Multimedia Cloud Computing

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Multimedia applications and services

Troubles

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- Conventional IT infrastructure is failing to cope with this data growth.

When multimedia meets clouds

- Why do we bother to process and deliver multimedia content through cloud computing?

Fundamental challenges for cloud-based multimedia computing

- Multimedia application and service heterogeneity.

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- Network heterogeneity.
- Device heterogeneity.

Multimedia-aware cloud

- Commercial services, *e.g.*, Amazon CloudFront, Windows Azure Media Services.

Multimedia-aware cloud

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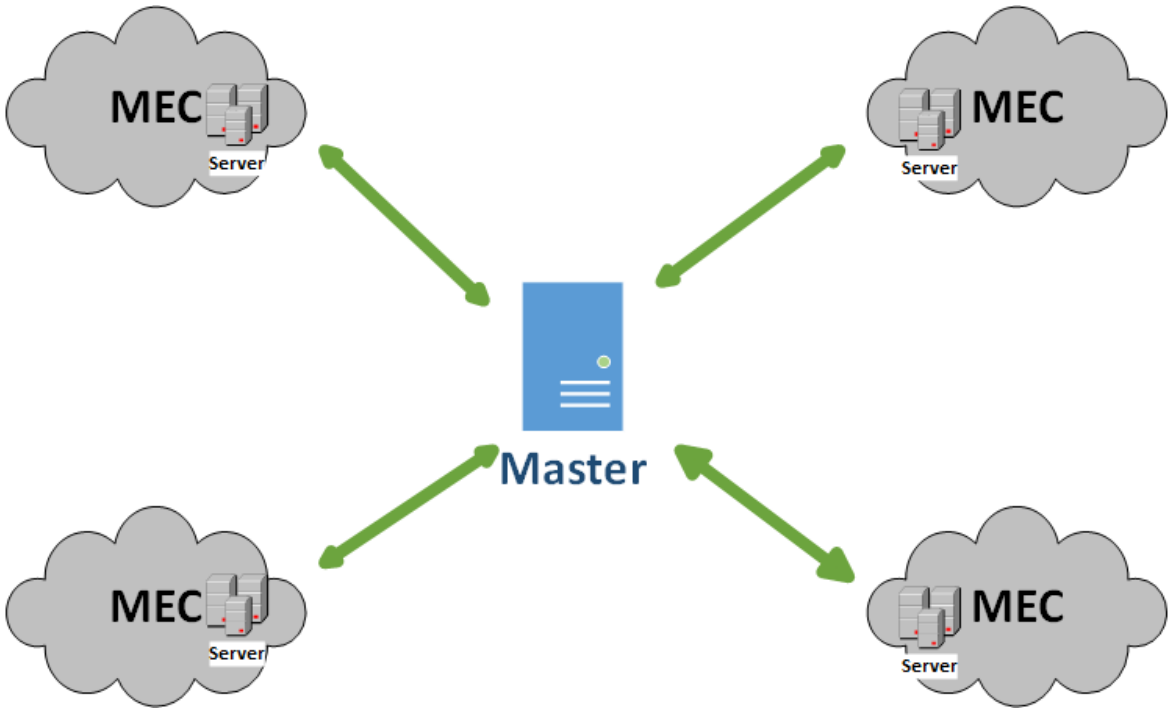
- Media-edge cloud (MEC) architecture.

