

# **Server Architecture for Network Independent Multimedia Service Control**

Wolfgang Kellerer

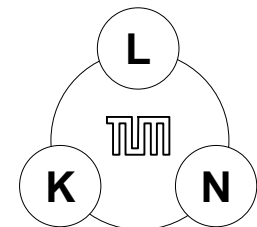
25.01.2001

ITG Workshop „IP in Telekommunikationsnetzen“, 25.-26.01.2001, Bremen

**Technische Universität München (TUM)**

Lehrstuhl für Kommunikationsnetze

Prof. Dr.-Ing J. Eberspächer



# Motivation: Heterogeneity and Convergence

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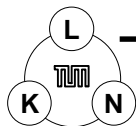
- **users:** availability of personalized services independent of access technology
- **service providers:** flexible and fast provisioning of new services to fulfil rising customer demands

Situation:

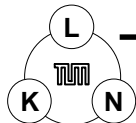
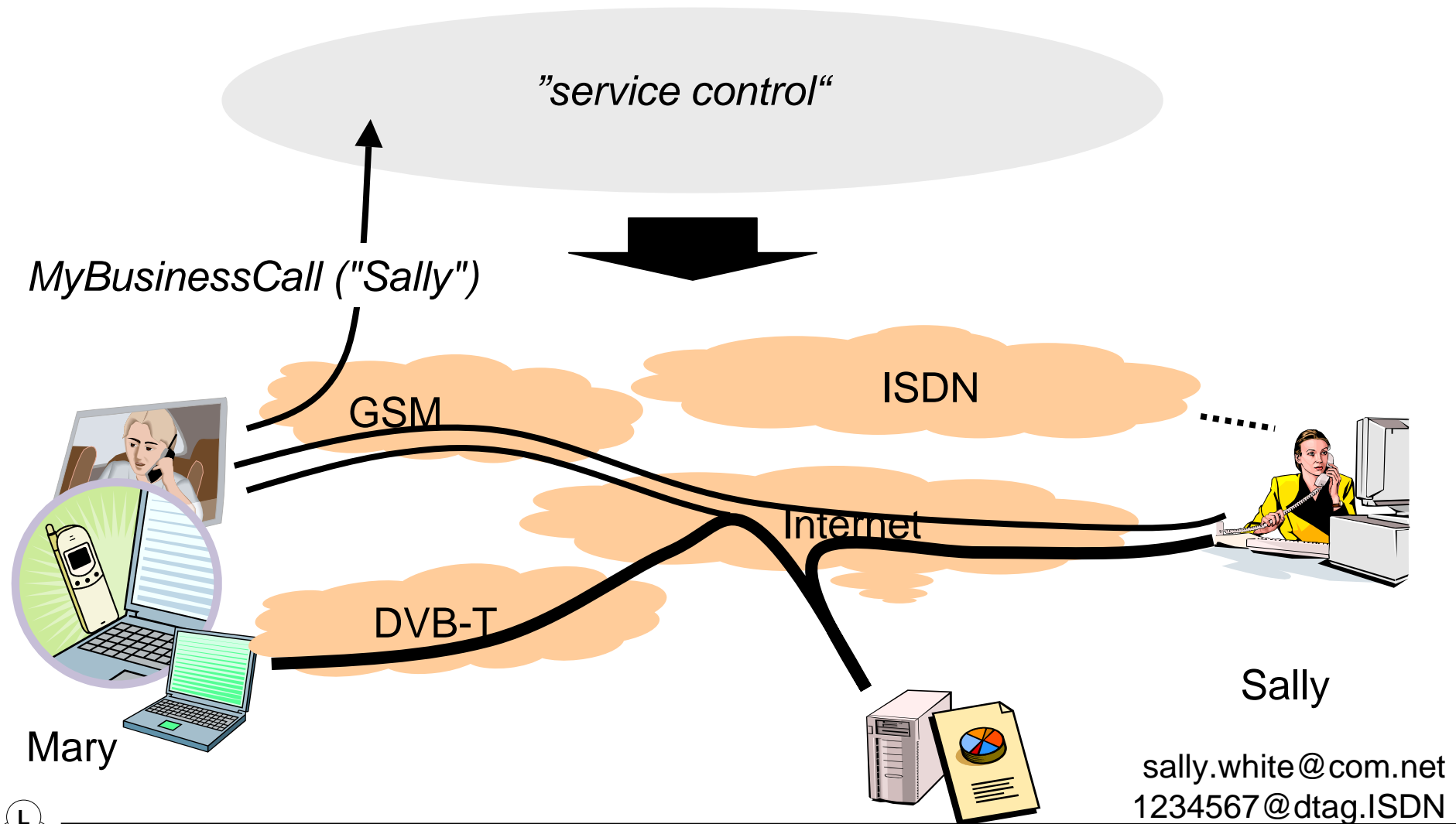
- **communication infrastructure:** increasing heterogeneity of communication systems and terminals

➔ **Convergence of systems on service level**  
**Uncoupling services from access technology**

*The success of new service architectures will substantially depend on how they cope with existing technology.*



