Contents

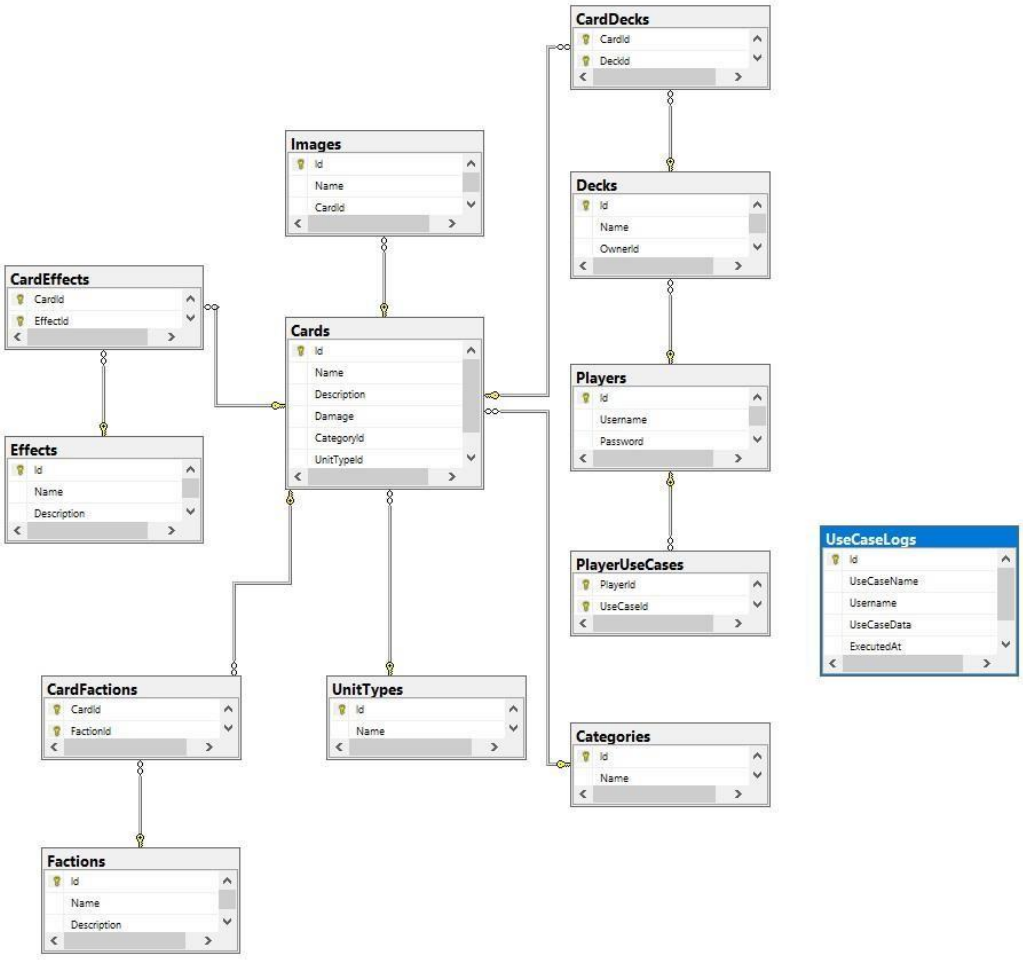
Opis Sistema:

Gwent je kartaška igra u kojoj postoje karte sa svojim:

- Fakcijama(svaka karta se može koristiti u više fakcija, ali postoje i specijalne karte koje pripadaju jednoj fakciji)
- Kategora(Npr Weather ili Vremenska karta koja upravlja napadom jedinica u odjeđenom tipu jedinice)
- Tip jedinice(postoje pešadija ili prva borbena linija, ranged jedinice ili druga borbena linija i siege jedinice ili treća borbena linija)
- Sistem je tako napravljen da postoji jedan korisnik koji može da upravlja celim sistemom dodavanjem novih entiteta
- Korisnici koji samo mogu da prave svoje deckove(špilove) i u njih da dodaju karte kao i da iz svojih špilova brišu karte(isključivo iz svojih što je regulisano validacijom i proverama)

Sistem je osmišljen tako da predstavlja katalog za karte i da korisnici mogu da upravljaju svojim špilovima.

Dizajn baze:


CardDecks
CardId
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Id
Name
CardId
Decks
Id
Name
OwnerId
CardEffects
CardId
EffectId
Cards
Id
Name
Description
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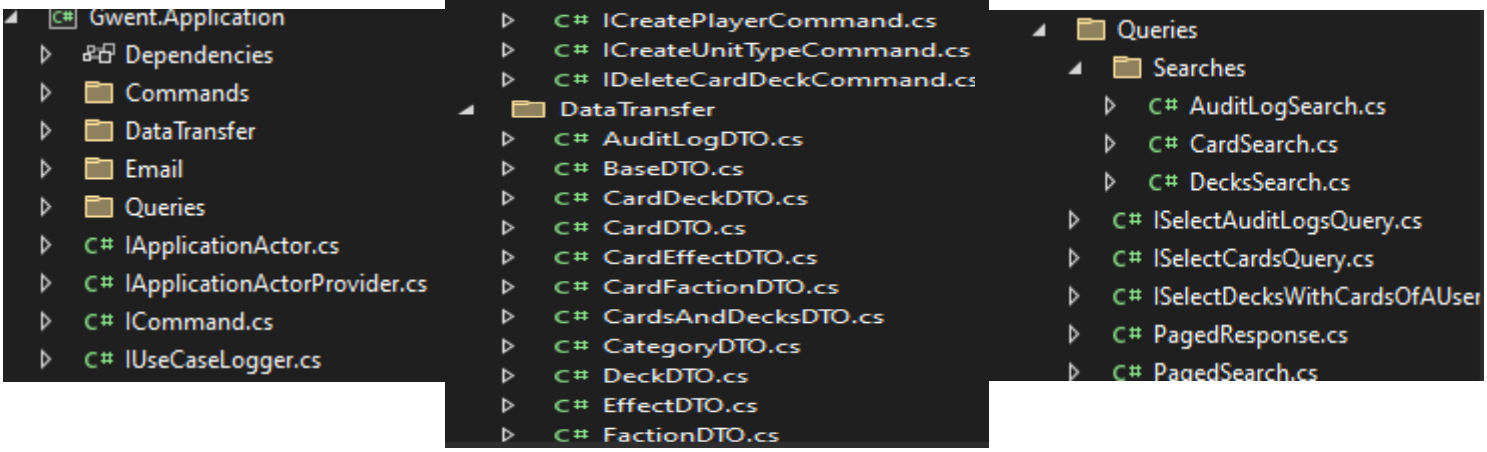
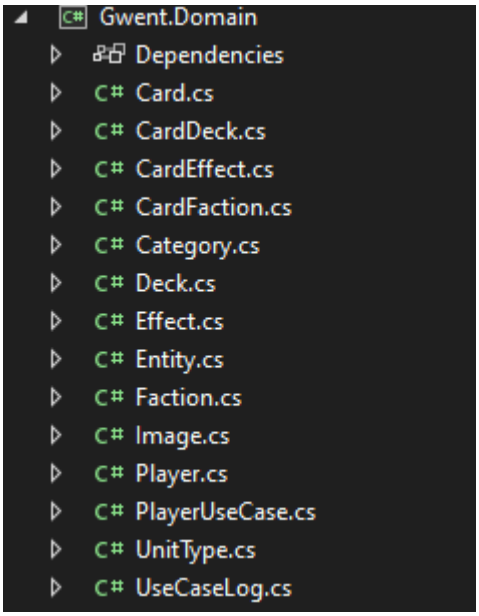
ExecutedAt
CardFactions
CardId
FactionId
UnitTypes
Id
Name
Categories
Id
Name
Factions
Id
Name
Description

Arhitektura sistema:

Sloj aplikacije:

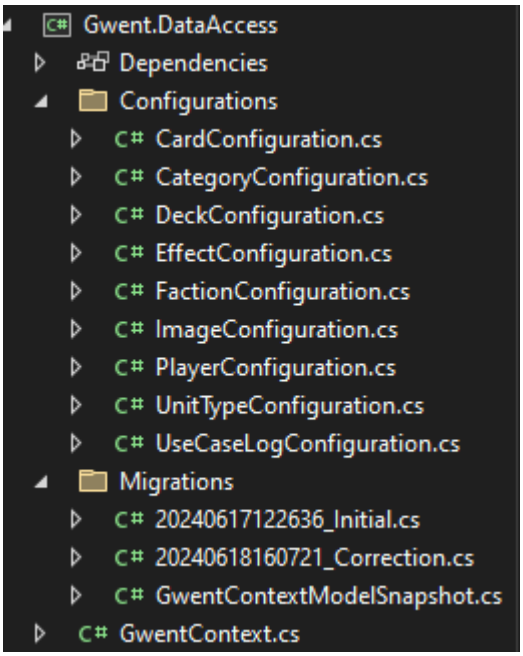


Domenski sloj:

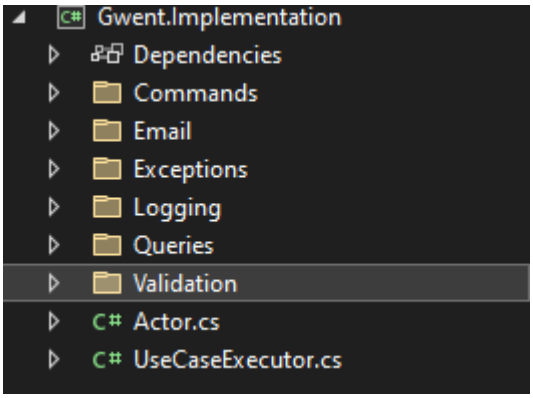


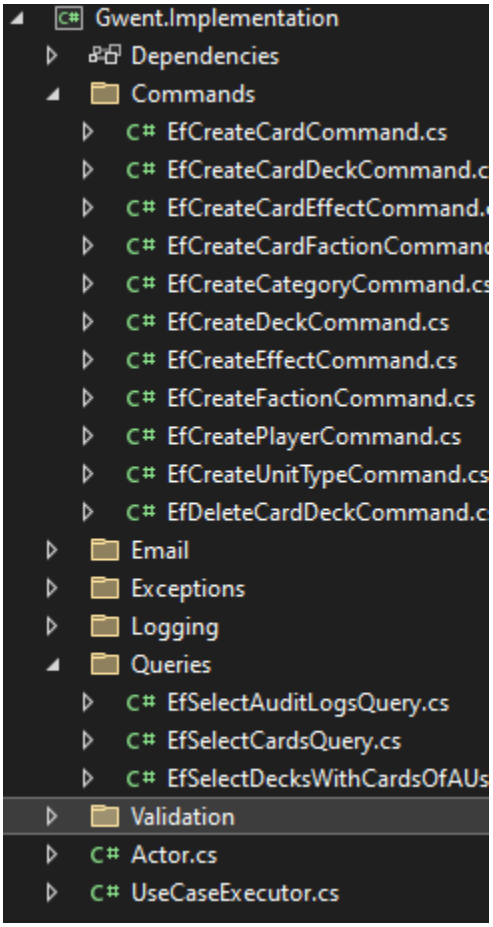
DataAccess sloj:

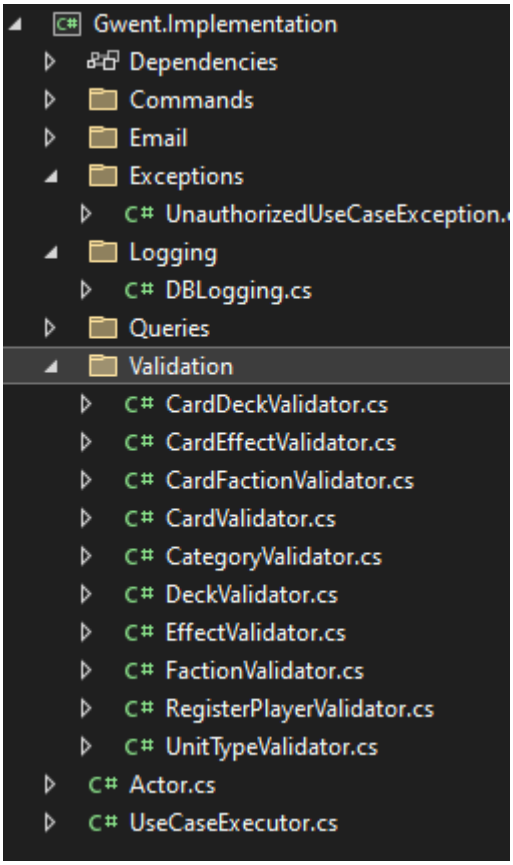
Baza je napravljena code-first pristupom



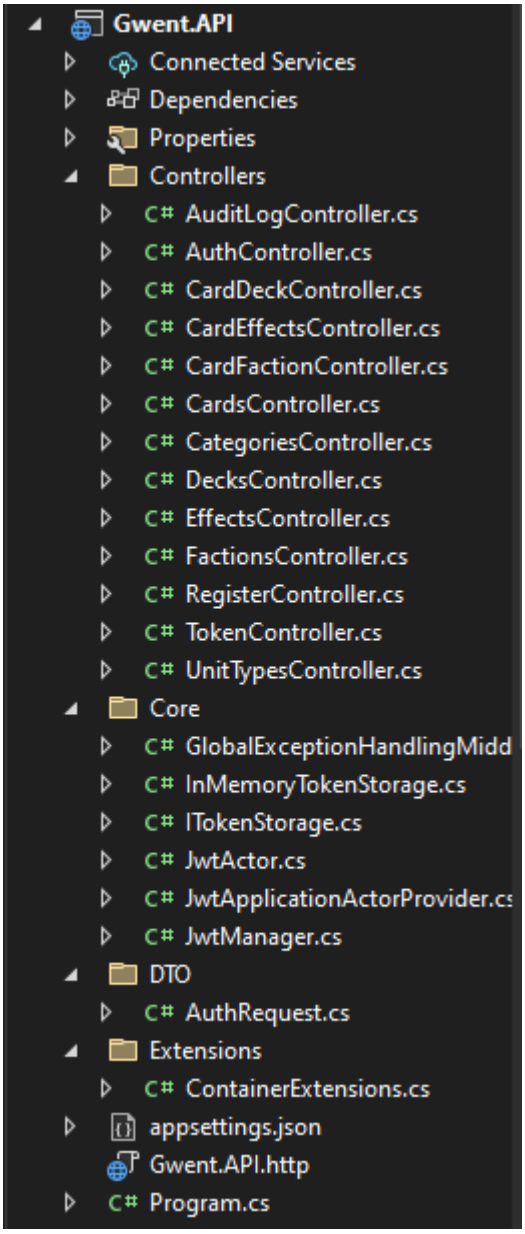
Sloj implementacije:







API sloj:


Gwent.API
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CardEffectsController.cs
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Gwent.API.http
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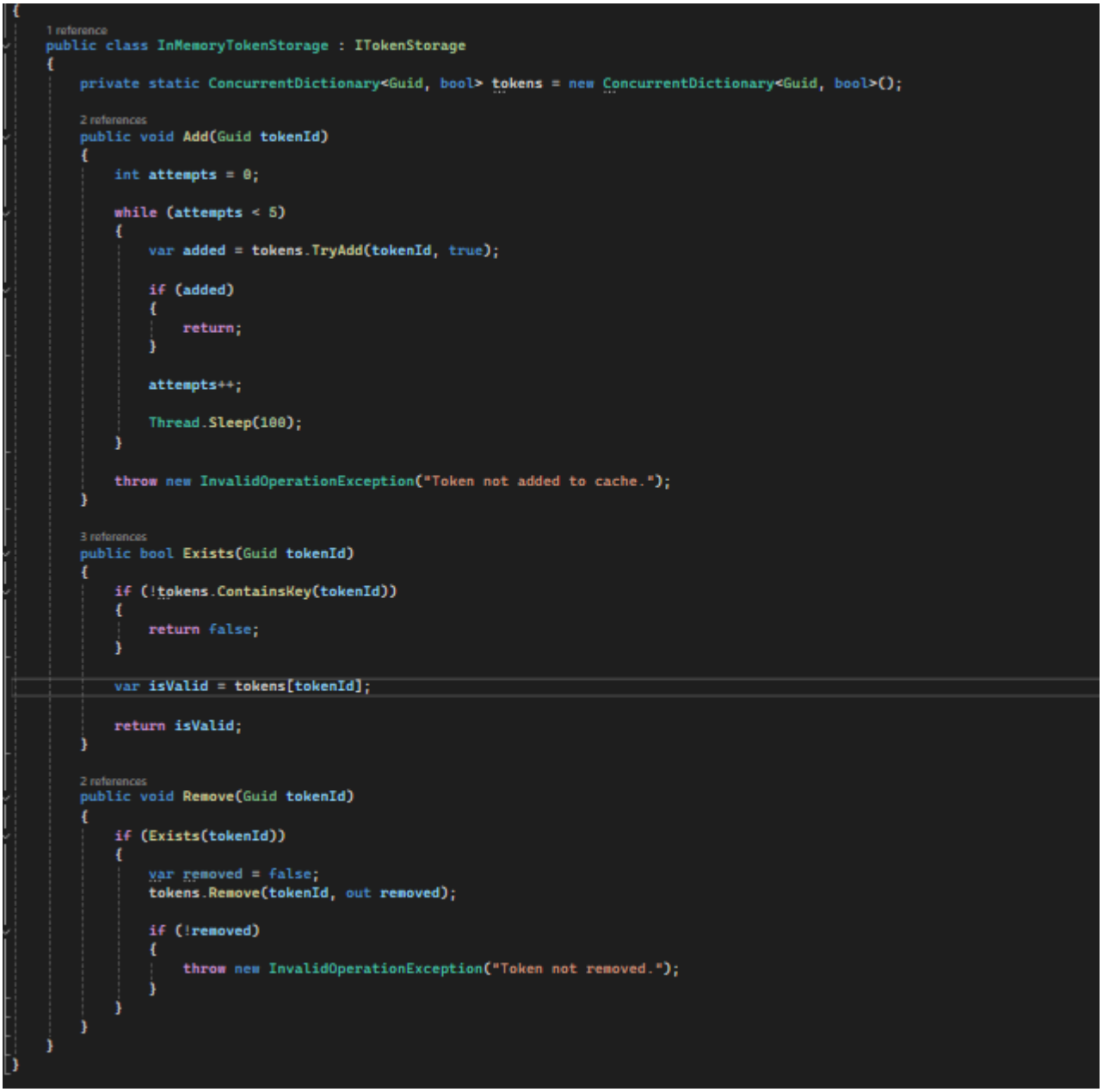
Validacija JWT tokenom:

- controller za dohvatanje tokena koji prima objekat sa poljima Username i Password koji proverava korisnika u bazi, ako postoji vraća token sa njegovim podacima

