

# PROJECTE DE TECNOLOGIES DE LA INFORMACIÓ - CURS 2012/2013



## OASIS

**Open Access System to  
Internet Media Services**

# Contents

1

Needs

2

Goals

3

Features

4

Benefits

# Contents

1

**Needs**

2

**Goals**

3

**Features**

4

**Benefits**

# Internet digital media: being pragmatic...

Despite the advances in R&D, the current offer for Internet media consumers in Europe is basically 3-play, i.e., telephony, data, and IPTV.



Any digital media product offered in the Internet that is neither telephony nor IPTV in the 3-play package is considered and treated as... **data**



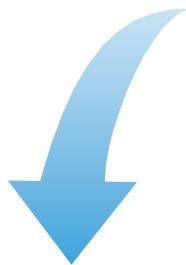
... which are delivered over the Internet on a best-effort basis



... so, in practice, the current offer of **non-best effort** digital media is reduced to ... “TV in a 3-play package”

# Access to non-best effort digital media

Today, when a consumer decides to acquire a product from the offer of non-best effort digital media — currently this means IPTV — the consumer needs to choose “one” among a set of access providers ...



... so the direct access to digital media<sup>(1)</sup> is coupled to, and thus limited by, the selection of the access provider.

<sup>(1)</sup> By direct access to digital media we mean that the content is delivered to consumers through a network platform such that IP packets do not traverse the best-effort Internet. An example of this is *IMAGENIO*, which was the commercial name of Telefonica’s IPTV service over xDSL in Spain.

# Access to non-best effort digital media

Since consumers don't have access to an offer of non-best effort digital media openly and directly, they just choose based on:

**The bandwidth offered by providers (10 Mbps, 20Mbps,...)**

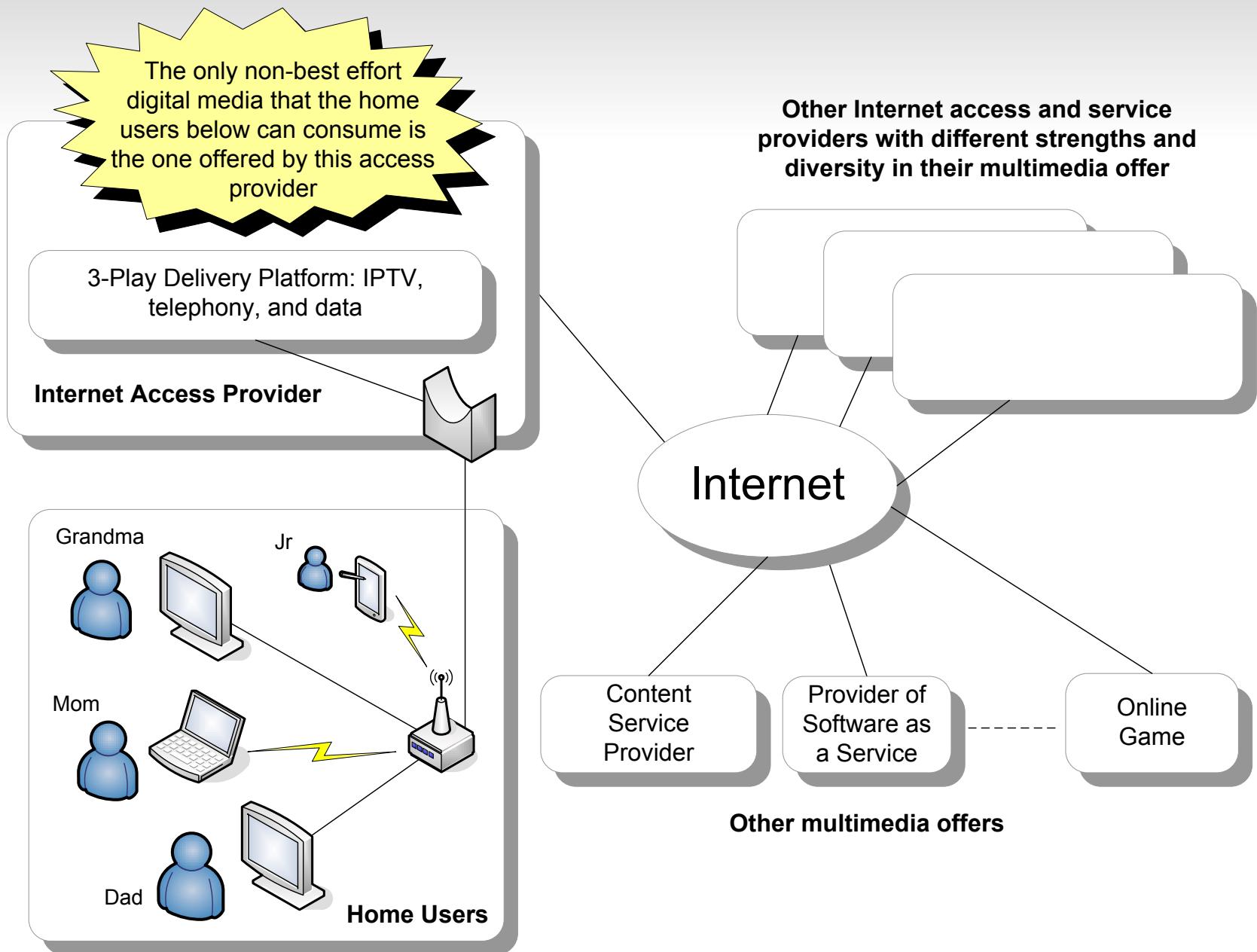
**The prices offered by providers**

**The 3-play package offered by each provider**

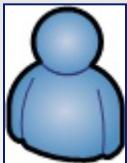
Considering that, aside from the IPTV and telephony packages contracted, everything else is “best-effort data” ...

... before we can *make available immersive and interactive media technologies providing users with more sophisticated forms of media and enhanced experiences*, we need to rethink the way we offer, access to, search for, choose, and deliver digital media.

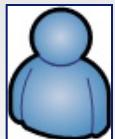
# Example: current access to the digital media offer



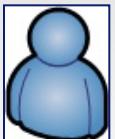
## Example (cont.): what if....



**Dad** wants to watch live a heavyweight fight in his Ultra HD/3D TV set



**Mom** needs to prepare work for tomorrow; she is a surgeon; she needs to analyze her patients' data, and she needs to access, experience, and use her tools for the analysis exactly as if she were at the hospital



**Grandma** wants to watch again, and on demand, some of her favorite TV shows — shows that ended some years ago



**Jr.** wants to play online in a networked fashion with some friends

# Example (cont.): what if....

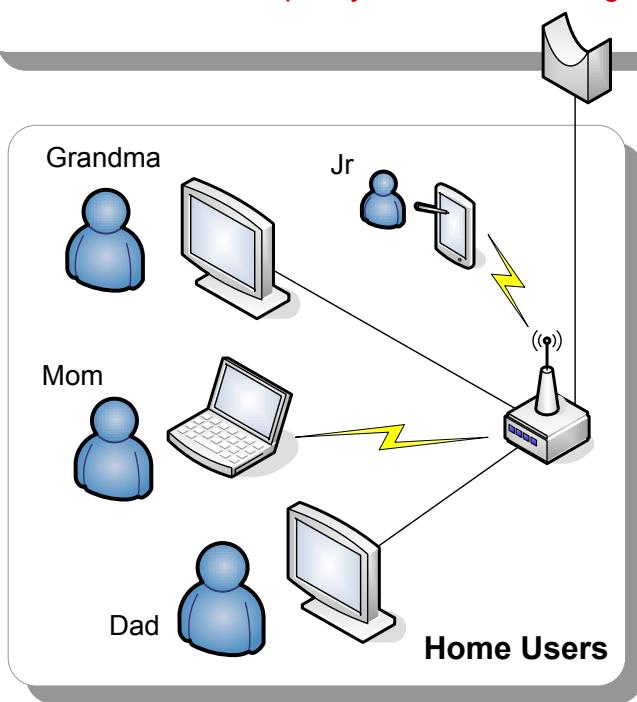
## Internet Access Provider 1

**Mom:** is perfectly served through this provider; it's the same provider of the hospital. That's the reason why they choose this access provider. Her sessions have guaranteed performance, and her traffic does not traverse the best-effort Internet.

**Dad:** the fight is not available through the channels offered by this provider

**Grandma:** cannot get along with the interface to select and personalize the content that she wants; the interface is too complex for her; she does not understand it.

**Jr.:** doesn't like the quality obtained for the game he is playing



## TV shows provider

This provider offers on demand the shows that Grandma wants to watch, together with an excellent interface to personalize content that was specially designed for elderly people. The interface offers a mix of images and voice commands that is very easy to use → serves Grandma's needs

## Sports Broadcasting Provider

Offers the heavyweight fight that Dad wants to watch. The fight is available in Ultra HD/3D for customers of local Internet access providers 2, 3, and 4.

## Internet Service Provider

The online game producer has a special agreement where its main delivery platform is supported by this ISP, so the experience for the game that Jr wants to play is remarkable through this provider

# Example (cont.): what if....

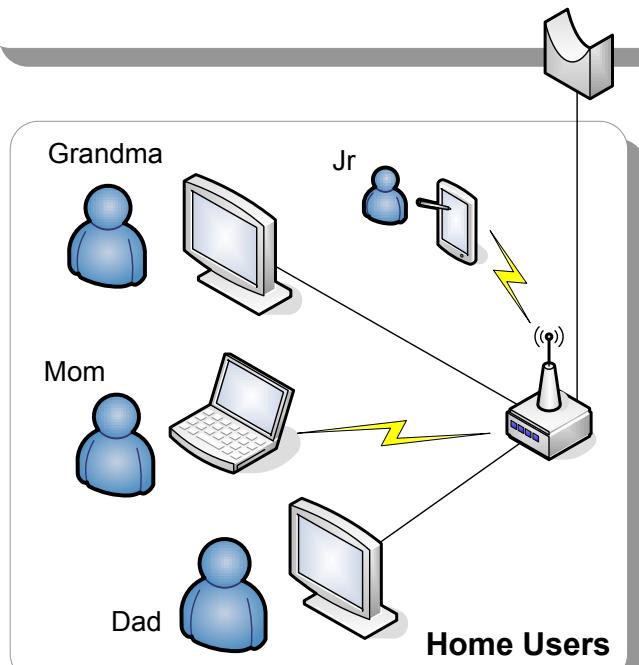
## Internet Access Provider 1

**Mom:** is perfectly served through this provider; it's the same provider of the hospital. That's the reason why they choose this access provider. Her sessions have guaranteed performance, and her traffic does not traverse the best-effort Internet.

Any digital media that is not within this Internet access provider's package cannot be accessed directly by consumers and thus is treated as "data".

→ Mom's session

**Jr.:** doesn't like the quality obtained for the game he is playing



## TV shows provider

This provider offers on demand the shows that Grandma wants to watch, together with an excellent interface to personalize content that was specially designed for elderly people. The interface offers a mix of images and voice commands that is very easy to use → serves Grandma's needs

## Sports Broadcasting Provider

Offers the heavyweight fight that Dad wants to watch. The fight is available in Ultra HD/3D for customers of local Internet access providers 2, 3, and 4.

## Internet Service Provider

The online game producer has a special agreement where its main delivery platform is supported by this ISP, so the experience for the game that Jr wants to play is remarkable through this provider

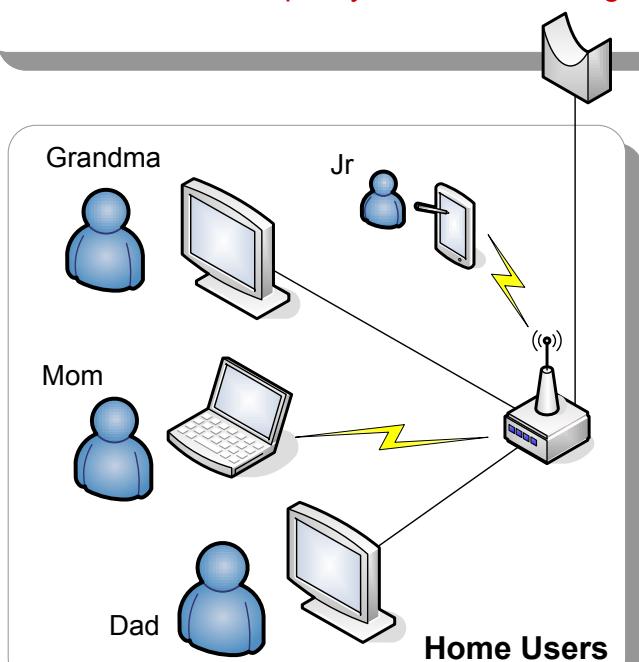
# Example (cont.): what if....

## Internet Access Provider 1

**Mom:** is perfectly served through this provider; it's the same provider of the hospital. That's the reason why they choose this access provider. Her sessions have guaranteed performance, and her traffic does not traverse the best-effort Internet.

Any digital media that is not within this Internet access provider's package cannot be accessed directly by consumers and thus is treated as "data".

**Jr.:** doesn't like the quality obtained for the game he is playing



## TV shows provider

This provider offers on demand the shows that Grandma wants to watch, together with an excellent interface to personalize content that was specially designed for elderly people. The interface offers a mix of images and voice commands that is very easy to use → serves Grandma's needs

## Sports Broadcasting Provider

Offers the heavyweight fight that Dad wants to watch. The fight is available in Ultra HD/3D for customers of local Internet access providers 2, 3, and 4.

... "data" are delivered over the public Internet without any performance guarantee ... so even when Dad is willing to pay-per-view live sports on Ultra HD/3D, the offer is not available for him. The option that Dad has today in the Internet is to buy the fight and watch a "best-effort transmission".

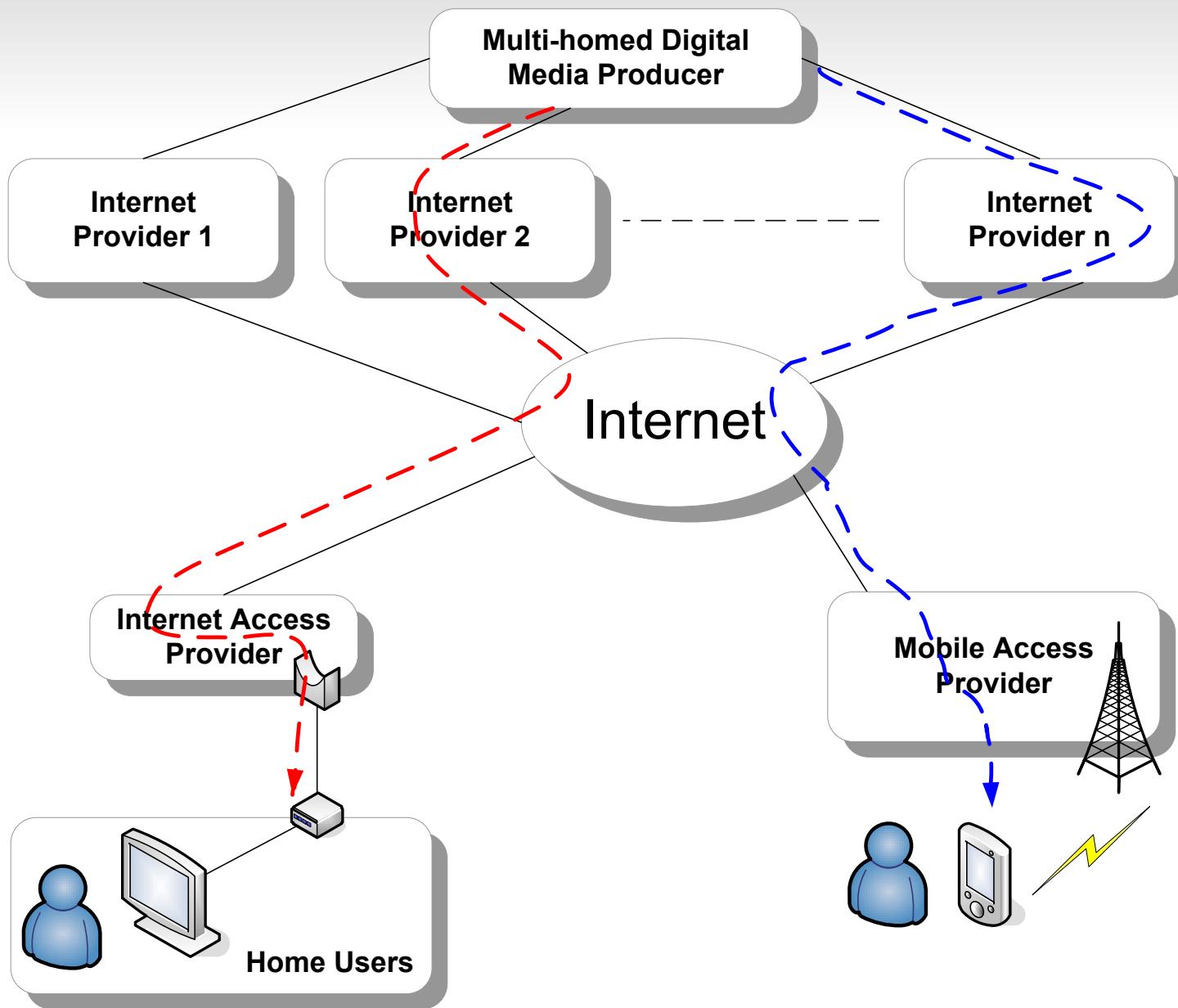
# Consequences...

The rigidness of current access to the offer of non-best effort digital media disables the possibility to dynamically select the “best player” for each service, since the offer is tied to “one” access provider.