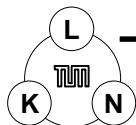
# Scenario



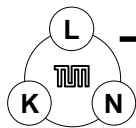
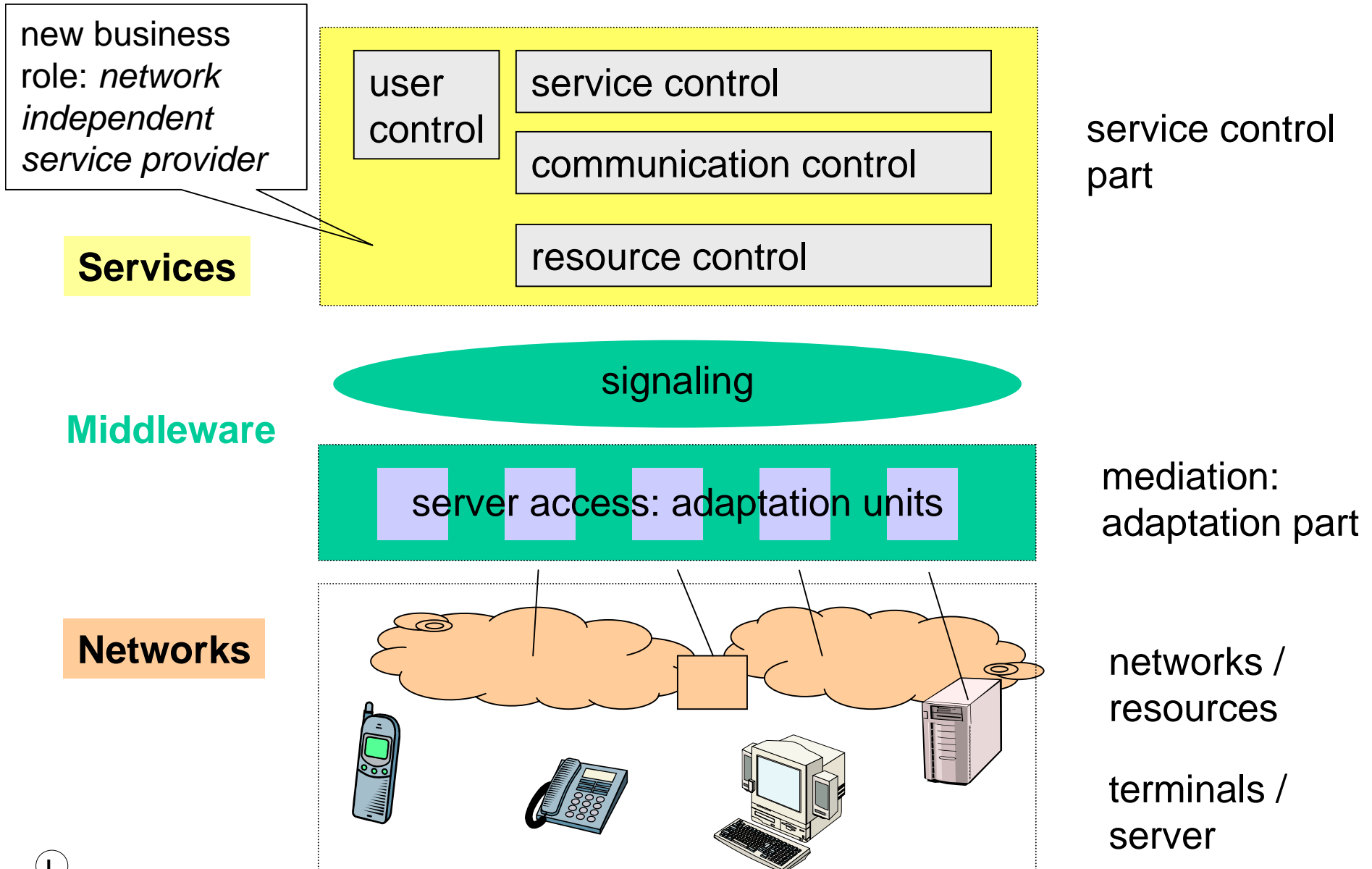
# Problems

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- Network independence:  
Integration of different network technologies
- User centric:  
Management of user access and user profiles
- Call control:  
dealing with multimedia services
- Decomposition:  
choosing the right interfaces and signaling mechanisms



# Server Architecture: Reference Model

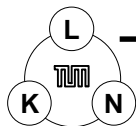


# Server Architecture: Main Characteristics

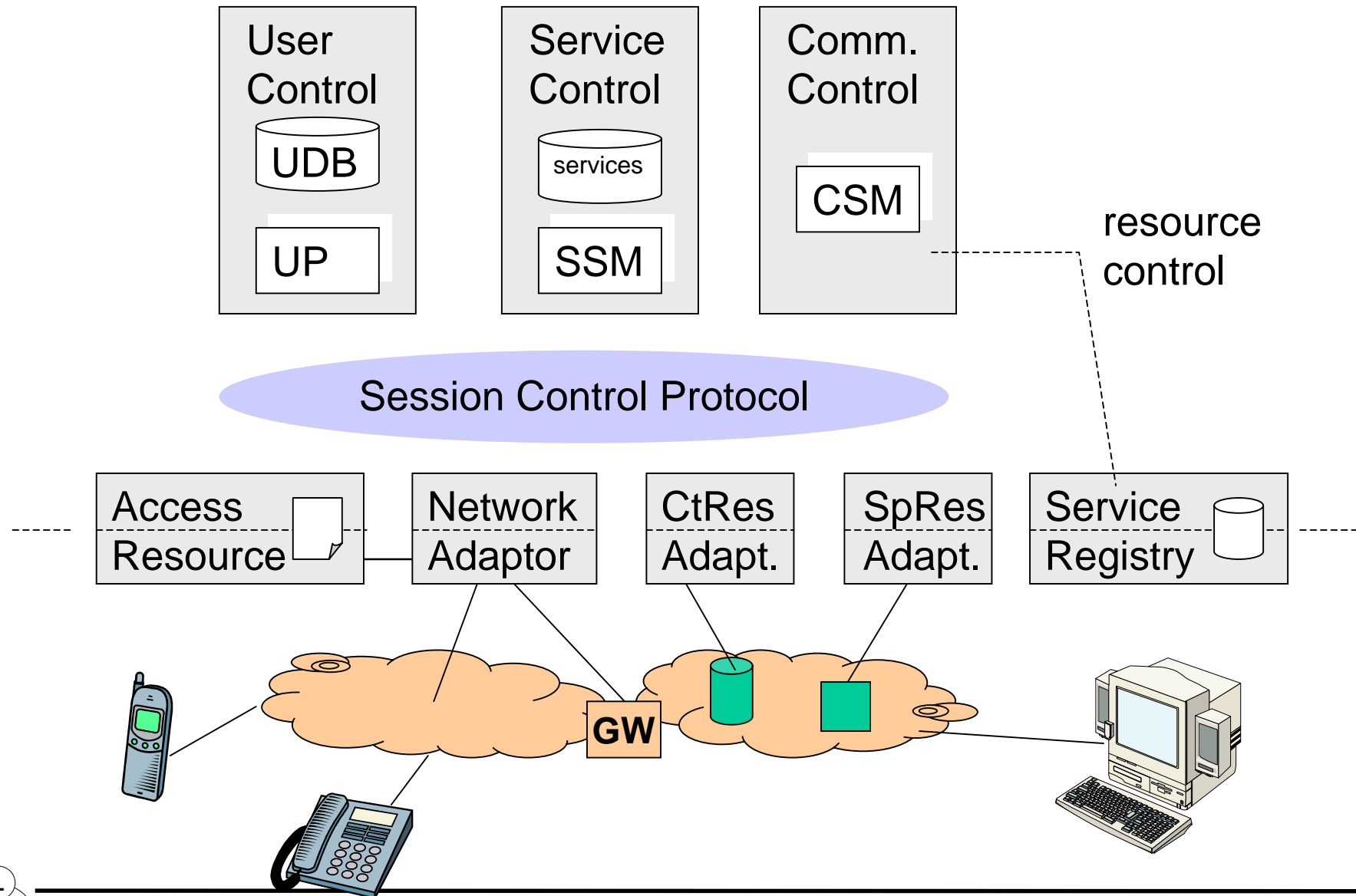
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Novel approach for network independent service provisioning and control

