ET 框架学习笔记（二）- - 网络交互相关

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1 IAwake 接口类系统，IStart 重构丢了

- 感觉还比较直接，就是帮助搭建热更新域与 Unity 常规工程域生命周期回调的桥，搭桥连线，连能就可以了。应该可以扩散出个 IStart 接口类

1.1 IMessage,IRequest,IResponse: 进程内？消息类

```
public interface IMessage {}
public interface IRequest: IMessage {
    int RpcId { get; set; }
}
public interface IResponse: IMessage {
    int Error { get; set; }
    string Message { get; set; }
    int RpcId { get; set; }
}
```

1.2 IActorMessage,IActorRequest,IActorResponse: 进程间的？消息类

```
// 不需要返回消息
public interface IActorMessage: IMessage {}
public interface IActorRequest: IRequest {}
public interface IActorResponse: IResponse {}
```

1.3 IActorLocationMessage: 进程间的位置消息相关

```
public interface IActorLocationMessage: IActorRequest {}
public interface IActorLocationRequest: IActorRequest {}
public interface IActorLocationResponse: IActorResponse {}
```

1.4 IMHandler,IMActorHandler: 消息处理器口类【傻傻分不清楚】

```
public interface IMHandler { // 同进程内的
    void Handle(Session session, object message);
    Type GetMessageType();
    Type GetResponseType();
}
public interface IMActorHandler { // 进程间的？
    // ETTask Handle(Entity entity, int fromProcess, object actorMessage);
    void Handle(Entity entity, int fromProcess, object actorMessage); // 自己改成这样的
    Type GetRequestType();
    Type GetResponseType();
}
```

1.5 ILoad,ISystemType: 加载系

```
public interface ISystemType {
    Type Type();
    Type SystemType();
    InstanceQueueIndex GetInstanceQueueIndex();
}

public interface ILoad {
}
public interface ILoadSystem: ISystemType {
    void Run(Entity o);
}
[ObjectSystem]
public abstract class LoadSystem<T> : ILoadSystem where T: Entity, ILoad {
    void ILoadSystem.Run(Entity o) {
        this.Load((T)o);
    }
    Type ISystemType.Type() {
        return typeof(T);
    }
    Type ISystemType.SystemType() {
        return typeof(ILoadSystem);
    }
    InstanceQueueIndex ISystemType.GetInstanceQueueIndex() {
        return InstanceQueueIndex.Load;
    }
    protected abstract void Load(T self);
}
```

1.6 IAwake: 最多可以带四个参数

```
 public interface IAwake {}
 public interface IAwake<A> {}
 public interface IAwake<A, B> {}
 public interface IAwake<A, B, C> {}
 public interface IAwake<A, B, C, D> {}
```

1.7 IStartSystem,StartSystem<T>: 自己加的。【还有问题】系统找不到

```
public interface IStart { }
public interface IStartSystem : ISystemType {
    void Run(Entity o);
}
[ObjectSystem]
public abstract class StartSystem<T> : IStartSystem where T: Entity, IStart {
    public void IStartSystem.Run(Entity o) {
        this.Start((T)o);
    }
    public Type ISystemType.Type() {
        return typeof(T);
    }
    public Type ISystemType.SystemType() {
        return typeof(IStartSystem);
    }
    InstanceQueueIndex ISystemType.GetInstanceQueueIndex() { // 这里没看懂在干什么，大概还有个地方，我得去改
        return InstanceQueueIndex.Start;
    }
    public abstract void Start(T self);
}
// 整合进了系统：InstanceQueueIndex
public enum InstanceQueueIndex {
    None = -1,
    Start, // 需要把这个回调加入框架统筹管理里去
    Update,
    LateUpdate,
    Load,
    Max,
}
```

- 参考项目：除了原文件放在 ET 域。也【复制了一份到客户端的热更新域里】。可是感觉不应该。因为其它所有的回调都不用复制就可以用。我哪里可能还是没能设置对

- 改天再检查一下。但是否，对于非系统框架扩展接口，不得不这样？仍然感觉不应该，因为系统框架里其它的生命周期回调函数都不需要复制。改天再做。

1.8 IUpdate:

```
public interface IUpdate {
}
public interface IUpdateSystem: ISystemType {
    void Run(Entity o);
}
[ObjectSystem]
public abstract class UpdateSystem<T> : IUpdateSystem where T: Entity, IUpdate {
    void IUpdateSystem.Run(Entity o) {
        this.Update((T)o);
    }
    Type ISystemType.Type() {
        return typeof(T);
    }
    Type ISystemType.SystemType() {
        return typeof(IUpdateSystem);
    }
    InstanceQueueIndex ISystemType.GetInstanceQueueIndex() {
        return InstanceQueueIndex.Update;
    }
    protected abstract void Update(T self);
}
```

