ITU-T Kaleidoscope Conference Innovations in NGN

Structuring the Next Generation Network using Standard-based Service Delivery Platforms

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Presentation Outline

- Telco Evolution and Service Platforms

- Problem, Aim and Approach

- Next Generation Network

- Service Delivery Platform

- Generic Service Oriented Architecture

- Service Delivery Platform Framework

- Proof of Concept

- Conclusion

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Telco Evolution

- Legacy telco **infrastructure** provides voice and data **services** to customers.

- Infrastructure **evolves** to support and interwork with diverse transports:
  - Circuit, packet, fixed and mobile, Internet, IT.

- Infrastructure supports **multimedia** services:
  - Voice, video, data and includes IT and Internet type services.

- IT, Internet and telco networks **converging**.

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Telco Evolution

- Telco business and infrastructure changing.

- Infrastructure is **packet-based** supporting:

  – FMC, IT enterprise and Internet interworking.

- Business model includes **external** partners.

  – Build services, provide content, …

- Telco is evolving into a Next Generation Network (**NGN**).

  – Manage network **interoperability**.

  – Support **service** development, delivery and management.

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Service Platforms

- Satisfy requirements using **service enablers**.

  - Provide **abstractions** of network resources, capabilities and data.

- Types of service platforms:

  - Telco uses the Service Delivery Platform (**SDP**).

  - Enterprise service platforms are based on Service Oriented Architecture (**SOA**) based.

- SOA based on Internet technology **standards**.

- As yet there are no SDP standards.

  - Mostly **proprietary** solutions.

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Problem, Aim and Approach

- The SDP is the service platform for the NGN.

  - But is mostly **proprietary**.

- Requires **standardisation** to support Interoperability and portability of apps.

- We motivate a **standardisable** architecture named the SDP **framework**, that:

  - exposes standard-based service enabler **interfaces**.

  - is defined by generalising SOA concepts into the Generic Service Oriented Architecture (**GSOA**).

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Next Generation Network

- Packet-based **transport** operates across enterprise, Internet, fixed, mobile networks.

- Provides old and new **services** to customers across any network.
  - Voice to streaming content.

- Separates network functions and service.

- Services operate **independently** of network functions.

- Visualise properties in a **reference** model.

