

The background of the slide is split diagonally. The left side features a blue-toned world map with a network of glowing white lines and dots connecting various points, suggesting a global network or data flow. The right side is a solid white background.

Android Automotive Powered by KANZI

Connected Cockpit

近几年Android车机的出货量趋势图
跟Linux、Windows等其他OS的对比？

Android Automotive Features



Android N (launched)

- ✓ Vehicle system UI
- ✓ HVAC management
- ✓ AM/FM radio management
- ✓ Backup camera management
- ✓ Vehicle audio routing
- ✓ Host side BT improvements
- ✓ VHAL, VNS
- ✓ Vehicle OS/App update mechanism(garage mode)

Android N.Car (launched)

- ✓ Core automotive apps
- ✓ Multi-screen (cluster) support
- ✓ BT: AVRCP 1.6, MAP 1.1
- ✓ Deep sleep management
- ✓ Additional Car APIs
- ✓ Audio management improvements
- ✓ App whitelisting

Android O (& MR1) (in development)

- ✓ Quick boot (<12 seconds)
- ✓ Treble HIDL migration
- ✓ Car Notification Center
- ✓ Android Auto Projected support
- ✓ Flash management improvements
- ✓ Identity management
- ✓ Emulator with vehicle net. sim
- ✓ Radio improvements
- ✓ Car Diagnostics APIs
- ✓ Audio improvements
- ✓ BT improvements (e.g. auto-connect)
- ✓ EVS

Android P (planning)

- ✓ Multi-zone audio
- ✓ Multi-display support
- ✓ Dual band hotspot support
- ✓ Multi-camera support(360 camera support)
- ✓ Vehicle network gatekeeping
- ✓ App/OS update size reduce
- ✓ More to come...

2016 Q3

2016 Q4

2017 Q3

2018 Q3

Android Automotive

Android		Android Automotive
APPLICATIONS	ALARM•BROWSER•CALCULATOR•CALENDAR•CAMERA•CLOCK•CONTACTS•DIALER•EMAIL•HOME•IM•MEDIA PLAYER•PHOTO ALBUM•SMS/MMS•VOICE DIAL	CAR DIALER•CAR HOME•CAR MEDIA•CAR MENU DRIVER•CAR MESSAGING•CAR NOTIFICATION•CAR SYSTEM BAR•CAR SETTINGS•HVAC•RADIO
ANDROID FRAMEWORK	CONTENT PROVIDERS•MANAGERS(ACTIVITY, LOCATION, PACKAGE, NOTIFICATION, RESOURCE, TELEPHONY, WINDOW) •VIEW SYSTEM	AUDIO POLICY API•CAR SENSORS•HAVC MANAGER•GLOBAL VOICE TRIGGER API•PERSONALIZATION•TRUST AGENT
ANDROID RUNTIME	ANDROID SYSTEM SERVICES	AUDIO FOCUS•BLUETOOTH STACK•CAR SERVICE•CAR UI MODE•CAR UI PROVIDER•GARAGE MODE•VEHICLE NETWORK SERVICE
ART•CORE LIBRARIES	AUDIO MANAGER•FREETYPE•LIBC•MEDIA FRAMEWORK•OPENGL/ES•SQLITE•SSL•SURFACE MANAGER•WEBKIT	
HAL	AUDIO•BLUETOOTH•CAMERA•DRM•EXTERNAL STORAGE•GRAPHICS•INPUT•MEDIA•SENSORS•TV	REARVIEW CAMERA HAL•VEHICLE HAL
LINUX KERNEL	DRIVERS(AUDIO, BINDER(IPC), BLUETOOTH, CAMERA, DISPLAY, KEYPAD, SHARED MEMORY, USB, WIFI) •POWER MANAGEMENT	CAN INTERFACE•DEEP SLEEP•MULTI-PROFILE USB HOST•REARVIEW CAMERA•QUICKBOOT

Cockpit Products



Cutting Edge
Digital Cluster



Connected
Infotainment System

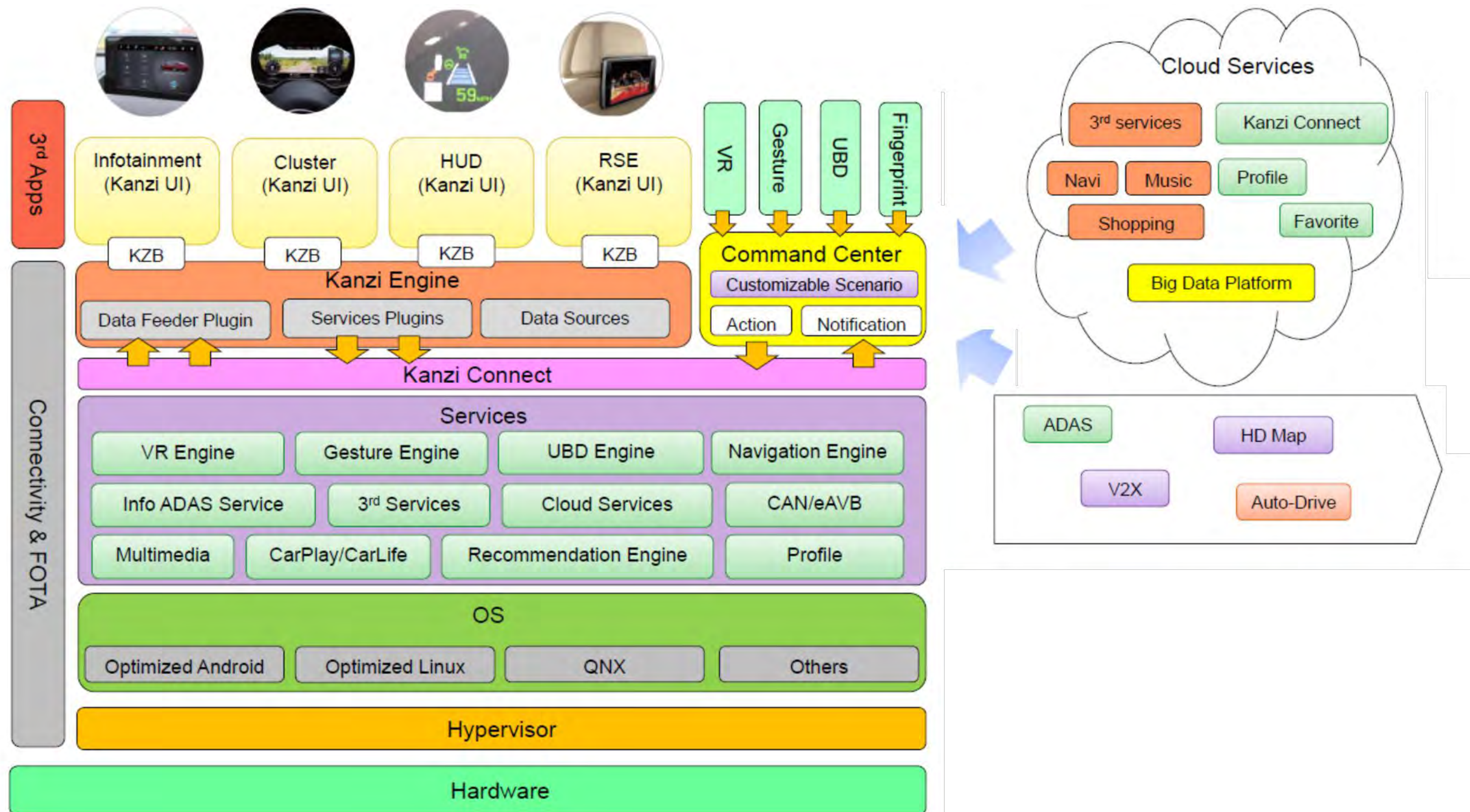


Head-Up Display



Rear Seat
Entertainment

Software Architecture of Cockpit



Requirement of Automotive OS

- ❖ Distributed system
 - Scalability for connectivity
 - Interaction between various sub-systems
- ❖ Safety and Security
 - Stable and reliable (ISO-26262)
 - Tamper-proofing
 - Cyber-Security
- ❖ Unified Human Interface
 - Consistent HMI style for brands
 - Easy to customize HMI