1.9 ILateUpdate: 好像是用于物理引擎，或是相机什么的更新，生命周期回调

```
public interface ILateUpdate {
}
public interface ILateUpdateSystem: ISystemType {
    void Run(Entity o);
}
[ObjectSystem]
public abstract class LateUpdateSystem<T> : ILateUpdateSystem where T: Entity, ILateUpdate {
    void ILateUpdateSystem.Run(Entity o) {
        this.LateUpdate((T)o);
    }
    Type ISystemType.Type() {
        return typeof(T);
    }
    Type ISystemType.SystemType() {
        return typeof(ILateUpdateSystem);
    }
    InstanceQueueIndex ISystemType.GetInstanceQueueIndex() {
        return InstanceQueueIndex.LateUpdate;
    }
    protected abstract void LateUpdate(T self);
}
```

1.10 ISingletonAwake|Update|LateUpdate: Singleton 生命周期回调

```
public interface ISingletonAwake {
    void Awake();
}
public interface ISingletonUpdate {
    void Update();
}
public interface ISingletonLateUpdate {
    void LateUpdate();
}
```

1.11 ISingleton,Singleton<T>: 单例

```
public interface ISingleton: IDisposable {
    void Register();
    void Destroy();
    bool IsDisposed();
}
public abstract class Singleton<T>: ISingleton where T: Singleton<T>, new() {
    private bool isDisposed;
    [StaticField]
    private static T instance;
    public static T Instance {
        get {
            return instance;
        }
    }
    void ISingleton.Register() {
        if (instance != null) {
            throw new Exception($"singleton register twice! {typeof (T).Name}");
        }
        instance = (T)this;
    }
    void ISingleton.Destroy() {
        if (this.isDisposed) {
            return;
        }
        this.isDisposed = true;

        instance.Dispose();
        instance = null;
    }
    bool ISingleton.IsDisposed() {
        return this.isDisposed;
    }
    public virtual void Dispose() {
    }
}
```

1.12 IDestroy,IDestroySystem,DestroySystem<T>: 销毁系

```
public interface IDestroy {
}
public interface IDestroySystem: ISystemType {
    void Run(Entity o);
}
[ObjectSystem]
public abstract class DestroySystem<T> : IDestroySystem where T: Entity, IDestroy {
    void IDestroySystem.Run(Entity o) {
        this.Destroy((T)o);
    }
    Type ISystemType.SystemType() {
        return typeof(IDestroySystem);
    }
    InstanceQueueIndex ISystemType.GetInstanceQueueIndex() {
        return InstanceQueueIndex.None;
    }
    Type ISystemType.Type() {
        return typeof(T);
    }
    protected abstract void Destroy(T self);
}
```

1.13 IEvent,AEvent<A>: 事件

```
public interface IEvent {
    Type Type { get; }
}
public abstract class AEvent<A>: IEvent where A: struct {
    public Type Type {
        get {
            return typeof (A);
        }
    }
    protected abstract ETTask Run(Scene scene, A a);
    public async ETTask Handle(Scene scene, A a) {
        try {
            await Run(scene, a);
        }
    catch (Exception e) {
      Log.Error(e);
    }
  }
}
```

1.14 IAddComponent: 添加组件系

```
public interface IAddComponent { }
public interface IAddComponentSystem: ISystemType {
  void Run(Entity o, Entity component);
}
[ObjectSystem]
public abstract class AddComponentSystem<T> : IAddComponentSystem where T: Entity, IAddComponent {
  void IAddComponentSystem.Run(Entity o, Entity component) {
    this.AddComponent((T)o, component);
  }
  Type ISystemType.SystemType() {
    return typeof(IAddComponentSystem);
  }
  InstanceQueueIndex ISystemType.GetInstanceQueueIndex() {
    return InstanceQueueIndex.None;
  }
  Type ISystemType.Type() {
    return typeof(T);
  }
  protected abstract void AddComponent(T self, Entity component);
}
```