MEC architecture



Cloud-aware multimedia application

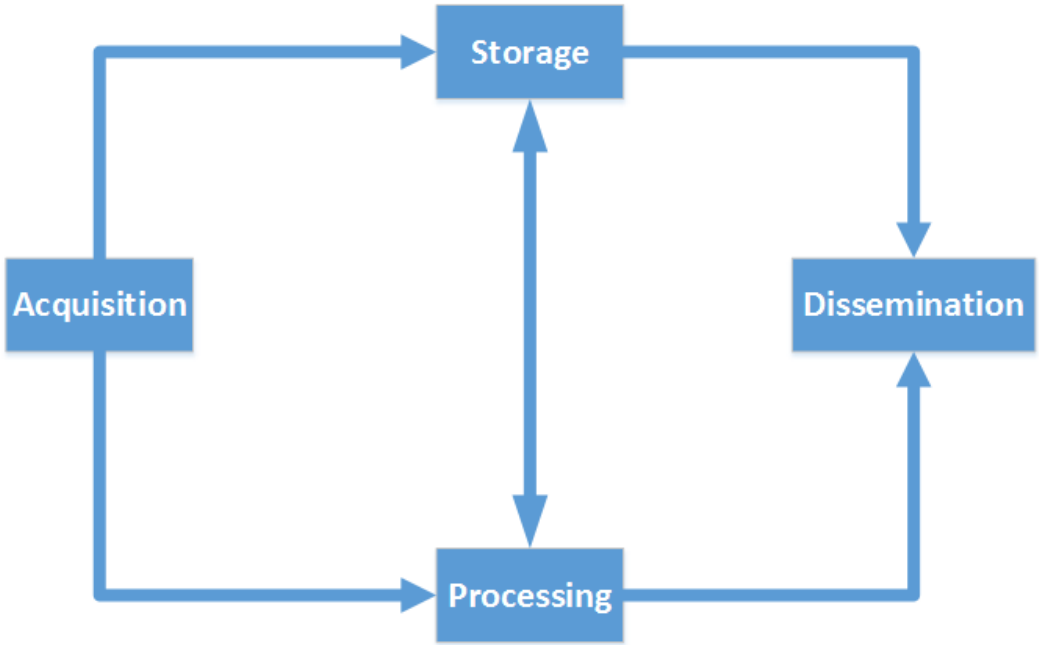
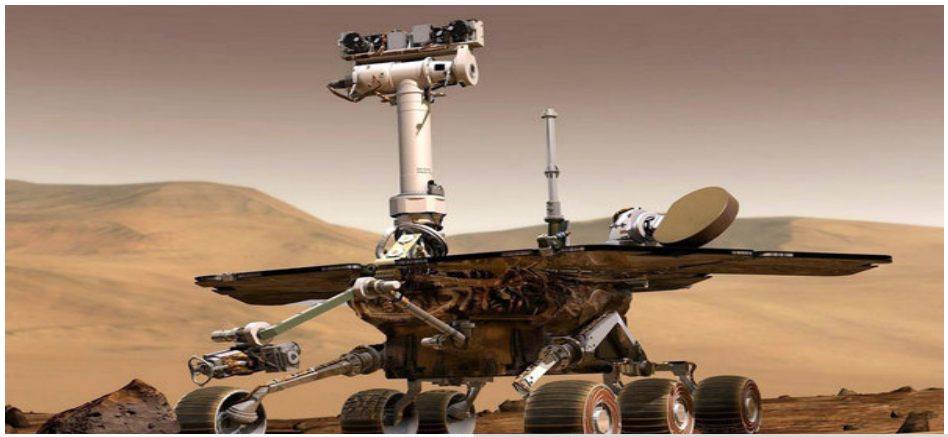


Figure: A typical multimedia lifecycle.

Case study



Cloud-based mobile multimedia application

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- Related work: "On the Investigation of Cloud-Based Mobile Media Environment with Service-Populating and QoS-Aware Mechanisms".

Background

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- Possible deterioration of QoS and congestion due to user mobility.

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- Possible deterioration of QoS and congestion due to user mobility.
- A single cloud is not adequate.

Open cloud

- Clouds on regional scale.

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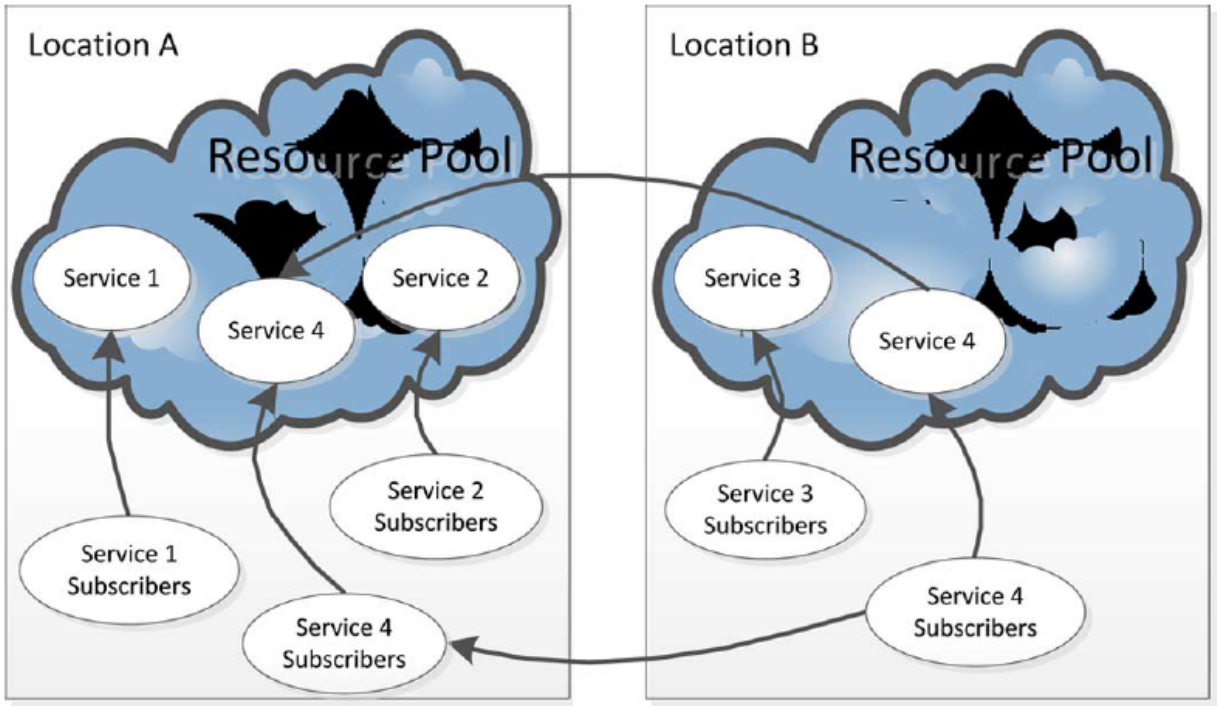
- "No boundaries".