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NGN Reference Model

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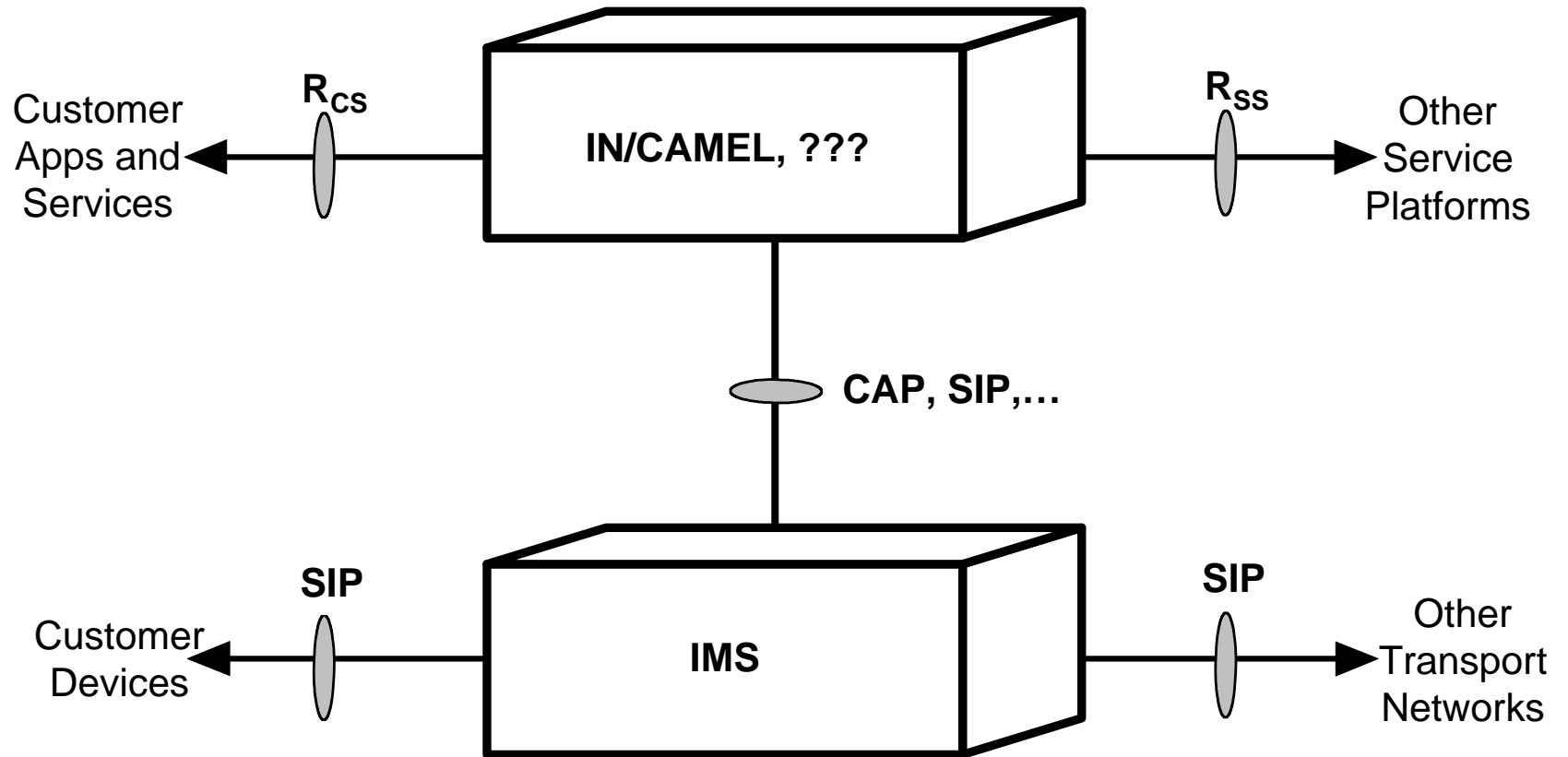
Service Delivery Platform

- Is an **IT-based** platform used by fixed/mobile telcos to provide services to customers.

- Manages service creation, provisioning, execution and **billing**.

- Enables service delivery is network and device **independent**.

- Provides developers with access to network capabilities and **content**.

