XP & Streaks Management Documentation

Overview

The **XP (Experience Points) and Streaks** system gamifies learning with daily goals, level progression, and streak tracking. This document covers XP calculation, streak management, daily goals, and level progression.

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XP System

XP Configuration

Component	Value	Description
Base Session XP	20 XP	Awarded for completing any session
Accuracy Bonus	10 XP	Awarded for ≥80% accuracy
Perfect Score Bonus	25 XP	Awarded for 100% accuracy
First Session Bonus	15 XP	First session of the day
Speed Bonus	Up to 10 XP	Completing faster than expected
Streak Bonus	2 XP/day (max 30)	Based on current streak
Perfect Day Bonus	50 XP	All 3 modalities completed
Badge Bonus	50 XP	Awarded with each badge

XP Calculation Formula

```
Total XP = Base (20)
         + Accuracy Bonus (10 if ≥80%)
         + Perfect Score (25 if 100%)
         + Speed Bonus (0–10)
         + Streak Bonus (current_streak * 2, max 30)
```

```
        + First Session (15 if first today)
        + Perfect Day (50 if R+L+G done)
```

XP Sources

XP can be earned from:

- **Sessions** - Completing listening, reading, or grammar sessions
- **Badges** - Earning achievement badges
- **Streaks** - Maintaining daily learning streaks
- **Bonuses** - Speed, accuracy, and perfect day bonuses

Streak System

How Streaks Work

1. **Streak Starts**: Complete any session on a day
2. **Streak Continues**: Complete at least one session the next day
3. **Streak Breaks**: Skip a day (no sessions completed)
4. **Streak Resets**: Starts at 1 after breaking

Streak Status

Status	Description	Condition
Active	Learned today	Last active = today
At Risk	Haven't learned today	Last active = yesterday
Broken	Missed a day	Last active > 1 day ago

Streak Tracking

```
{
  "current_streak": 15,
  "longest_streak": 30,
  "last_active_date": "2025-10-06",
  "is_active_today": true,
  "streak_status": "active"
}
```

Level System

Level Calculation

Levels are calculated using **exponential XP growth**:

```
XP Required for Level N = 100 * (1.5 ^ (N - 1))
```

Level Progression Table

Level	XP Required (Total)	XP for This Level	Level Name
1	0	0	Beginner
2	100	100	Beginner
3	250	150	Beginner
4	475	225	Beginner
5	813	338	Beginner
6	1,320	507	Intermediate
7	2,080	760	Intermediate
8	3,220	1,140	Intermediate
9	4,930	1,710	Intermediate
10	7,495	2,565	Intermediate
15	38,443	-	Advanced
20	254,803	-	Expert
25	1,693,508	-	Expert
30+	-	-	Master

Level Names

Level Range	Name
1-5	**Beginner**
6-10	**Intermediate**
11-20	**Advanced**
21-35	**Expert**
36+	**Master**

Daily Goals & Progress

Default Daily Goals

1. **XP Goal**: 100 XP
2. **Session Goal**: 3 sessions (1 per modality)

3. **Perfect Day**: Complete Listening + Reading + Grammar

Daily Progress Tracking

```json
{
  "date": "2025-10-06",
  "xp_earned": 85,
  "xp_goal": 100,
  "sessions_completed": 2,
  "session_goal": 3,
  "time_spent_minutes": 45,
  "modalities_completed": ["listening", "reading"],
  "goals": [
    {
      "goal_type": "xp",
      "target": 100,
      "current": 85,
      "is_completed": false
    },
    {
      "goal_type": "sessions",
      "target": 3,
      "current": 2,
      "is_completed": false
    },
    {
      "goal_type": "perfect_day",
      "target": 1,
      "current": 0,
      "is_completed": false
    }
  ],
  "is_perfect_day": false
}
```

API Endpoints

1. Get User XP Summary

Endpoint: GET /api/v1/users/{user_id}/xp

Description: Get total XP, today's XP, and level information.

Response:

```json
{
  "user_id": "uuid",
  "total_xp": 1250,
  "today_xp": 75,
```

```
    "current_level": 6,
    "xp_to_next_level": 70,
    "level_progress_pct": 85
  }
}
```

2. Get Daily XP Breakdown

Endpoint: GET /api/v1/users/{user_id}/xp/daily

Description: Detailed XP breakdown for today with sources.