What is Kanzi

Kanzi UI Engine

- ❖ Based on OpenGL/ES 2.0 or higher
- ❖ High-Performance UI engine
- ❖ Cross Platform

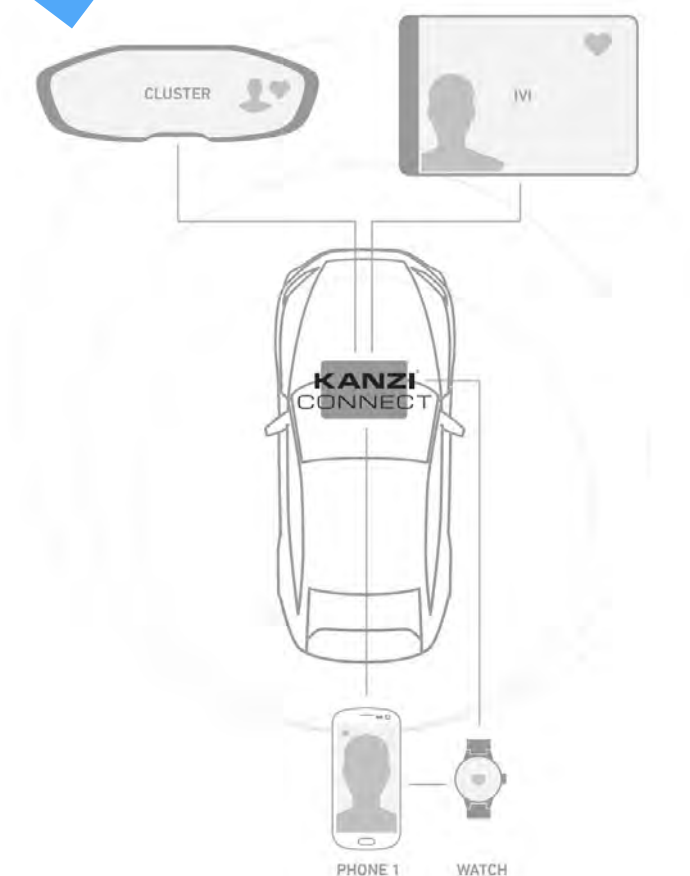


Kanzi Studio

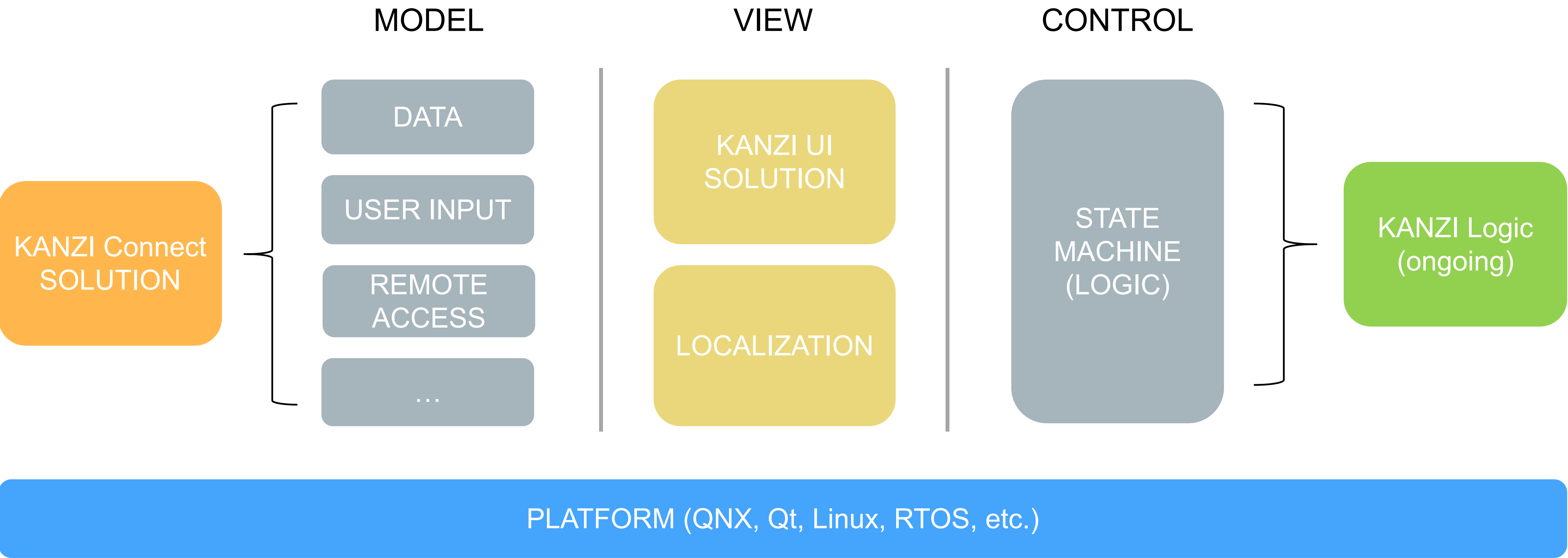
- ❖ IDE for Kanzi family toolkit
- ❖ WYSIWYG
- ❖ Drag & drop without coding
- ❖ Simulator for developer and designer