- Satisfies NGN service stratum requirements.
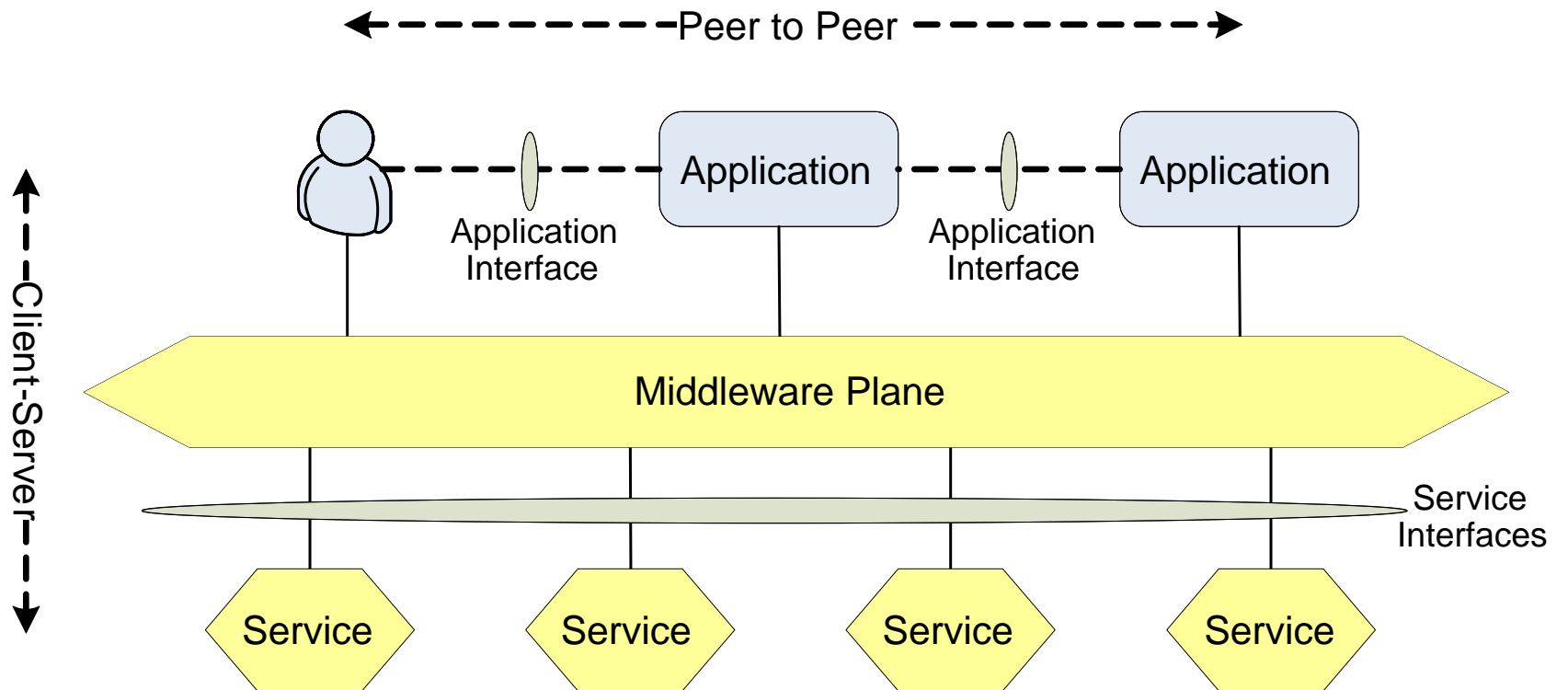
General SDP Architecture