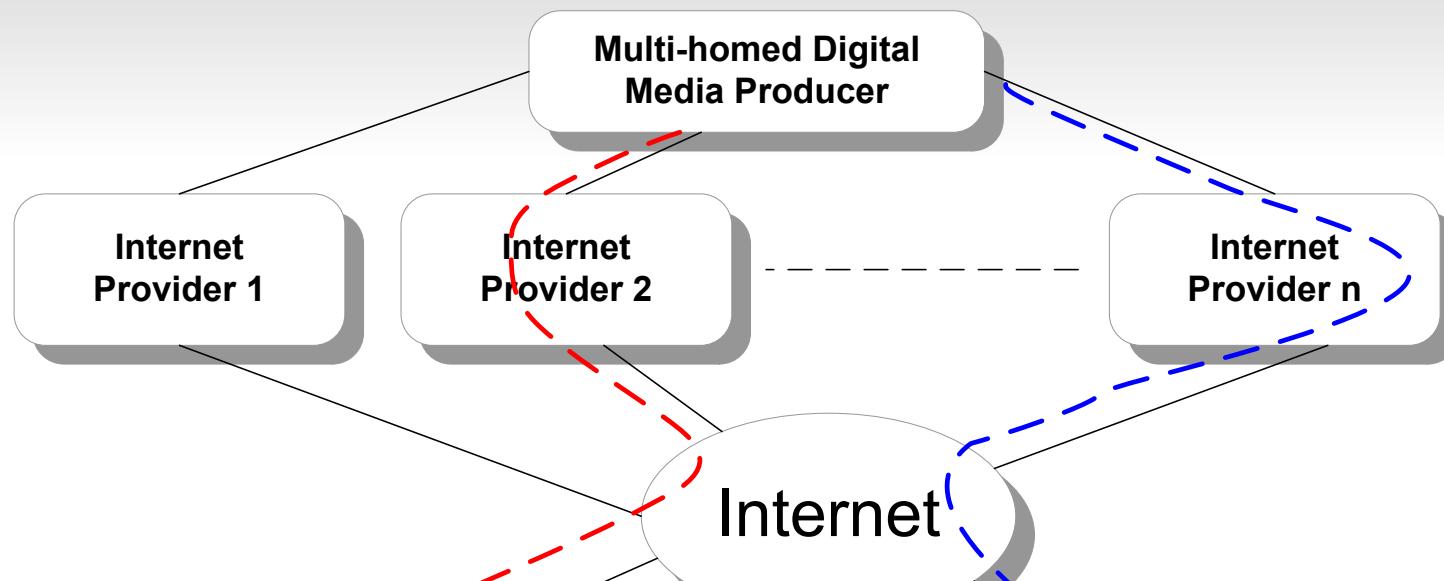
This rigidness limits the consumer involvement capabilities and clearly impacts on the prosumers behavior. Indeed, the gap between “what we want to offer and do over the Internet” and “what we can actually offer and do over it today”, conditions not only the behavior of media prosumers, but also the arise of new products and business opportunities on the Internet.

This rigidness also hinders the development of environments enabling personalization of content preferences and content selection tools. In a scenario where consumers could have access to a wider and open offer of non-best effort digital media, the interfaces to humans need to have customizable profiles, and be adapted differently to Grandma, to Jr, to Mom, and to Dad.

# A closer look to the offer and delivery



# A closer look to the offer and delivery



## Inherent limitations of the Internet as a media delivery platform:

1. Digital media is typically offered via WWW and delivered through the Internet on a best-effort basis.
2. Despite the progress made in content search and distribution, as well as in the design of standardized tools and control plane features supporting dynamic requests and allocation of resources, the offer and delivery of digital media over the Internet is far behind the expectations of media prosumers. When the content demand of a multi-homed digital media producer increases, human intervention (phone calls, emails,...) and human-assisted configurations are needed to allocate more resources so as to improve e2e delivery ... still, the quality obtained at destination is unpredictable.

# Digital media delivery platform ... the needs

Make possible the access to an offer of non-best effort digital media openly and directly, where consumers can select the content they want to consume in a personalized way.

Tackle the rigidness of current platforms for offering and delivering digital media



We need a pragmatic approach with less human-assisted intervention and predictable performance at destination

The delivery platform must be sustainable and enable profitable businesses

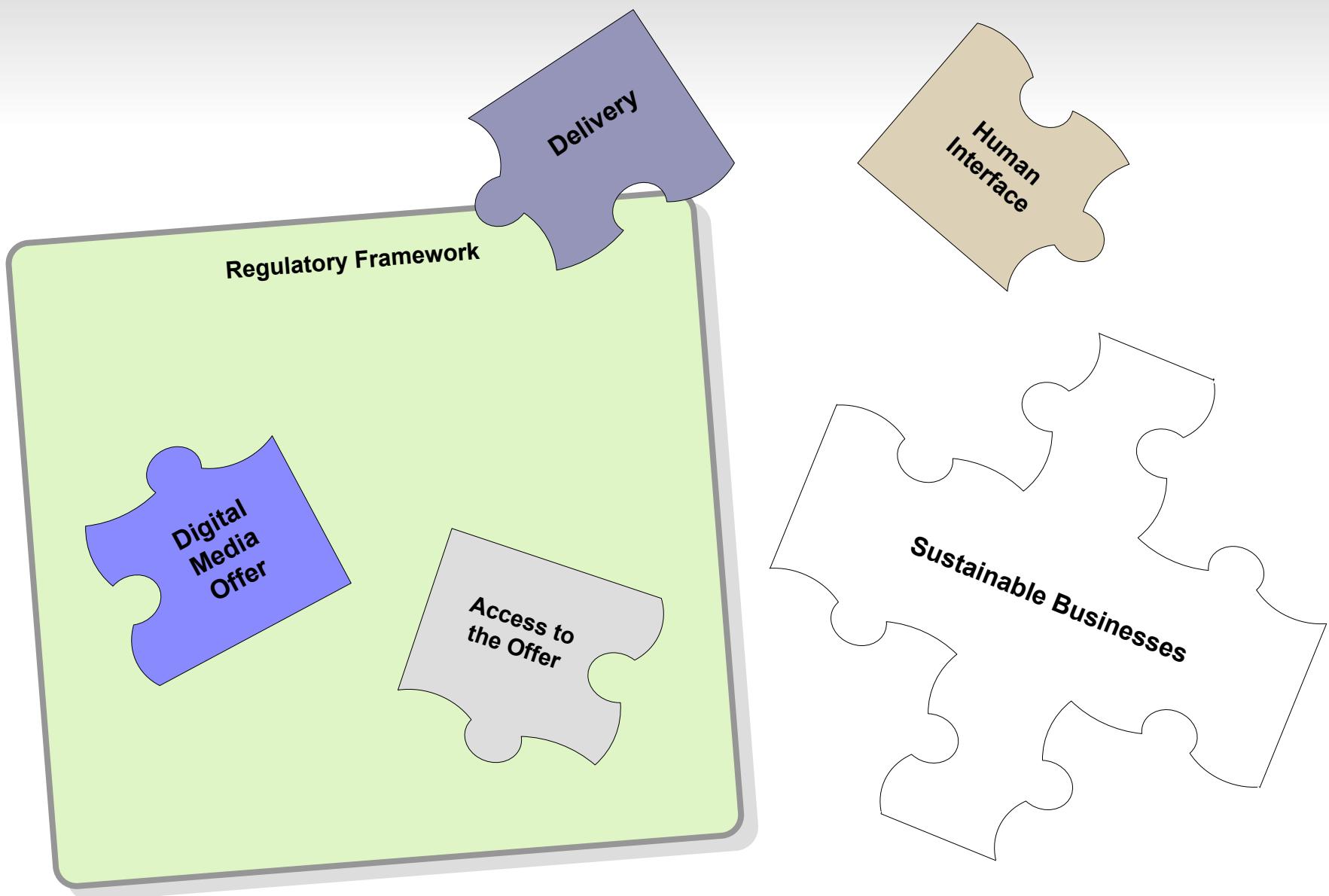


Open new markets enabling new business opportunities for all, media prosumers and the providers in charge of distributing the media



Give special attention to the regulatory framework and its expected evolution

# Digital media delivery platform ... the puzzle



# Contents

1

Needs

2

Goals

3

Features

4

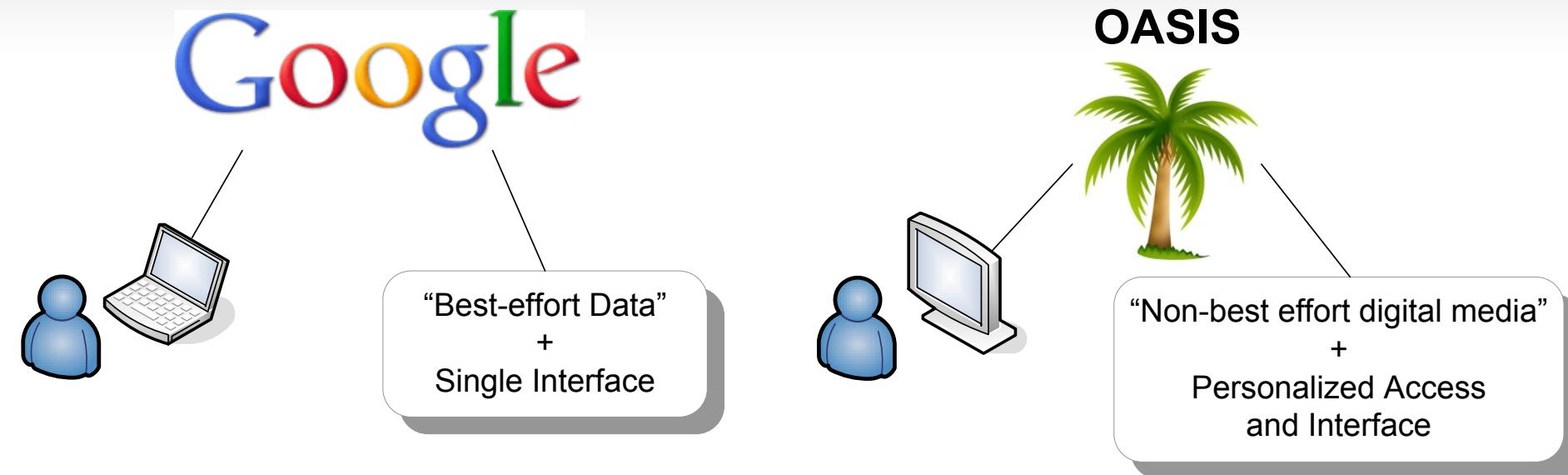
Benefits

# OASIS: Global Goals

## Regulatory Framework



# The Role of the OASIS ...



While Google operates as a “connector” between users and “best-effort content”, OASIS will operate as a “connector” between consumers and media and service providers that are willing to deliver content without traversing the best-effort Internet.

# Contents



Needs



Goals



Features



Benefits

# Going back to the example: before OASIS

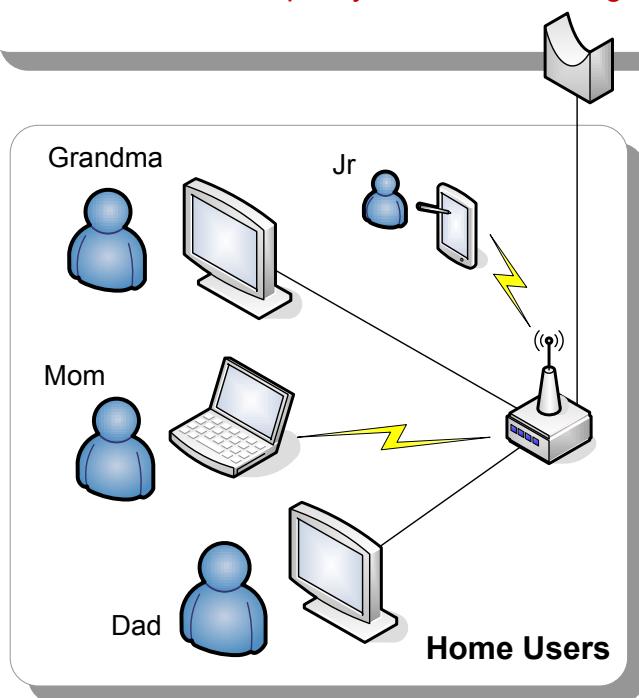
## Internet Access Provider 1

**Mom:** is perfectly served through this provider; it's the same provider of the hospital. That's the reason why they choose this access provider. Her sessions have guaranteed performance, and her traffic does not traverse the best-effort Internet.

**Dad:** the fight is not available through the channels offered by this provider

**Grandma:** cannot get along with the interface to select and personalize the content that she wants; the interface is too complex for her; she does not understand it.

**Jr.:** doesn't like the quality obtained for the game he is playing



## TV shows provider

This provider offers on demand the shows that Grandma wants to watch, together with an excellent interface to personalize content that was specially designed for elderly people. The interface offers a mix of images and voice commands that is very easy to use → serves Grandma's needs

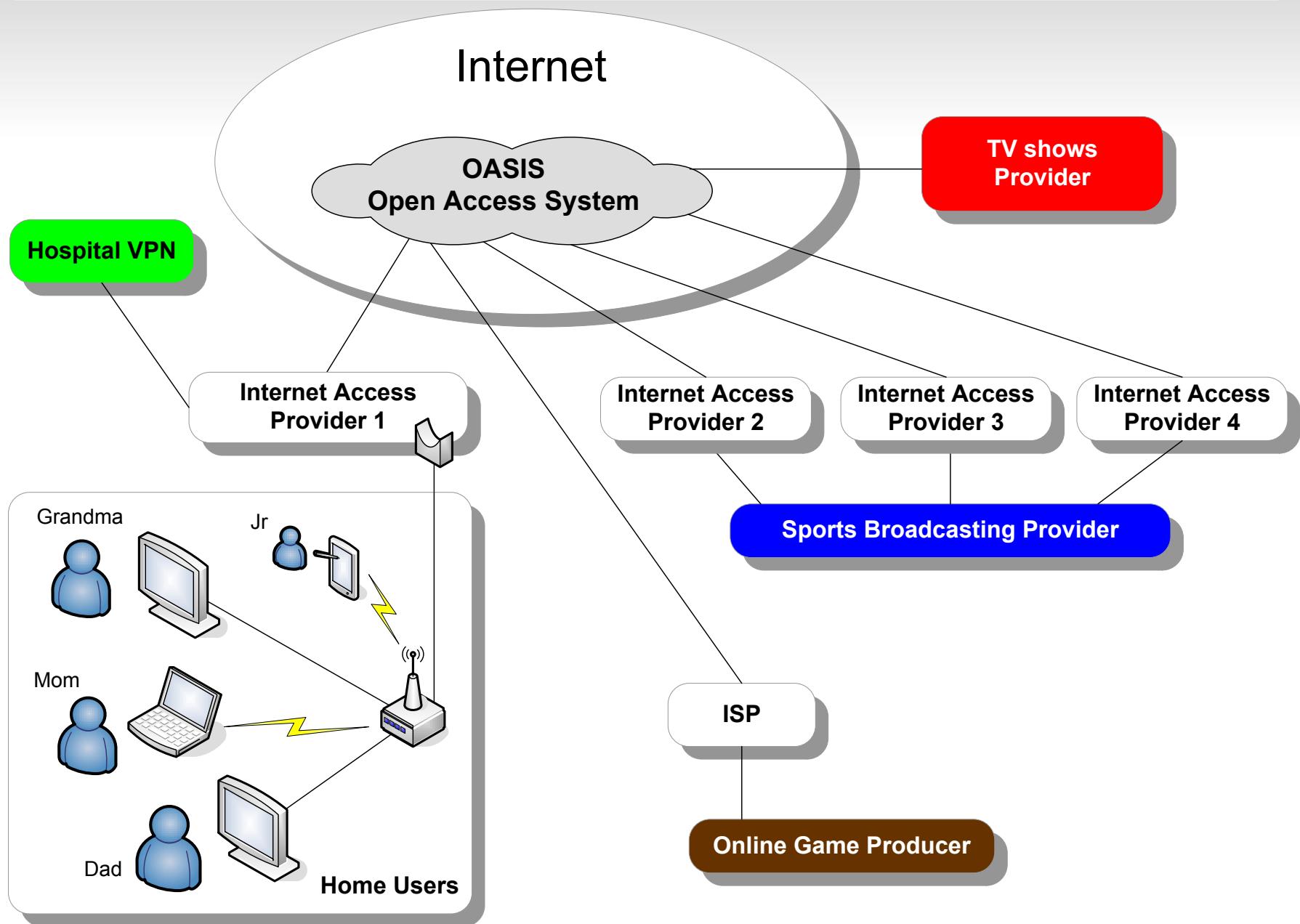
## Sports Broadcasting Provider

Offers the heavyweight fight that Dad wants to watch. The fight is available in Ultra HD/3D for customers of local Internet access providers 2, 3, and 4.

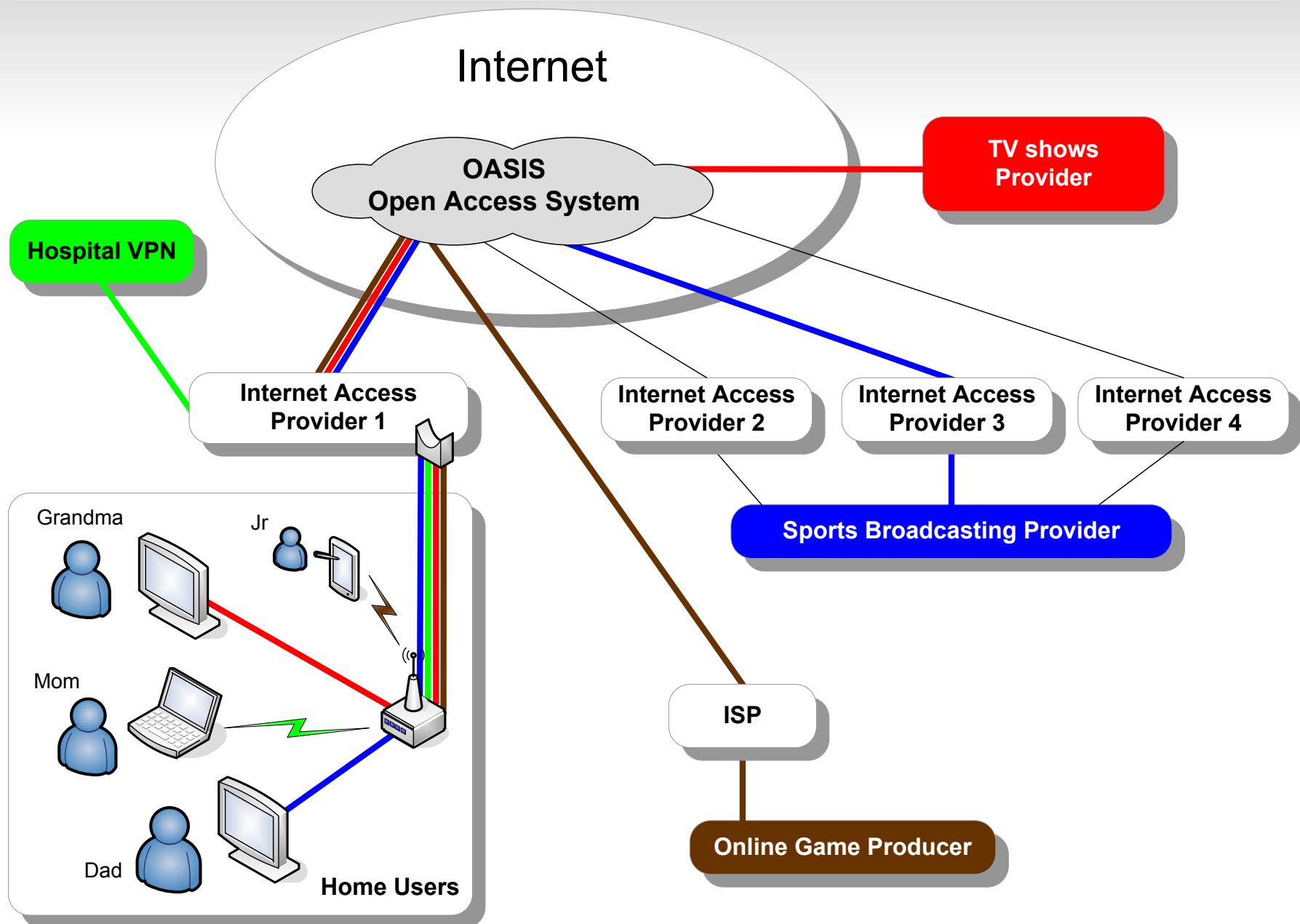
## Internet Service Provider

The online game producer has a special agreement where its main delivery platform is supported by this ISP, so the experience for the game that Jr wants to play is remarkable through this provider