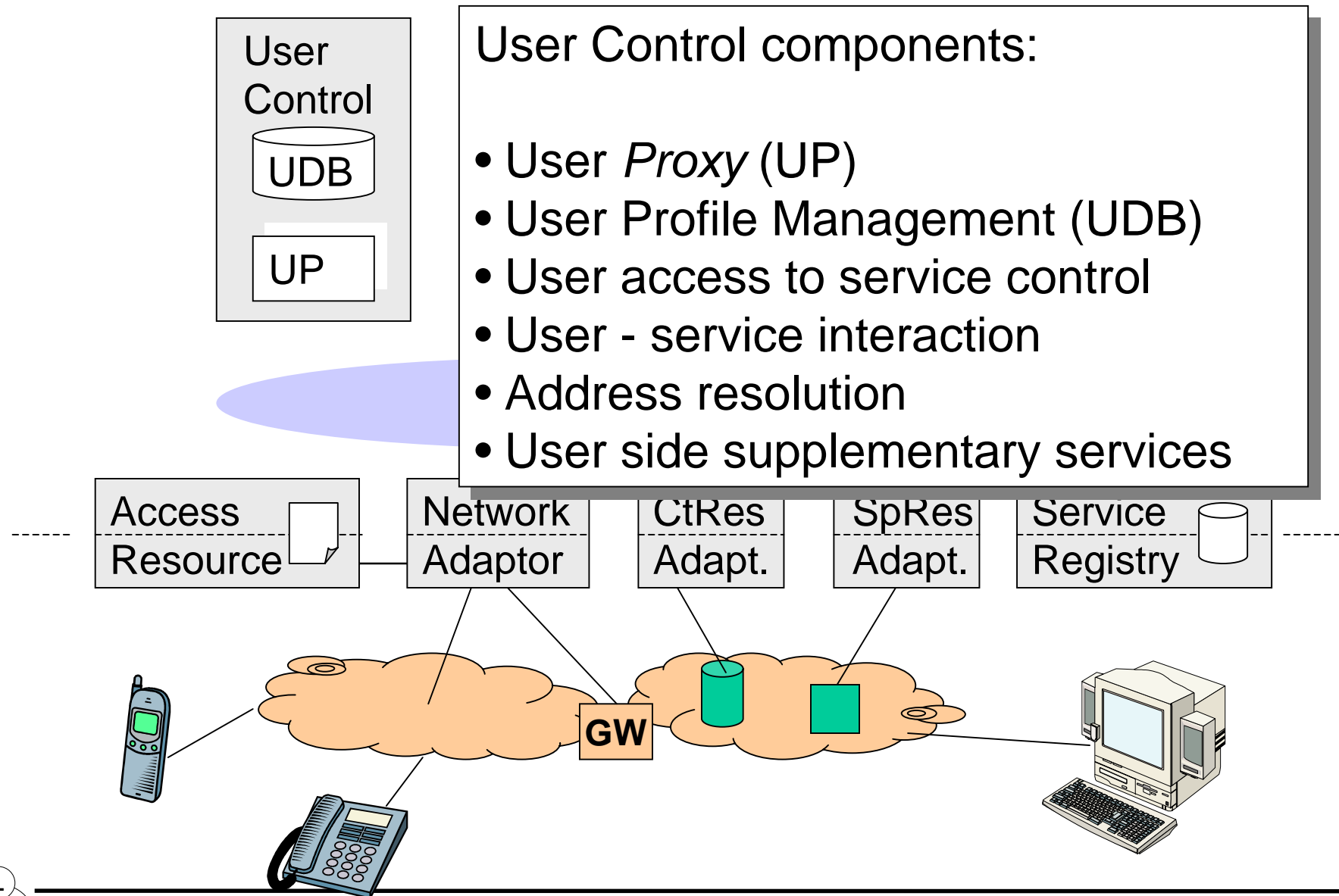
- Network Adaptors allow adaptive selection / combination of different communication systems (signaling gateways)
- User Control part addresses personalized services
- User initiated QoS model
- Service control signaling using the IETF Session Initiation Protocol (SIP)
- Object-oriented service session description
- Access to the server / user interaction is based on XML / LDAP
- Use of service discovery mechanisms to deal with changing infrastructure
  