Kanzi Connect

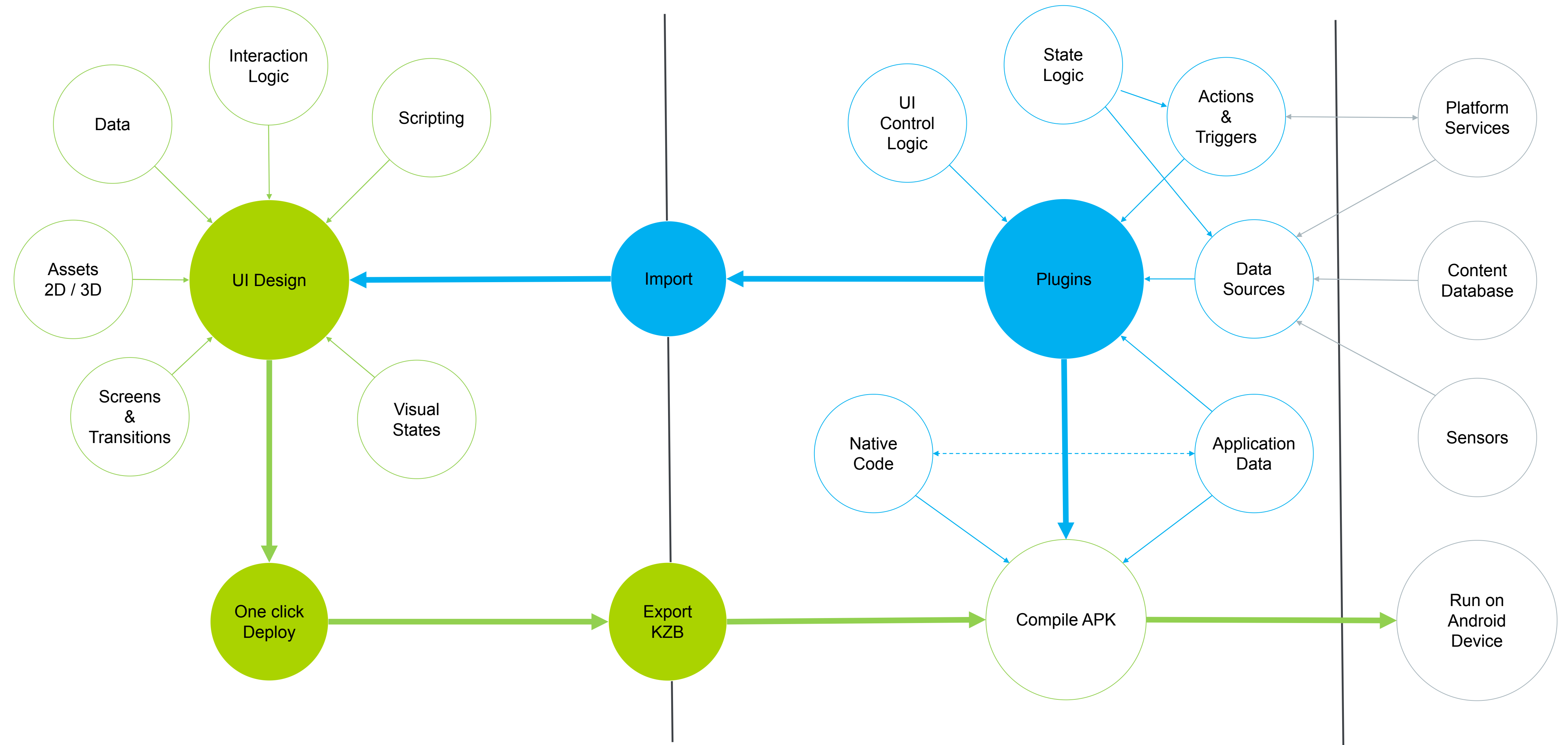
- ❖ Client-Server RPC
- ❖ Secured Communication
- ❖ Bearer can be IP, CAN, BT, etc.