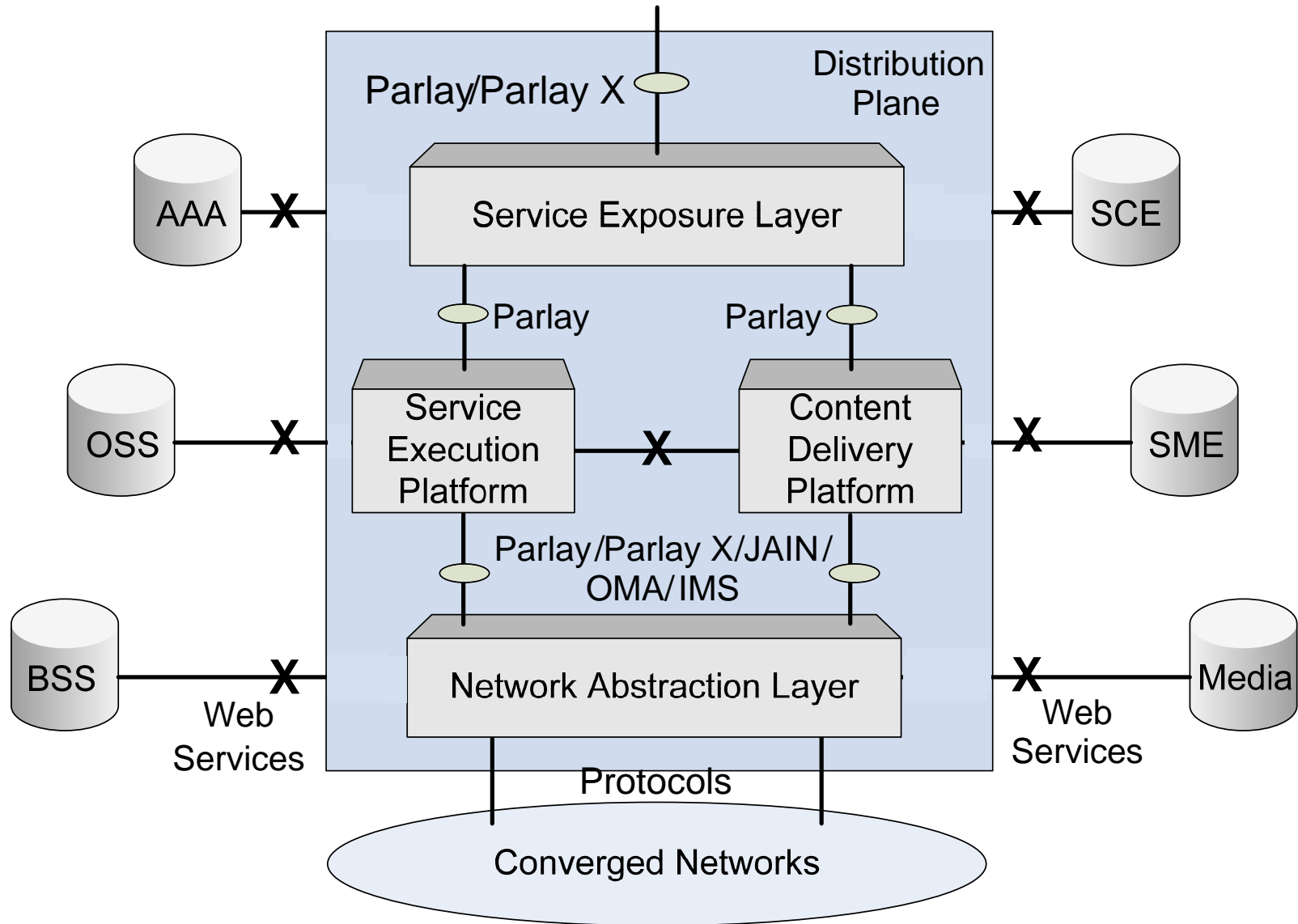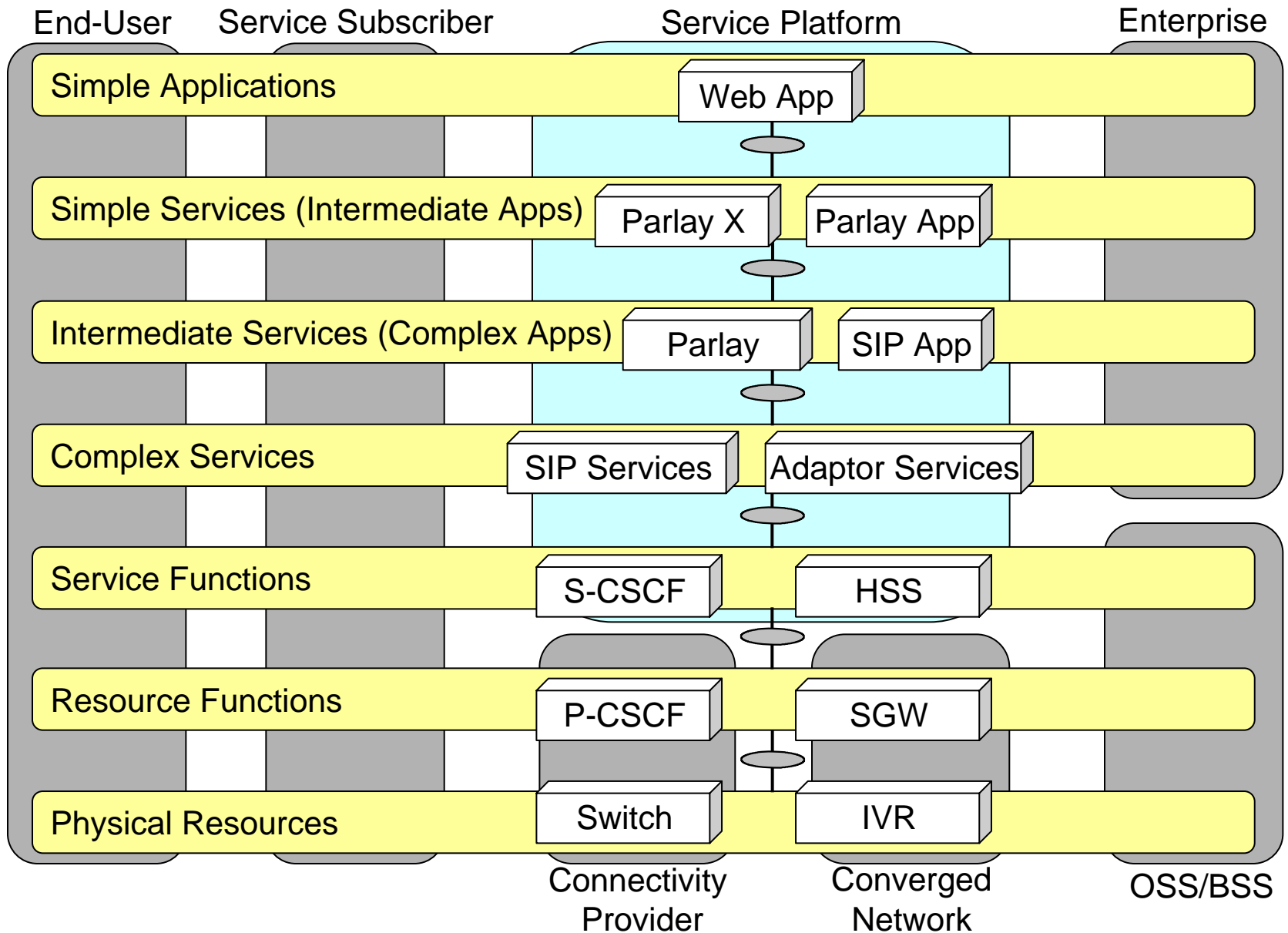
Generic Service Oriented Architecture