Response:

```
{
  "user_id": "uuid",
  "date": "2025-10-06",
  "xp_earned_today": 120,
  "xp_goal": 100,
  "goal_completion_pct": 120,
  "sessions_today": 3,
  "breakdown": [
    {
      "user_id": "uuid",
      "amount": 20,
      "source": "session",
      "occurred_at": "2025-10-06T10:00:00Z"
    },
    {
      "user_id": "uuid",
      "amount": 50,
      "source": "perfect_day_bonus",
      "occurred_at": "2025-10-06T14:00:00Z"
    },
    {
      "user_id": "uuid",
      "amount": 50,
      "source": "badge_streak_7",
      "occurred_at": "2025-10-06T14:00:00Z"
    }
  ]
}
```

3. Get User Level Info

Endpoint: GET /api/v1/users/{user_id}/level

Description: Detailed level progression information.

Response:

```json
{
  "current_level": 8,
  "level_name": "Intermediate",
  "total_xp": 3500,
  "xp_for_current_level": 3220,
  "xp_for_next_level": 4930,
  "xp_to_next_level": 1430,
  "progress_pct": 16
}
```

4. Get User Streak

Endpoint: GET /api/v1/users/{user_id}/streak

Description: Current streak status and history.

Response:

```json
{
  "user_id": "uuid",
  "current_streak": 15,
  "longest_streak": 30,
  "last_active_date": "2025-10-06",
  "is_active_today": true,
  "streak_status": "active"
}
```

5. Get Daily Progress

Endpoint: GET /api/v1/users/{user_id}/daily-progress

Description: Complete daily progress with all goals.

Response:

```json
{
  "user_id": "uuid",
  "date": "2025-10-06",
  "xp_earned": 120,
  "xp_goal": 100,
  "sessions_completed": 3,
  "session_goal": 3,
  "time_spent_minutes": 55,
  "modalities_completed": ["listening", "reading", "grammar"],
  "goals": [
    {
```

```json
      "goal_type": "xp",
      "target": 100,
      "current": 120,
      "is_completed": true
    },
    {
      "goal_type": "sessions",
      "target": 3,
      "current": 3,
      "is_completed": true
    },
    {
      "goal_type": "perfect_day",
      "target": 1,
      "current": 1,
      "is_completed": true
    }
  ],
  "is_perfect_day": true
}
```

---

6. Get Streak Calendar

Endpoint: GET /api/v1/users/{user_id}/streak-calendar?month=2025-10

Description: Calendar view of activity for a month.

Response:

```json
{
  "user_id": "uuid",
  "current_month": "2025-10",
  "days": [
    {
      "date": "2025-10-01",
      "sessions_completed": 3,
      "modalities_completed": ["listening", "reading", "grammar"],
      "total_xp_earned": 150,
      "streak_day": 15
    },
    {
      "date": "2025-10-02",
      "sessions_completed": 2,
      "modalities_completed": ["listening", "reading"],
      "total_xp_earned": 85,
      "streak_day": 16
    }
  ],
  "current_streak": 16,
  "perfect_days": 12
}
```
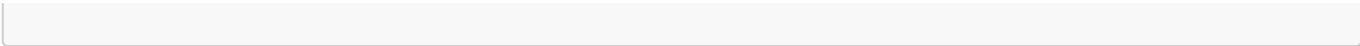
XP Calculation Examples

Example 1: Basic Session (Low Performance)

Scenario:

- Accuracy: 65%
- Duration: 900 seconds (expected: 720 seconds - slower)
- Streak: 0 (new user)
- First session: No

XP Breakdown:

```
Base XP:              20
Accuracy Bonus:        0  (< 80%)
Perfect Score:         0  (< 100%)
Speed Bonus:           0  (slower than expected)
Streak Bonus:          0  (no streak)
First Session:         0  (not first today)
Perfect Day:           0  (not all modalities)
_____
Total XP:             20
```

Example 2: Great Session (High Performance)

Scenario:

- Accuracy: 95%
- Duration: 540 seconds (expected: 720 seconds - 25% faster)
- Streak: 10 days
- First session: Yes

XP Breakdown:

```
Base XP:              20
Accuracy Bonus:       10  (≥ 80%)
Perfect Score:         0  (< 100%)
Speed Bonus:           2  (25% faster = 2.5 XP, rounded)
Streak Bonus:         20  (10 days * 2 XP)
First Session:        15  (first of the day)
Perfect Day:           0  (not all modalities yet)
_____
Total XP:             67
```

Example 3: Perfect Day Achievement

Scenario:

- User completes all 3 modalities
- Listening: 85% accuracy, 10-day streak
- Reading: 90% accuracy
- Grammar: 100% accuracy (perfect score)