- Focus: Single service provider domain



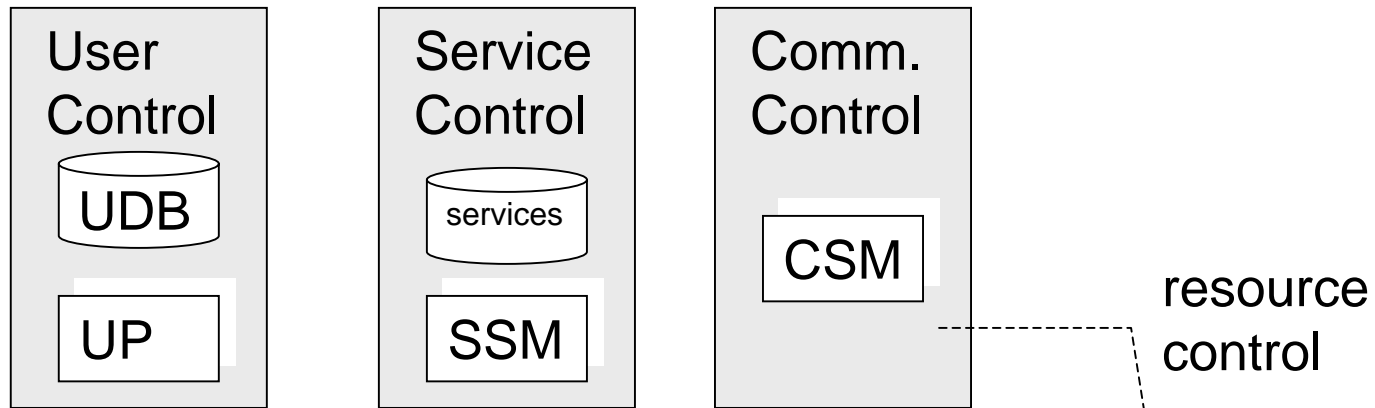
# Server Architecture: Main Components



# User Control Components



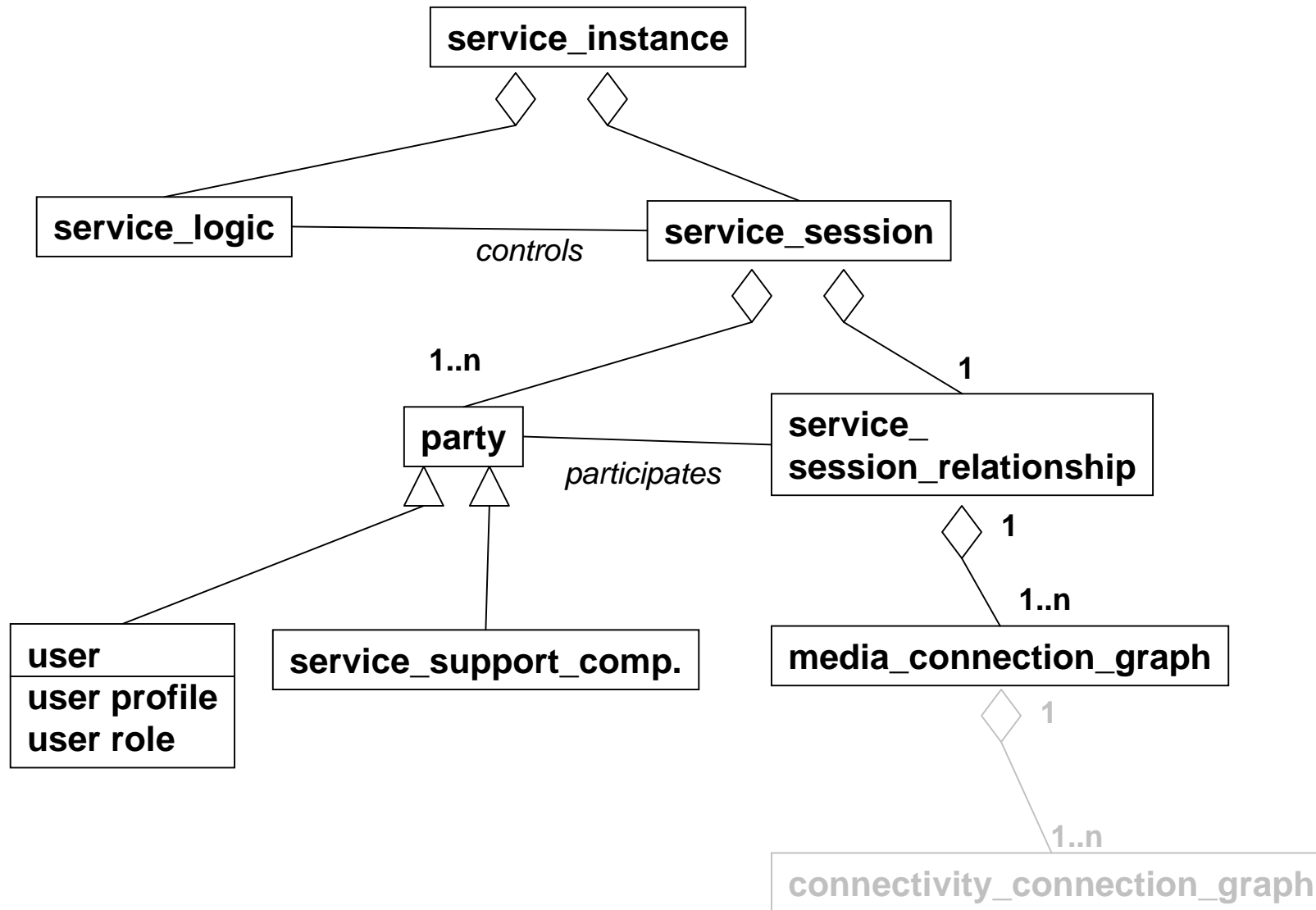
# Service Control Components



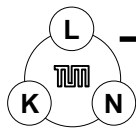
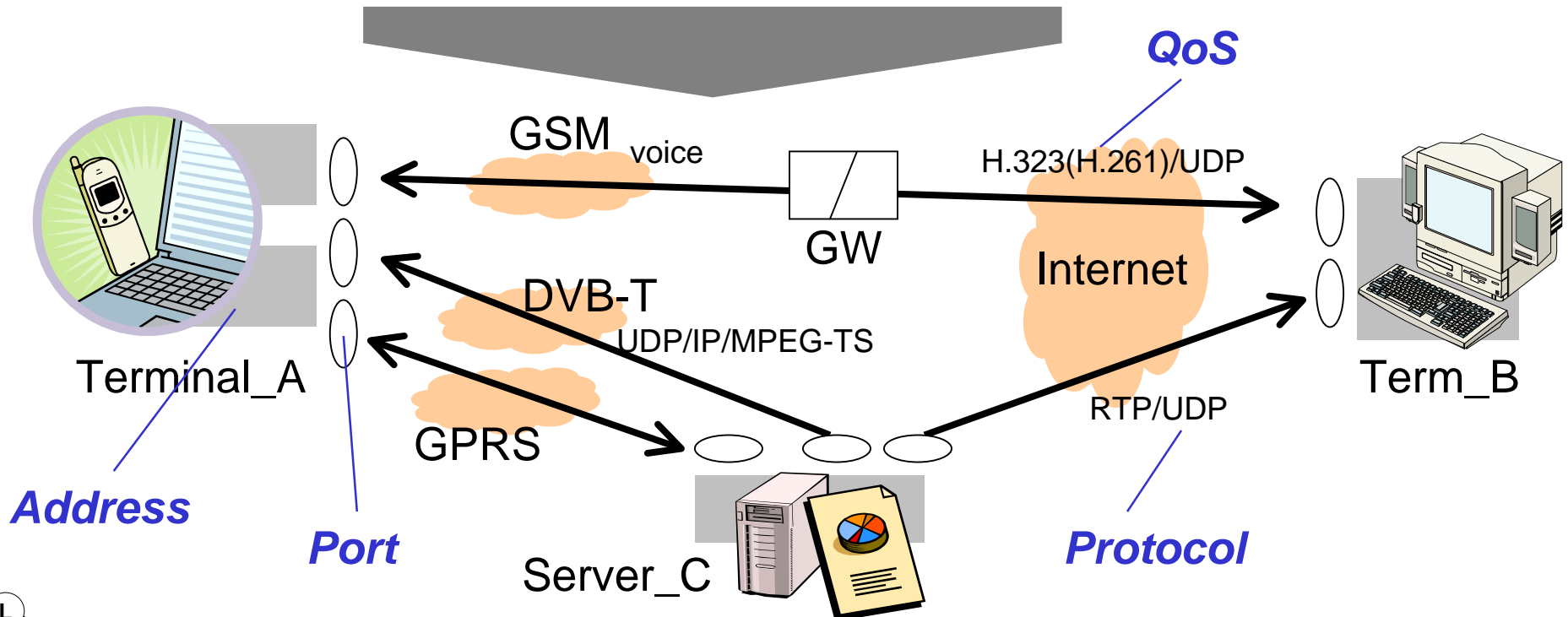
