	Commander
5	5	Vintage
6	6	Two Headed Giant

Table: Tier

The Tier table stores the name and weight of Magic the Gathering tournament tiers. The weighting is important for calculating players' league points based on the tournaments they participated in.

```
CREATE TABLE Tier (
      id    SERIAL,
      name    text      NOT NULL,
      weight INTEGER NOT NULL,
  PRIMARY KEY (id)
);
```

Dependencies: id -> name, weight

	id	name	weight
1	1	Best	100
2	2	Grand Prix	10
3	3	Pro Tour	5
4	4	Prerelease	3
5	5	Friday Night Magic	1

Table: Tournament

This table stores the information on tournaments. Their names, locations, dates, and tier are all stored here.

```
CREATE TABLE Tournament (
      id    SERIAL,
      name  text  NOT NULL,
      location text    NOT NULL,
      date  date  NOT NULL DEFAULT current_date,
      tierID   integer NOT NULL REFERENCES Tier(id),
  PRIMARY KEY (id)
);
```

Dependencies: id -> name, location, date, tierid

	id	name	location	date	tierid
1	1	Super amazing tournament of champions	the moon	2017-12-01	1
2	2	FNM	Poughkeepsie, NY	2017-12-01	5
3	3	Grand Prix Atlanta	Atlanta, GA	2017-12-01	2
4	4	Grand Prix Warsaw	Warsaw, Germany	2017-12-01	2
5	5	Iconic masters Prerelease	New York, NY	2017-12-01	4

Table: Person

This table stores basic information on a person. This does not guarantee they are a player, judge, or banned person.

```
CREATE TABLE Person (
      id    SERIAL,
      fname  text      NOT NULL,
      lname  text      NOT NULL,
      bday   INTEGER NOT NULL,
      bmonth INTEGER NOT NULL,
      byear  INTEGER NOT NULL,
  PRIMARY KEY (id)
);
```

	id	fname	lname	bday	bmonth	byear
1	1	Anders	Lykkehoy	5	12	1994
2	2	Richard	Garfield	26	6	1963
3	3	Bob	Smith	2	3	1990
4	4	Some	Guy	1	1	1991
5	5	Morris	Norton	3	7	1980
6	6	Mark	Watson	15	10	1997
7	7	Jeff	Fletcher	22	12	2005
8	8	Bad	Guy	22	12	2005

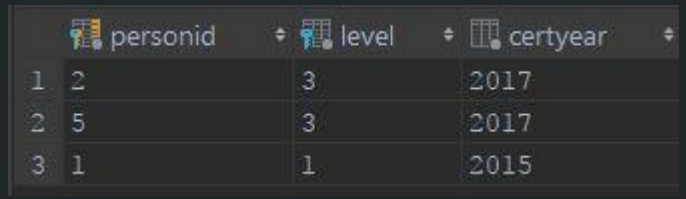
Dependencies: id -> fname, lname, bday, bmonth, byear

Table: Judge

The judge table has information on people who are certified judges. Their judge level and year they were certified are stored here.

```
CREATE TABLE Judge (
      personID INTEGER NOT NULL REFERENCES
Person(id),
      level INTEGER NOT NULL REFERENCES
JudgeLevel(level),
      certYear INTEGER NOT NULL,
  PRIMARY KEY (personID)
);
```

Dependencies: personid -> level, certYear



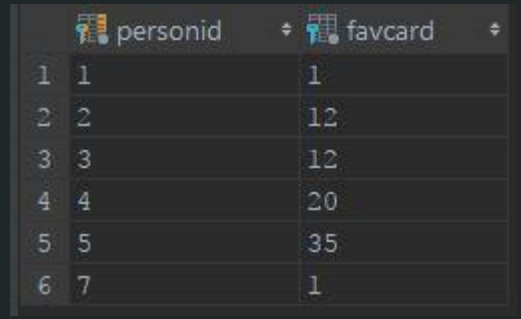
	personid	level	certyear
1	2	3	2017
2	5	3	2017
3	1	1	2015

Table: Player

The Player table has information on people who are registered players.

```
CREATE TABLE Player (
     personID INTEGER NOT NULL REFERENCES
Person(id),
     favCard  INTEGER NOT NULL REFERENCES
Card(id),
  PRIMARY KEY (personID)
);
```

Dependencies: personid -> favCard



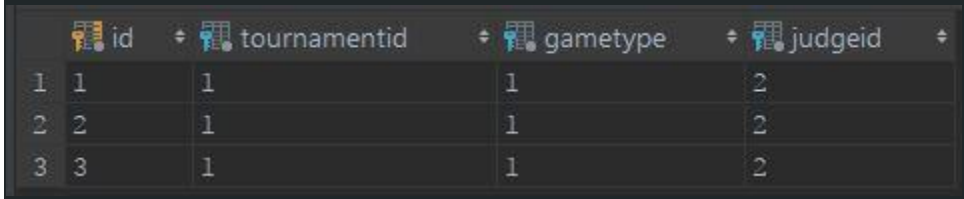
	personid	favcard
1	1	1
2	2	12
3	3	12
4	4	20
5	5	35
6	7	1