takodje ovde postoji I metoda za logout koja brise korisnika iz token storage-a

```
public class AuthController : ControllerBase
{
    private readonly JwtManager _manager;
    0 references
    public AuthController(JwtManager _manager)
    {
        this._manager = _manager;
    }

    [HttpPost]
    0 references
    public IActionResult Post([FromBody] AuthRequest request)
    {
        string token = _manager.MakeToken(request.Username, request.Password);
        if(token == null)
        {
            return NotFound(new { error = "Invalid credentials, try again." });
        }
        return Ok(new AuthResponse { Token = token });
    }

    [Authorize]
    [HttpDelete]
    0 references
    public IActionResult Delete([FromServices] ITokenStorage storage)
    {
        storage.Remove(this.Request.GetTokenId().Value);
        return NoContent();
    }
}
```



```
{
    1 reference
    public class InMemoryTokenStorage : ITokenStorage
    {
        private static ConcurrentDictionary<Guid, bool> tokens = new ConcurrentDictionary<Guid, bool>();

        2 references
        public void Add(Guid tokenId)
        {
            int attempts = 0;

            while (attempts < 5)
            {
                var added = tokens.TryAdd(tokenId, true);

                if (added)
                {
                    return;
                }

                attempts++;

                Thread.Sleep(100);
            }

            throw new InvalidOperationException("Token not added to cache.");
        }

        3 references
        public bool Exists(Guid tokenId)
        {
            if (!tokens.ContainsKey(tokenId))
            {
                return false;
            }

            var isValid = tokens[tokenId];

            return isValid;
        }

        2 references
        public void Remove(Guid tokenId)
        {
            if (Exists(tokenId))
            {
                var removed = false;
                tokens.Remove(tokenId, out removed);

                if (!removed)
                {
                    throw new InvalidOperationException("Token not removed.");
                }
            }
        }
    }
}
```

```
public interface ITokenStorage
{
    3 references
    bool Exists(Guid tokenId);
    2 references
    void Add(Guid tokenId);
    2 references
    void Remove(Guid tokenId);
}
```

```
1 reference
public class Actor : IApplicationActor
{
    8 references
    public int Id { get; set; }

    4 references
    public string Identity { get; set; }

    4 references
    public IEnumerable<int> AllowedUseCases { get; set; }
}

2 references
public class UnauthorizedActor : IApplicationActor
{

    7 references
    public int Id => 0;
    3 references
    public string Identity => "unauthorized";
    3 references
    public IEnumerable<int> AllowedUseCases => new List<int> { 8 , 11};
}
```

```
public class JwtApplicationActorProvider : IApplicationActorProvider
{
    private string authorizationHeader;


    public JwtApplicationActorProvider(string authorizationHeader)
    {
        this.authorizationHeader = authorizationHeader;
    }

    public IApplicationActor GetActor()
    {
        if (authorizationHeader.Split("Bearer ").Length != 2)
        {
            return new UnauthorizedActor();
        }

        string token = authorizationHeader.Split("Bearer ")[1];

        var handler = new JwtSecurityTokenHandler();

        var tokenObj = handler.ReadJwtToken(token);

        var claims = tokenObj.Claims;

        var claim = claims.First(x => x.Type == "jti").Value;

        var actor = new Actor
        {
            Identity = claims.First(x => x.Type == "Identity").Value,
            Id = int.Parse(claims.First(x => x.Type == "Id").Value),
            AllowedUseCases = JsonConvert.DeserializeObject<List<int>>(claims.First(x => x.Type == "UseCases").Value)
        };

        return actor;
    }
}
```

```
public class JwtManager
{
    private readonly GwentContext _context;
    private readonly ITokenStorage _storage;

    0 references
    public JwtManager(GwentContext context, ITokenStorage storage)
    {
        _context = context;
        _storage = storage;
    }

    1 reference
    public string MakeToken(string username, string password)
    {
        var user = _context.Players.Where(x => x.Username == username).Select(x => new
        {
            x.Username,
            x.Password,
            x.Id,
            UseCases = x.UseCases.Select(x => x.UseCaseId)
        }).FirstOrDefault();

        if (user == null)
        {
            return null;
        }

        var issuer = "asp_api";
        var secretKey = "this is my custom Secret key for authentication";
        Guid token_guid = Guid.NewGuid();
        string token_id = token_guid.ToString();
        var claims = new List<Claim> // Jti : "",
        {
            new Claim(JwtRegisteredClaimNames.Jti, token_id, ClaimValueTypes.String),
            new Claim(JwtRegisteredClaimNames.Iss, "asp_api", ClaimValueTypes.String),
            new Claim(JwtRegisteredClaimNames.Iat, DateTimeOffset.UtcNow.ToUnixTimeSeconds().ToString(), ClaimValueTypes.Integer64),
            new Claim("Id", user.Id.ToString()),
            new Claim("Identity", user.Username.ToString()),
            new Claim("UseCases",JsonConvert.SerializeObject(user.UseCases)),
        };

        var key = new SymmetricSecurityKey(Encoding.UTF8.GetBytes(secretKey));

        var credentials = new SigningCredentials(key, SecurityAlgorithms.HmacSha256);

        var now = DateTime.UtcNow;
        var token = new JwtSecurityToken(
            issuer: issuer,
            audience: "Any",
            claims: claims,
            notBefore: now,
            expires: now.AddSeconds(300),
            signingCredentials: credentials);

        _storage.Add(token_guid);

        return new JwtSecurityTokenHandler().WriteToken(token);
    }
```

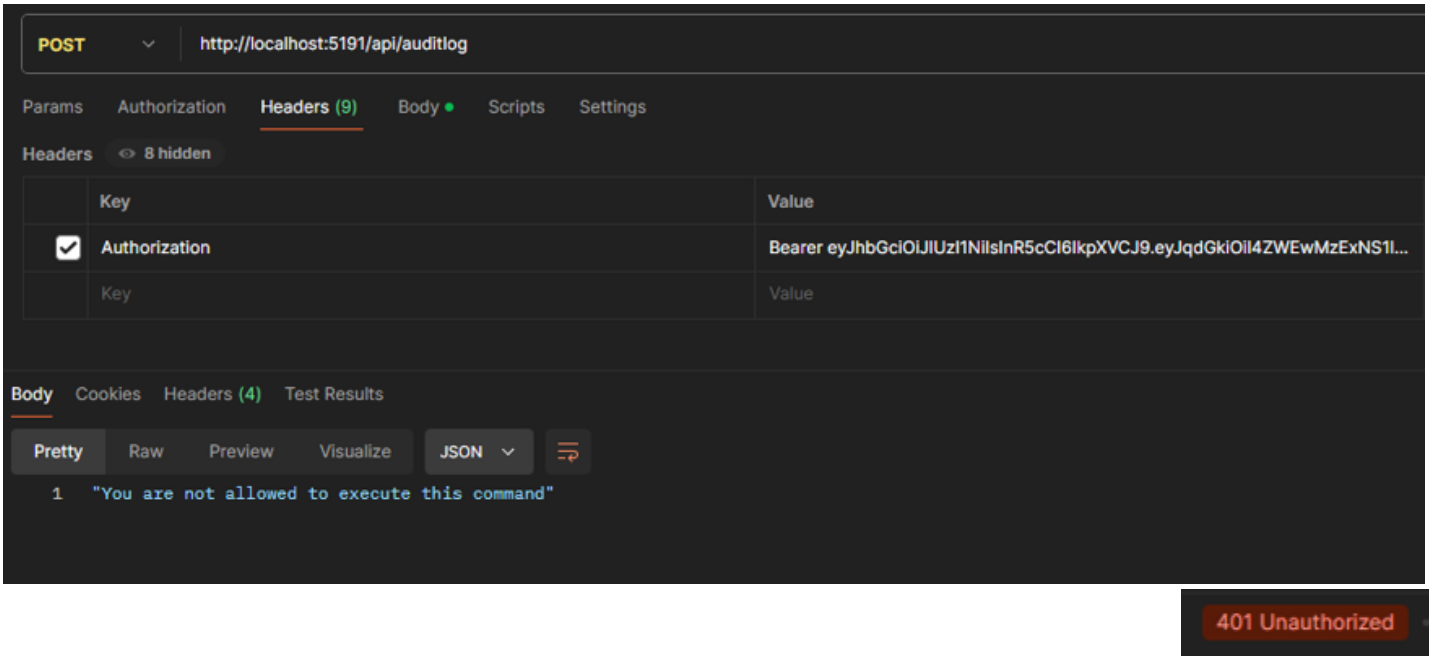
```
1 reference
public class AuthRequest
{
    1 reference
    public string Username { get; set; }
    1 reference
    public string Password { get; set; }
}

1 reference
public class AuthResponse
{
    1 reference
    public string Token { get; set; }
}
```

```
1 reference
public class RegisterController : ControllerBase
{
    public IApplicationActor actor;
    public UseCaseExecutor executor;
    public GwentContext context;

    0 references
    public RegisterController(IApplicationActor actor, UseCaseExecutor executor, GwentContext context)
    {
        this.actor = actor;
        this.executor = executor;
        this.context = context;
    }

    // POST api/<RegisterController>
    [HttpPost]
    0 references
    public IActionResult Post([FromBody] PlayerDTO dto, [FromServices] ICreatePlayerCommand command)
    {
        if (dto == null)
        {
            return UnprocessableEntity();
        }

        Player check = context.Players.Where(x => x.Username == dto.Username).FirstOrDefault();

        if (check != null)
        {
            return Conflict(new { error = "A player with the same username already exists! Try something else." });
        }

        executor.ExecuteCommand(command, dto);
        return Ok(new { message = "You have succesfully registered!" });
    }
}
}
```