- Collection of technology, implementation and distribution independent **concepts**.

- Distributed system **architecture** containing:

  - services (service enablers) with **interfaces** abstracting infrastructure capabilities.

  - applications that **invoke** service interfaces.

  - a middleware plane to hide **distribution**.

- GSOA seen in WS SOA, Parlay X and Parlay.

  - Is a **design pattern** used to structure various service platform architectures.

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GSOA Representation

SDP Framework

End-User	Service Subscriber	Service Platform		Enterprise
Simple Applications		Web App		
Simple Services (Intermediate Apps)		Parlay X	Parlay App	
Intermediate Services (Complex Apps)		Parlay	SIP App	
Complex Services		SIP Services	Adaptor Services	
Service Functions		S-CSCF	HSS	
Resource Functions		P-CSCF	SGW	
Physical Resources		Switch	IVR	

Connectivity Provider Converged Network OSS/BSS

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Applying the GSOA to the Framework

Client App · Server App · 3rd Party App

R_{SS}

R_{CS}

Simple Service Middleware

Service · Service · Service · Service · Service · Service

R_{ST}

Service Function · Service Function · Service Function · Service Function · Service Function · Service Function · Service Function

Resource Function Middleware

R_{CT}

R_{TT}

Resource · Resource · Resource · Resource · Resource · Resource · Resource

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Proof of Concept

- SDP must support an Internet Protocol Television (**IPTV**) service.

- IPTV Requirements:
  - Deliver content to customers.
  - Enable voice communication.
  - Presence enabled messaging.

- Extend the SDP framework to define an **architecture** that delivers services
 - Voice, Messaging, Presence and IPTV.

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Mapping Technologies

- Parlay X web services for simple service layer.

- Parlay SCFs and **SCS** for intermediate and complex service layer respectively.

- IMS for service and resource function layers.

- Remaining layers reuse telco infrastructure.

- Alternative mappings:

  - Collapse **layers** for e.g. Parlay X web services invoke IMS directly.

  - Remove **domains** for e.g. join end-user and service subscriber domains.