Table: Match

The Match table holds information on individual matches such as the tournament they were played in, the game type, and the judge who presided over the match.

```
CREATE TABLE Match (
      id         SERIAL,
      tournamentID INTEGER NOT NULL REFERENCES
Tournament(id),
      gameType   INTEGER NOT NULL REFERENCES
GameType(id),
      judgeID    INTEGER NOT NULL REFERENCES
Judge(personID),
  PRIMARY KEY (id)
);
```

Dependencies: id -> tournamentid, gameType, judgeid



	id	tournamentid	gametype	judgeid
1	1	1	1	2
2	2	1	1	2
3	3	1	1	2

Table: PlaysIn

This table links players to matches. Each player in a match has their deckid saved as well as their side. This is important for non-traditional game modes like 2 Headed Giant where multiple people play on the same side. It also stores the result of the match. The result can be null denoting a game that is scheduled but has not occurred, or that is in the process of being played.

```
CREATE TABLE PlaysIn (
     matchID  INTEGER NOT NULL REFERENCES Match(id),
     playerID INTEGER NOT NULL REFERENCES Player(personID),
     deckID   INTEGER NOT NULL REFERENCES Deck(id),
     side  integer NOT NULL,
     result   CHAR(1) CHECK (result = 'W' or result = 'L'),
  PRIMARY KEY (matchID, playerID)
);
```

	matchid	playerid	deckid	side	result
1	1	1	1	1	W
2	1	3	1	2	L
3	2	1	1	1	<null>
4	2	4	2	2	<null>

Dependencies: (matchid, playerid) -> deckid, side, result

Table: BannedPeople

This table stores people who have been banned from Wizards of the Coast sanctioned events. The reason for the ban, the start date, and the length are found here.

```
CREATE TABLE BannedPeople (
     personID   INTEGER NOT NULL REFERENCES Person(id),
     reason     text,
     startDate  date  NOT NULL DEFAULT current_date,
     legth_months INTEGER NOT NULL,
  PRIMARY KEY (personID)
);
```

Dependencies: personid -> reason, starteDate, length_months

	personid	reason	startdate	legth_months
1	8	hes a bad guy	2000-01-01	6
2	6	cheating	2017-12-01	12

Views

View: fullMatchView

This view shows the full information on a match, the players, their sides, the judge, result, and game type.

```
CREATE VIEW fullMatchView AS
SELECT match.id as match_id, PlaysIn.playerID as player_id,
       p1.fname as player_name, PlaysIn.side,
       judge.personID as judge_id,
       p2.fname as judge_name, result, gameType.name
FROM Match INNER JOIN PlaysIn ON Match.id = PlaysIn.matchID
              INNER JOIN Player ON PlaysIn.playerID = Player.personID
              INNER JOIN Judge ON Match.judgeID = Judge.personID
              INNER JOIN person as p1 ON Player.personID = p1.id
              INNER JOIN person as p2 ON Judge.personID = p2.id
              INNER JOIN gametype ON Match.gameType = GameType.id;
```

	match_id	player_id	player_name	side	judge_id	judge_name	result	name
1	1	1	Anders	1	2	Richard	W	Standard
2	1	3	Bob	2	2	Richard	L	Standard
3	2	1	Anders	1	2	Richard	<null>	Standard
4	2	4	Some	2	2	Richard	<null>	Standard

View: bannedPeopleinfo

This table stores people who have been banned from Wizards of the Coast sanctioned events. The reason for the ban, the start date, and the length are found here.

```
CREATE VIEW bannedPeopleInfo AS
SELECT personID, fname, lname, startDate, legth_months
FROM BannedPeople INNER JOIN person ON
      BannedPeople.personID = Person.id;
```

	personid	fname	lname	startdate	legth_months
1	8	Bad	Guy	2000-01-01	6
2	6	Mark	Watson	2017-12-01	12

Reports

Report: DeckList Card Counts

This report shows the total counts of a card across all decks and sorts by highest amount first.

```
SELECT cardID, sum(instances) as rate
FROM DeckList
GROUP BY cardID
ORDER BY rate DESC;
```

	cardid	rate
1	15	8
2	4	4
3	1	4
4	13	4
5	5	4
6	11	4
7	3	4
8	14	4
9	12	4
10	10	4
11	9	4
12	6	4
13	2	4
14	8	4
15	7	4