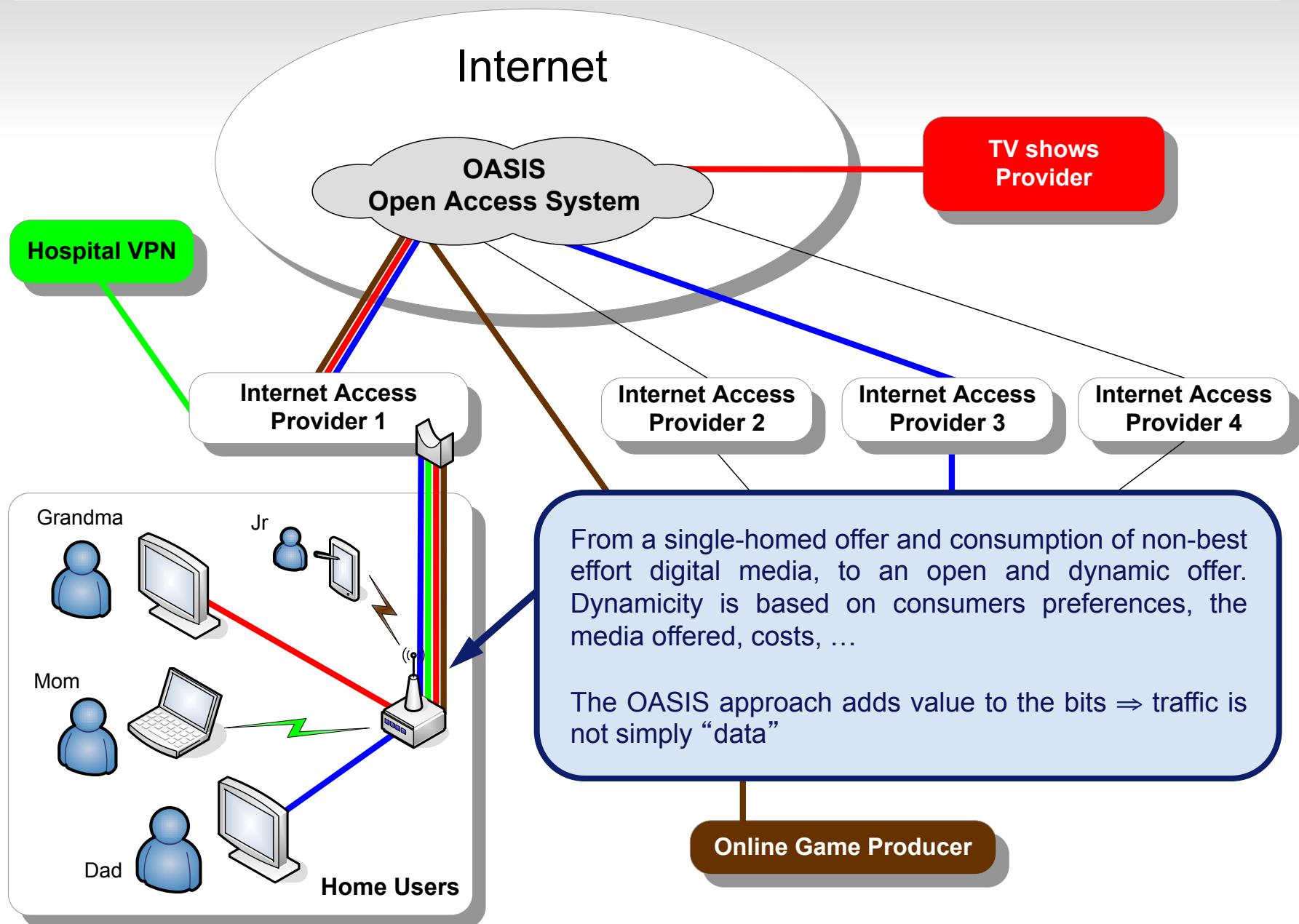
# Going back to the example: the OASIS approach



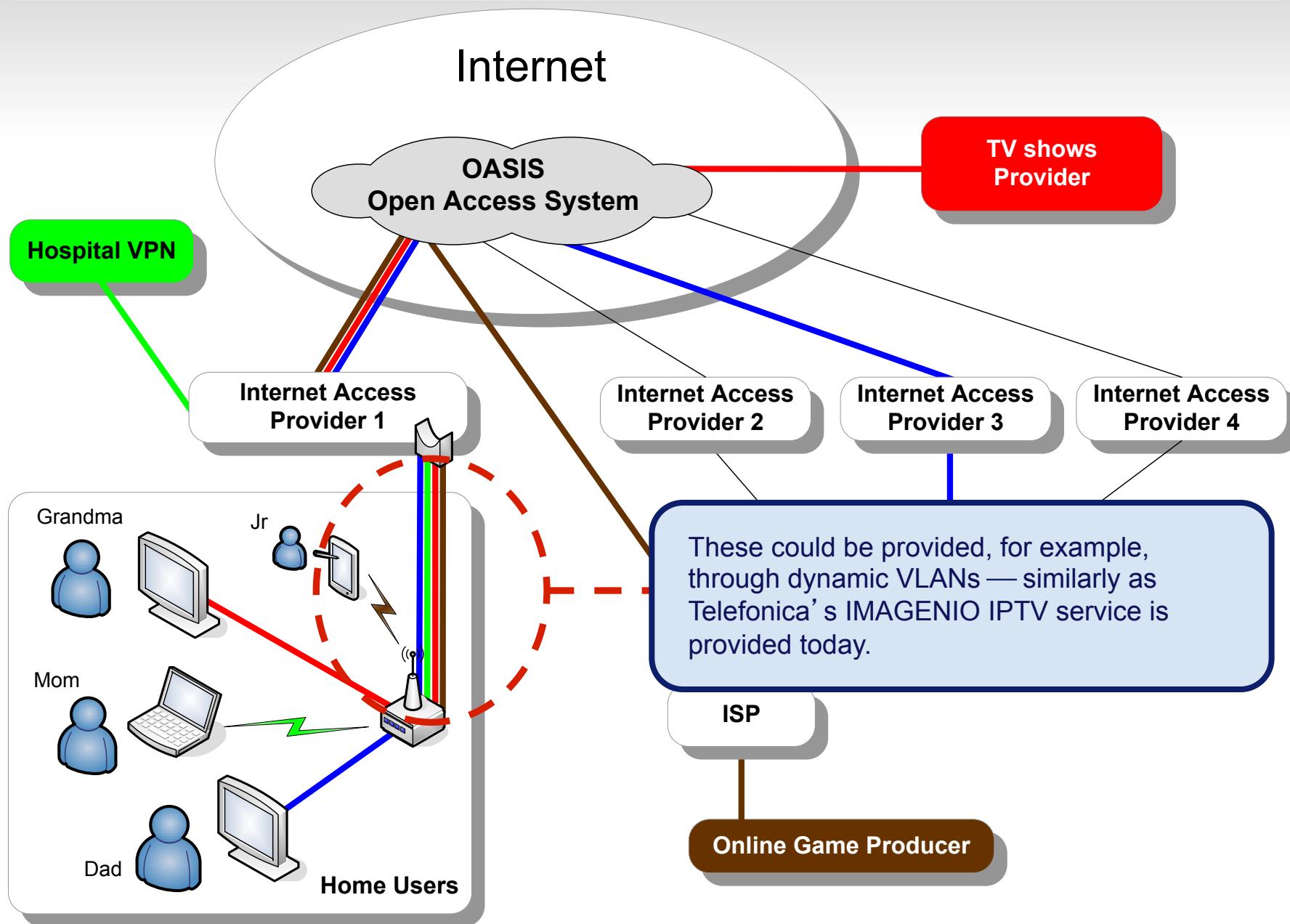
# Going back to the example: the OASIS approach



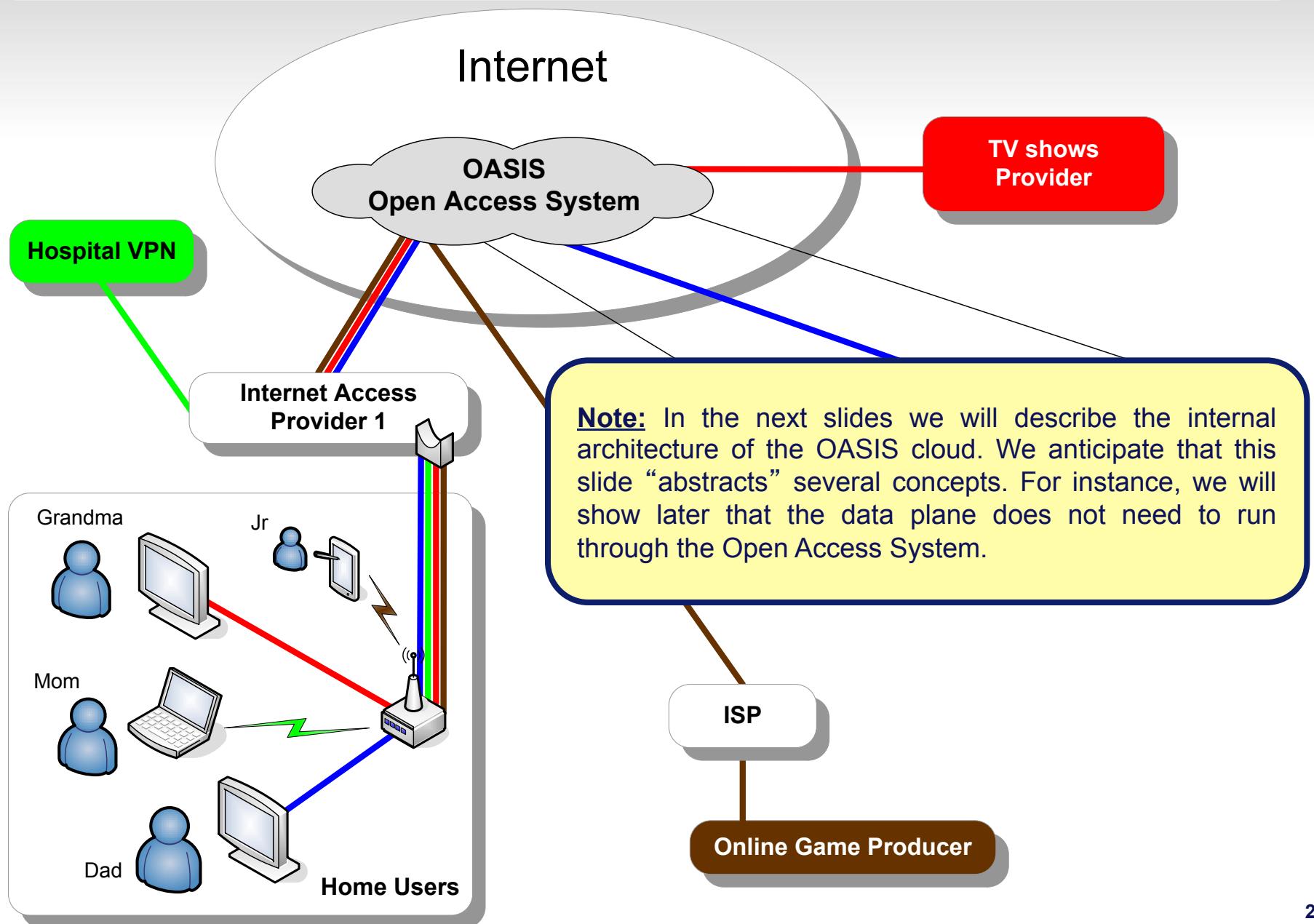
# Going back to the example: the OASIS approach



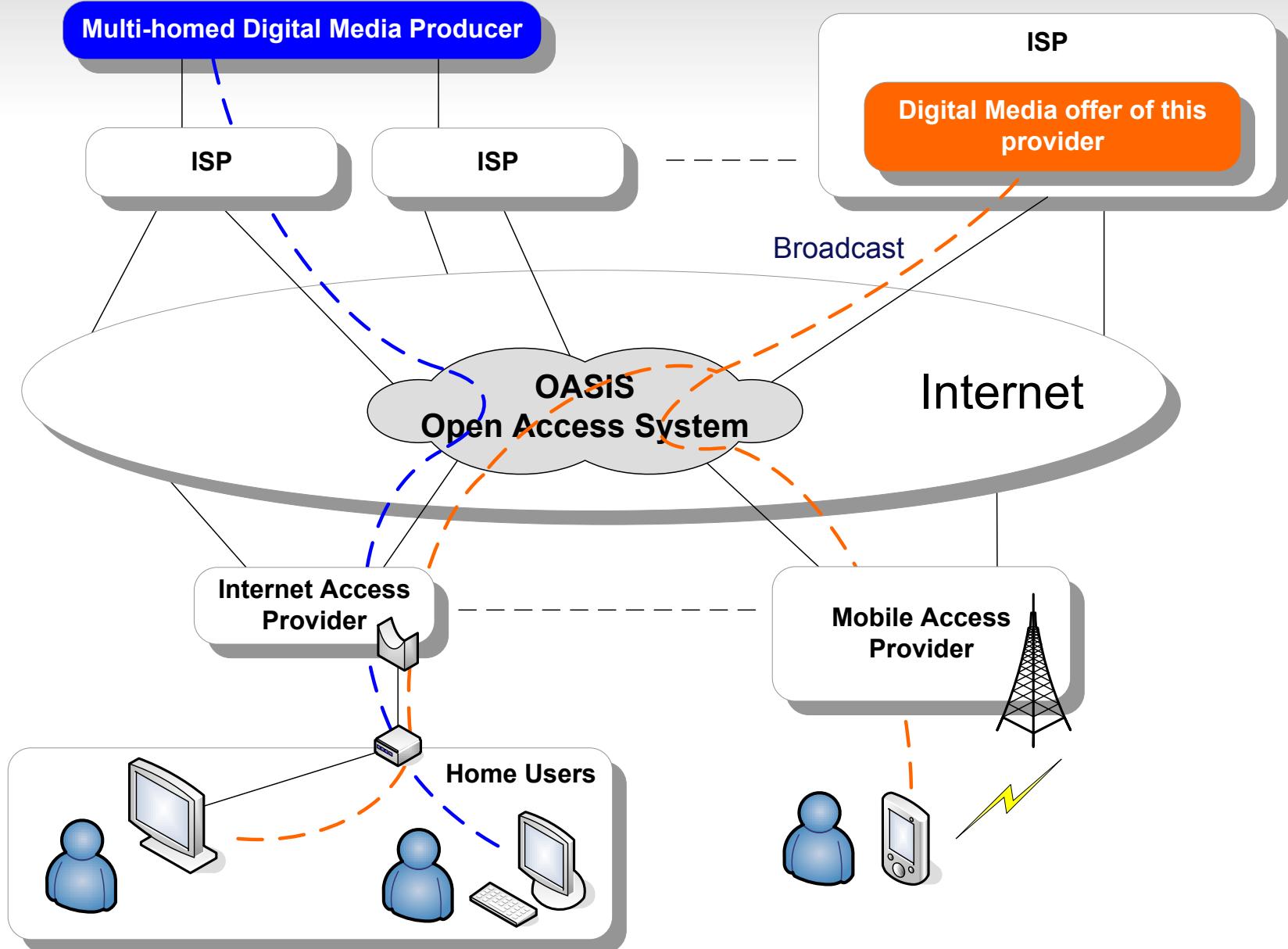
# Going back to the example: the OASIS approach



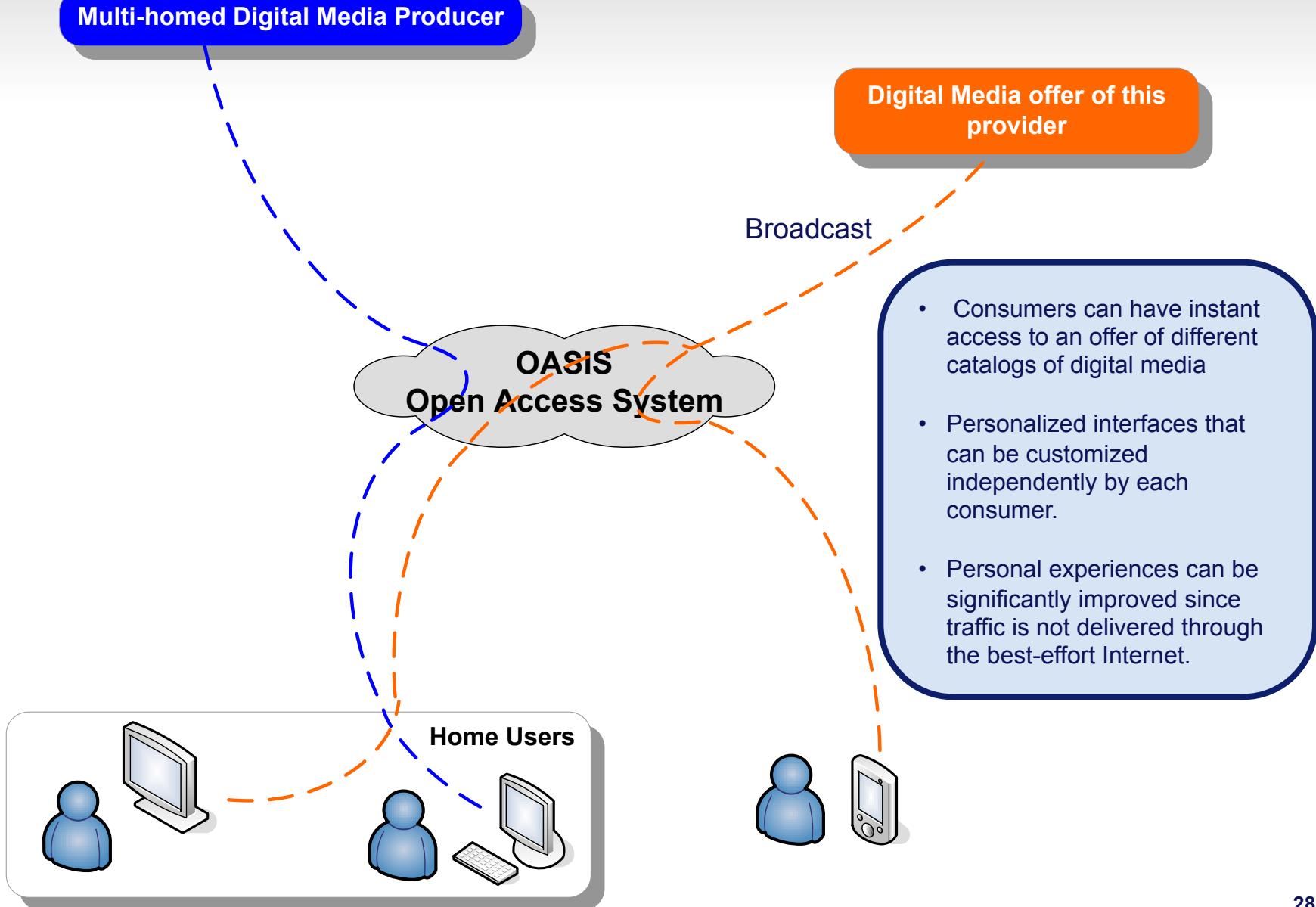
# Going back to the example: the OASIS approach