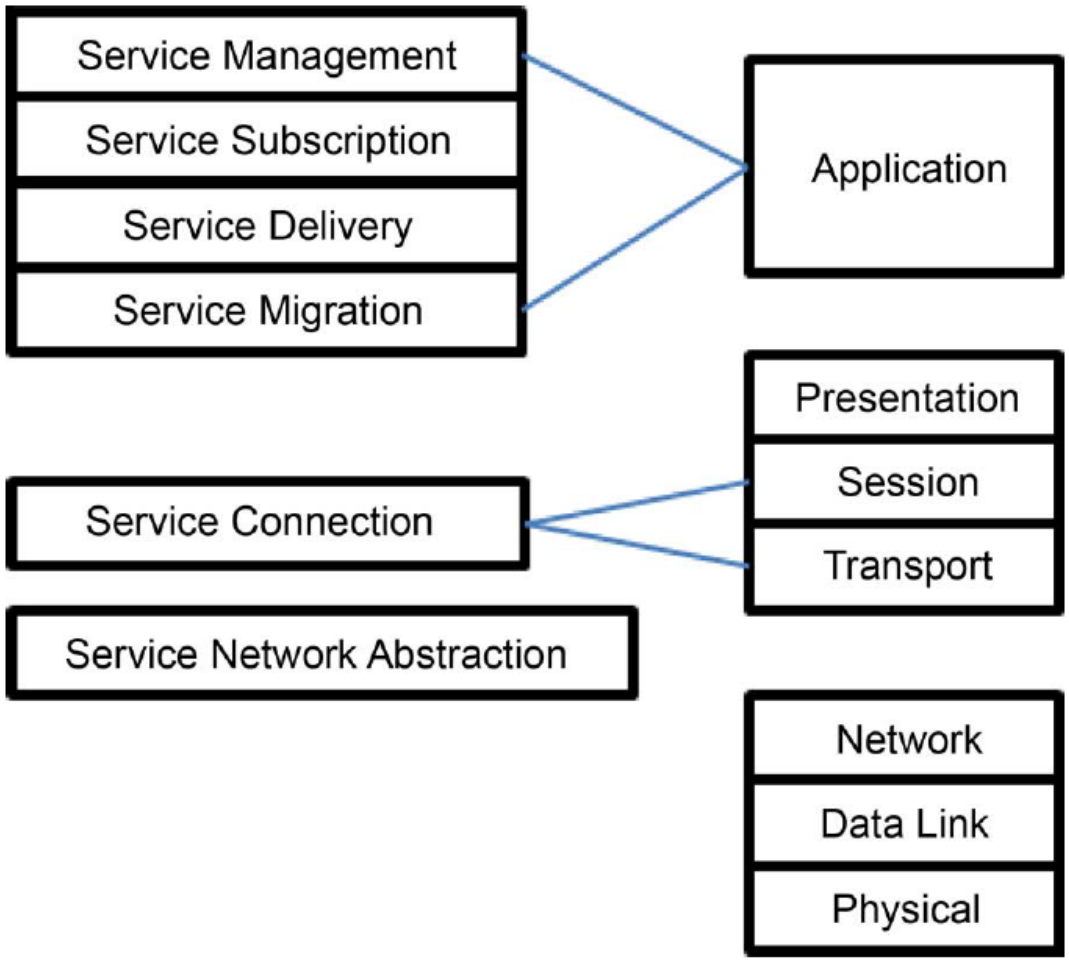
Open cloud

- Clouds on regional scale.
- "No boundaries".
- Service populating.

Service migration example



Layers of the architecture



Service management layer

- Service Level Aggrement (SLA) between services and clouds, Service ID.

Service management layer

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- Responsible for service registration and migration in clouds.

Service subscription layer

- SLA between users and services, User IDs.

Service subscription layer

- SLA between users and services, User IDs.
- Responsible for user subscription and billing.

Service delivery layer

- Responsible for service delivery.