Report: Currently Banned People

This report shows the full details on people whose bans are still in effect. That is the duration of the ban is not complete.

```
SELECT id, fname, lname, reason, startDate, legth_months, age(current_date, startDate)
FROM bannedpeople INNER JOIN Person ON BannedPeople.personID = Person.id
WHERE extract(YEAR FROM age(current_date, startDate)) * 12 + extract(MONTH FROM age(current_date,
startDate)) < legth_months;
```

	id	fname	lname	reason	startdate	legth_months	age
1	6	Mark	Watson	cheating	2017-12-01	12	0 years 0 mons 1 days 0 hours 0 mins 0.00 secs

Stored Procedures

Stored Procedure: get_matches_by_tournament

This stored procedure will get all matchid's for a given tournament.

```
CREATE OR REPLACE FUNCTION get_matches_by_tournament(text) RETURNS
  TABLE (matchID INTEGER) AS
$$
DECLARE
  tournamentName ALIAS FOR $1;
BEGIN
  RETURN QUERY
      SELECT DISTINCT Match.id
      FROM Match INNER JOIN tournament ON Match.tournamentID = Tournament.id
      WHERE tournament.name = tournamentName;
END;
$$LANGUAGE plpgsql;
```

```
SELECT *
FROM get_matches_by_tournament('Super amazing tournament of champions');
```

	matchid
1	1
2	2
3	3

Stored Procedure: get_points_for_player

This stored procedure will calculate the points a player has earned from all the tournaments they have participated useing the tournament weight.

```
CREATE OR REPLACE FUNCTION get_points_for_player(text, text) RETURNS
  TABLE (points BIGINT) AS
$$
DECLARE
  firstName ALIAS FOR $1;
  lastName ALIAS FOR $2;
BEGIN
  RETURN QUERY
       SELECT coalesce(sum(tier.weight), 0)
       FROM PlaysIn INNER JOIN Person ON playerID = id
              INNER JOIN match ON PlaysIn.matchID = Match.id
              INNER JOIN tournament ON Match.tournamentID = Tournament.id
              INNER JOIN tier ON Tournament.tierID = Tier.id
       WHERE fname = firstName
       AND lname = lastName
       AND result = 'W';
END;
$$LANGUAGE plpgsql;
```

```
SELECT *
FROM get_points_for_player('Anders', 'Lykkehoy');
```

	points
1	100

Triggers

Trigger: check_match_judge

This trigger makes sure someone who is a judge is not scheduled to play in a match they also officiate.

```
CREATE OR REPLACE FUNCTION check_match_judge()
  RETURNS TRIGGER AS
$$
BEGIN
  IF exists(SELECT *
              FROM match
              WHERE Match.id = NEW.matchID
              AND match.judgeID = NEW.playerID) THEN
       RAISE NOTICE 'Cannot judge and play in the same match';
       RETURN NULL;
  END IF;
  RETURN NEW;
END;
$$
LANGUAGE plpgsql;

CREATE TRIGGER check_match_judge
  BEFORE INSERT OR UPDATE ON PlaysIn
  FOR EACH ROW
  EXECUTE PROCEDURE check_match_judge();
```

```
sql> INSERT INTO playsin (matchid, playerid, deckid, side, result)
   VALUES (2, 2, 1, 1, NULL)
[2017-12-02 22:14:07] [00000] Cannot judge and play in the same match
[2017-12-02 22:14:07] completed in 7ms
```

Trigger: check_deck_size

This trigger makes you cannot put in more than 40 cards into a decklist as per Magic the Gathering's standard tournament rules.

```
CREATE OR REPLACE FUNCTION check_deck_size()
  RETURNS TRIGGER AS
$$
DECLARE
  numCards INTEGER := 0;
BEGIN
  SELECT INTO numCards sum(instances) FROM DeckList WHERE NEW.id = DeckList.id;

  IF numCards + NEW.instances > 60 THEN
       RAISE NOTICE 'There are too many cards in that deck.';
       RETURN NULL;
  END IF;
  RETURN NEW;
END;
$$
LANGUAGE plpgsql;

CREATE TRIGGER check_deck_size
  BEFORE INSERT OR UPDATE ON DeckList
  FOR EACH ROW
  EXECUTE PROCEDURE check_deck_size();
```

```
sql> INSERT INTO decklist (id, cardid, instances)
VALUES (1, 17, 2)
[2017-12-02 22:18:04] [00000] There are too many cards in that deck.
[2017-12-02 22:18:04] completed in 16ms
```