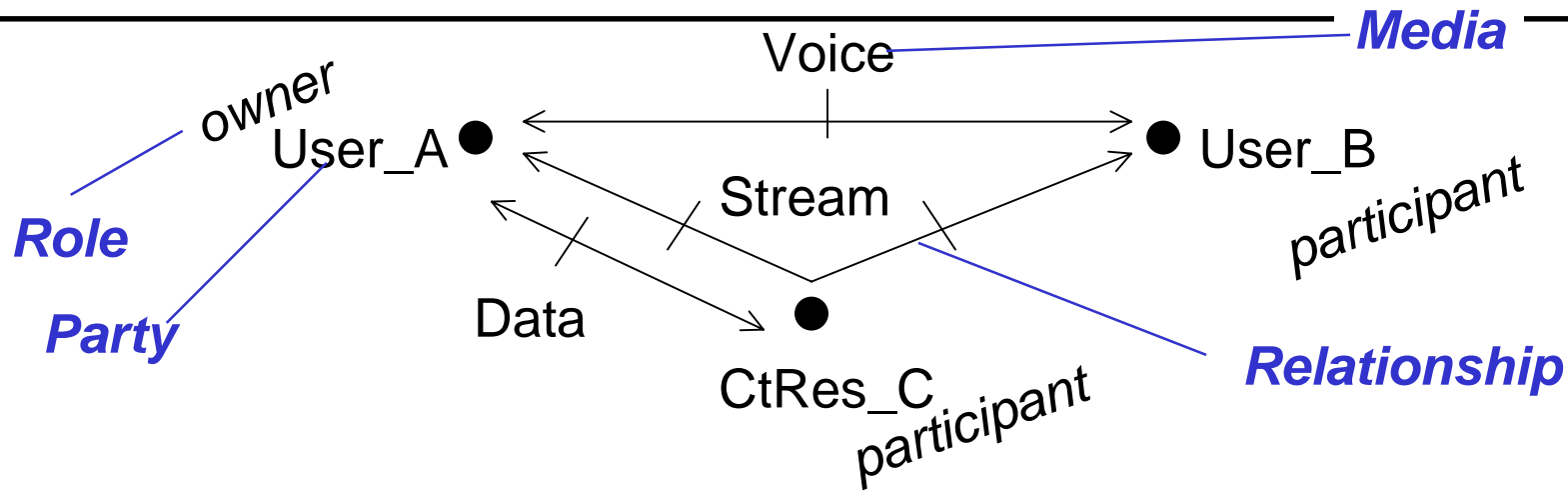
## Service Control components:

- Service Session Managers (SSM):  
Service instantiation and service control
- Independent of user and network specific data
- Service definition:
  - Object-oriented session model
  - XML based service logic