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Implemented SDP Architecture
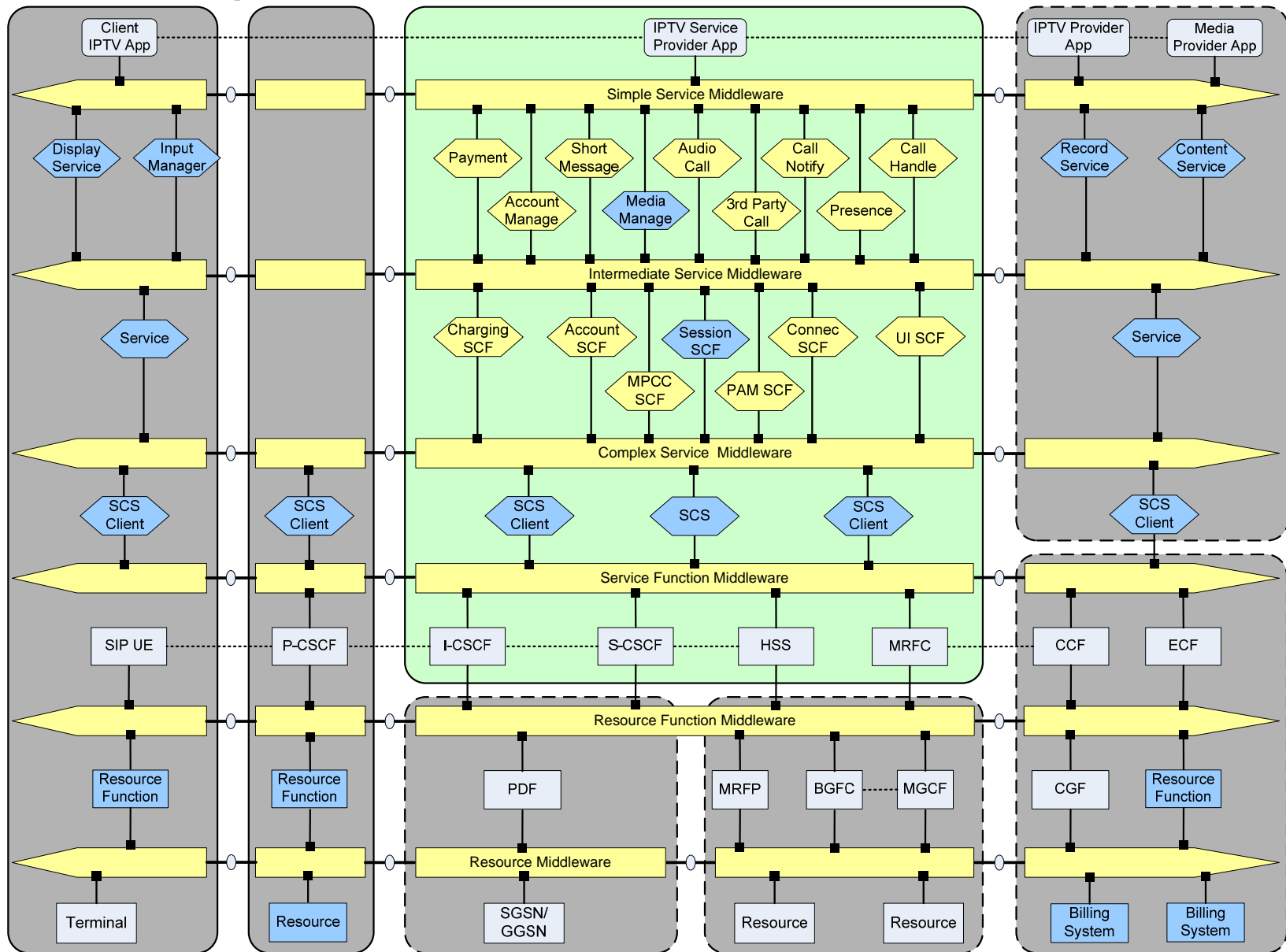
Results

- Parlay X APIs exposed to 3rd parties, but some new APIs **needed**.

- ESB middleware not fully **standardised**.

- Parlay APIs with **modifications** abstracted lower network functionality.

- Provided some Parlay SCS to SIP **mappings**.

- Network simulator simulated rich **service enablers**.

- Evaluated service **interfaces** for the SDP.

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Conclusion

- SDP framework promotes a **standards-based** service platform architecture for NGN.

- Used multiple GSOAs to consistently implement NGN **reference points**.

- Framework is **extendable**.

- Proof of concept **evaluated** technologies service interfaces for the SDP.

- Framework provides a **foundation** of concepts and abstractions that contribute to SDP **standardisation**.

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Appendix: Interfaces

- Data Session Web Service**(New)**:
  - SessionManager:startSessionRequest, pauseSessionRequest, resumeSessionRequest, stopSessionRequest.

- Data Session Controller SCF**(Modified)**:
  - IpDataSessionControlManager:createSession, pauseSession, resumeSession, endSession

- Mapping to SIP**(New)**:
  - connecReq – INVITE
  - Pause, resume and end session requests are mapped to new SIP messages.

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