Security

Rolls

The current rolls are admin, tournamentAdmin, judge, and player. Start with removing everyone's abilities then add back in admin to have full power.

```
CREATE ROLE admin;
CREATE ROLE tournamentAdmin;
CREATE ROLE judge;
CREATE ROLE player;

--
-- Remove access from all rolls before restoring it.
--
REVOKE ALL ON ALL TABLES IN SCHEMA public from admin;
REVOKE ALL ON ALL TABLES IN SCHEMA public from tournamentAdmin;
REVOKE ALL ON ALL TABLES IN SCHEMA public from judge;
REVOKE ALL ON ALL TABLES IN SCHEMA public from player;

--
-- Give admin back power.
--
GRANT ALL ON ALL TABLES IN SCHEMA public to admin;
```

Rolls: Player

The player roll has control over deck and decklist alowing them to edit their decks. They can also view all the cards from all the sets as well as see the matches they are scheduled to play in.

```
GRANT SELECT , INSERT , UPDATE , DELETE ON Deck to player;
GRANT SELECT , INSERT , UPDATE , DELETE ON Decklist to player;
GRANT UPDATE ON Person to player;
GRANT UPDATE ON Player to player;
GRANT SELECT ON Card TO player;
GRANT SELECT ON Set TO player;
GRANT SELECT ON Match TO player;
GRANT SELECT ON PlaysIn TO player;
GRANT SELECT ON Tournament TO player;
GRANT SELECT ON GameType TO player;
GRANT SELECT ON Tier TO player;
```

Rolls: Judge

The judge roll has much the same power as the player, but they are also allowed to ban people change information about matches, and other judges.

```
GRANT SELECT , INSERT , UPDATE ON BannedPeople to judge;
GRANT SELECT , UPDATE ON Match to judge;
GRANT SELECT , UPDATE ON PlaysIn to judge;
GRANT SELECT , UPDATE ON Judge to judge;
GRANT SELECT ON Deck TO judge;
GRANT SELECT ON DeckList TO judge;
GRANT SELECT ON Card TO judge;
GRANT SELECT ON Set TO judge;
GRANT SELECT ON Match TO judge;
GRANT SELECT ON PlaysIn TO judge;
GRANT SELECT ON Tournament TO judge;
GRANT SELECT ON GameType TO judge;
GRANT SELECT ON Tier TO judge;
```

Rolls: TournamentAdmin

The routnamentAdmin roll is an extension of the judge. They are given all the same power as a judge including banning people, but are also allowed to edit information on the tournaments themselves. They are not however allowed to change anything about tournament tiers, or gametypes.

```
GRANT SELECT , INSERT , UPDATE ON BannedPeople to tournamentAdmin;
GRANT SELECT , INSERT , UPDATE ON Match to tournamentAdmin;
GRANT SELECT , INSERT , UPDATE ON PlaysIn to tournamentAdmin;
GRANT SELECT , INSERT , UPDATE ON Tournament to tournamentAdmin;
GRANT SELECT , UPDATE ON Judge to tournamentAdmin;
GRANT SELECT ON Deck TO tournamentAdmin;
GRANT SELECT ON DeckList TO tournamentAdmin;
GRANT SELECT ON Card TO tournamentAdmin;
GRANT SELECT ON Set TO tournamentAdmin;
GRANT SELECT ON Match TO tournamentAdmin;
GRANT SELECT ON PlaysIn TO tournamentAdmin;
GRANT SELECT ON Tournament TO tournamentAdmin;
GRANT SELECT ON GameType TO tournamentAdmin;
GRANT SELECT ON Tier TO tournamentAdmin;
```

Implementation Notes and Known Problems

Implementation and Known Problems

- Currently player points are only awarded for a win. Something to look at is if base points should be given just for attending events, or if loses should award a small percentage of points a win would have been worth. Those are both things that if ruled on would require changing in the get_points_for_player function.

- Currently there is no way to ban cards from decks. While it is very rare for a card to be banned in standard, it's very common for older game types with less rules on allowed sets.

- Currently there is nothing stopping a banned player from being a judge or a player. For now this means judges and tournament organizers need to check the currently banned people report to make sure they are not scheduling banned people.

Future Enhancements

Future Enhancements

- Include more information on cards. Currently we only store card names and the sets they are from. Going forward it could be beneficial to store information such as rarity, mana-cost, mana-color, attack, defence, and special effects.
- There is currently no way of informing judges their license is about to or has expired. This is another improvement that could be made
- Storing things like player points or win/loses might also be beneficial. Instead of calculating them every time they are needed, having them update at the end of tournaments would be much better.
- Being able to separate promotional version of cards from various events or products would also be useful. This would give insight into the kinds of rewards our players like and want more of.
- The current definition for the standard game type is the 3 most recent blocks. In the past a block has been made of 3 sets, but recently Wizards of the Coast has released 2 set blocks. This makes it hard to track what cards are standard legal. A way to fix this issue would be to have an additional table listing the blocks and the sets that belong to them.