

数据结构说明

核心数据类型

基础类型

```
interface Point {  
  x: number;  
  y: number;  
}  
  
interface Point3D extends Point {  
  z: number;  
}  
  
interface Size {  
  width: number;  
  height: number;  
}  
  
interface Rotation {  
  x: number;  
  y: number;  
  z: number;  
}
```

图元基类

```
interface BaseElement {  
  id: string;  
  type: ElementType;  
  position: Point;  
  rotation: number;  
  version: number;  
  createdAt: string;  
  updatedAt: string;  
  properties: Record<string, any>;  
  style?: ElementStyle;  
}  
  
type ElementType = 'wall' | 'seat' | 'door' | 'window' | 'meetingRoom';
```

墙体图元

```

interface WallElement extends BaseElement {
  type: 'wall';
  startPoint: Point;
  endPoint: Point;
  thickness: number;
  height: number;
  properties: WallProperties;
}

interface WallProperties {
  material?: string;
  color?: string;
  texture?: string;
}

```

座位图元

```

interface SeatElement extends BaseElement {
  type: 'seat';
  size: Size;
  properties: SeatProperties;
}

interface SeatProperties {
  occupant?: string;
  department?: string;
  status: 'vacant' | 'occupied';
}

```

门窗图元

```

interface DoorElement extends BaseElement {
  type: 'door';
  width: number;
  height: number;
  openDirection: 'left' | 'right';
}

interface WindowElement extends BaseElement {
  type: 'window';
  width: number;
  height: number;
  sillHeight: number;
}

```

状态管理

Space状态

```
interface SpaceState {
  elements: BaseElement[];
  selectedElements: string[];
  viewMode: ViewMode;
  gridSettings: GridSettings;
}

interface ViewMode {
  mode: '2d' | '3d';
  camera?: CameraSettings;
}

interface GridSettings {
  enabled: boolean;
  size: number;
  snap: boolean;
}
```

命令系统

```
interface Command {
  type: CommandType;
  element?: BaseElement;
  previousElement?: BaseElement;
  elements?: BaseElement[];
}

type CommandType =
  | 'ADD_ELEMENT'
  | 'UPDATE_ELEMENT'
  | 'DELETE_ELEMENT'
  | 'BATCH_DELETE_ELEMENTS'
  | 'ROTATE_ELEMENT';
```

文件系统

```
interface SpaceFile {
  id: string;
  name: string;
  userId: string;
  content: {
    elements: BaseElement[];
  };
  createdAt: string;
  updatedAt: string;
}
```

```
}  
  
interface FileListItem {  
  id: string;  
  name: string;  
  updatedAt: string;  
}
```

样式系统

图元样式

```
interface ElementStyle {  
  DEFAULT: string;  
  HOVER: string;  
  SELECTED: string;  
  BORDER_DEFAULT?: string;  
  BORDER_SELECTED?: string;  
}  
  
interface ElementColors {  
  WALL: ElementStyle;  
  SEAT: ElementStyle;  
  DOOR: ElementStyle;  
  WINDOW: ElementStyle;  
  MEETING_ROOM: ElementStyle;  
}
```

材质系统

```
interface Material {  
  id: string;  
  name: string;  
  type: 'color' | 'texture';  
  value: string;  
  properties?: MaterialProperties;  
}  
  
interface MaterialProperties {  
  roughness?: number;  
  metalness?: number;  
  opacity?: number;  
  map?: string;  
  normalMap?: string;  
}
```