1.15 IGetComponent: 获取组件系。【这里没有看明白】: 再去找细节 // ««««««««««

```
// GetComponentSystem 有巨大作用, 比如每次保存 Unit 的数据不需要所有组件都保存, 只需要保存 Unit 变化过的组件
// 是否变化可以通过判断该组件是否 GetComponent, Get 了就记录该组件【这里没有看明白】: 再去找细节  // <<<<<<<<<<<<<<<<<<<<
// 这样可以只保存 Unit 变化过的组件
// 再比如传送也可以做此类优化
public interface IGetComponent {
}
public interface IGetComponentSystem: ISystemType {
  void Run(Entity o, Entity component);
}
[ObjectSystem]
public abstract class GetComponentSystem<T> : IGetComponentSystem where T: Entity, IGetComponent {
  void IGetComponentSystem.Run(Entity o, Entity component) {
    this.GetComponent((T)o, component);
  }
  Type ISystemType.SystemType() {
    return typeof(IGetComponentSystem);
  }
  InstanceQueueIndex ISystemType.GetInstanceQueueIndex() {
    return InstanceQueueIndex.None;
  }
  Type ISystemType.Type() {
    return typeof(T);
  }
  protected abstract void GetComponent(T self, Entity component);
}
```

1.16 ISerializeToEntity,IDeserialize,IDeserializeSystem,DeserializeSystem< 序列化，反序列化

```
public interface ISerializeToEntity {
}
public interface IDeserialize {
}
public interface IDeserializeSystem: ISystemType {
  void Run(Entity o);
}
// 反序列化后执行的 System
```

```
[ObjectSystem]
public abstract class DeserializeSystem<T> : IDeserializeSystem where T: Entity, IDeserialize {
    void IDeserializeSystem.Run(Entity o) {
        this.Deserialize((T)o);
    }
    Type ISystemType.SystemType() {
        return typeof(IDeserializeSystem);
    }
    InstanceQueueIndex ISystemType.GetInstanceQueueIndex() {
        return InstanceQueueIndex.None;
    }
    Type ISystemType.Type() {
        return typeof(T);
    }
    protected abstract void Deserialize(T self);
}
```

1.17 IInvoke,AInvokeHandler<A>,AInvokeHandler<A, T>: 激活类

```
public interface IInvoke {
    Type Type { get; }
}
public abstract class AInvokeHandler<A>: IInvoke where A: struct {
    public Type Type {
        get {
            return typeof (A);
        }
    }
    public abstract void Handle(A a);
}
public abstract class AInvokeHandler<A, T>: IInvoke where A: struct {
    public Type Type {
        get {
            return typeof (A);
        }
    }
    public abstract T Handle(A a);
}
```

1.18 ProtoBuf 相关:IExtensible,IExtension,IProtoOutput<TOutput>,IMeasur 看不懂

1.18.1 IExtensible

```
// Indicates that the implementing type has support for protocol-buffer
// <see cref="IExtension">extensions</see>.
// <remarks>Can be implemented by deriving from Extensible.</remarks>
public interface IExtensible {
    // Retrieves the <see cref="IExtension">extension</see> object for the current
    // instance, optionally creating it if it does not already exist.
    // <param name="createIfMissing">Should a new extension object be
    // created if it does not already exist?</param>
    // <returns>The extension object if it exists (or was created), or null
    // if the extension object does not exist or is not available.</returns>
    // <remarks>The <c>createIfMissing</c> argument is false during serialization,
    // and true during deserialization upon encountering unexpected fields.</remarks>
    IExtension GetExtensionObject(bool createIfMissing);
}
```

1.18.2 IExtension

```
// Provides addition capability for supporting unexpected fields during
// protocol-buffer serialization/deserialization. This allows for loss-less
// round-trip/merge, even when the data is not fully understood.
public interface IExtension {
    // Requests a stream into which any unexpected fields can be persisted.
    // <returns>A new stream suitable for storing data.</returns>
    Stream BeginAppend();
    // Indicates that all unexpected fields have now been stored. The
    // implementing class is responsible for closing the stream. If
    // "commit" is not true the data may be discarded.
    // <param name="stream">The stream originally obtained by BeginAppend.</param>
    // <param name="commit">True if the append operation completed successfully.</param>
    void EndAppend(Stream stream, bool commit);
    // Requests a stream of the unexpected fields previously stored.
    // <returns>A prepared stream of the unexpected fields.</returns>
    Stream BeginQuery();
    // Indicates that all unexpected fields have now been read. The
    // implementing class is responsible for closing the stream.
    // <param name="stream">The stream originally obtained by BeginQuery.</param>
    void EndQuery(Stream stream);
    // Requests the length of the raw binary stream; this is used
    // when serializing sub-entities to indicate the expected size.
    // <returns>The length of the binary stream representing unexpected data.</returns>
    int GetLength();
}
// Provides the ability to remove all existing extension data
public interface IExtensionResettable : IExtension {
    void Reset();
}
```