XP Breakdown:

Listening Session:

```
Base: 20 + Accuracy: 10 + Streak: 20 + First: 15 = 65 XP
```

Reading Session:

```
Base: 20 + Accuracy: 10 + Streak: 20 = 50 XP
```

Grammar Session:

```
Base: 20 + Accuracy: 10 + Perfect: 25 + Streak: 20 + Perfect Day: 50 = 125 XP
```

Total XP Today: 240 XP 🎉

Example 4: Streak Bonus Growth

Streak Days	Streak Bonus	Total XP (80% accuracy)
0	0 XP	30 XP
1	2 XP	32 XP
5	10 XP	40 XP
10	20 XP	50 XP
15	30 XP (max)	60 XP
20+	30 XP (max)	60 XP

Best Practices

For Learners

1. **Maintain Streaks**: Log in daily to keep streak bonuses
2. **Aim for Perfect Days**: Complete all 3 modalities for 50 XP bonus
3. **Focus on Accuracy**: ≥80% unlocks 10 XP bonus
4. **Speed Matters**: Complete sessions efficiently for speed bonus
5. **Track Progress**: Check daily goals to stay motivated

For Frontend Implementation

1. Display XP Gains After Session

```
// Show XP breakdown after session completion
{
  "base_xp": 20,
  "accuracy_bonus": 10,
  "streak_bonus": 20,
  "total_xp": 50,
  "message": "Great job! +50 XP earned"
}
```

2. Show Streak Status

```
// Daily reminder for streak maintenance
if (streak_status === "at_risk") {
  showNotification("Complete a session today to maintain your 15-day streak!");
}
```

3. Progress Bars

```
// Show visual progress
<ProgressBar
  current={xp_to_next_level}
  total={xp_for_next_level}
  label="Level 8 → Level 9"
/>
```

4. Daily Goal Tracking

```
// Display goal completion
goals.forEach(goal => {
  if (goal.is_completed) {
    showCheckmark(goal.goal_type);
  }
});
```

Gamification Tips

1. **Level Up Celebrations**: Show animation when user levels up
2. **Streak Milestones**: Celebrate 7, 30, 100 day streaks
3. **Daily Challenges**: Encourage "Perfect Day" achievement
4. **Leaderboards**: Show top XP earners (coming soon)
5. **Badge Integration**: Award badges for XP milestones

Database Schema

XP Ledger Table

```sql
CREATE TABLE xp_ledger (
  xp_id UUID PRIMARY KEY,
  user_id UUID NOT NULL,
  amount INTEGER NOT NULL,
  source TEXT NOT NULL,  -- 'session', 'badge', 'streak_bonus', etc.
  occurred_at TIMESTAMP WITH TIME ZONE DEFAULT NOW()
);
```

Streaks Table

```sql
CREATE TABLE streaks (
  streak_id UUID PRIMARY KEY,
  user_id UUID NOT NULL UNIQUE,
  current_streak INTEGER DEFAULT 0,
  longest_streak INTEGER DEFAULT 0,
  last_active_date DATE,
  created_at TIMESTAMP WITH TIME ZONE DEFAULT NOW()
);
```

Integration with Sessions

When a session is submitted, XP and streaks are automatically updated:

```
# After session completion
1. Calculate accuracy and duration
2. Get current streak
3. Check if first session today
4. Check if perfect day (after this session)
5. Calculate XP with all bonuses
6. Award XP to xp_ledger
```

```
7. Update streak
8. Check and award badges
```

Frequently Asked Questions

Q: What happens if I miss a day? A: Your streak resets to 1 when you next complete a session.

Q: Can I earn XP without completing sessions? A: Yes, earning badges awards 50 XP each.

Q: Is there a maximum XP cap? A: No, you can earn unlimited XP.

Q: How is "today" defined? A: Based on UTC timezone (can be configured to user's timezone).

Q: Do all sessions earn the same base XP? A: Yes, all modalities (listening, reading, grammar) earn 20 base XP.

Q: What's the fastest way to level up? A: Maintain a streak, complete all 3 modalities daily, and aim for high accuracy.

Summary

The XP and Streaks system provides:

- ✅ **Motivating Rewards** - XP bonuses for achievements
- ✅ **Daily Engagement** - Streak tracking encourages consistency
- ✅ **Level Progression** - Clear advancement path
- ✅ **Goal Tracking** - Daily targets keep users focused
- ✅ **Gamification** - Makes learning fun and competitive

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