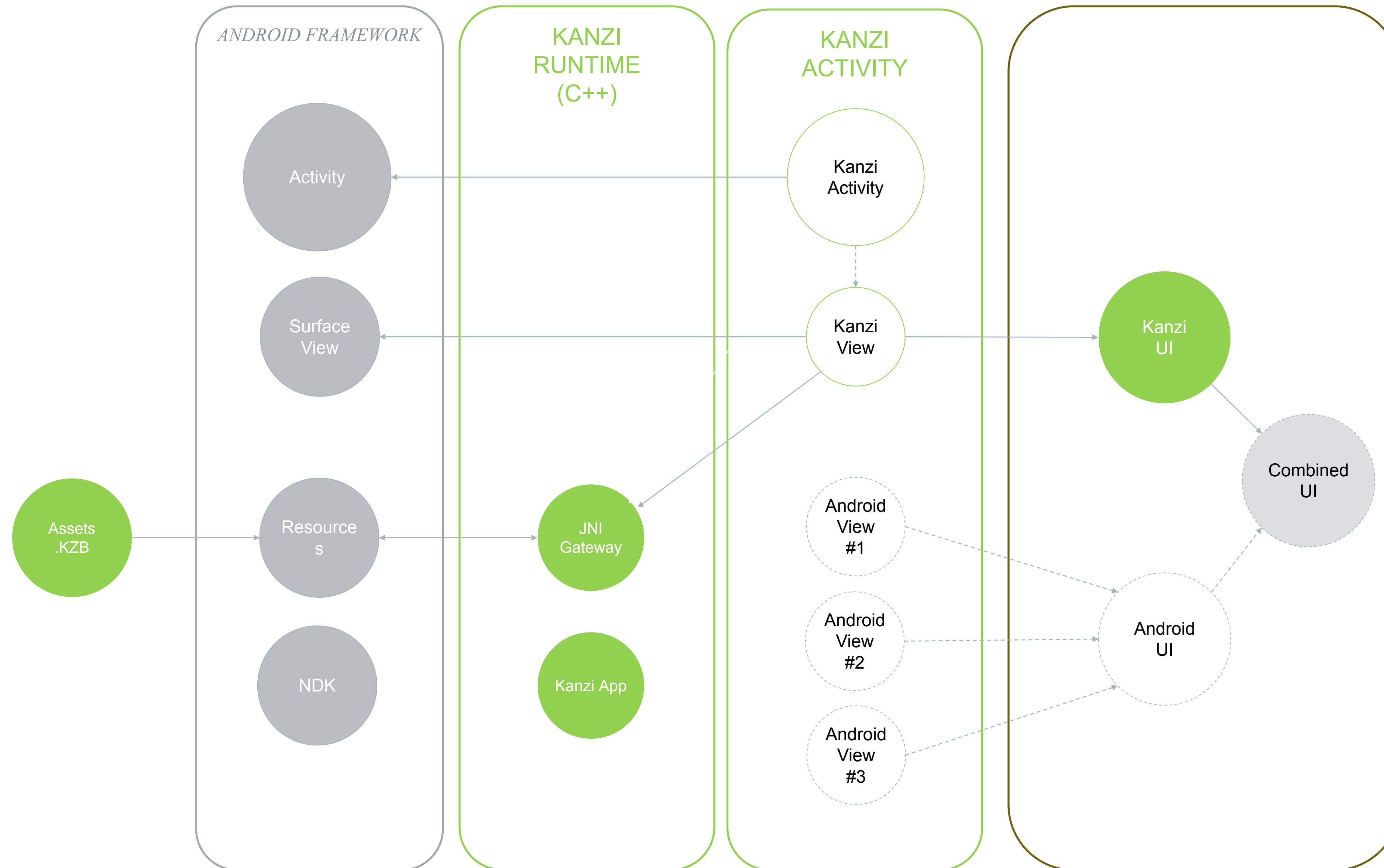


Principal of Kanzi



KANZI UI

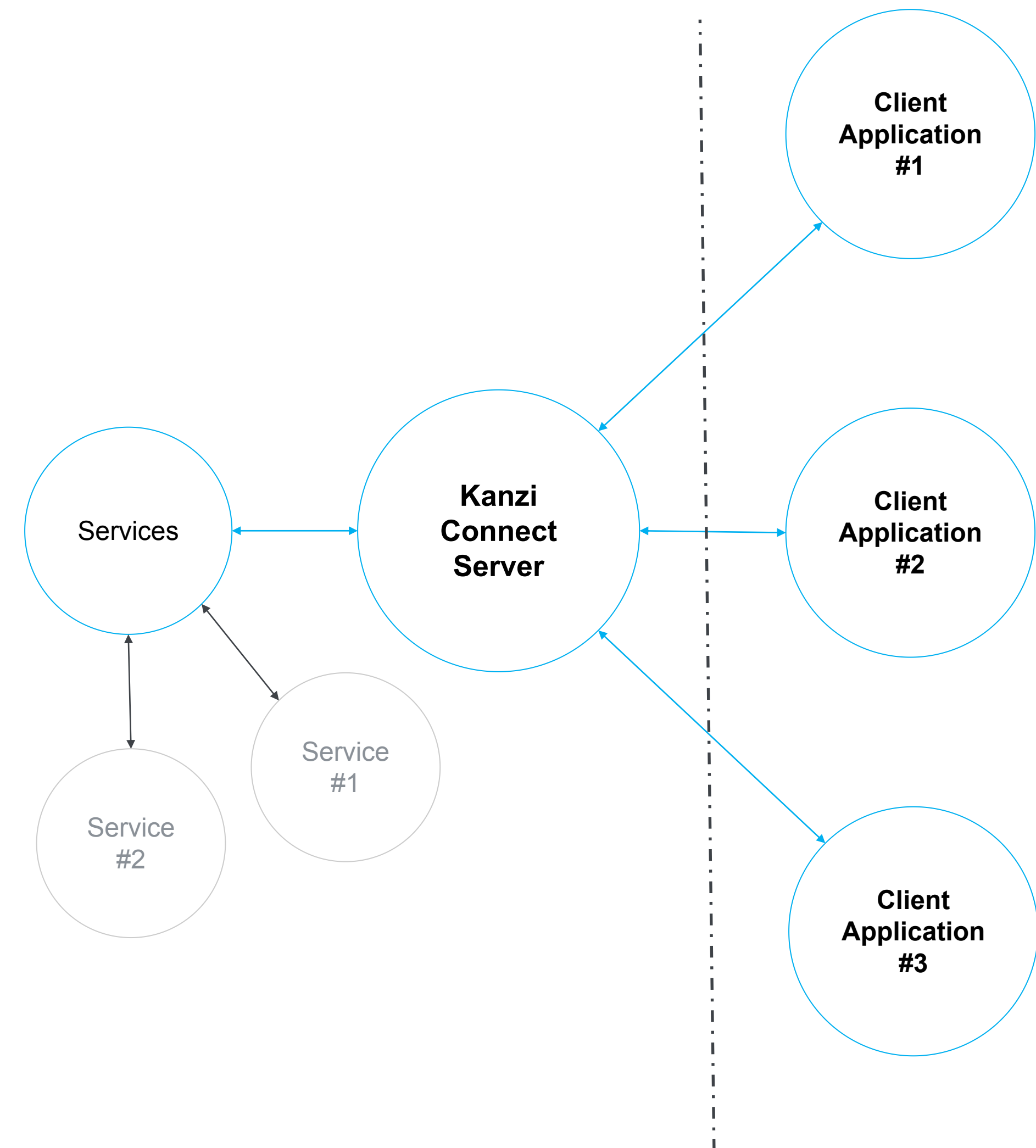




KANZI Connect

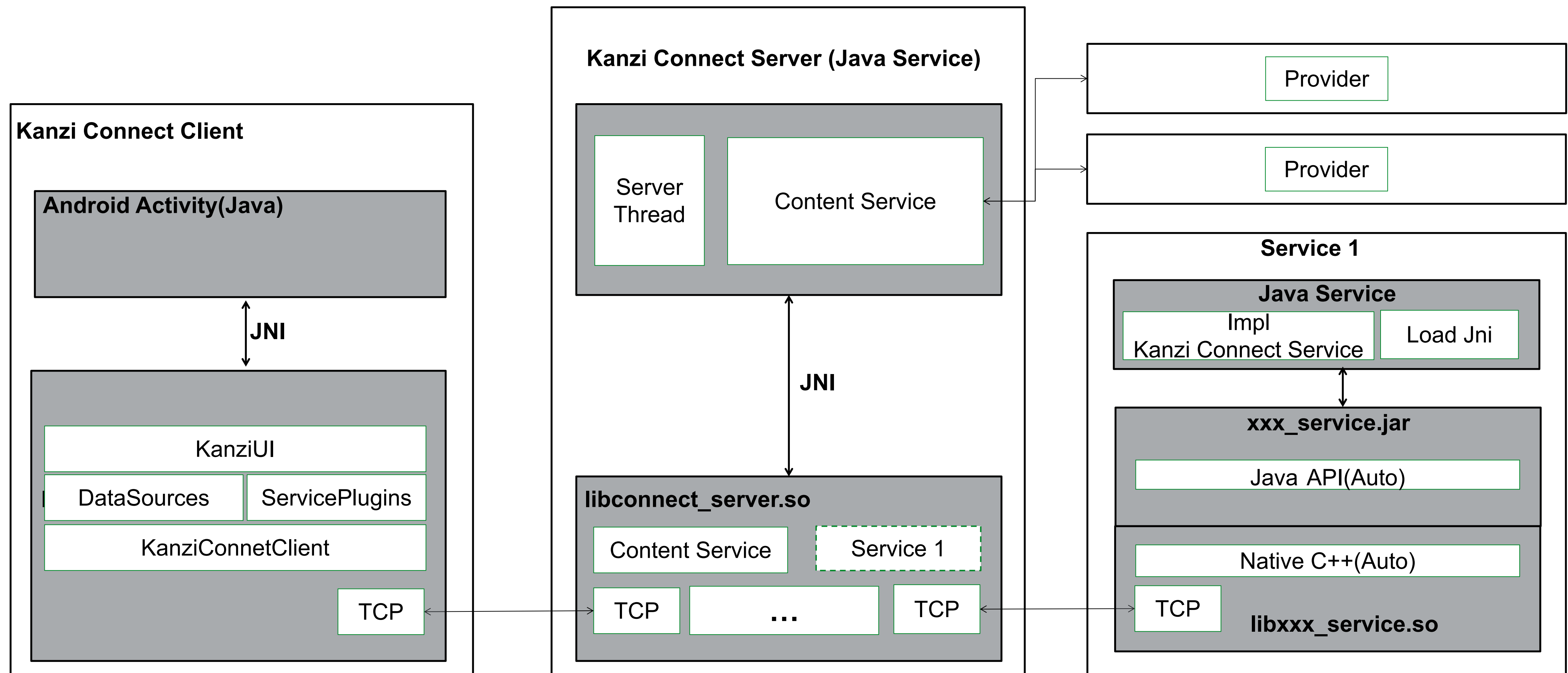
KANZI CONNECT ARCHITECTURE (OVERALL)

- **Kanzi Connect Server** - a system that hosts services and allows clients to access them
- **Kanzi Connect Client** – a device that connects to server and consumes digital services
- **Kanzi Connect Service** – a software component that provides integration to platform features or external components and can be used to serve almost any particular use-case