1.18.3 IProtoOutput<TOutput>,IMeasuredProtoOutput<TOutput>,MeasureState<T>: 看得头大

```
// Represents the ability to serialize values to an output of type <typeparamref name="TOutput"/>
public interface IProtoOutput<TOutput> {
    // Serialize the provided value
    void Serialize<T>(TOutput destination, T value, object userState = null);
}
// Represents the ability to serialize values to an output of type <typeparamref name="TOutput"/>
// with pre-computation of the length
public interface IMeasuredProtoOutput<TOutput> : IProtoOutput<TOutput> {
    // Measure the length of a value in advance of serialization
    MeasureState<T> Measure<T>(T value, object userState = null);
    // Serialize the previously measured value
    void Serialize<T>(MeasureState<T> measured, TOutput destination);
}
// Represents the outcome of computing the length of an object; since this may have required computing lengths
// for multiple objects, some metadata is retained so that a subsequent serialize operation using
// this instance can re-use the previously calculated lengths. If the object state changes between the
// measure and serialize operations, the behavior is undefined.
public struct MeasureState<T> : IDisposable {
// note: * does not actually implement this API;
// it only advertises it for 3.* capability/feature-testing, i.e.
// callers can check whether a model implements
// IMeasuredProtoOutput<Foo>, and *work from that*
    public void Dispose() => throw new NotImplementedException();
    public long Length => throw new NotImplementedException();
}
```

2 【拖拉机游戏房间】组件：分析

2.1 TractorRoomEvent: 拖拉机房间,【待修改完成】

```
// UI 系统的事件机制：定义，如何创建拖拉机游戏房间【TODO:】UNITY 里是需要制作相应预设的
[UIEvent(UIType.TractorRoom)]
public class TractorRoomEvent: AUIEvent {
    public override async ETTask<UI> OnCreate(UIComponent uiComponent, UILayer uiLayer) {
        await ETTask.CompletedTask;
        await uiComponent.DomainScene().GetComponent<ResourcesLoaderComponent>().LoadAsync(UIType.TractorRoom.StringToAB())

        GameObject bundleGameObject = (GameObject) ResourcesComponent.Instance.GetAsset(UIType.TractorRoom.StringToAB(), UI
        GameObject room = UnityEngine.Object.Instantiate(bundleGameObject, UIEventComponent.Instance.GetLayer((int)uiLayer)
        UI ui = uiComponent.AddChild<UI, string, GameObject>(UIType.TractorRoom, room);
        // 【拖拉机游戏房间】：它可能由好几个不同的组件组成，这里要添加的不止一个
        ui.AddComponent<GamerComponent>(); // 玩家组件：这个控件带个 UI 小面板，要怎么添加呢？
        ui.AddComponent<TractorRoomComponent>(); // <<<<<<<<<<<<<<<<<<<< 房间组件：合成组件系统，自带【互动组件】
        return ui;
    }
    public override void OnRemove(UIComponent uiComponent) {
        ResourcesComponent.Instance.UnloadBundle(UIType.TractorRoom.StringToAB());
    }
}
```

2.2 GamerComponent: 玩家【管理类组件】，是对房间里四个玩家的管理。

- 【GamerComponent】玩家组件：是对一个房间里四个玩家的（及其在房间里的坐位位置）管理（分东南西北）。可以添加移除玩家。

```
// 组件：是提供给房间用，用来管理游戏中每个房间里的最多三个当前玩家
public class GamerComponent : Entity, IAwake { // 它也有【生成系】
    private readonly Dictionary<long, int> seats = new Dictionary<long, int>();
    private readonly Gamer[] gamers = new Gamer[4];
    public Gamer LocalGamer { get; set; } // 提供给房间组件用的：就是当前玩家。。。
    // 添加玩家
    public void Add(Gamer gamer, int seatIndex) {
        gamers[seatIndex] = gamer;
        seats[gamer.UserID] = seatIndex;
    }
    // 获取玩家
    public Gamer Get(long id) {
        int seatIndex = GetGamerSeat(id);
        if (seatIndex >= 0)
            return gamers[seatIndex];
        return null;
    }
    // 获取所有玩家
    public Gamer[] GetAll() {
        return gamers;
    }
    // 获取玩家座位索引
    public int GetGamerSeat(long id) {
        int seatIndex;
        if (seats.TryGetValue(id, out seatIndex))
            return seatIndex;
        return -1;
    }
    // 移除玩家并返回
    public Gamer Remove(long id) {
        int seatIndex = GetGamerSeat(id);
        if (seatIndex >= 0) {
            Gamer gamer = gamers[seatIndex];
            gamers[seatIndex] = null;
            seats.Remove(id);
            return gamer;
        }
        return null;
    }
    public override void Dispose() {
        if (this.IsDisposed)
            return;
        base.Dispose();
        this.LocalGamer = null;
        this.seats.Clear();
        for (int i = 0; i < this.gamers.Length; i++)
            if (gamers[i] != null) {
                gamers[i].Dispose();
                gamers[i] = null;
            }
    }
}
```