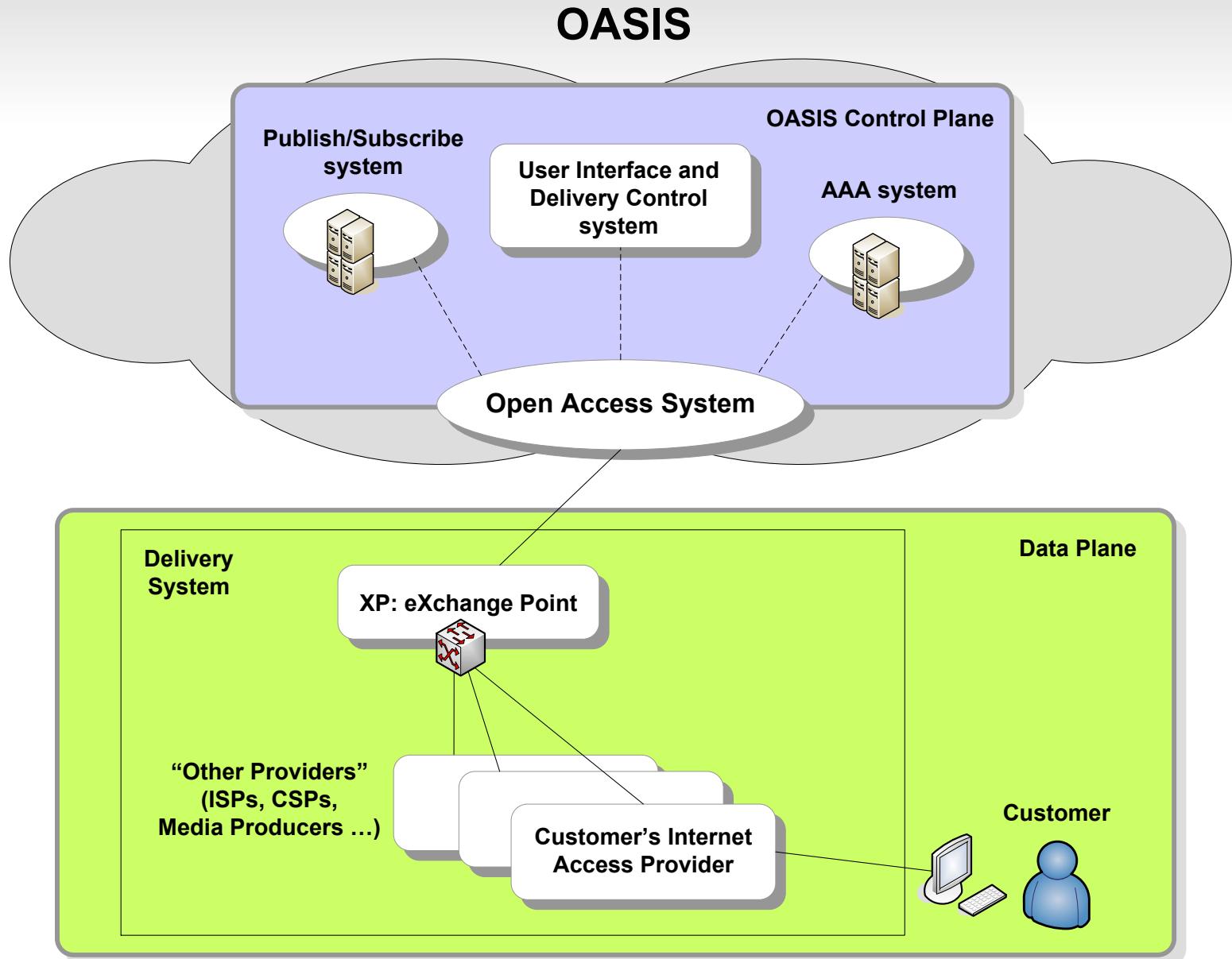
# OASIS features: the big picture



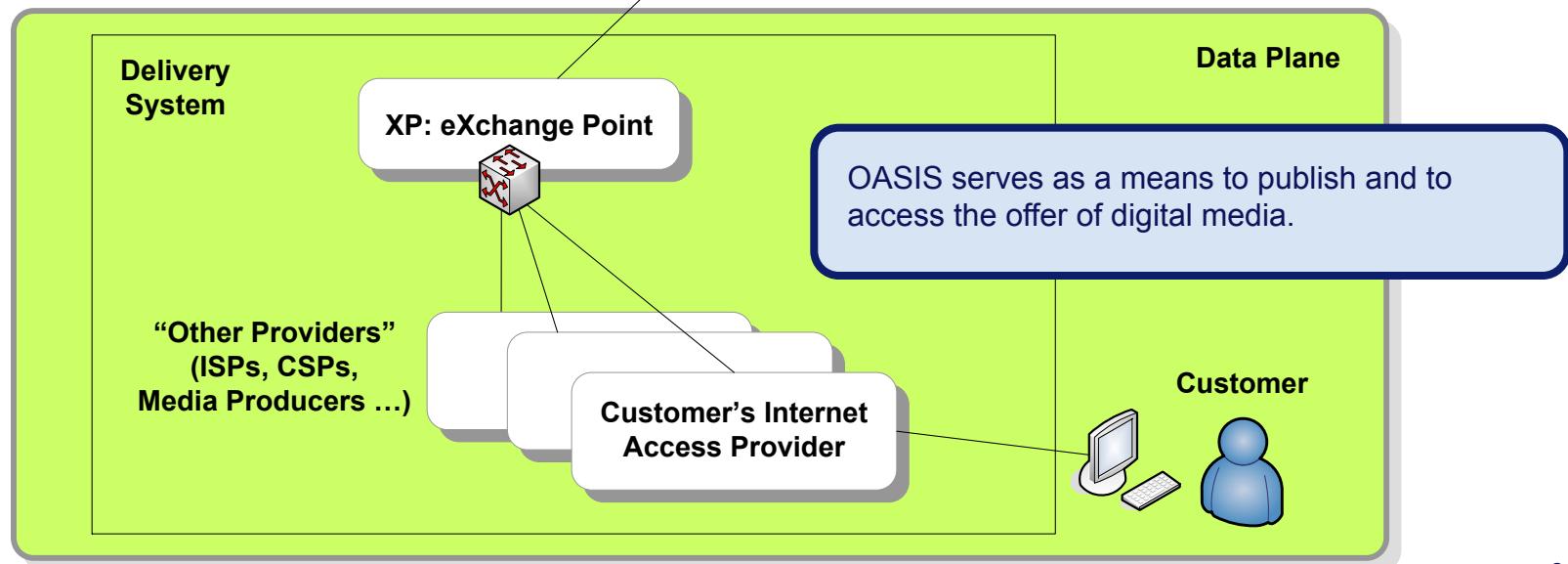
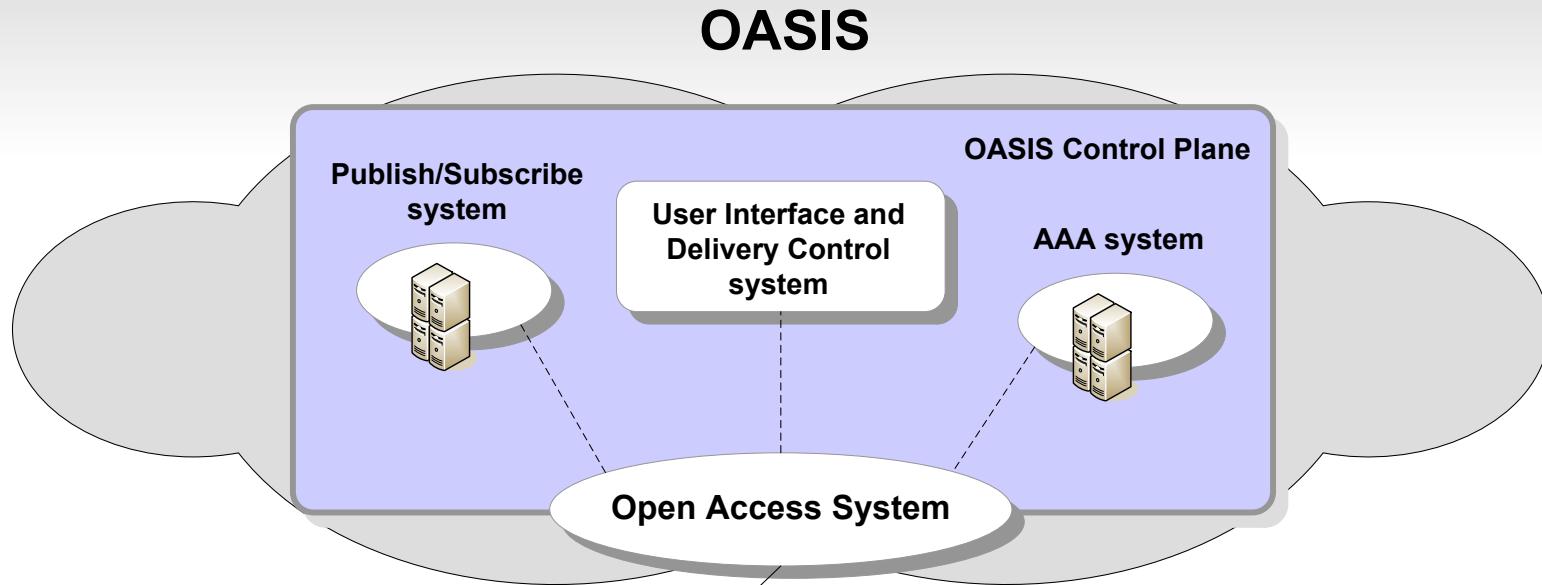
# OASIS features: the big picture



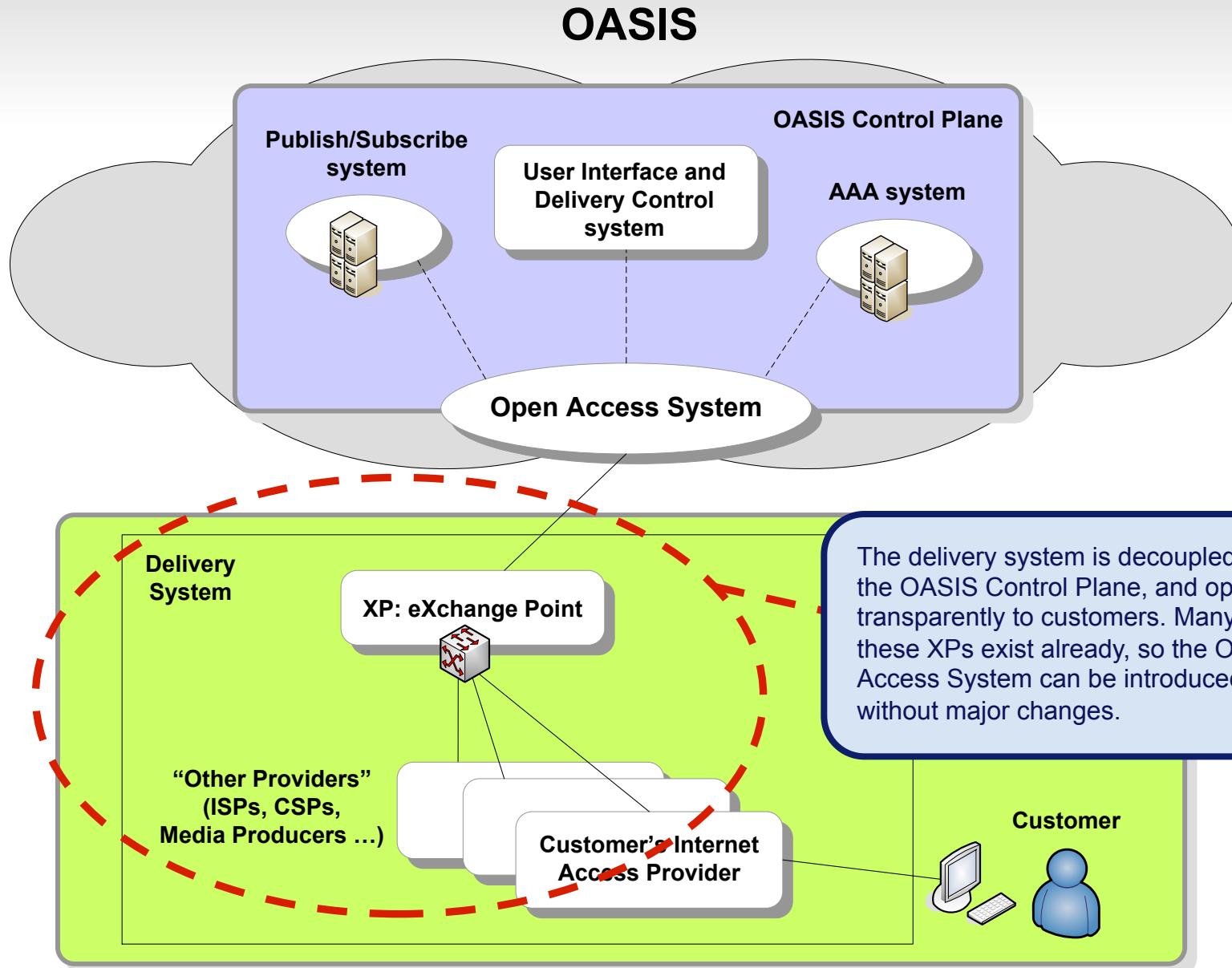
# OASIS features: inside the OASIS cloud



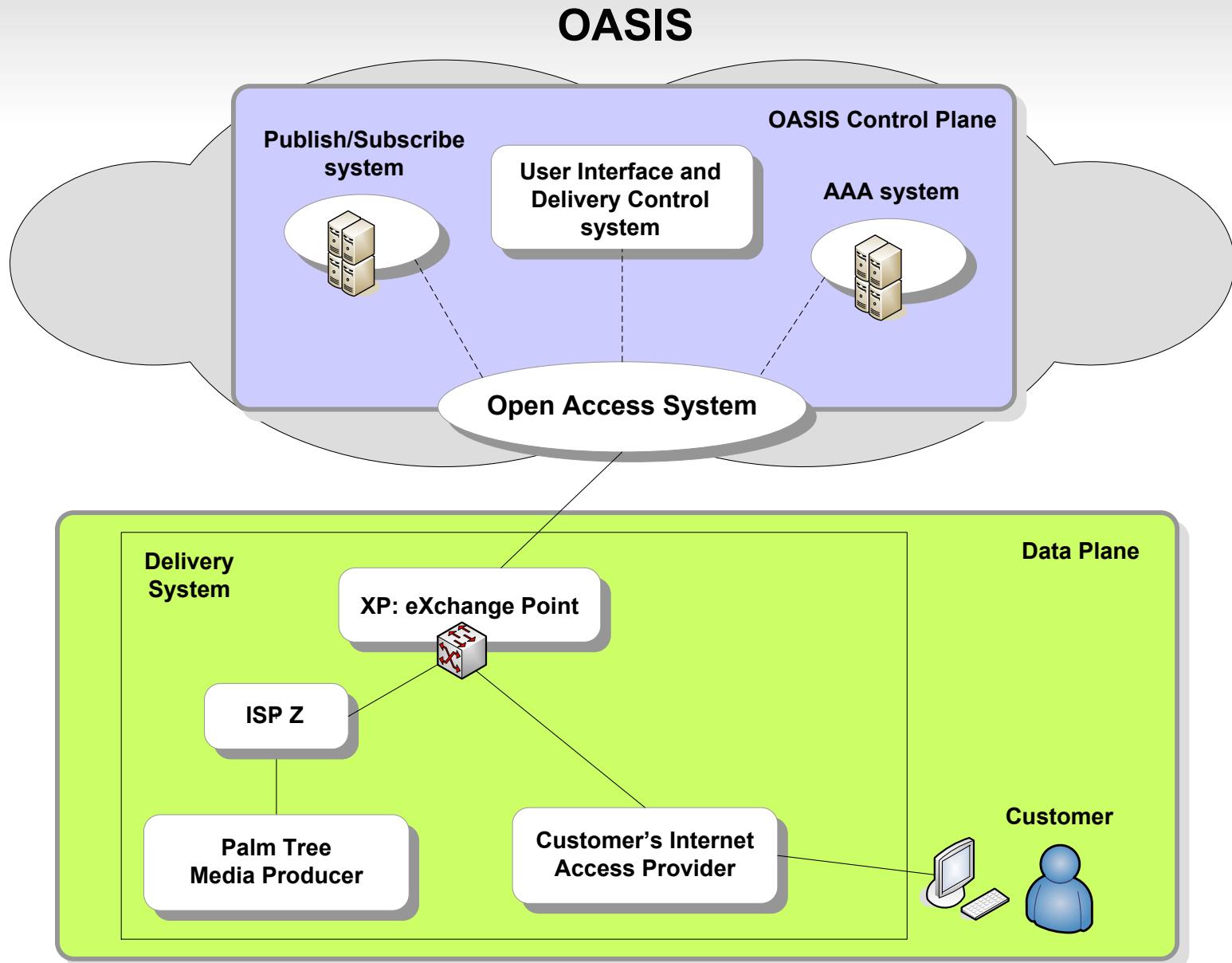
# OASIS features: inside the OASIS cloud