Na ovom endpointu se korisnik registruje I automatski mu se dodeljuju use case-ovi koje moze da izvrsi.

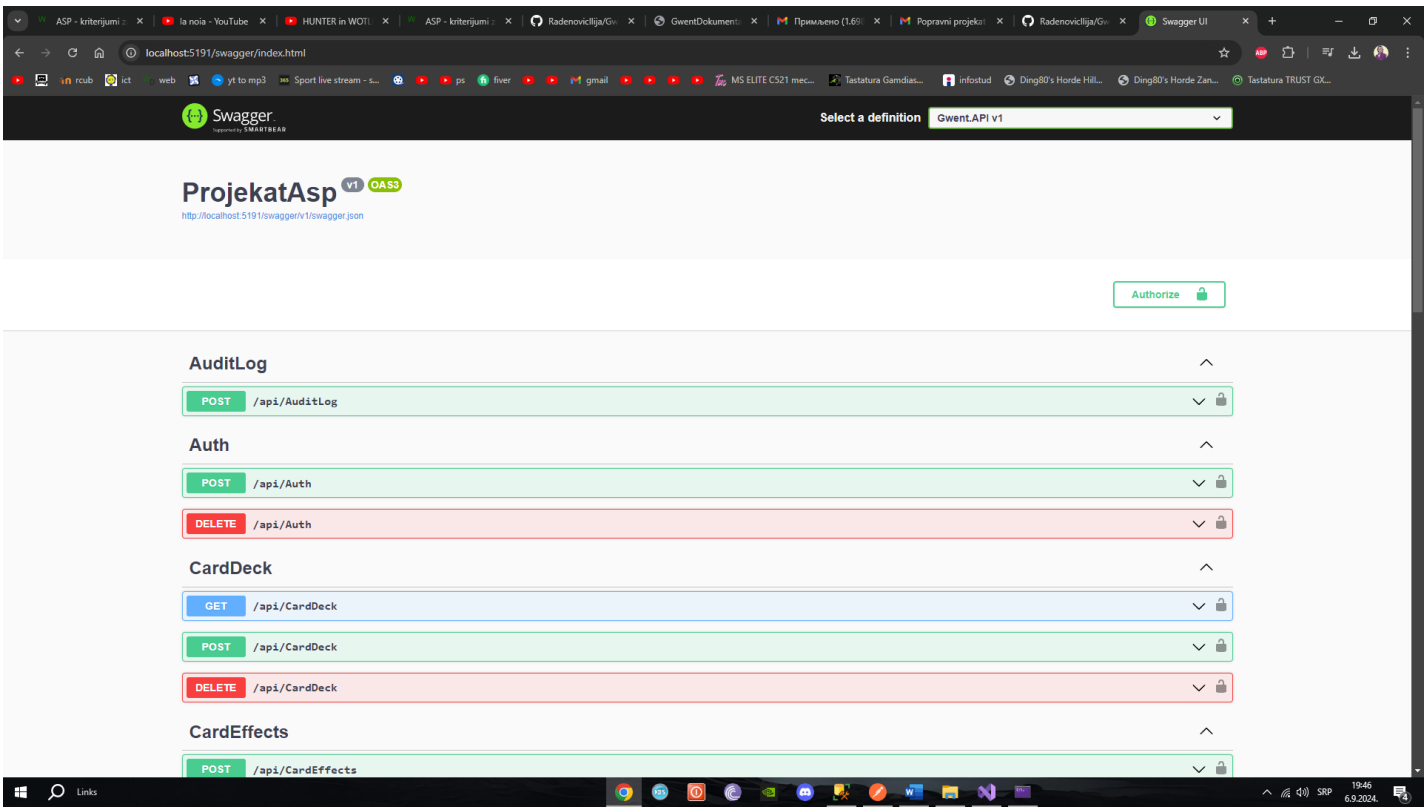
```
2 references
public void Execute(PlayerDTO request)
{
    validator.ValidateAndThrow(request);

    Player p = new Player
    {
        Username = request.Username,
        Password = request.Password,
    };

    context.Players.Add(p);
    context.SaveChanges();

    context.PlayerUseCases.Add(new PlayerUseCase
    {
        PlayerId = p.Id,
        UseCaseId = 9
    });
    context.PlayerUseCases.Add(new PlayerUseCase
    {
        PlayerId = p.Id,
        UseCaseId = 10
    });
    context.PlayerUseCases.Add(new PlayerUseCase
    {
        PlayerId = p.Id,
        UseCaseId = 11
    });
    context.PlayerUseCases.Add(new PlayerUseCase
    {
        PlayerId = p.Id,
        UseCaseId = 12
    });

    context.SaveChanges();
}
```