2.3 Gamer: 【服务端】一个玩家个例。对应这个玩家的相关信息

```
// 房间玩家对象
public sealed class Gamer : Entity, IAwake<long> {
    // 用户 ID（唯一）
    public long UserID { get; private set; }
    // 玩家 GateActorID
    public long PlayerID { get; set; }
    // 玩家所在房间 ID
    public long RoomID { get; set; }
    // 是否准备
    public bool IsReady { get; set; }
    // 是否离线
    public bool isOffline { get; set; }
    public void Awake(long id) {
        this.UserID = id;
    }
    public override void Dispose() {
        if (this.IsDisposed) return;
        base.Dispose();
        this.UserID = 0;
        this.PlayerID = 0;
        this.RoomID = 0;
        this.IsReady = false;
        this.isOffline = false;
    }
}
```

2.4 Gamer: 【客户端】一个玩家个例。它说只要一点儿信息就行

- 传进程间消息的时候，也只传这两个关键参数。

```
public sealed class Gamer : Entity { // 玩家对象
    // 玩家唯一 ID
    public long UserID { get; set; }
    // 是否准备
    public bool IsReady { get; set; }
    public override void Dispose() {
        if (this.IsDisposed) return;
        base.Dispose();
        this.UserID = 0;
        this.IsReady = false;
    }
}
```

2.5 GamerUIComponent: 【客户端】玩家 UI 组件：每个玩家背个小面板，来显示必要信息（钱，抢不抢庄，反过的主等）

```
public class GamerUIComponent : Entity, IStart { // 玩家 UI 组件
    public GameObject Panel { get; private set; } // UI 面板
    // 玩家昵称
    public string NickName { get { return name.text; } }
    private Image headPhoto;
    private Text prompt;
    private Text name;
    private Text money;
    public void Start() {
        if (this.GetParent<Gamer>().IsReady)
            SetReady();
    }
    // 重置面板
    public void ResetPanel() {
        ResetPrompt();
        this.headPhoto.gameObject.SetActive(false);
        this.name.text = "空位";
        this.money.text = "";
        this.Panel = null;
        this.prompt = null;
        this.name = null;
        this.money = null;
        this.headPhoto = null;
    }
    // 设置面板
    public void SetPanel(GameObject panel) {
        this.Panel = panel;
        // 绑定关联
        this.prompt = this.Panel.Get<GameObject>("Prompt").GetComponent<Text>();
        this.name = this.Panel.Get<GameObject>("Name").GetComponent<Text>();
        this.money = this.Panel.Get<GameObject>("Money").GetComponent<Text>();
        this.headPhoto = this.Panel.Get<GameObject>("HeadPhoto").GetComponent<Image>();
```

```
            UpdatePanel();
        }
        // 更新面板
        public void UpdatePanel() {
            if (this.Panel != null) {
                SetUserInfo();
                headPhoto.gameObject.SetActive(false);
            }
        }
        // 设置玩家身份
        public void SetIdentity(Identity identity) {
            if (identity == Identity.None) return;
            string spriteName = $"Identity_{Enum.GetName(typeof(Identity), identity)}";
            Sprite headSprite = CardHelper.GetCardSprite(spriteName);
            headPhoto.sprite = headSprite;
            headPhoto.gameObject.SetActive(true);
        }
        // 玩家准备
        public void SetReady() {
            prompt.text = "准备！";
        }
        // 出牌错误
        public void SetPlayCardsError() {
            prompt.text = "您出的牌不符合规则！";
        }
        // 玩家不出
        public void SetDiscard() {
            prompt.text = "不出";
        }
        // 打 2 时，玩家抢不抢庄：或者去想，玩家要不要反主牌花色
        public void SetGrab(GrabLandlordState state) {
            switch (state) {
            case GrabLandlordState.Not:
                break;
            case GrabLandlordState.Grab:
                prompt.text = "抢地主";
                break;
            case GrabLandlordState.UnGrab:
                prompt.text = "不抢";
                break;
            }
        }
        public void ResetPrompt() { // 重置提示
            prompt.text = "";
        }
        public void GameStart() { // 游戏开始
            ResetPrompt();
        }
        private async void SetUserInfo() { // 设置用户信息
            G2C_GetUserInfo_Ack g2C_GetUserInfo_Ack = await SessionComponent.Instance.Session.Call(new C2G_GetUserInfo_Req() {
            if (this.Panel != null) {
                name.text = g2C_GetUserInfo_Ack.NickName;
                money.text = g2C_GetUserInfo_Ack.Money.ToString();
            }
        }
        public override void Dispose() {
            if (this.IsDisposed) return;
            base.Dispose();
            ResetPanel(); // 重置玩家 UI
        }
    }
```