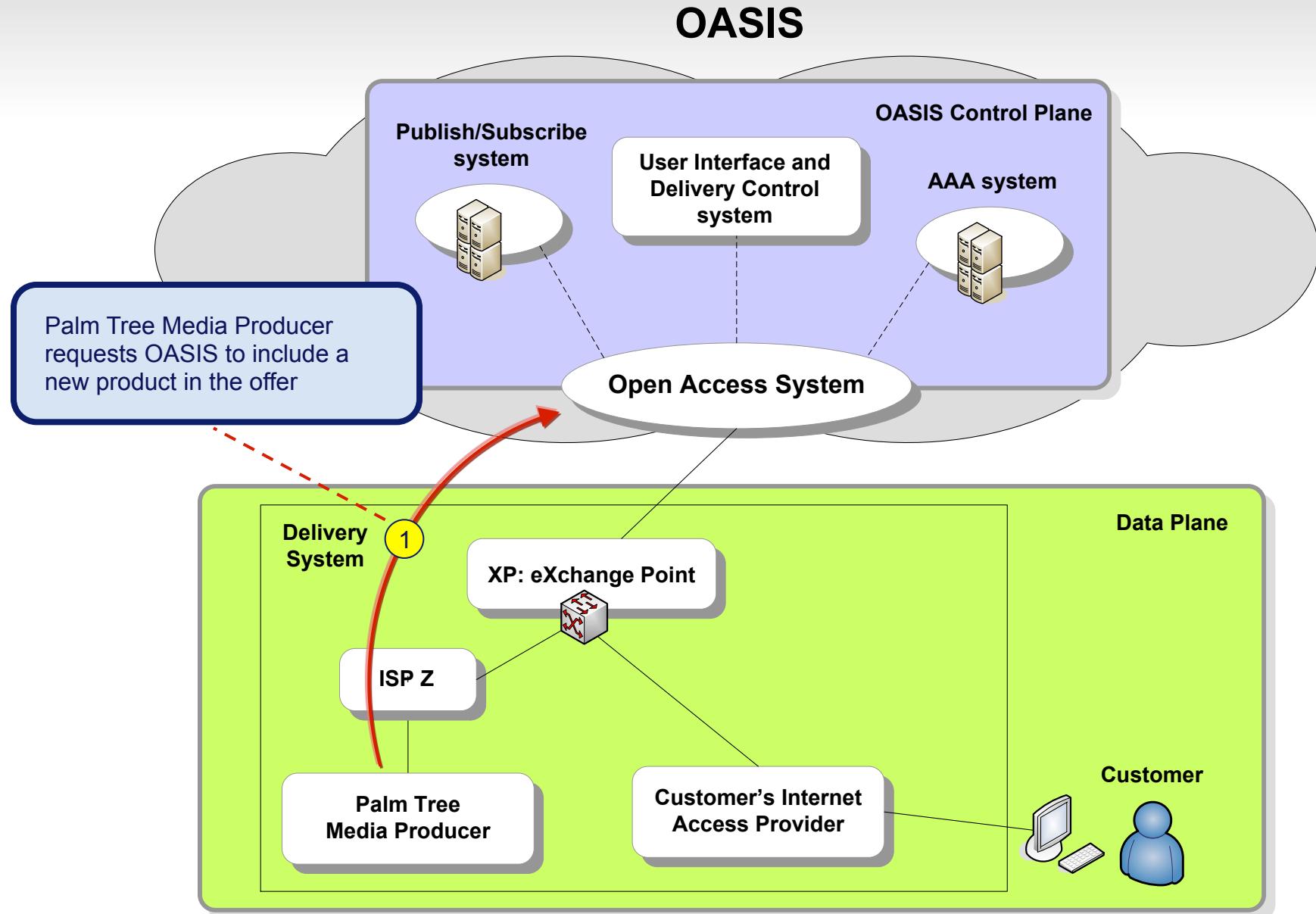
# OASIS features: inside the OASIS cloud