Autorizacija na nivou slucaja koriscenja(granulacija)

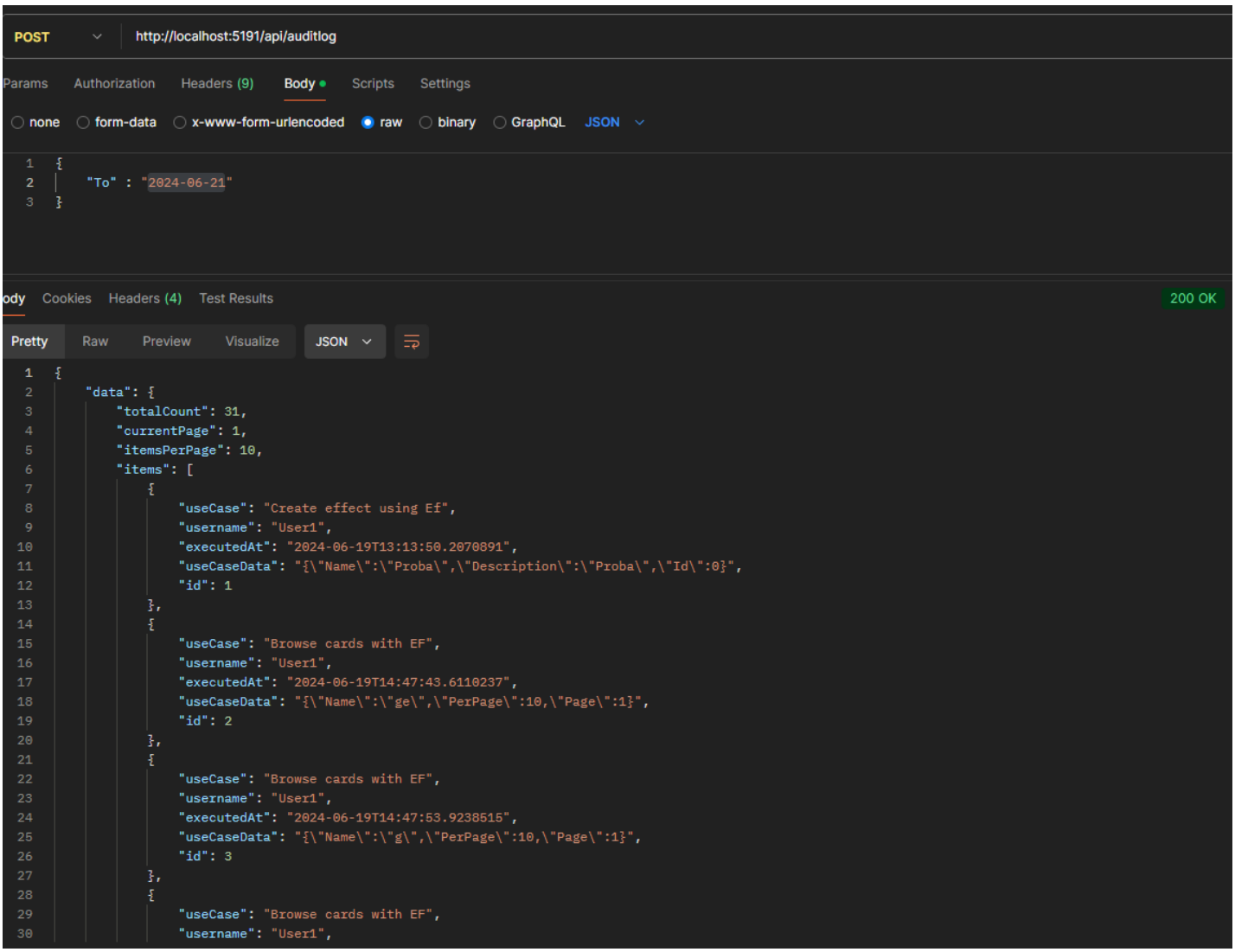


Korisnik koji je poslao zahtev na ovaj endpoint nema u svojim dozvoljenim use caseovima citanje auditlogova I time se ispisala poruka I statusni kod 401.