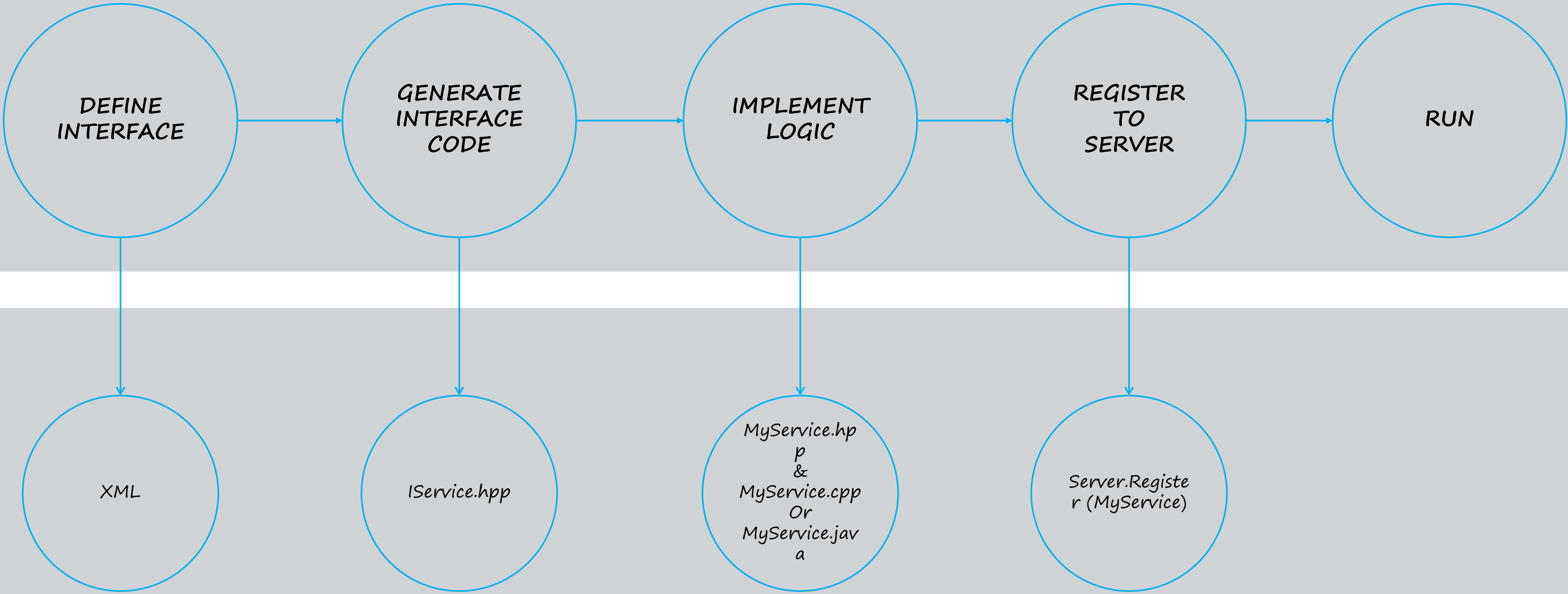


KANZI CONNECT ARCHITECTURE (ANDROID)

- ❖ Kanzi Connect is written in cross platform C++
- ❖ Kanzi Connect offers C++, Java and Rest API