2.6 Protobuf 里面的消息与参考

- 这里把 Protobuf 里面可以传的游戏相关也整理一下。

```
message GamerInfo {
    int64 UserID = 1;
    bool IsReady = 2;
}
message GamerScore {
    int64 UserID = 1;
    int64 Score = 2;
}
message GamerState {
    int64 UserID = 1;
    ET.Server.Identity UserIdentity = 2; // 命名空间的问题
^^IGrabLandlordState State = 3;
}
message GamerCardNum { // IMessage
    int64 UserID = 1;
    int32 Num = 2;
}
message Actor_GamerGrabLandlordSelect_Ntt { // IActorMessage 参考去想：抢庄，与反主牌花色，如何写消息
    int32 RpcId = 90;
    int64 ActorId = 94;
    int64 UserID = 1;
    bool IsGrab = 2;
}
```

2.7 TractorRoomComponent: 游戏房间，自带其它组件，当有嵌套时，如何才能系统化地、工厂化地、UI 上的事件驱动地，生成这个组件呢？

```
public class TractorRoomComponent : Entity, IAwake {
    private TractorInteractionComponent interaction; // 嵌套组件：互动组件
    private Text multiples;
    public readonly GameObject[] GamersPanel = new GameObject[4];
    public bool Matching { get; set; }
    public TractorInteractionComponent Interaction { // 组件里套组件，要如何事件机制触发生成？
        get {
            if (interaction == null) {
                UI uiRoom = this.GetParent<UI>();
                UI uiInteraction = TractorInteractionFactory.Create(UIType.TractorInteraction, uiRoom);
                interaction = uiInteraction.GetComponent<TractorInteractionComponent>();
            }
            return interaction;
        }
    }
```

2.8 TractorInteractionComponent: 感觉是视图 UI 上的一堆调控，逻辑控制

- 上下这一两个组件里，除了 ProtoBuf 消息里传递的类找不到，没有其它错误
- 【嵌套】：是这里的难点。其它都可以一个触发一个地由事件发布触发订阅者的回调，可是当一个组件内存在嵌套，又是系统化【内部组件生成完成后，外部组件才生成完成】生成，我是要把这两个组件合并成一个吗？还是说，我不得不把它折成粒度更小的 UI 上的事件驱动机制，以符合系统框架？要去所源码弄透。

```
    // 【互动组件】：一堆的视图控件管理
    public class TractorInteractionComponent : Entity, IAwake { // 多个按钮：有些暂时是隐藏的
        private Button playButton;
        private Button promptButton;
        private Button discardButton;
        private Button grabButton;
        private Button disgrabButton;
        private Button changeGameModeButton;
        private List<Card> currentSelectCards = new List<Card>();

        public bool isTrusteeship { get; set; }
        public bool IsFirst { get; set; }
```

3 Net 网络交互相关：只在【服务端】用

3.1 NetInnerComponent: 【服务端】对不同进程的处理组件。是服务器的组件

```
namespace ET.Server {
    // 【服务器】：对不同进程的一些处理
    public struct ProcessActorId {
        public int Process;
        public long ActorId;
        public ProcessActorId(long actorId) {
            InstanceIdStruct instanceIdStruct = new InstanceIdStruct(actorId);
            this.Process = instanceIdStruct.Process;
            instanceIdStruct.Process = Options.Instance.Process;
            this.ActorId = instanceIdStruct.ToLong();
        }
    }

    public struct NetInnerComponentOnRead {
        public long ActorId;
        public object Message;
    }

    [ComponentOf(typeof(Scene))]
    public class NetInnerComponent: Entity, IAwake<IPEndPoint>, IAwake, IDestroy {
        public int ServiceId;

        public NetworkProtocol InnerProtocol = NetworkProtocol.KCP;
        [StaticField]
        public static NetInnerComponent Instance;
    }
}
```