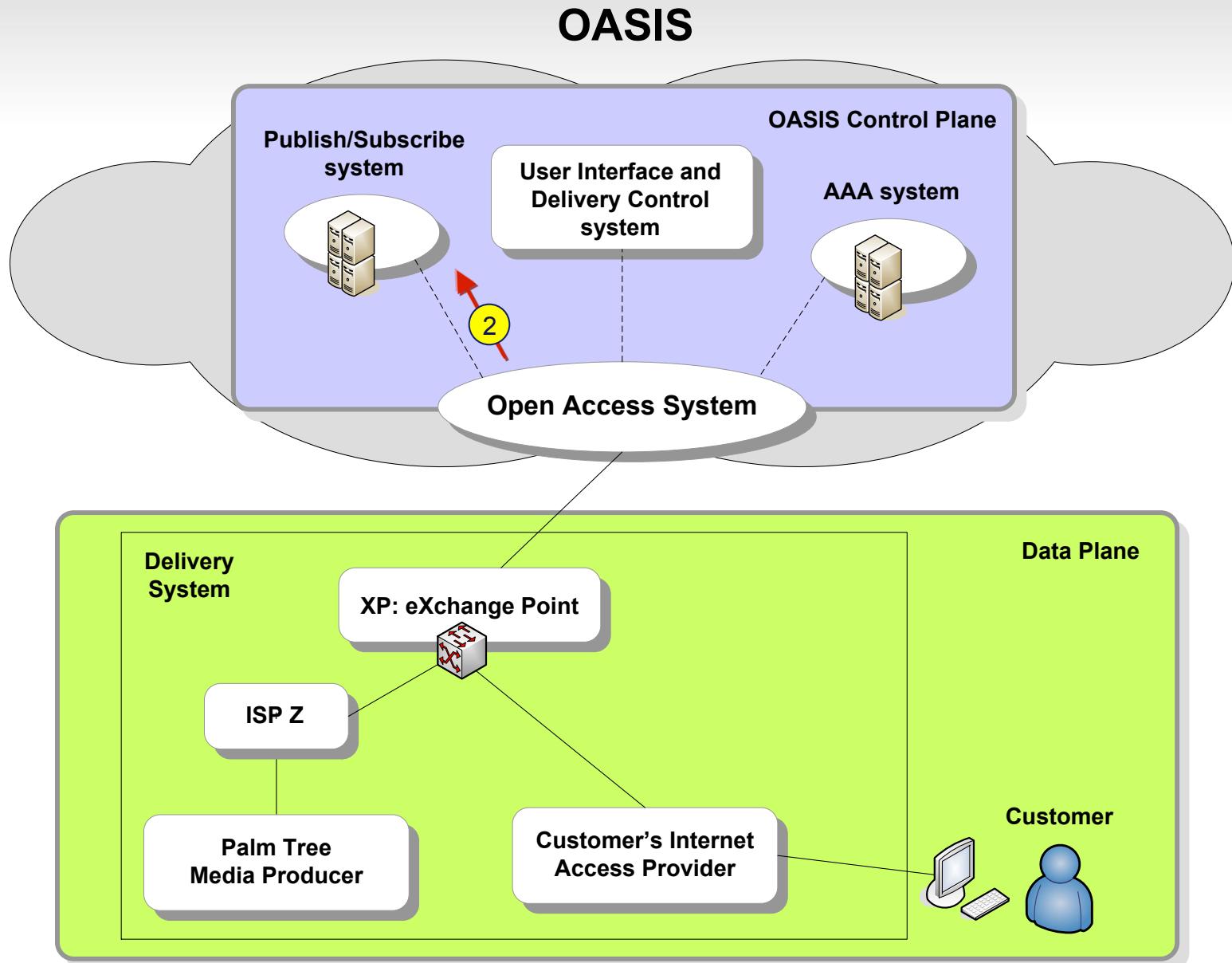
# Offer of digital media



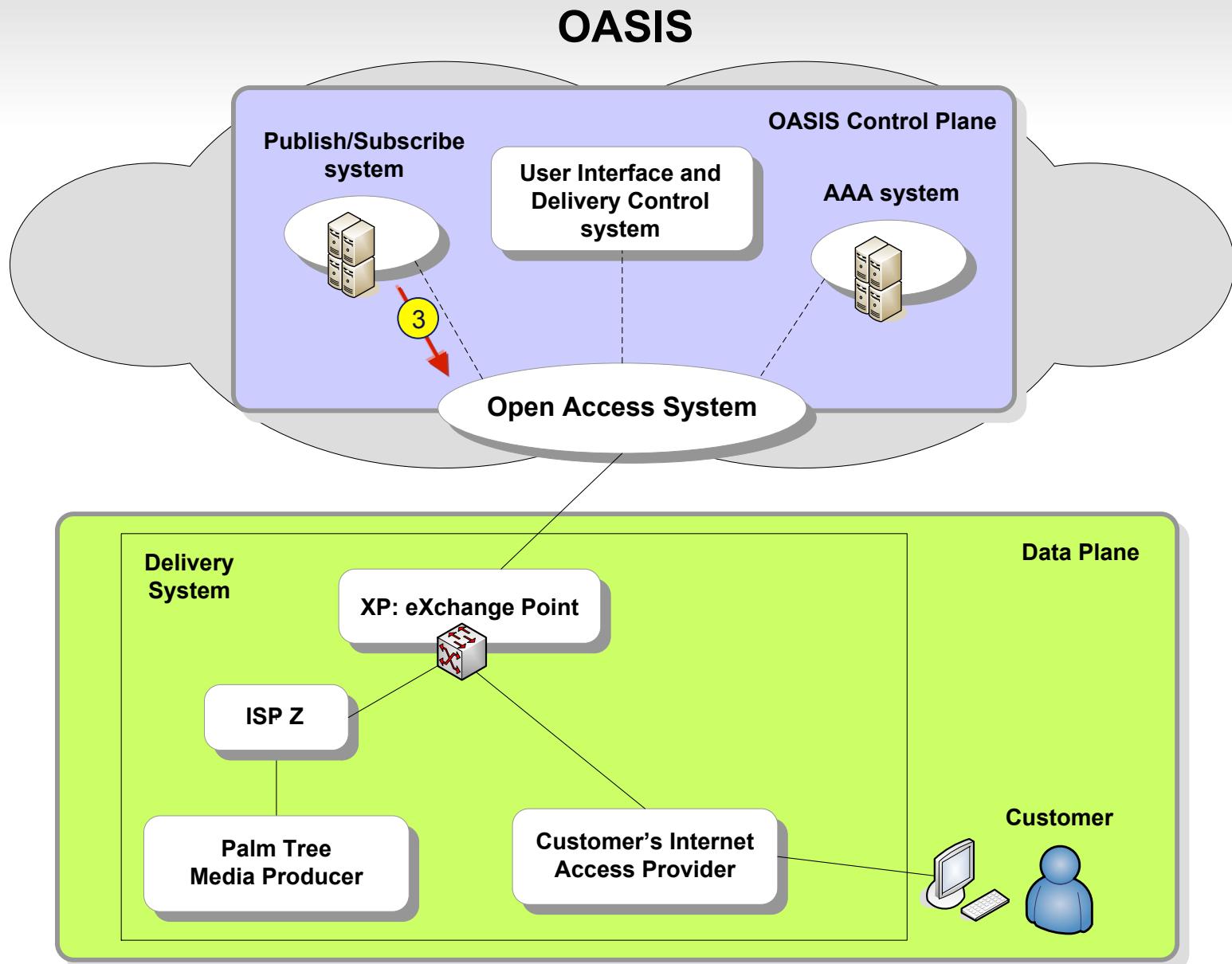
# Offer of digital media



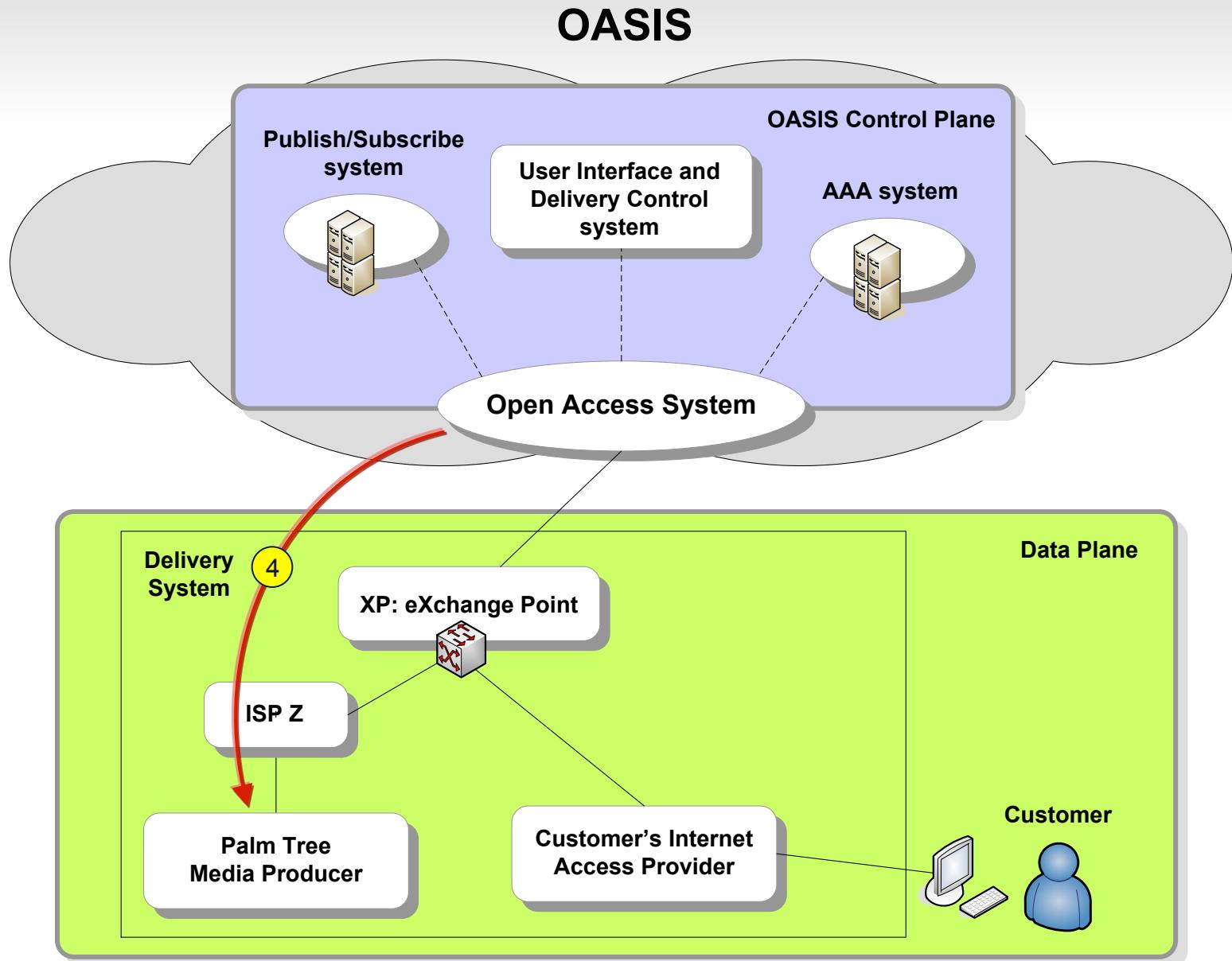
# Offer of digital media



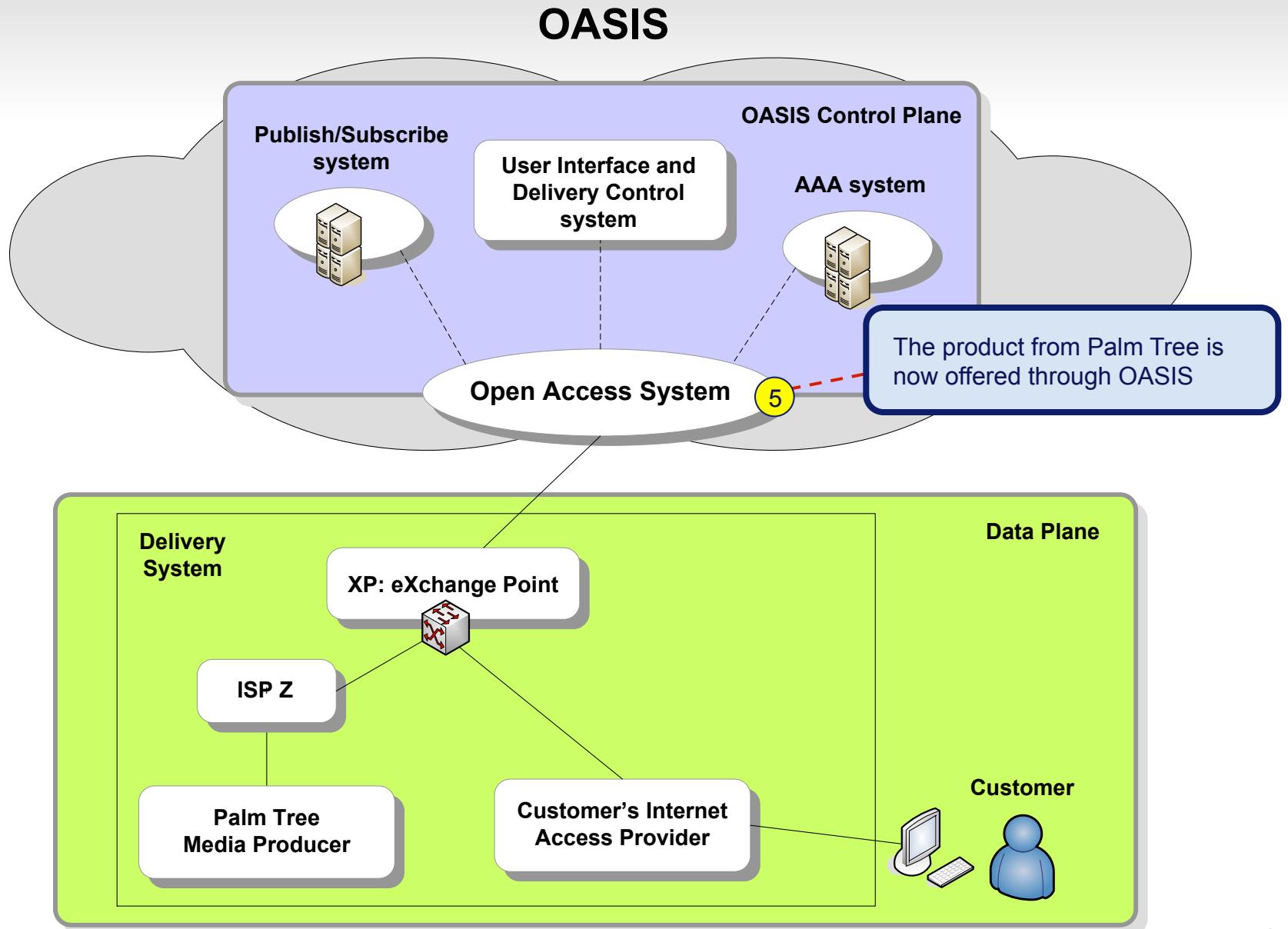
# Offer of digital media



# Offer of digital media

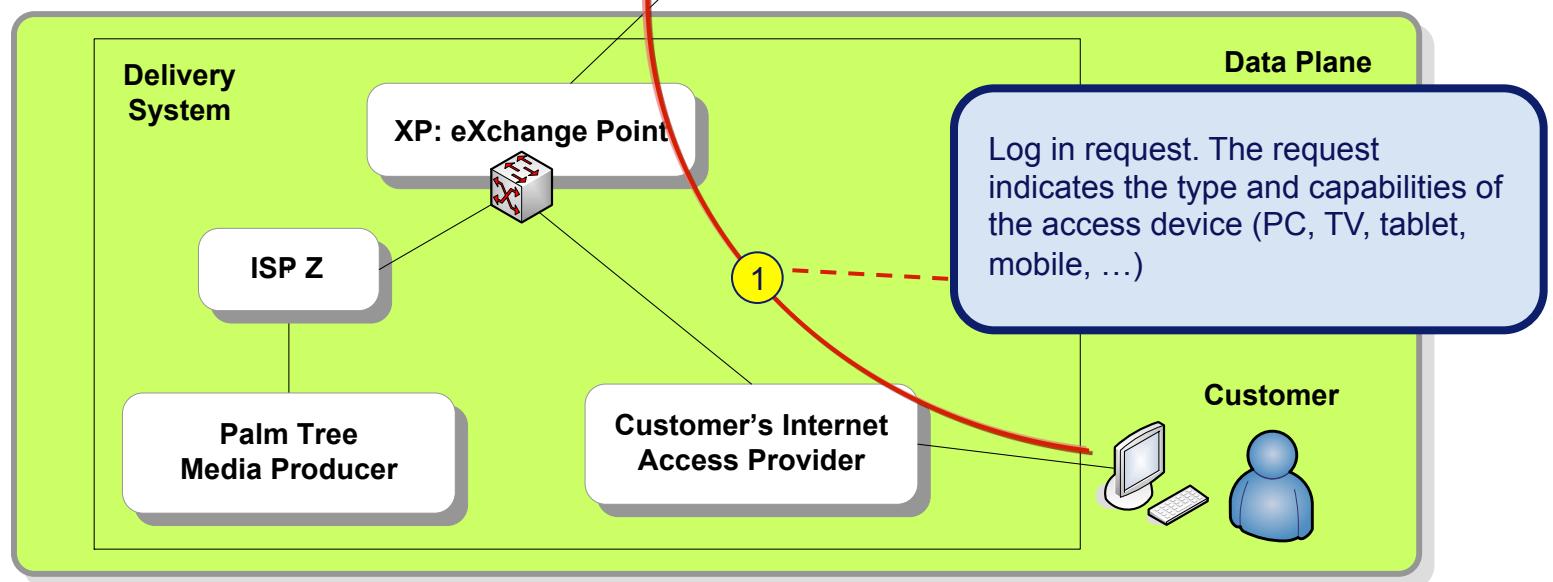
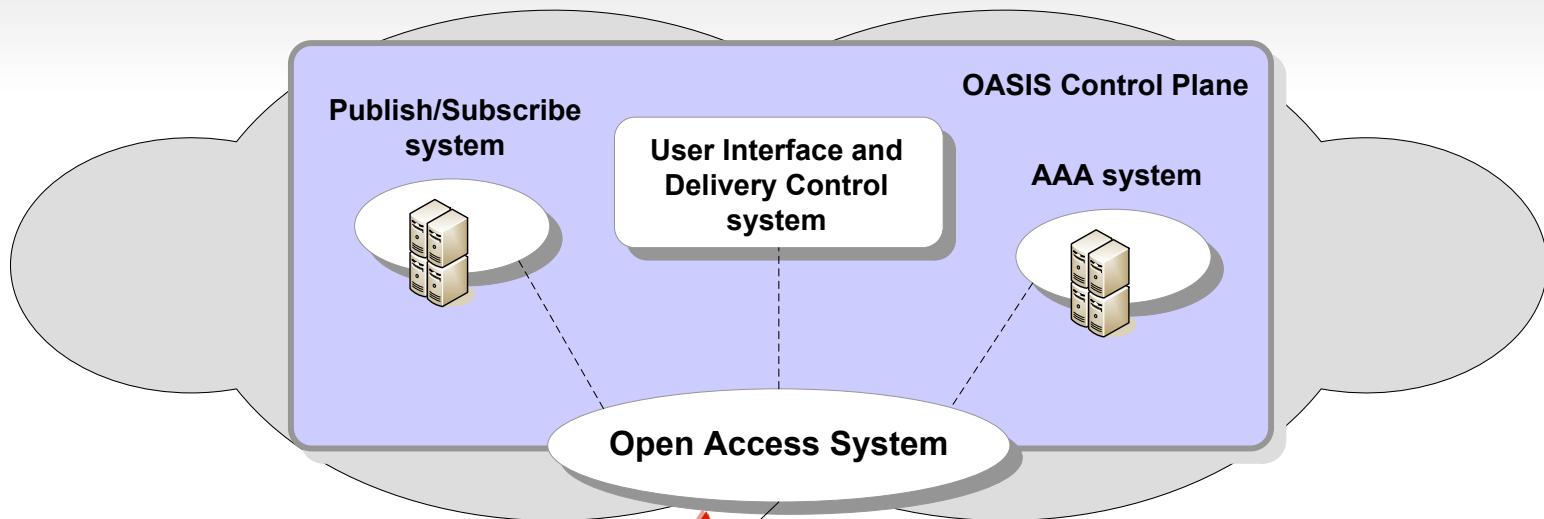


# Offer of digital media



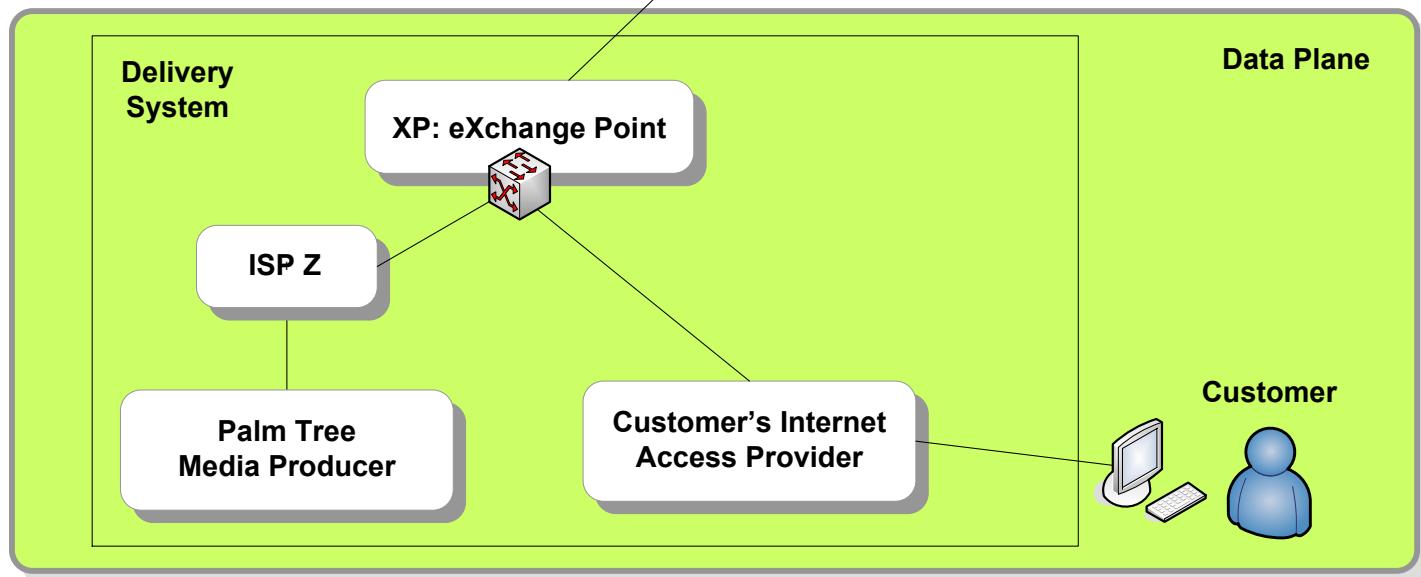
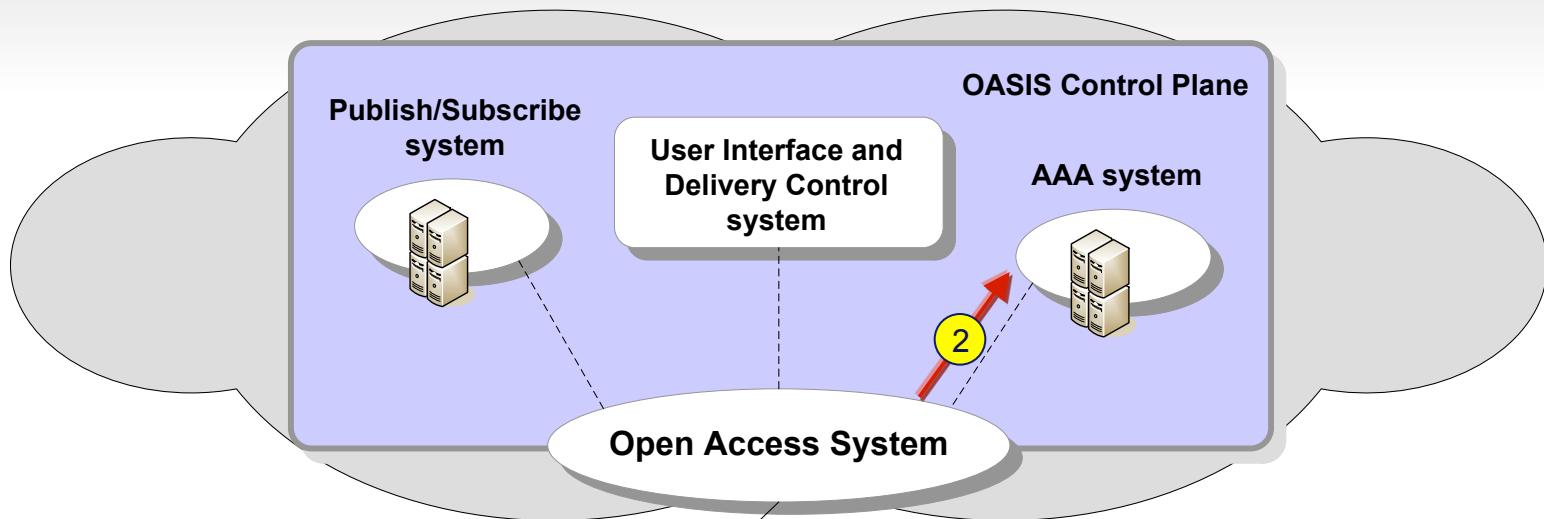
# Access to the offer

## OASIS



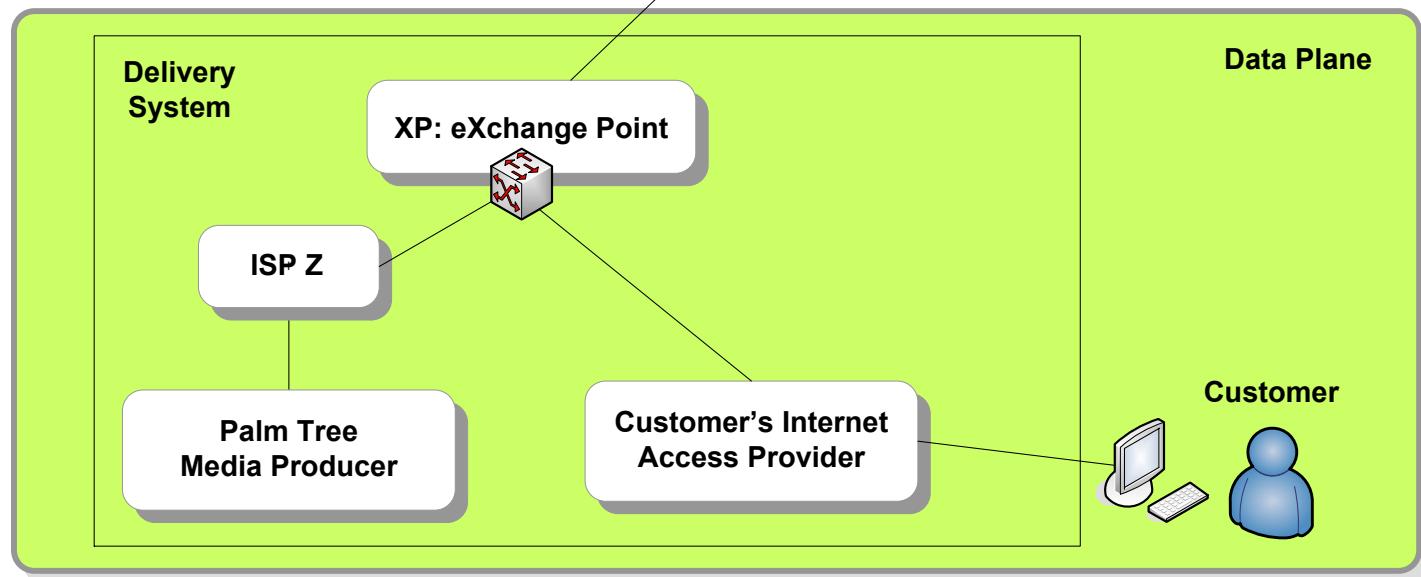
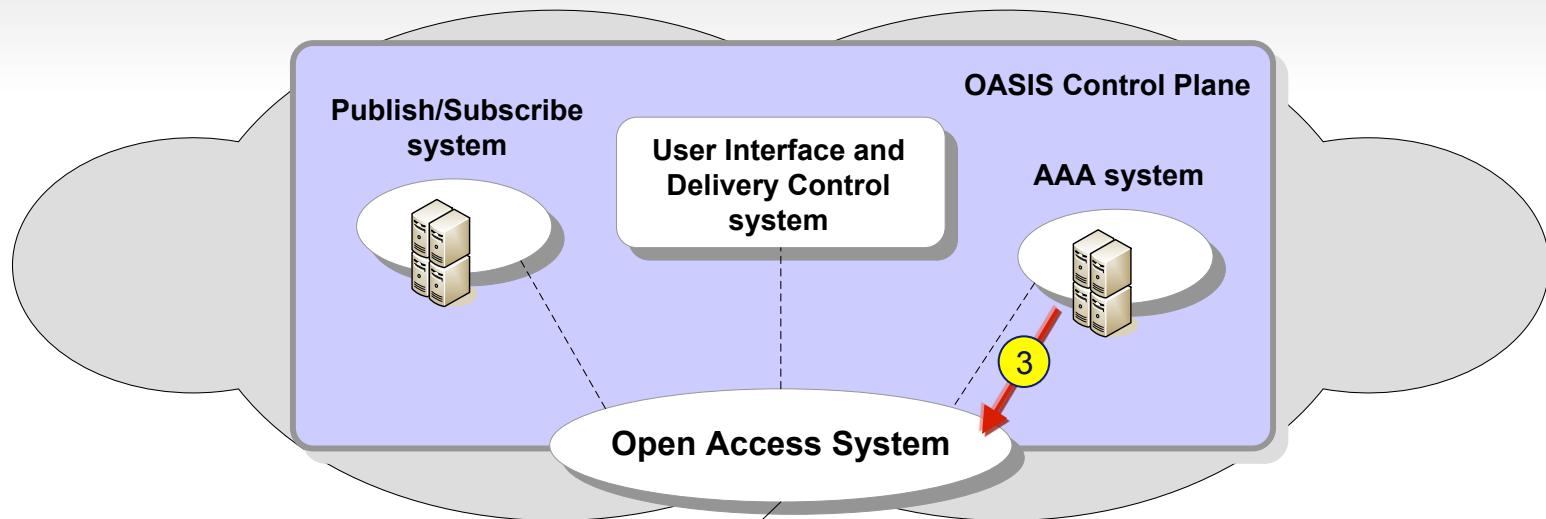
# Access to the offer

## OASIS



# Access to the offer

## OASIS

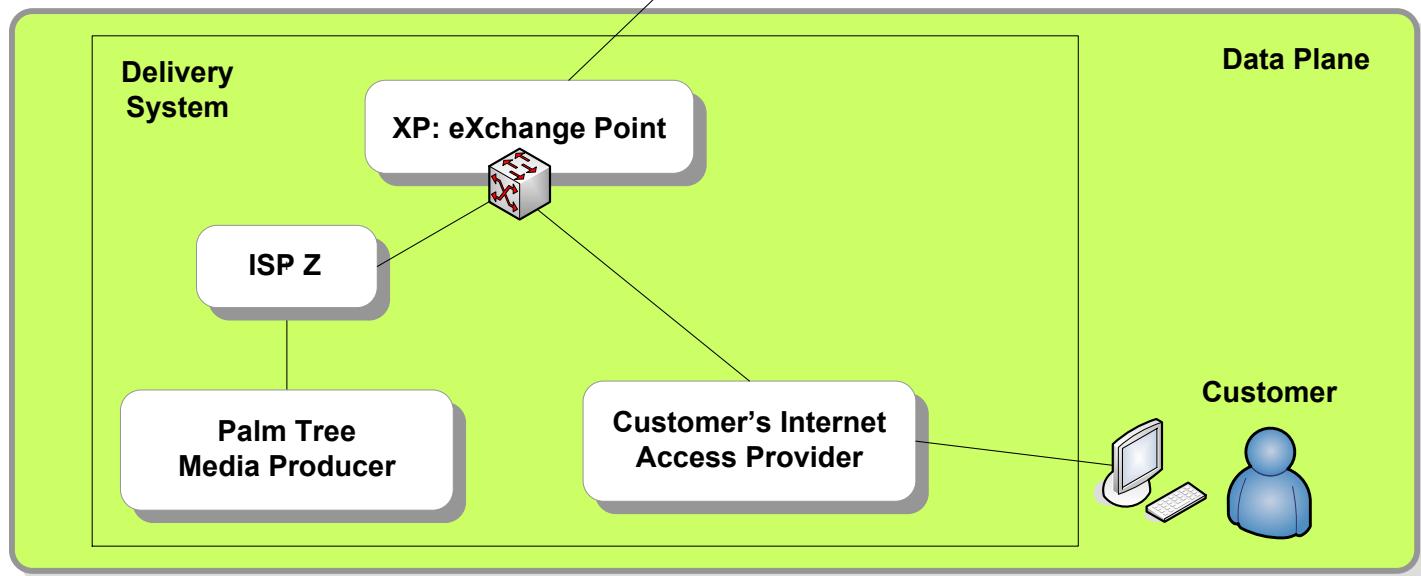
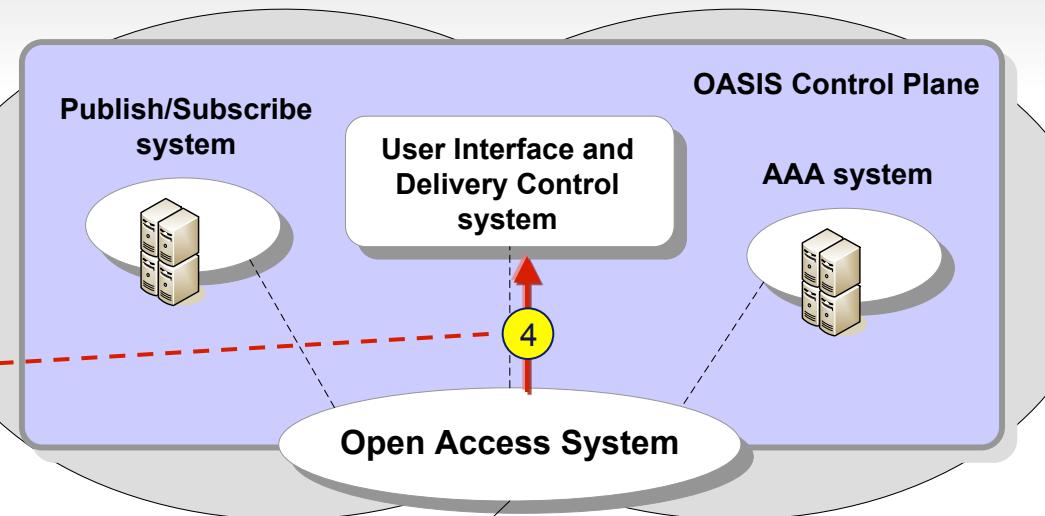