SERVICE DEVELOPMENT WORKFLOW

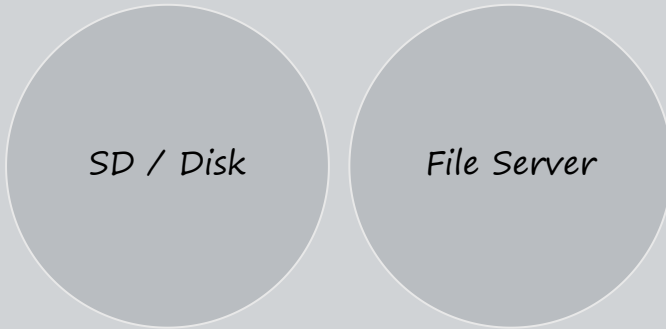
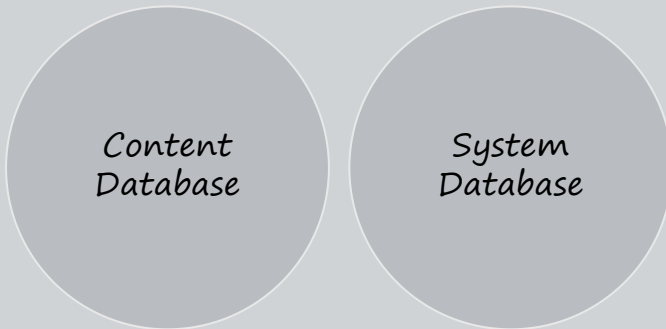
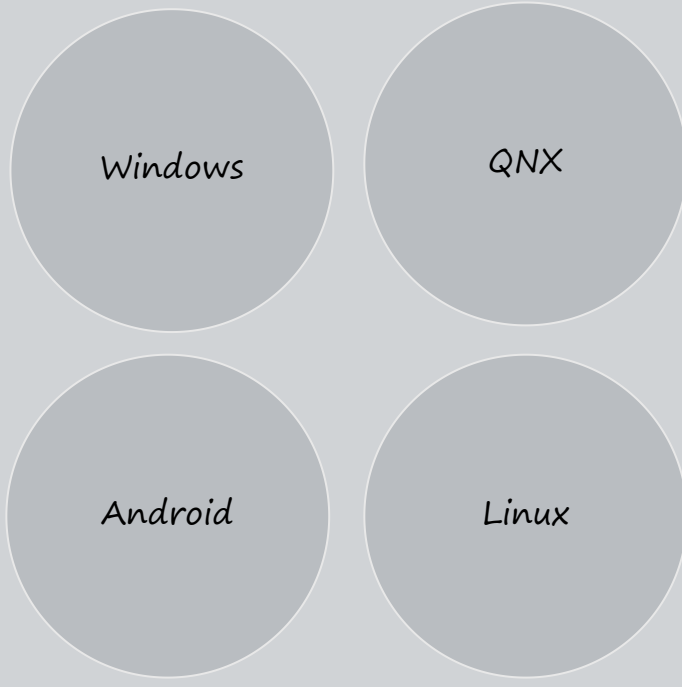
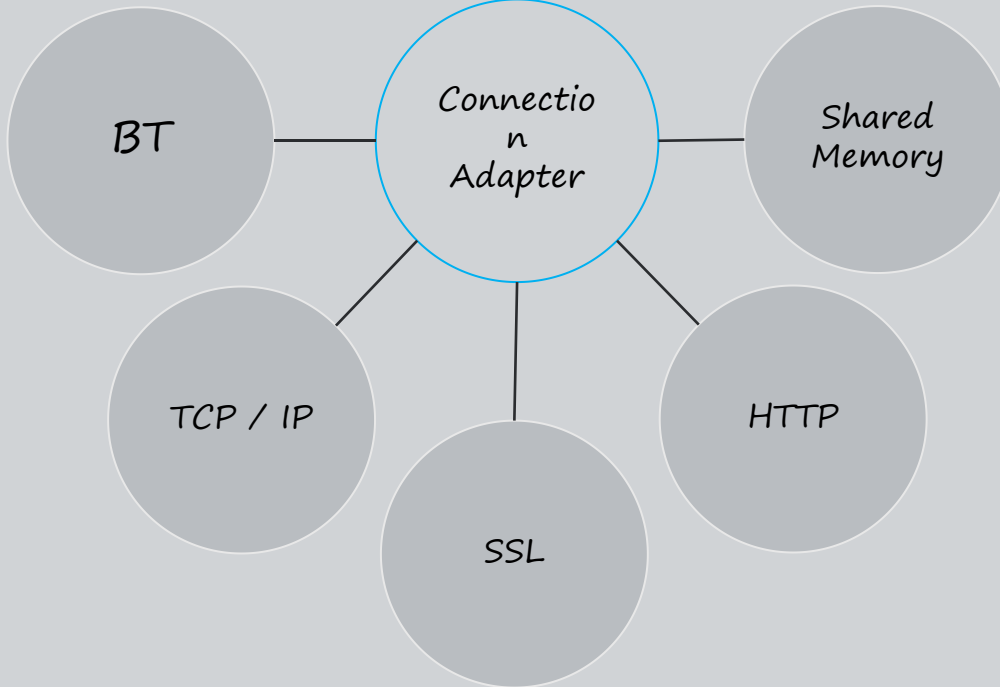
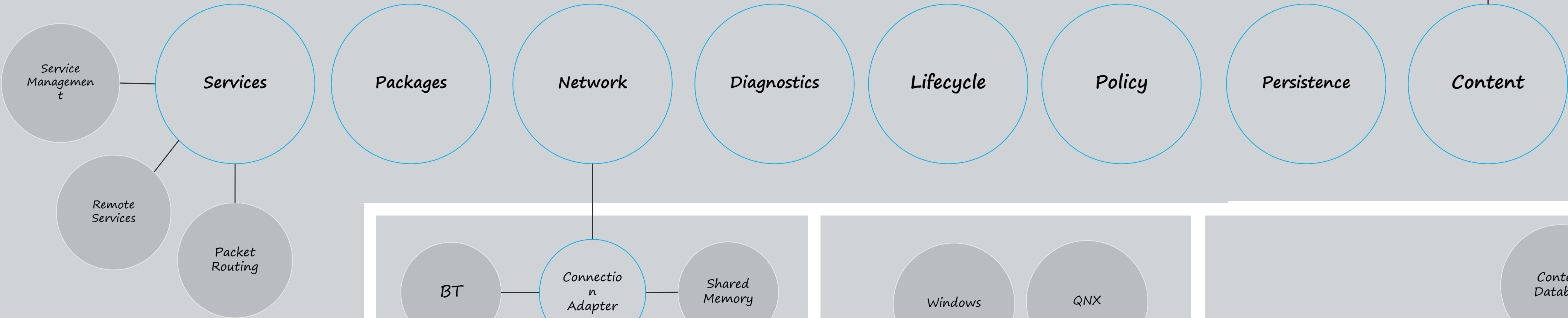
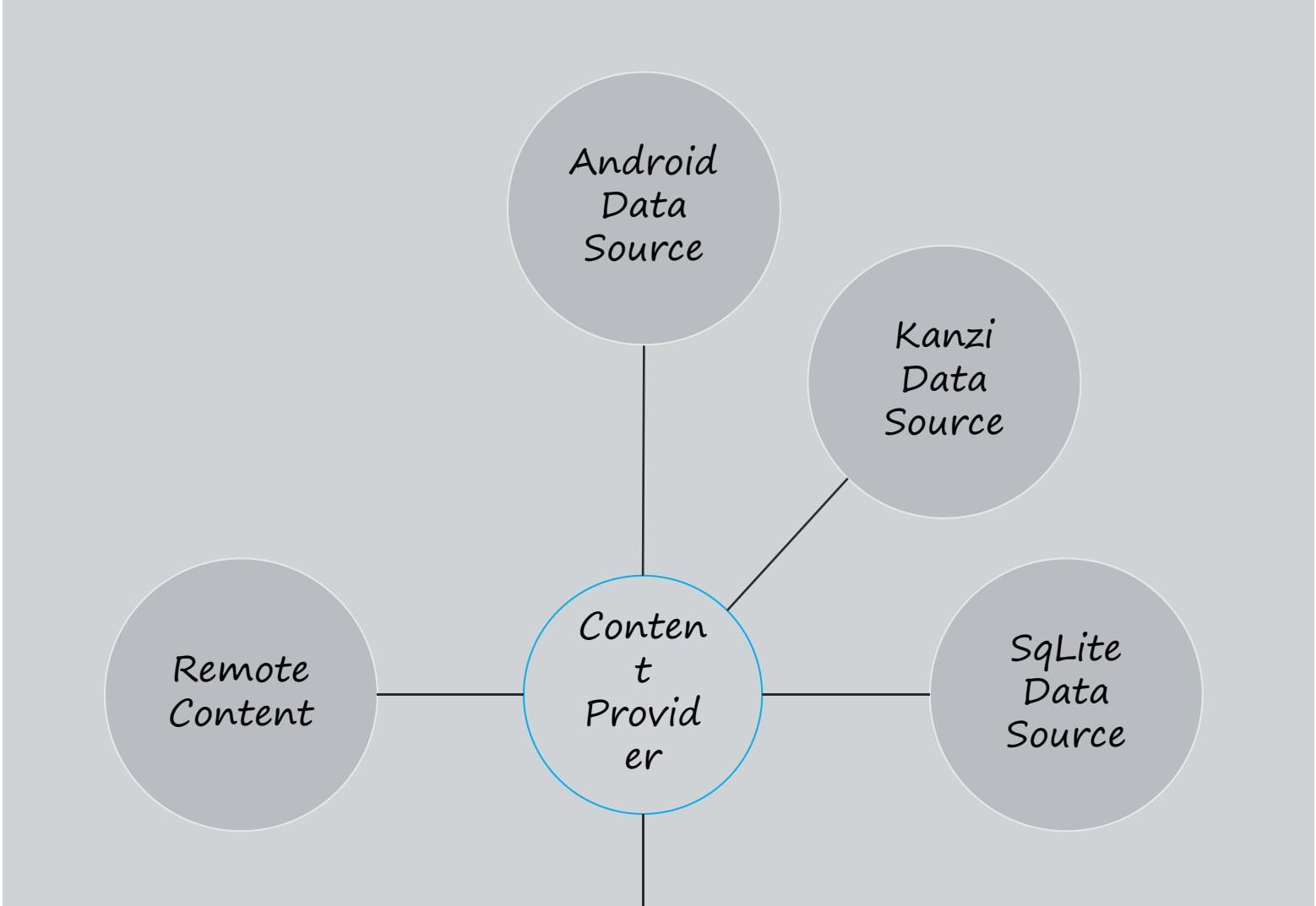
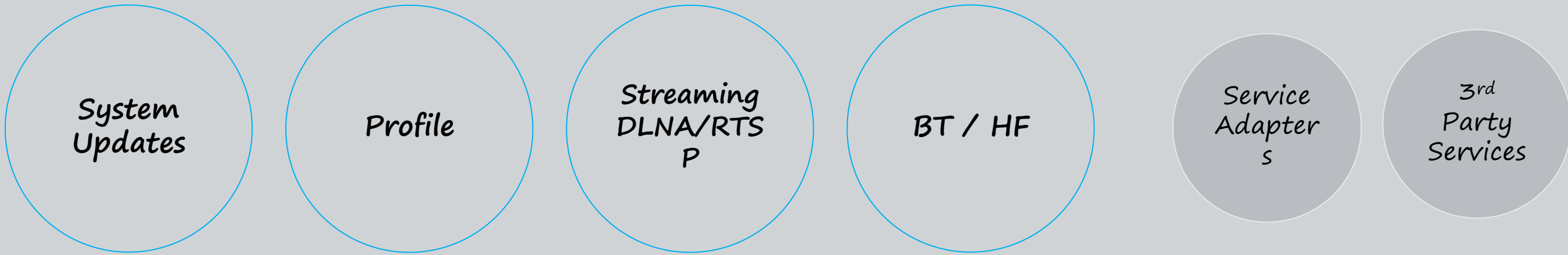