3.2 NetInnerComponentSystem: 生成系

```
[FriendOf(typeof(NetInnerComponent))]
public static class NetInnerComponentSystem {
    [ObjectSystem]
    public class NetInnerComponentAwakeSystem: AwakeSystem<NetInnerComponent> {
        protected override void Awake(NetInnerComponent self) {
            NetInnerComponent.Instance = self;
            switch (self.InnerProtocol) {
                case NetworkProtocol.TCP: {
                    self.ServiceId = NetServices.Instance.AddService(new TService(AddressFamily.InterNetwork, ServiceType.I
                    break;
                }
                case NetworkProtocol.KCP: {
                    self.ServiceId = NetServices.Instance.AddService(new KService(AddressFamily.InterNetwork, ServiceType.I
                    break;
                }
            }
            NetServices.Instance.RegisterReadCallback(self.ServiceId, self.OnRead);
            NetServices.Instance.RegisterErrorCallback(self.ServiceId, self.OnError);
        }
    }
    [ObjectSystem]
    public class NetInnerComponentAwake1System: AwakeSystem<NetInnerComponent, IPEndPoint> {
        protected override void Awake(NetInnerComponent self, IPEndPoint address) {
            NetInnerComponent.Instance = self;
            switch (self.InnerProtocol) {
                case NetworkProtocol.TCP: {
                    self.ServiceId = NetServices.Instance.AddService(new TService(address, ServiceType.Inner));
                    break;
                }
                case NetworkProtocol.KCP: {
                    self.ServiceId = NetServices.Instance.AddService(new KService(address, ServiceType.Inner));
                    break;
                }
            }
            NetServices.Instance.RegisterAcceptCallback(self.ServiceId, self.OnAccept);
            NetServices.Instance.RegisterReadCallback(self.ServiceId, self.OnRead);
            NetServices.Instance.RegisterErrorCallback(self.ServiceId, self.OnError);
        }
    }
    [ObjectSystem]
    public class NetInnerComponentDestroySystem: DestroySystem<NetInnerComponent> {
        protected override void Destroy(NetInnerComponent self) {
            NetServices.Instance.RemoveService(self.ServiceId);
        }
    }
    private static void OnRead(this NetInnerComponent self, long channelId, long actorId, object message) {
        Session session = self.GetChild<Session>(channelId);
        if (session == null)
```

```
            return;
        session.LastRecvTime = TimeHelper.ClientFrameTime();
        self.HandleMessage(actorId, message);
    }
    public static void HandleMessage(this NetInnerComponent self, long actorId, object message) {
        EventSystem.Instance.Publish(Root.Instance.Scene, new NetInnerComponentOnRead() { ActorId = actorId, Message = mess
    }
    private static void OnError(this NetInnerComponent self, long channelId, int error) {
        Session session = self.GetChild<Session>(channelId);
        if (session == null)
            return;
        session.Error = error;
        session.Dispose();
    }
    // 这个 channelId 是由 CreateAcceptChannelId 生成的
    private static void OnAccept(this NetInnerComponent self, long channelId, IPEndPoint ipEndPoint) {
        Session session = self.AddChildWithId<Session, int>(channelId, self.ServiceId);
        session.RemoteAddress = ipEndPoint;
        // session.AddComponent<SessionIdleCheckerComponent, int, int, int>(NetThreadComponent.checkInteral, NetThreadCompo
    }
    private static Session CreateInner(this NetInnerComponent self, long channelId, IPEndPoint ipEndPoint) {
        Session session = self.AddChildWithId<Session, int>(channelId, self.ServiceId);
        session.RemoteAddress = ipEndPoint;
        NetServices.Instance.CreateChannel(self.ServiceId, channelId, ipEndPoint);
        // session.AddComponent<InnerPingComponent>();
        // session.AddComponent<SessionIdleCheckerComponent, int, int, int>(NetThreadComponent.checkInteral, NetThreadCompo
        return session;
    }
    // 内网 actor session，channelId 是进程号
    public static Session Get(this NetInnerComponent self, long channelId) {
        Session session = self.GetChild<Session>(channelId);
        if (session != null)
            return session;
        IPEndPoint ipEndPoint = StartProcessConfigCategory.Instance.Get((int) channelId).InnerIPPort;
        session = self.CreateInner(channelId, ipEndPoint);
        return session;
    }
}
```