# Object Oriented Service Session Model



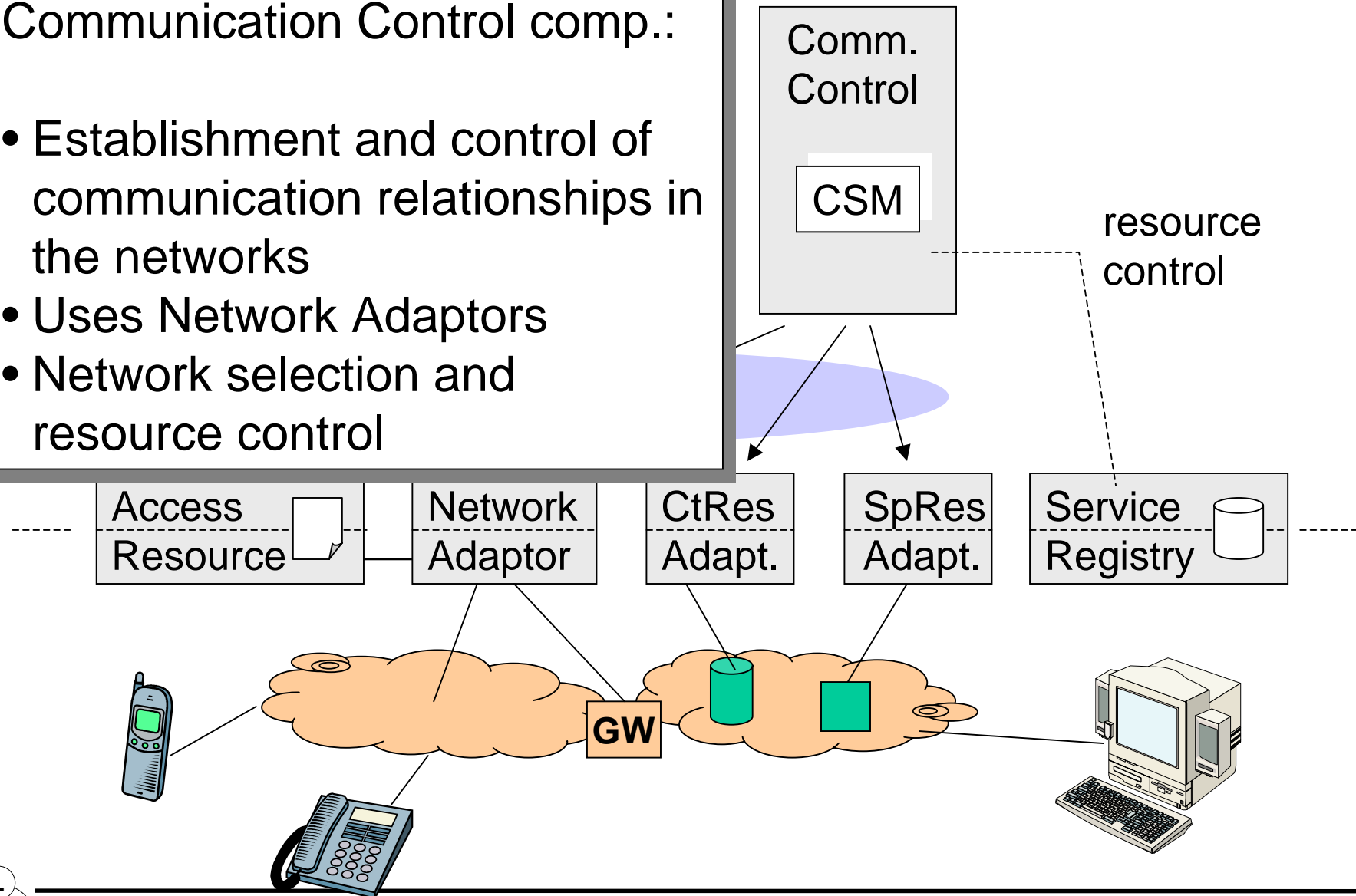
# Service Session -> Communication Session



# Communication Control Components

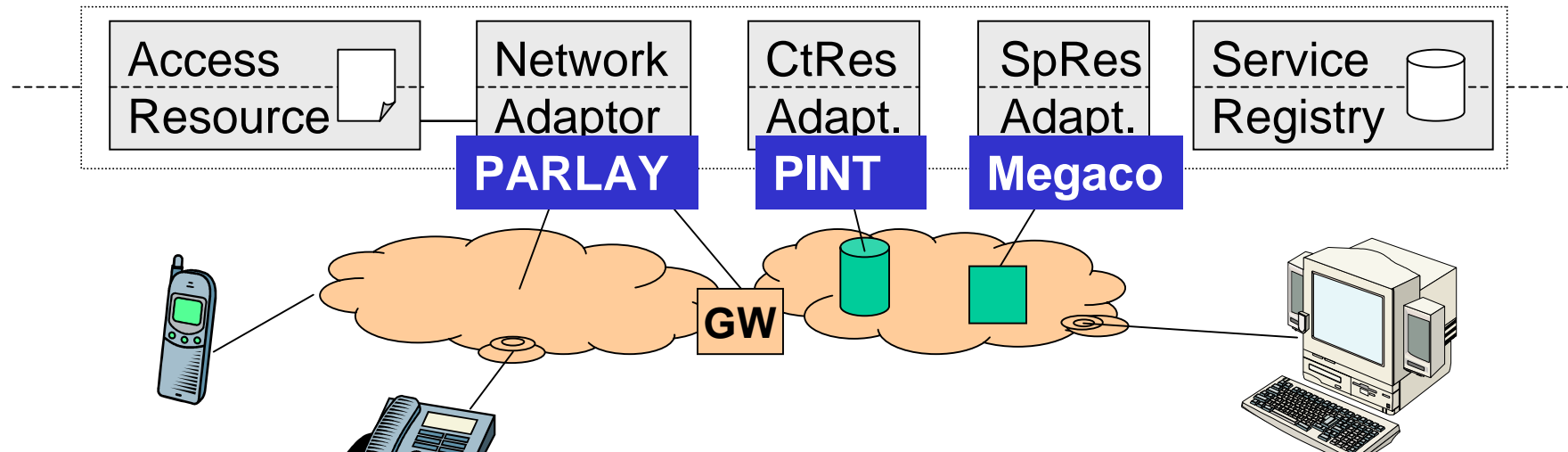
Communication Control comp.:

- Establishment and control of communication relationships in the networks
- Uses Network Adaptors
- Network selection and resource control



# Adaptation Part: Adaptor Units

## Session Control Protocol



- **NA** Network Adaptors: 1st party: UNI / 3rd party: PARLAY / Gateways
- **CtResA** Content Resource Adaptors / **SpResA** Special Resource Adaptors
- **AR** Access Resource: XML / LDAP based presentation adaptation
- **SR** Service Registry: JINI based service discovery

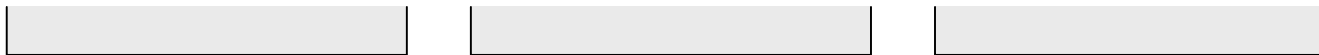
‘Gateways’ for the mapping of service architecture messages (SesCP) onto communication system signaling

# Signaling Platform: Session Control Protocol (SesCP)

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SesCP supports

- Setup, negotiation and handling of complex multimedia sessions
- Flexibility to allow new services
- Separation of functionality; User initiated QoS model

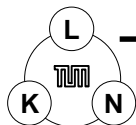


**SesCP:**  
**a generic transaction protocol**  
**that supports the transport and negotiation**  
**of generic session descriptions**