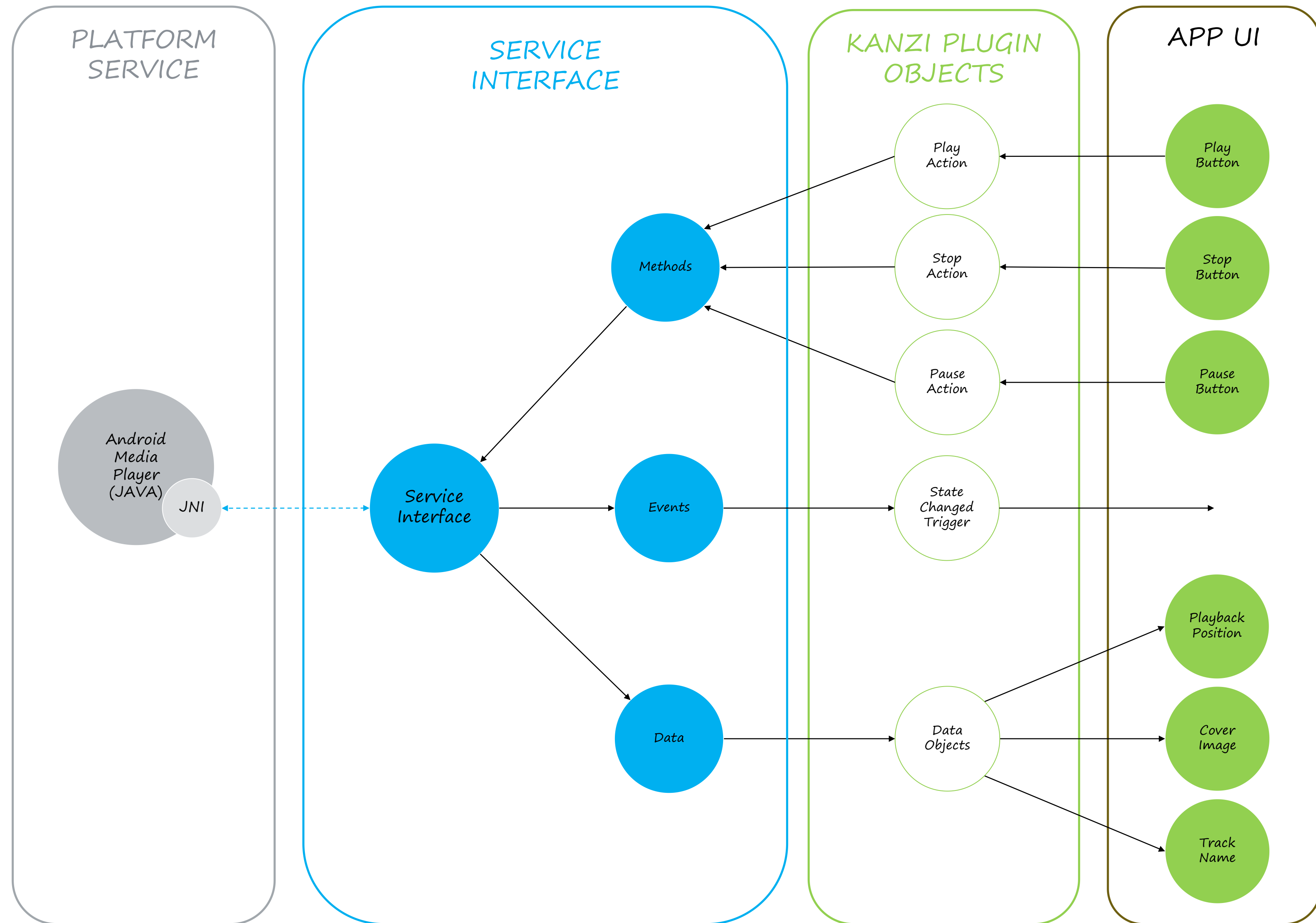


KANZI[®]