Swagger specifikacija:



Audit log sa pretragom I paginacijom:



Pretraga audit logova je moguca sa datumom od I do kada je izvrsen audit log I nazivom korisnika koji je izvrsio use case

Pretraga i paginacija

http://localhost:5191/api/cards?name=a

Na ovom endpointu dobija se rezultat pretrage karata sa opcijom paginacije


```
{
  "data": {
    "totalCount": 4,
    "currentPage": 1,
    "itemsPerPage": 10,
    "items": [
      {
        "name": "Geralt of Rivia",
        "description": "A seasoned witcher experienced in dealing with the most powerful monsters",
        "damage": 10,
        "unitTypeId": 1,
        "categoryId": 1,
        "id": 1
      },
      {
        "name": "Yennefer of Vangerberg",
        "description": "Sorceress with many skills and talents.",
        "damage": 7,
        "unitTypeId": 2,
        "categoryId": 1,
        "id": 3
      },
      {
        "name": "John Natalis",
        "description": "A strong warrior from the Northern Realms",
        "damage": 10,
        "unitTypeId": 1,
        "categoryId": 1,
        "id": 4
      },
      {
        "name": "Cirilla Fiona Ellen Riannon",
        "description": "Know when fairy tales cease to be tales? When people start believing in them",
        "damage": 15,
        "unitTypeId": 1,
        "categoryId": 1,
        "id": 5
      }
    ],
```

Granulacija privilegija na osnovu svakog korisnika i logovanje izvršavanja usecase-a u tabelu UseCaseLogs

Klasa UseCaseExecutor služi za obradu svakog usecase-a i takođe u sebi sadrži proveru da li korisnik koji je pokrenuo usecase može da izvrši isti time što proverava njegov niz int-ova koji se izvlači iz baze da li se u njemu nalazi Id tekućeg usecase-a,

```
public class UseCaseExecutor
{
    private readonly IApplicationActor actor;
    private readonly IUseCaseLogger logger;

    public UseCaseExecutor(IApplicationActor actor, IUseCaseLogger logger)
    {
        this.actor = actor;
        this.logger = logger;
    }

    public TResult ExecuteQuery<TSearch, TResult>(IQuery<TSearch, TResult> query, TSearch search)
    {
        logger.Log(query, actor, search);

        if (!actor.AllowedUseCases.Contains(query.Id))
        {
            throw new UnauthorizedUseCaseException(query, actor);
        }

        return query.Execute(search);
    }

    public void ExecuteCommand<TRequest>(
        ICommand<TRequest> command,
        TRequest request)
    {
        logger.Log(command, actor, request);
        if (!actor.AllowedUseCases.Contains(command.Id))
        {
            throw new UnauthorizedUseCaseException(command, actor);
        }

        command.Execute(request);
    }
}
```

```
public class DBLogging : IUseCaseLogger
{
    private readonly GwentContext context;

    public DBLogging(GwentContext context)
    {
        this.context = context;
    }


    public void Log(IUseCase useCase, IApplicationActor actor, object data)
    {
        UseCaseLog log = new UseCaseLog
        {
            UseCaseName = useCase.Name,
            Username = actor.Identity,
            UseCaseData = JsonConvert.SerializeObject(data),
            ExecutedAt = DateTime.Now,
        };

        context.UseCaseLogs.Add(log);
        context.SaveChanges();
    }
}
```

	Id	UseCaseName	Username	UseCaseData	ExecutedAt
1	1	Create effect using Ef	User1	{"Name":"Proba","Description":"Proba","Id":0}	2024-06-19 13:13:50.2070891
2	2	Browse cards with EF	User1	{"Name":"ge","PerPage":10,"Page":1}	2024-06-19 14:47:43.6110237
3	3	Browse cards with EF	User1	{"Name":"g","PerPage":10,"Page":1}	2024-06-19 14:47:53.9238515
4	4	Browse cards with EF	User1	{"Name":"a","PerPage":10,"Page":1}	2024-06-19 14:47:59.0547557
5	5	Create a deck using EF	User1	{"Name":"Deck1","OwnerId":1,"Id":0}	2024-06-19 16:26:47.8353171
6	6	Create a deck using EF	User1	{"Name":"Deck2","OwnerId":1,"Id":0}	2024-06-19 16:28:24.6783601
7	7	Create a deck using EF	User1	{"Name":"Deck3","OwnerId":1,"Id":0}	2024-06-19 16:31:28.4865619
8	8	Create a deck using EF	User1	{"Name":"Deck3","OwnerId":1,"Id":0}	2024-06-19 16:31:46.3448029
9	9	Create a deck using EF	User1	{"Name":"Deck3","OwnerId":1,"Id":0}	2024-06-19 16:32:10.1398965
10	10	Create a deck using EF	User1	{"Name":"Deck3","OwnerId":1,"Id":0}	2024-06-19 16:32:27.0933364
11	11	Create a deck using EF	User1	{"Name":"Deck3","OwnerId":1,"Id":0}	2024-06-19 16:42:44.2868150
12	12	Create a deck using EF	User1	{"Name":"Deck3","OwnerId":1,"Id":0}	2024-06-19 16:42:47.1287988
13	13	Create a deck using EF	User1	{"Name":"Deck3","OwnerId":1,"Id":0}	2024-06-19 16:43:41.0564130
14	14	Create a deck using EF	User1	{"Name":"Deck3","OwnerId":1,"Id":0}	2024-06-19 16:44:06.2331780
15	15	Create a deck using EF	User1	{"Name":"Deck3","OwnerId":1,"Id":0}	2024-06-19 16:45:37.9497819
16	16	Create a deck using EF	User1	{"Name":"Deck3","OwnerId":1,"Id":0}	2024-06-19 16:53:20.5522054
17	17	Create a deck using EF	User1	{"Name":"Deck4","OwnerId":1,"Id":0}	2024-06-19 16:55:52.8034389
18	18	Create a deck using EF	User1	{"Name":"Deck5","OwnerId":1,"Id":0}	2024-06-19 16:55:55.9834030
19	19	Create a deck using EF	User1	{"Name":"Deck6","OwnerId":1,"Id":0}	2024-06-19 16:55:58.8548486