# Access to the offer

## OASIS

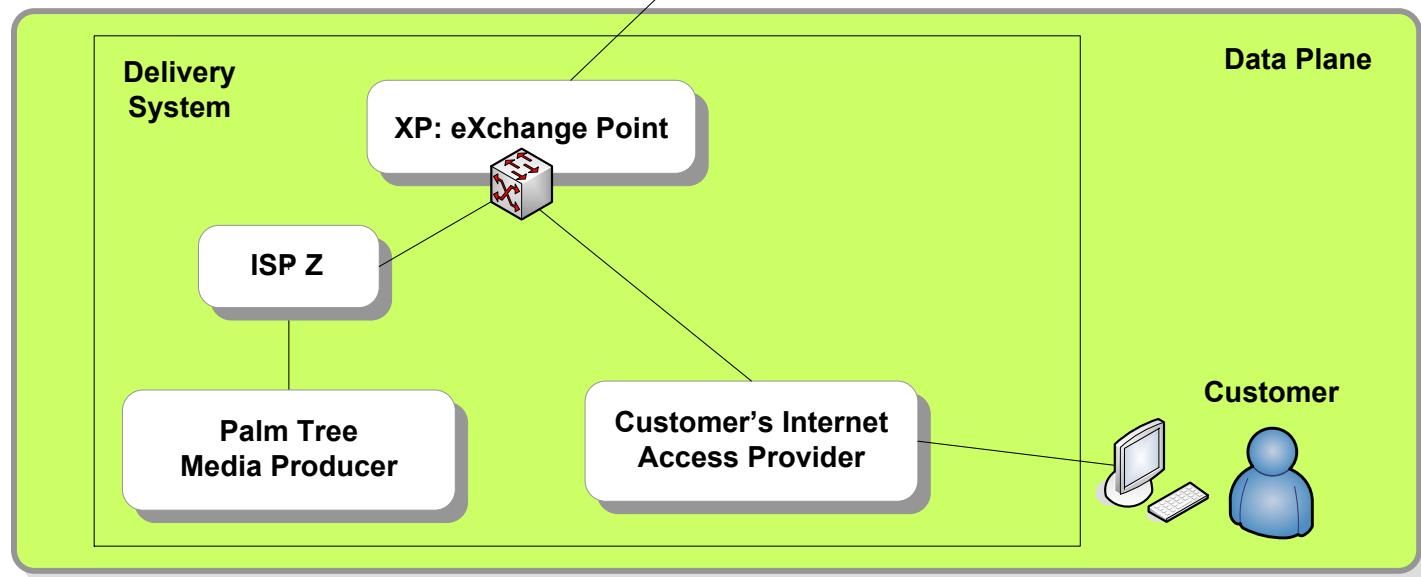
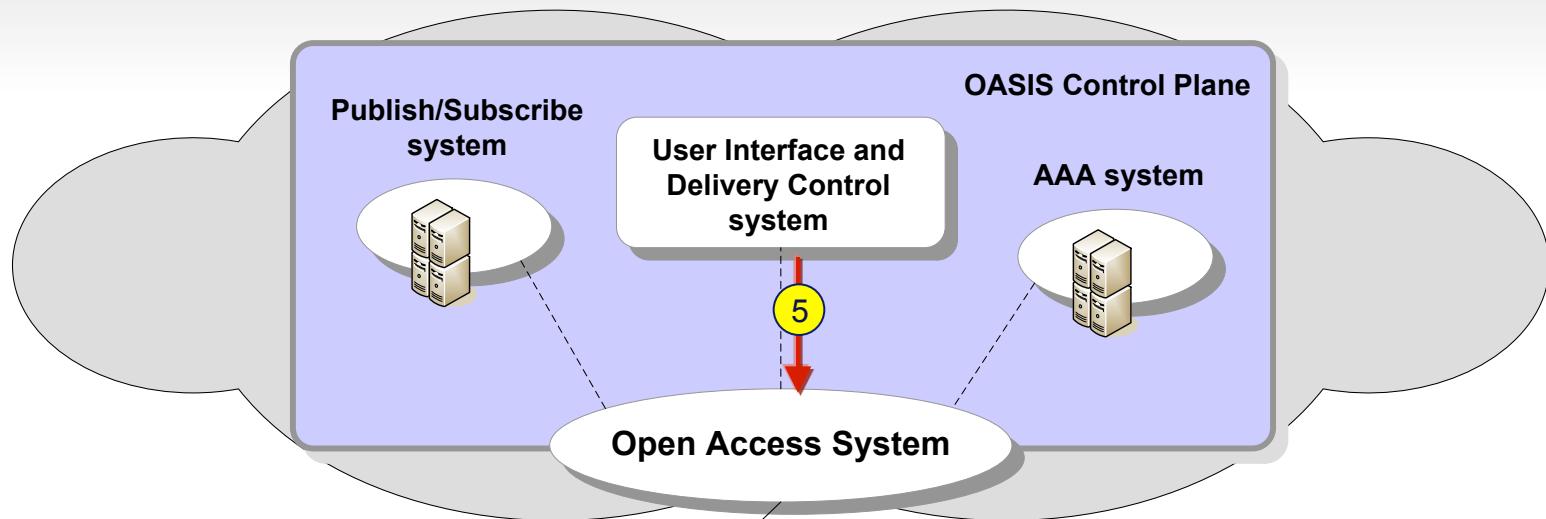
Requests:

1. Status and content pending to be delivered
2. The personal interface, adapted to the capabilities of the access device



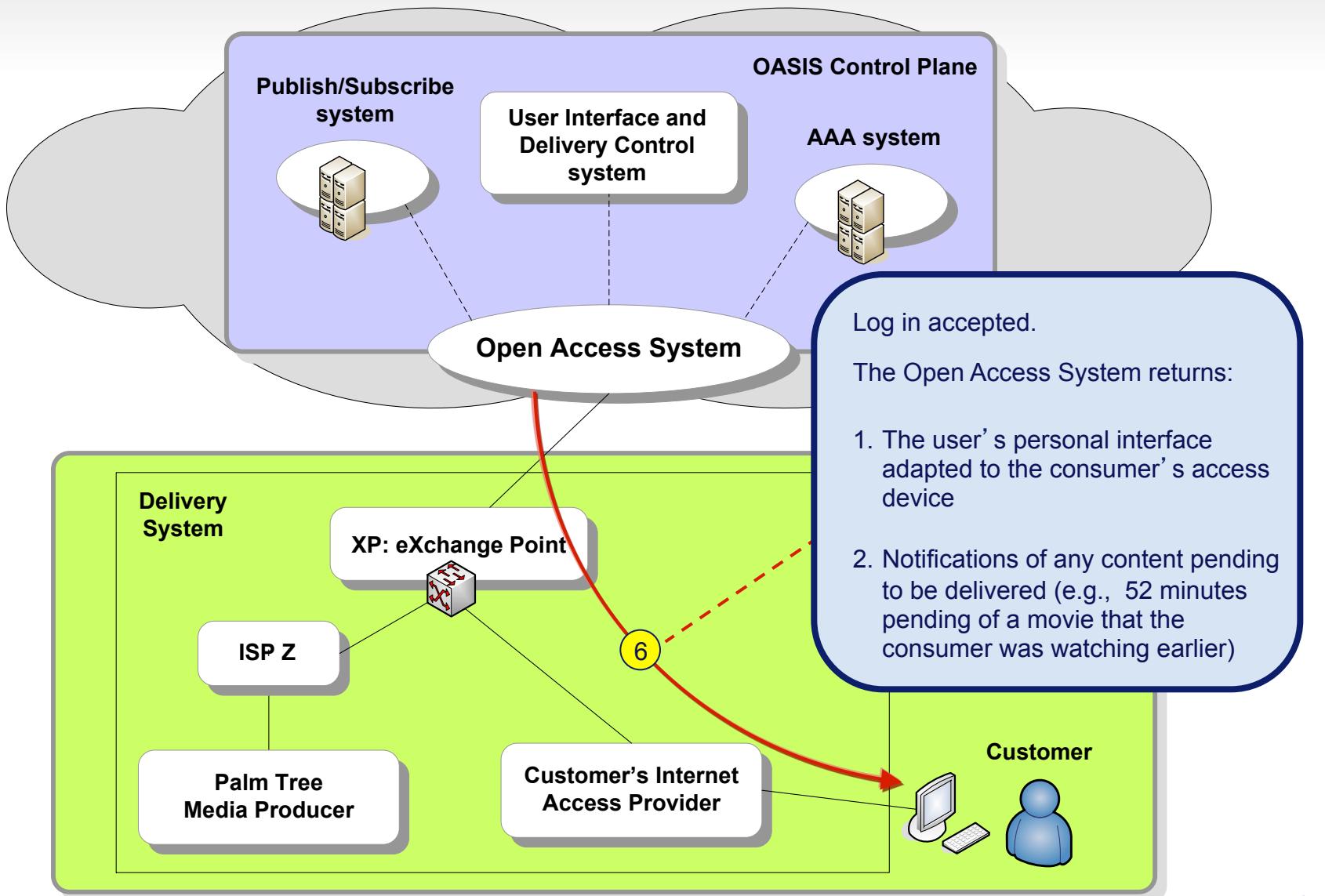
# Access to the offer

## OASIS



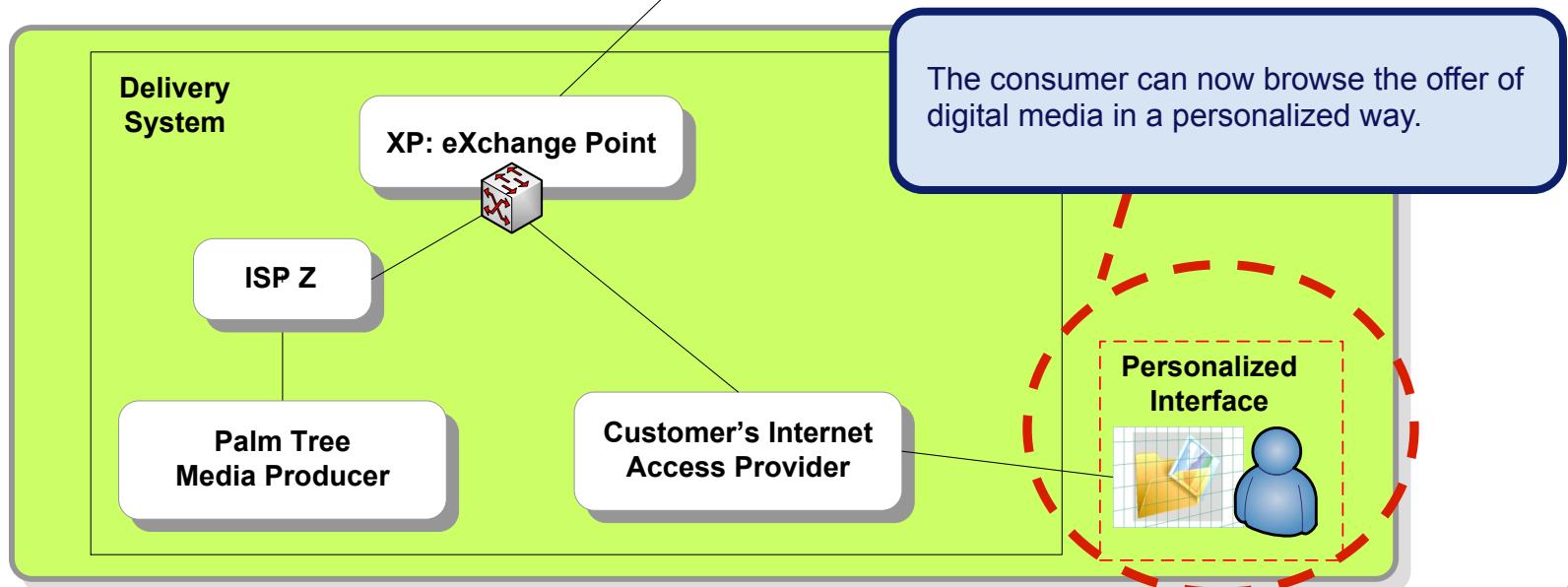
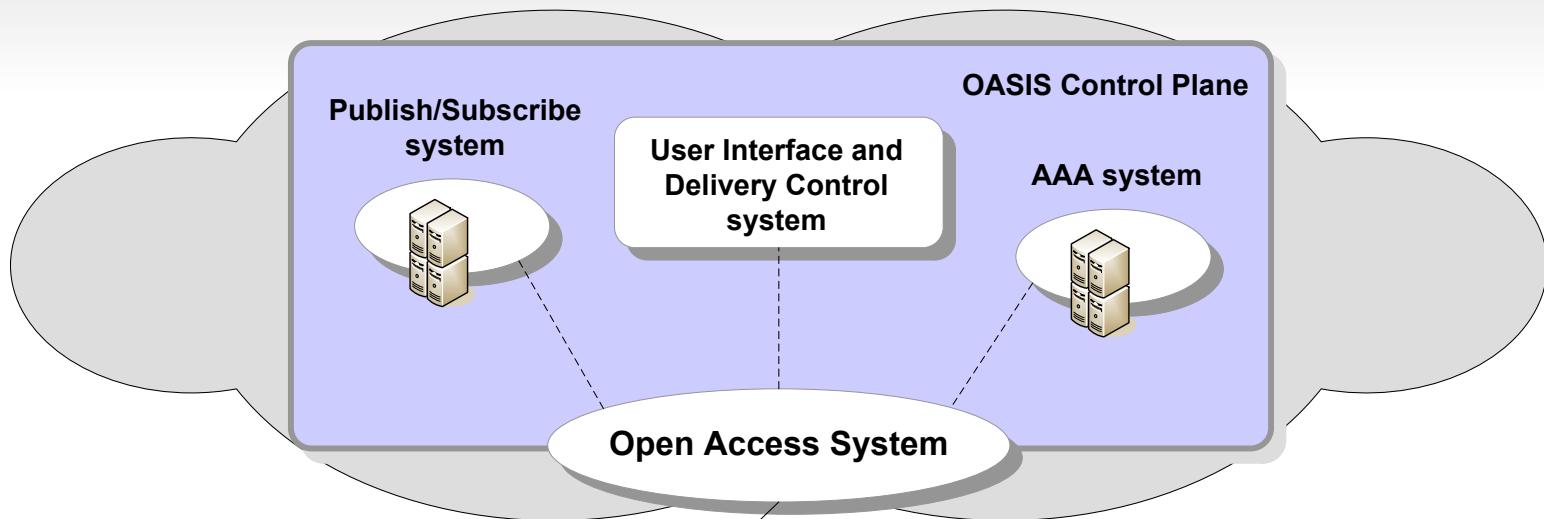
# Access to the offer