Version 1.0

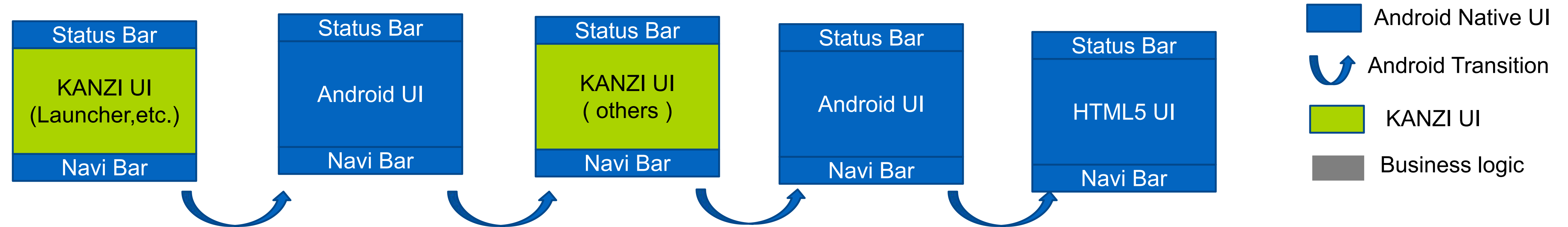
Availability in 2018/2019



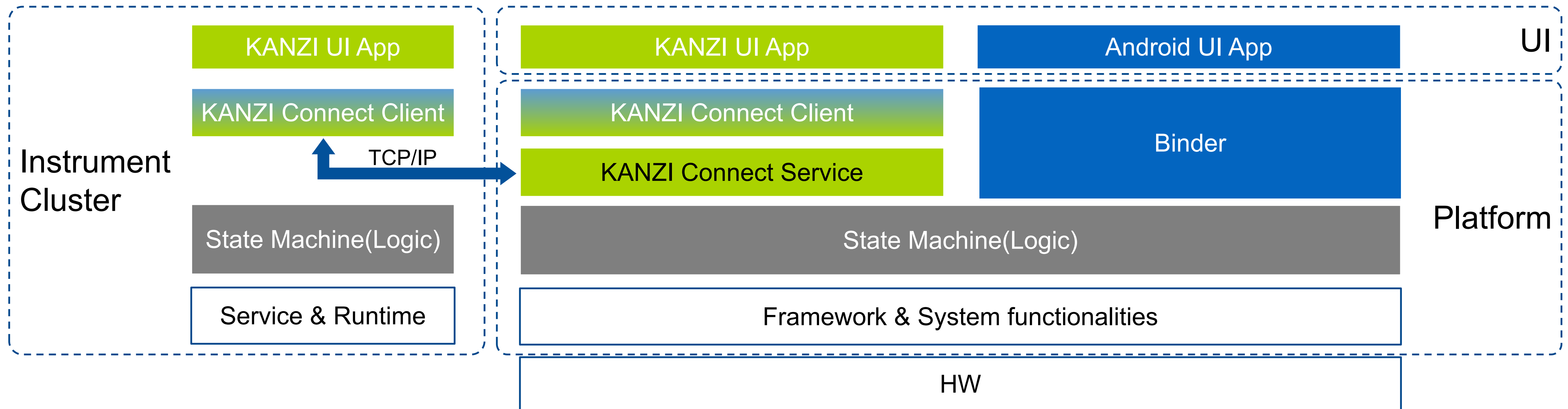


Android based KANZI IVI Solution – Short Term

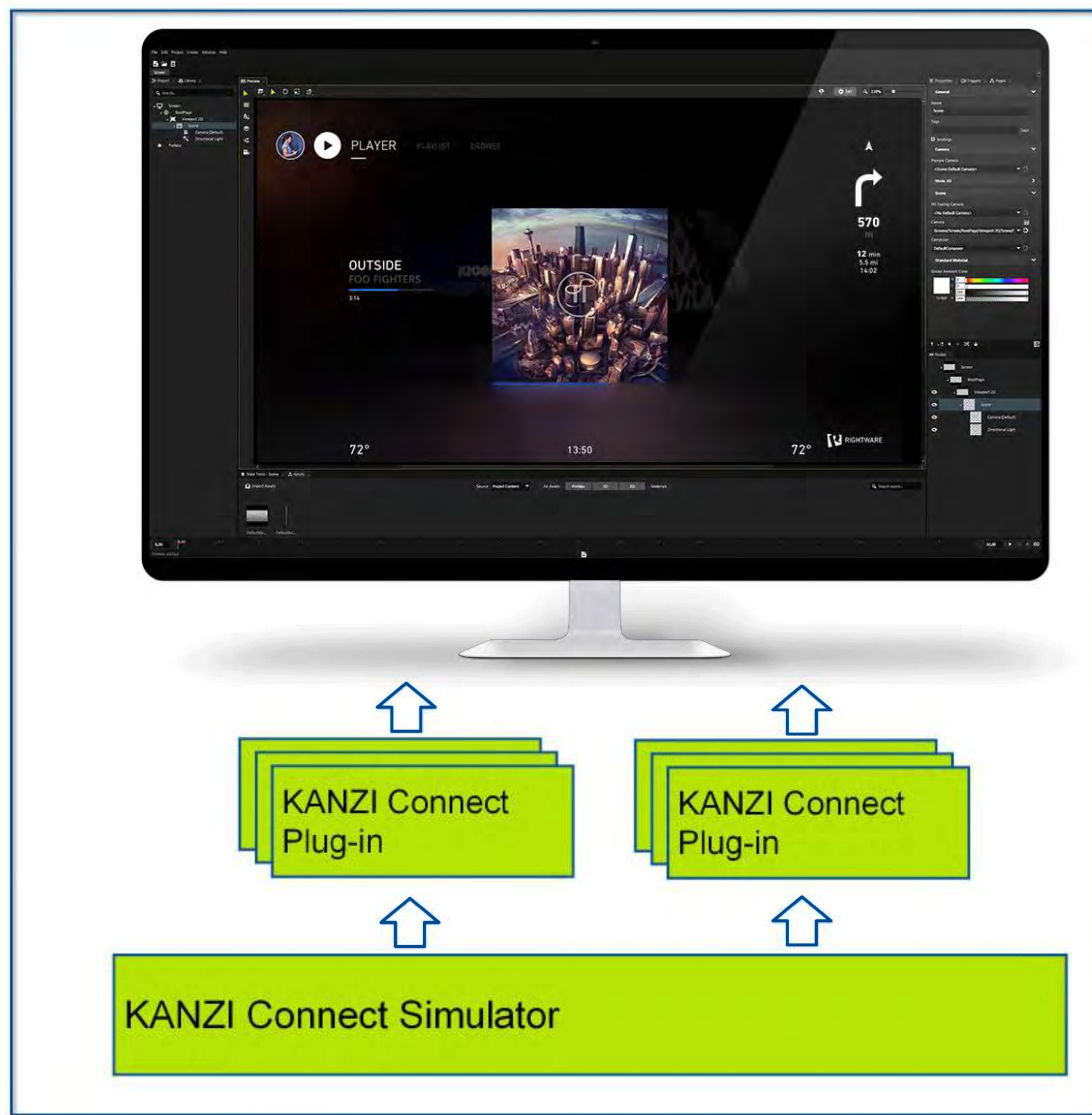
❖ IVI UI Style Overview – Hybrid Solution



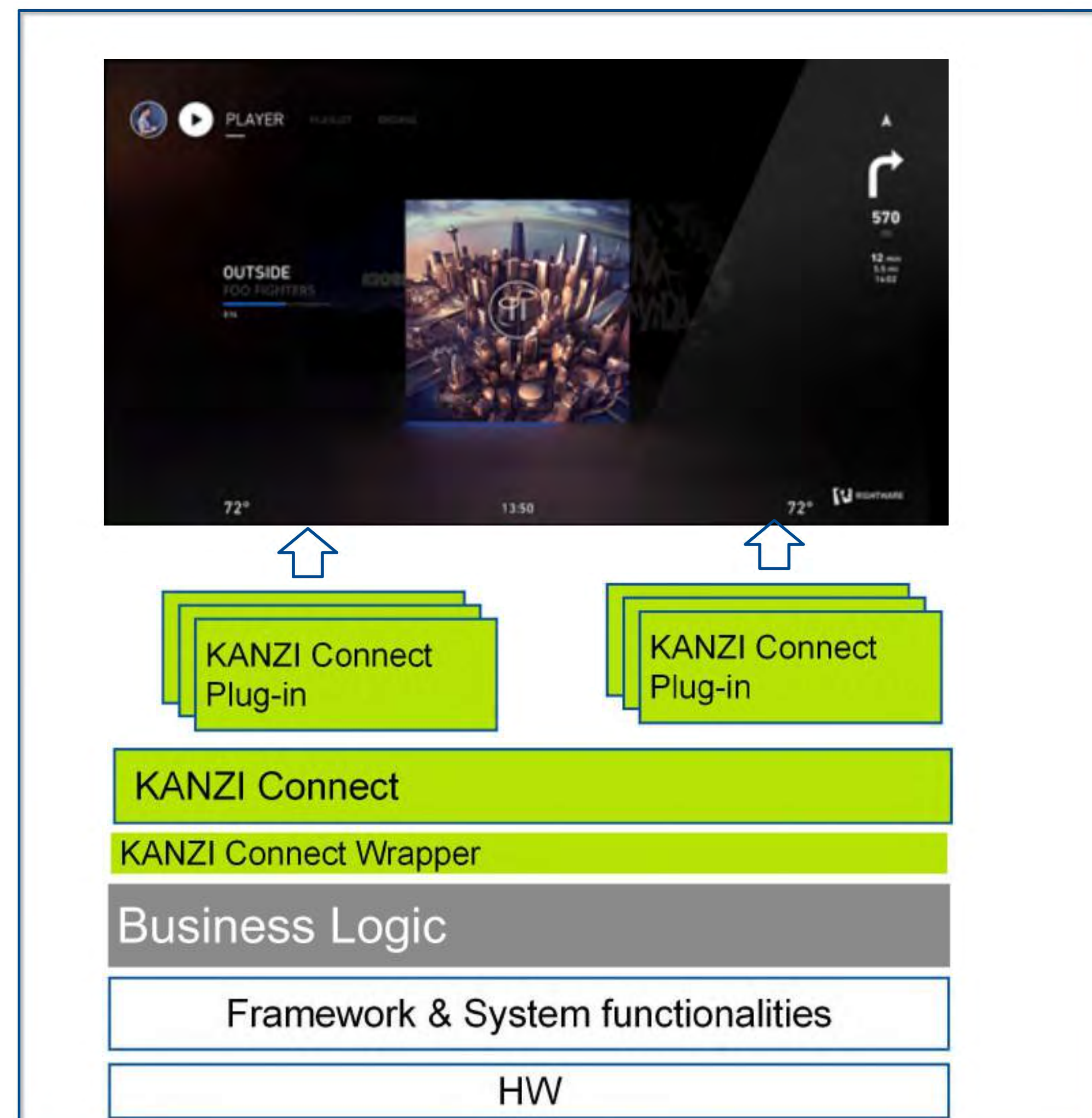
❖ Software Architecture Overview



KANZI IVI Solution



PC - Prototyping



Device – Deployment