4 消息处理器：AMActorHandler<E, Message> 继承类的返回类型，全改成了 void

4.1 AMActorHandler<E, Message>：基类的抽象方法 Run 的返回类型被固定死了，报了狠多错

- 这样，可以把所有自己继承类的报错去掉。可是因为还没能理解透彻，不知道先前的 ETVoid 是为什么，现在会不会产生什么其它意外的错。作个记号。

```
[EnableClass]
public abstract class AMActorHandler<E, Message>: IMActorHandler where E : Entity where Message : class, IActorMessag

    // protected abstract ETTask Run(E entity, Message message);  // <<<<<<<<<<<<<<<<<<<<<<
    protected abstract void Run(E entity, Message message);  // 可以改成是自己想要的，返回类型，因为只有自己的继承类在使

    public async ETTask Handle(Entity entity, int fromProcess, object actorMessage) {
        if (actorMessage is not Message msg) {
            Log.Error($" 消息类型转换错误: {actorMessage.GetType().FullName} to {typeof (Message).Name}");
            return;
        }
        if (entity is not E e) {
            Log.Error($"Actor 类型转换错误: {entity.GetType().Name} to {typeof (E).Name} --{typeof (Message).Name}");
            return;
        }
        await this.Run(e, msg);
    }
    public Type GetRequestType() {
        if (typeof (IActorLocationMessage).IsAssignableFrom(typeof (Message))) {
            Log.Error($"message is IActorLocationMessage but handler is AMActorHandler: {typeof (Message)}");
        }
```

```
            return typeof (Message);
        }
        public Type GetResponseType() {
            return null;
        }
    }
```

4.2 IMActorHandler: 接口类的定义，同样要改

```
public interface IMActorHandler {
    // ETTask Handle(Entity entity, int fromProcess, object actorMessage);
    void Handle(Entity entity, int fromProcess, object actorMessage); // 自己改成这样的
    Type GetRequestType();
    Type GetResponseType();
}
```

5 写在最后：反而是自己每天查看一再更新的

- 因为感觉还是不曾系统性地读 ET7 的源码，或者说有效阅读，因为没有带着实际问题的看源码，感觉都不叫看读源码呀。这里会记自己的感觉需要赶快查看的地方。
- 【ET 框架的整体架构】：感觉把握不够。常常命名空间分不清。要把这个大的框架，比较高层面的架构再好好看下。然后就是对自顶向下的不同层级场景，所需要的主要的不同组件，分不清，仍需要再熟悉一下源码
- 【问题】：某些消息，还分不清是内网还是外网消息，暂时先放一下，到时再改
- 【问题】：上次那个 ET-EUI 框架的时候，曾经出现过 opcode 不对应，也就是说，我现在生成的进程间消息，有可能还是会存在服务器码与客户端码不对应，这个完备的框架，这次应该不至于吧？
- 【ClientComponent】：新框架里重构丢了，去找怎么替代？那么现在去追一下，客户端的起始与场景加载或是切换大致过程。它变成了什么客户端场景管理？
- 【UIType】部分类：这个类出现在了三四个不同的程序域，现在重构了，好像添加得不对。要再修改

6 现在的修改内容，记忆

- 【任何时候，活宝妹就是一定要嫁给亲爱的表哥！！！】
- 【活宝妹坐等亲爱的表哥，领娶活宝妹回家！爱表哥，爱生活！！！】

7 TODO 今天晚上把几个消息抓全了，免得一堆的报错

- **【IStartSystem:】**感觉还有点儿小问题。认为：我应该不需要同文件两份，一份复制到客户端热更新域。我认为，全框架应该如其它接口类一样，只要一份就可以了。**【晚点儿再检查一遍】**
- 【Proto2CS】：进程间消息里的，【牌相关的】，尤其是它们所属的命名空间，没写对，现在总是找不到定义。
- **【Protobuf 里进程间传递的游戏数据相关信息：】**这个现在成为重构的主要 compile-error. 因为找不到类。需要去弄懂
    - 包括 Identity, Weight,Suits, 抢不抢地主【抢不抢庄】，以及可能的反不反主牌花色等。

  - 找不到的那些类，我可能【内网】【外网】消息没分对。
  - 【Identity】与【Card】：外网消息里，怎么会找不到呢？再回去检查一遍。下午要把这个弄通，要开始思路怎么设计重构拖拉机项目。

- 去把【拖拉机房间、斗地主房间组件的，玩家什么的一堆组件】弄明白

- 把参考游戏里，打牌相关的逻辑与模块好好看下，方便自己熟悉自己重构项目的源码后，画葫芦画瓢地重构

- 【任何时候，活宝妹就是一定要嫁给亲爱的表哥！！！爱表哥，爱生活！！！】

8 拖拉机游戏：【重构 OOP/OOD 设计思路】

- 自己是学过，有这方面的意识，但并不是说，自己就懂得，就知道该如何狠好地设计这些类。现在更多的是要受 ET 框架，以及参考游戏手牌设计的启发，来帮助自己一再梳理思路，该如何设计它。

- 【GamerComponent】玩家组件：是对一个房间里四个玩家的（及其在房间里的坐位位置）管理（分东南西北）。可以添加移除玩家。

-