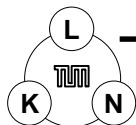
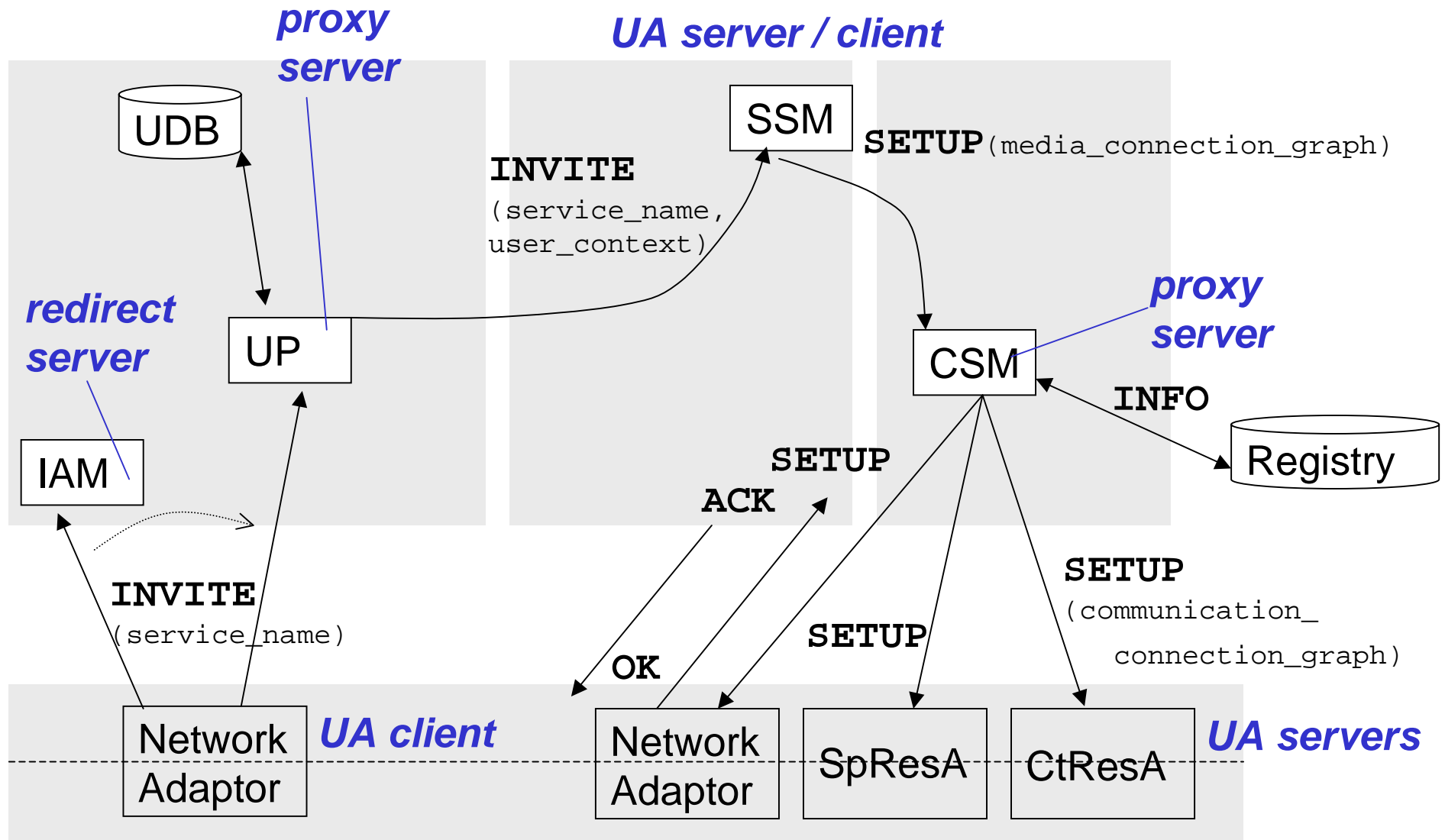


SesCP is based on the IETF Session Initiation Protocol (SIP)

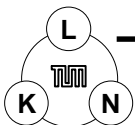
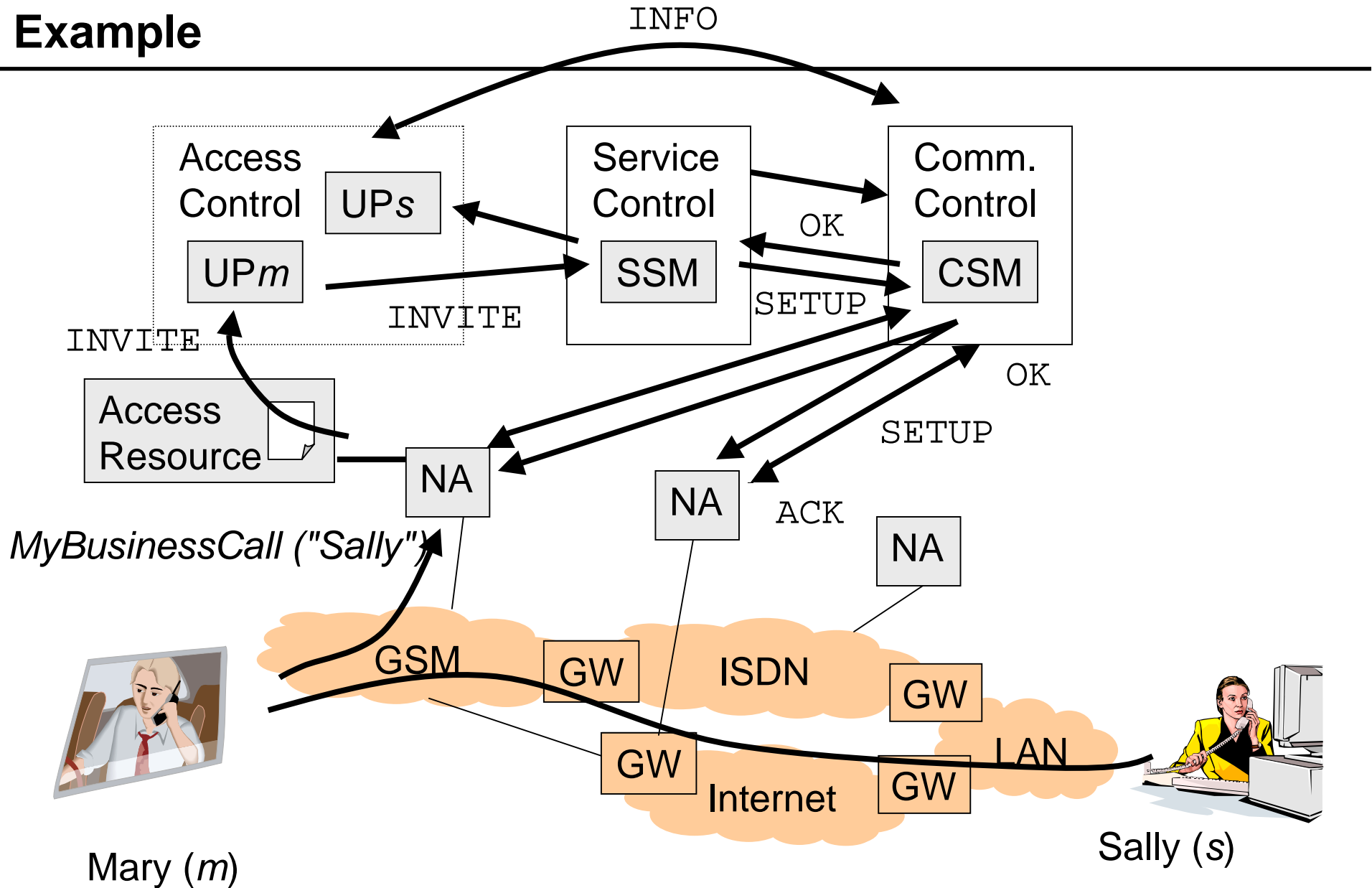
- SIP messages = session description containers  $\leftrightarrow$  fixed set of IF
- Proxy mechanism supports layered session model