Service delivery layer

- Responsible for service delivery.
- Collect QoS data and make decisions on whether to migrate one service.

Service migration layer

- Responsible for migration of services between clouds.

Service migration layer

- Responsible for migration of services between clouds.
- Instruct the clouds with regard to resource allocation.

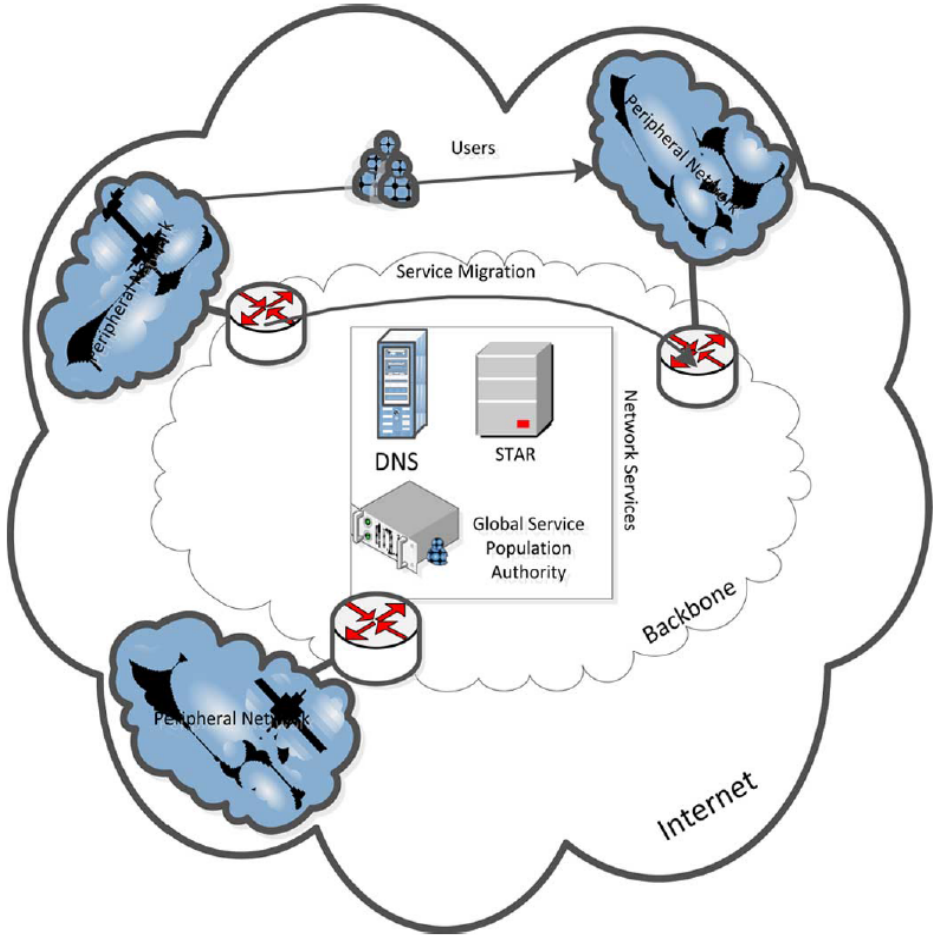
Service connection layer

- Monitoring the connections between users and services.

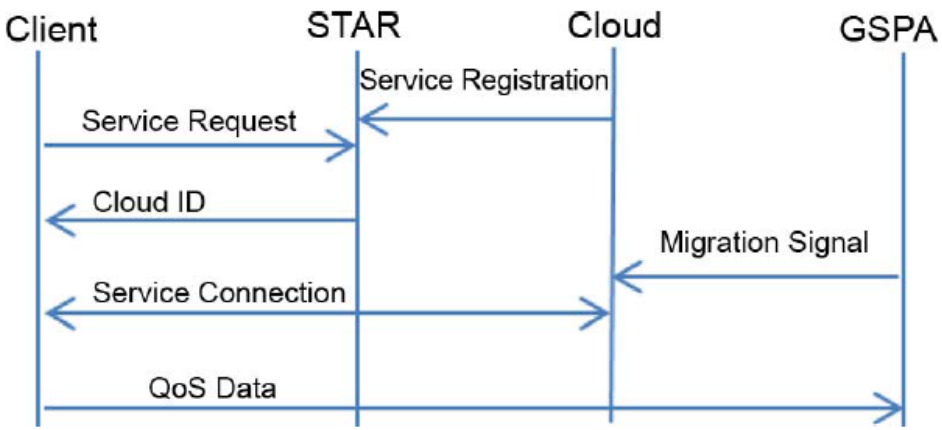
Service connection layer

- Monitoring the connections between users and services.
- QoS tracking.

Global service infrastructure



Service delivery handshake diagram



Thoughts

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- What can we do?

Thanks!