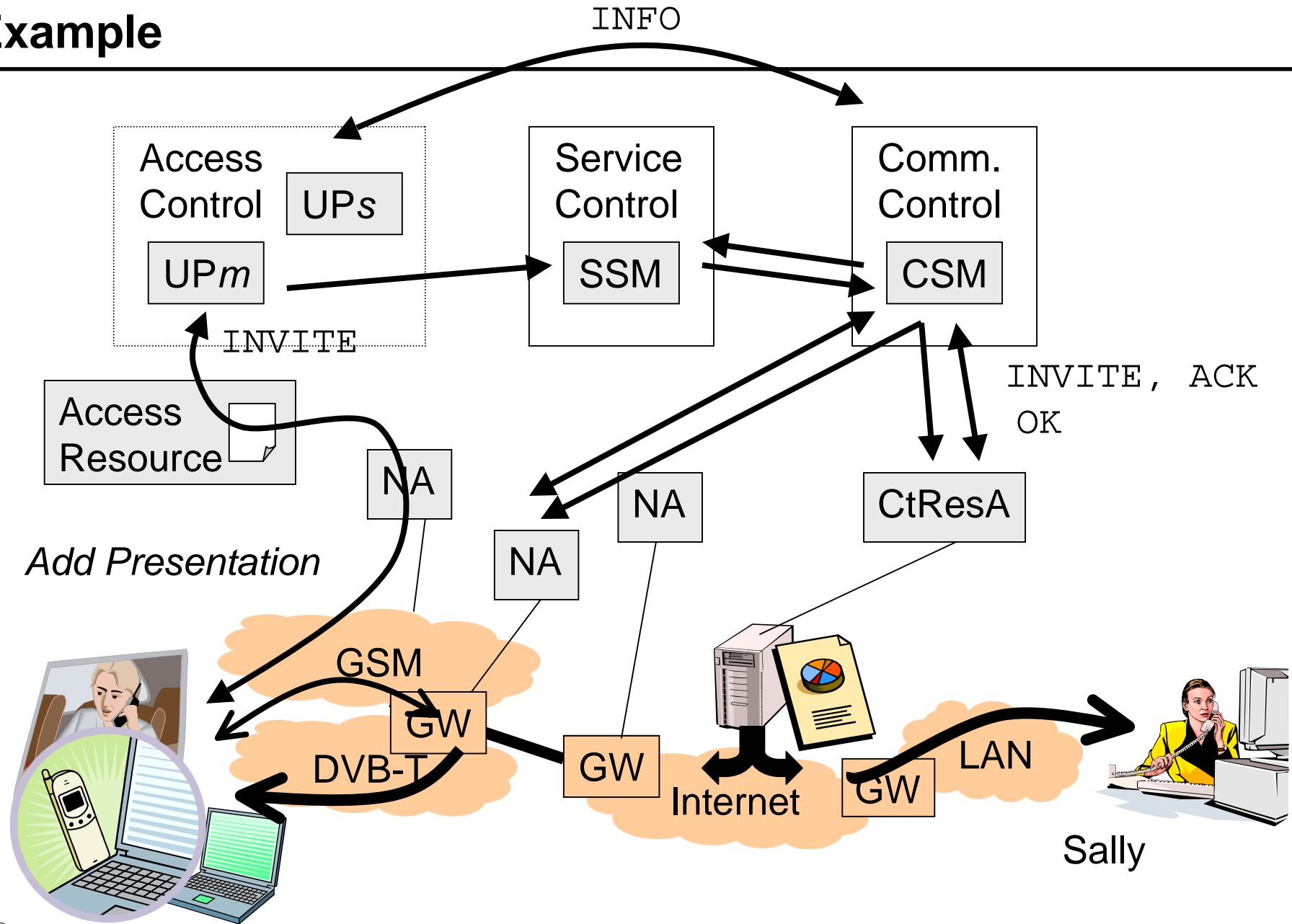
# SesCP: Message Proxying – Layered Session



# Example



# Example

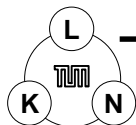


# Conclusion

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## the presented server architecture

- supports service control in diverse networks and with heterogeneous terminals without infrastructure changes
- enables deployment of services in networks they were originally not designed for (support convergence)
- provides independence of network providers (business role: independent service provider)
- is easily deployable in an IP based Next Generation Network (IETF SIP based signaling)



# References

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