## OASIS

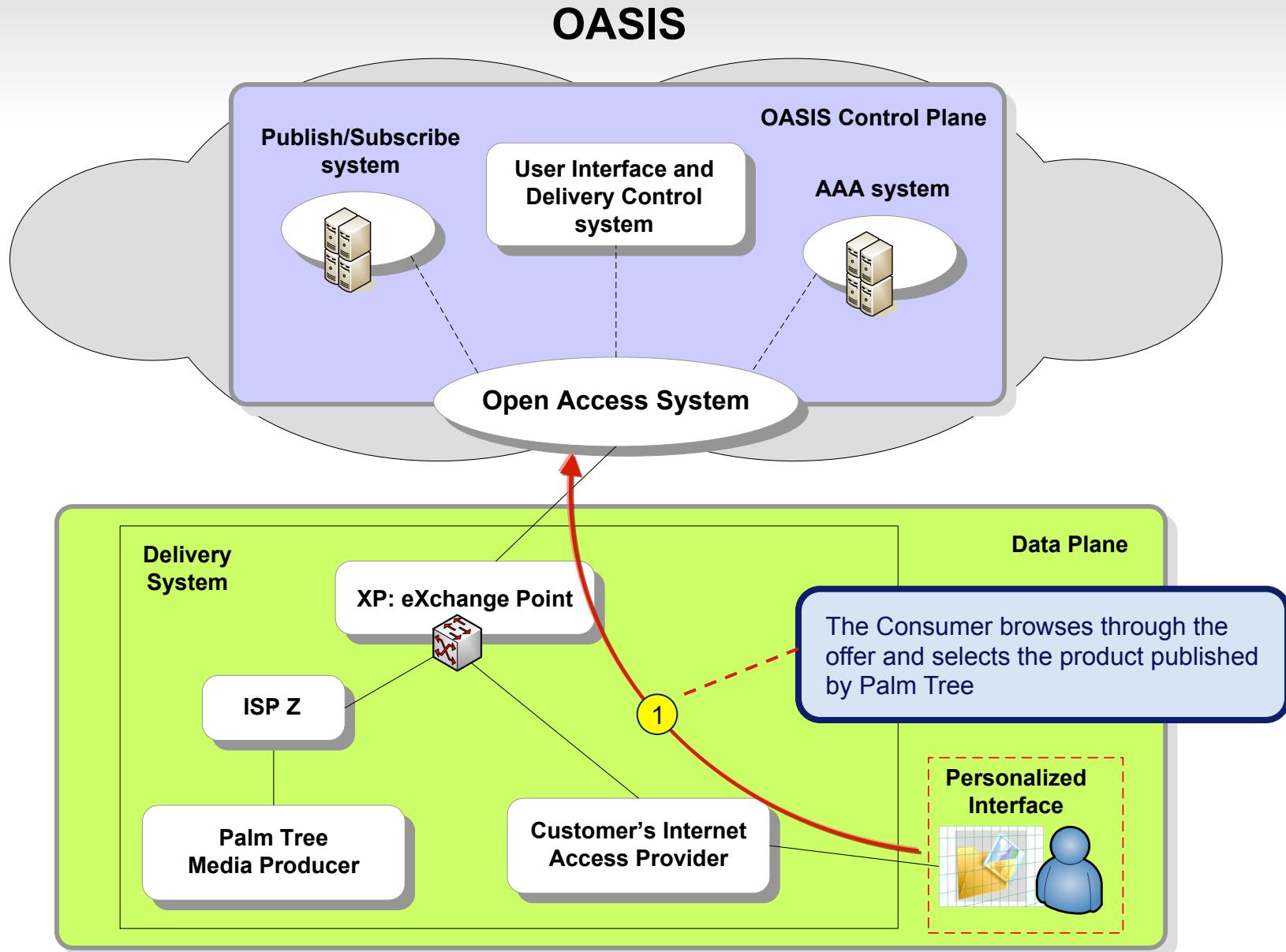


# Access to the offer

## OASIS



# Delivery of digital media

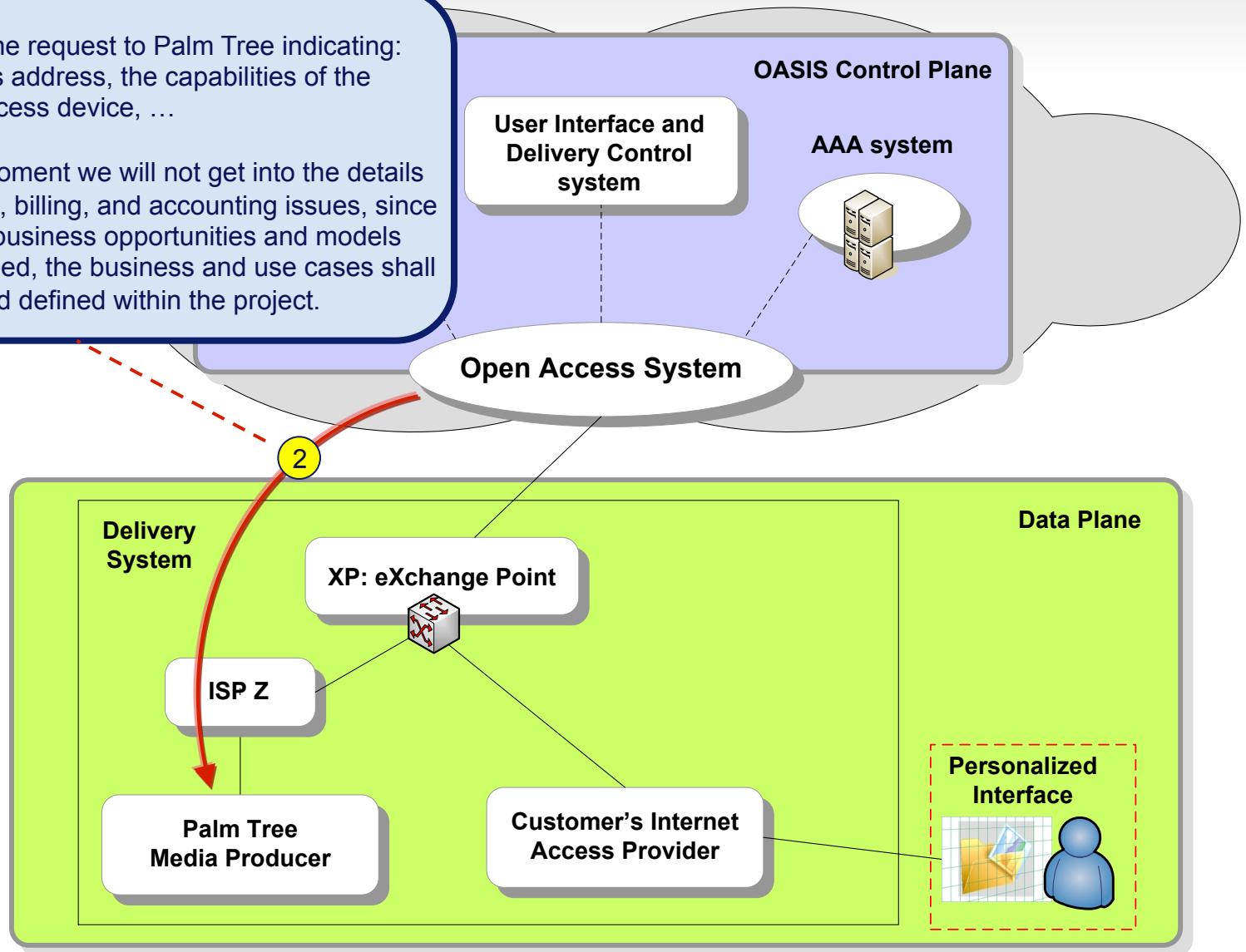


# Delivery of digital media

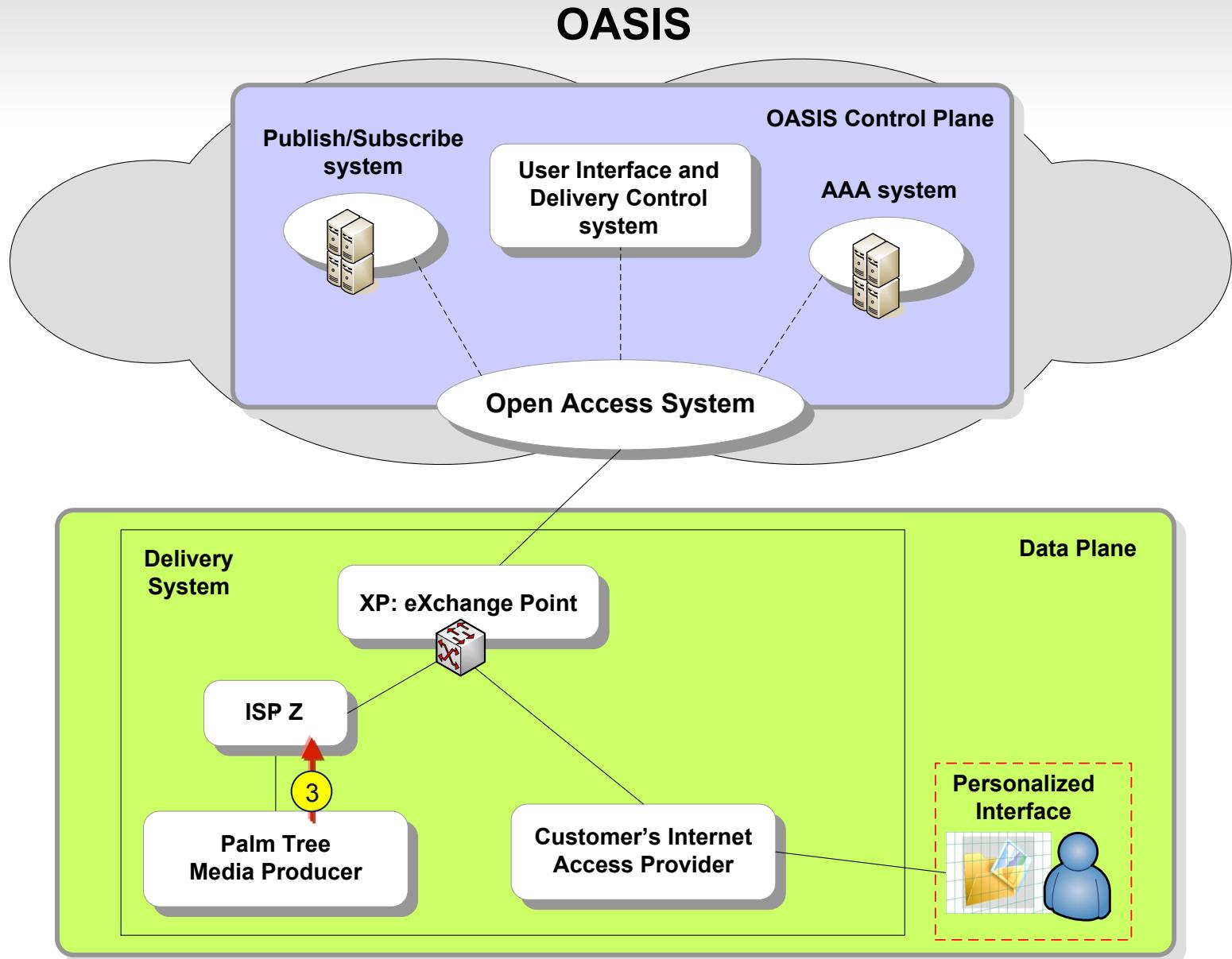
## OASIS

OASIS sends the request to Palm Tree indicating: the consumer's address, the capabilities of the consumer's access device, ...

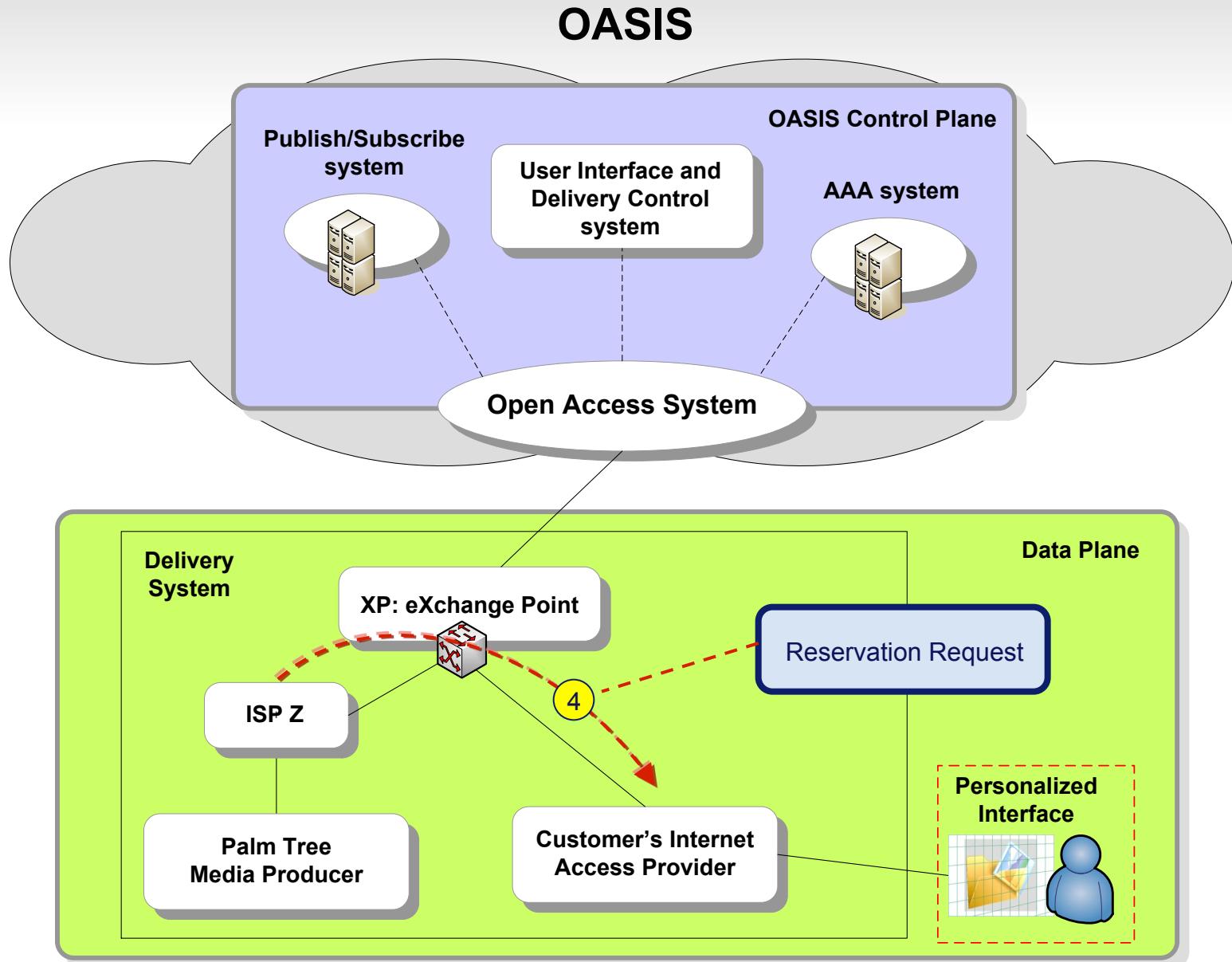
**Note:** for the moment we will not get into the details of the purchase, billing, and accounting issues, since many different business opportunities and models arise here. Indeed, the business and use cases shall be analyzed and defined within the project.



# Delivery of digital media

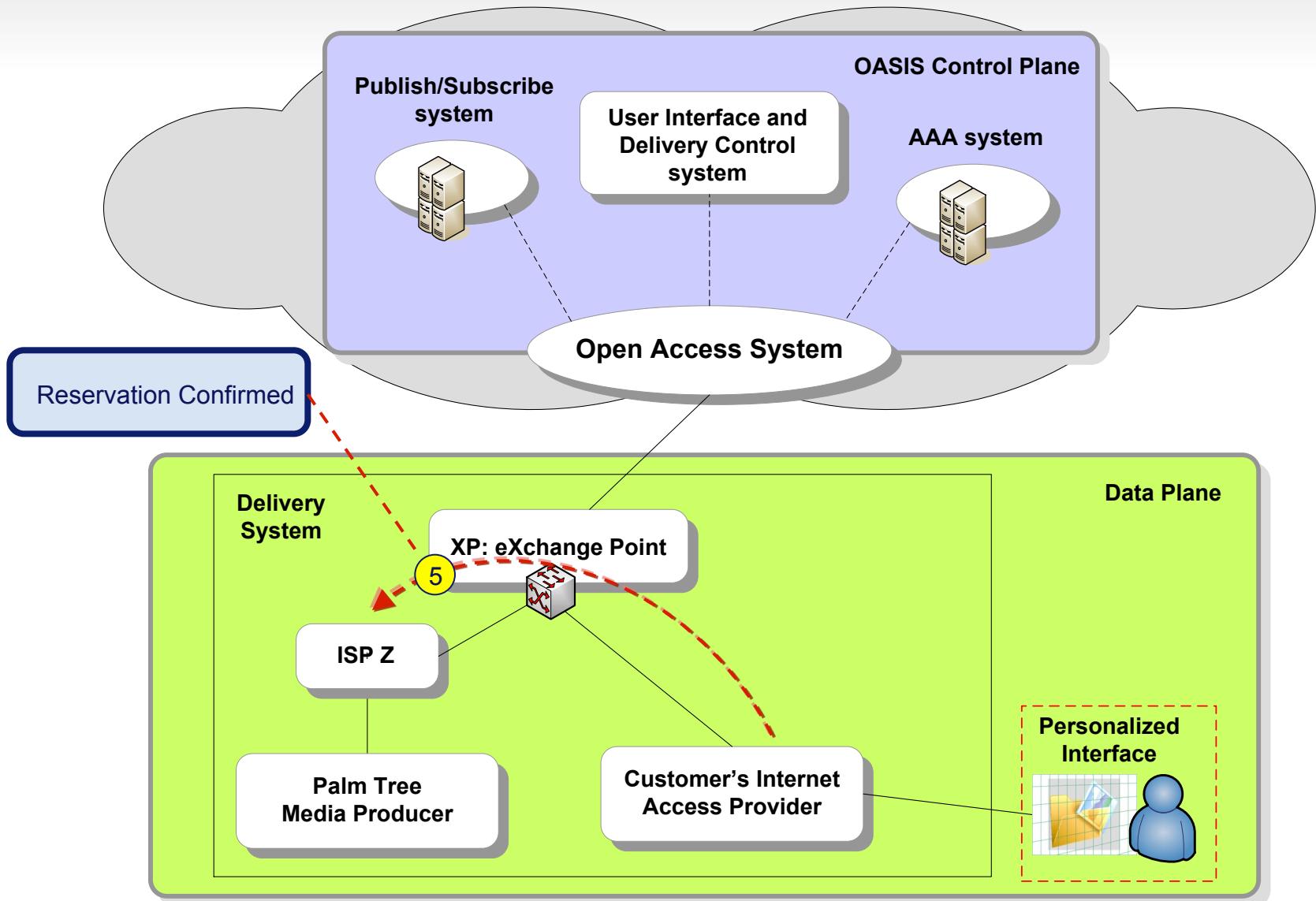


# Delivery of digital media



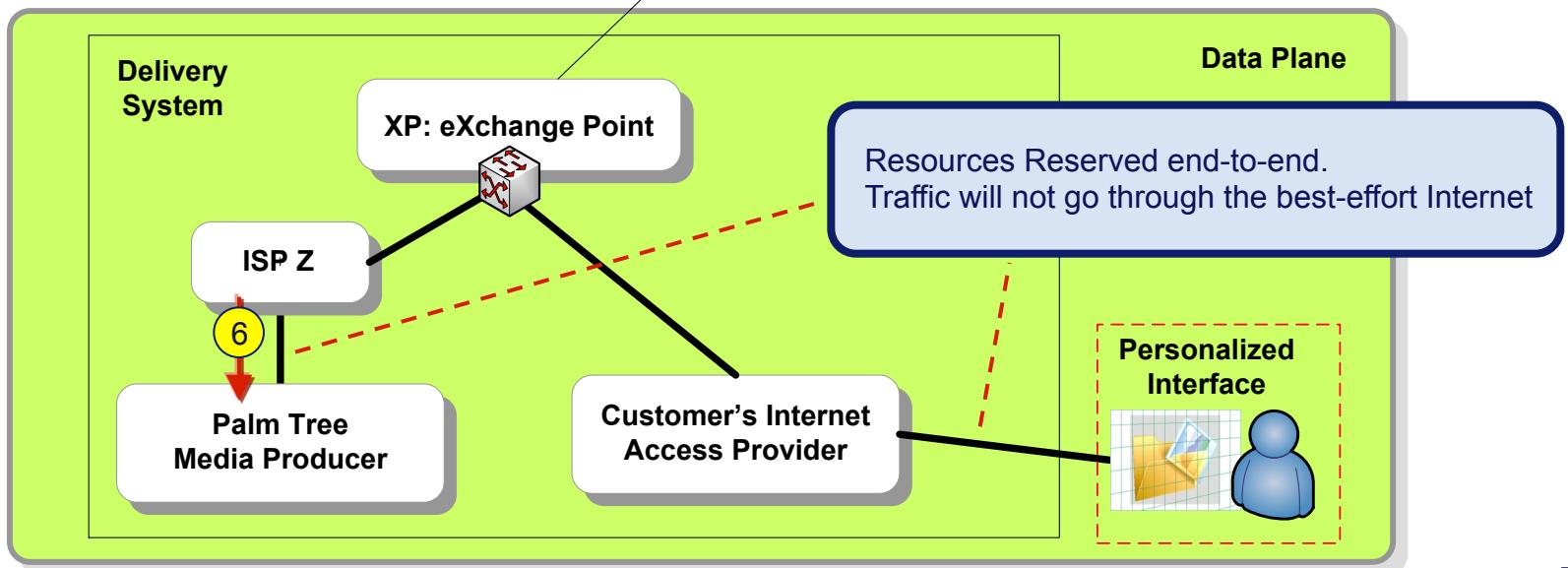
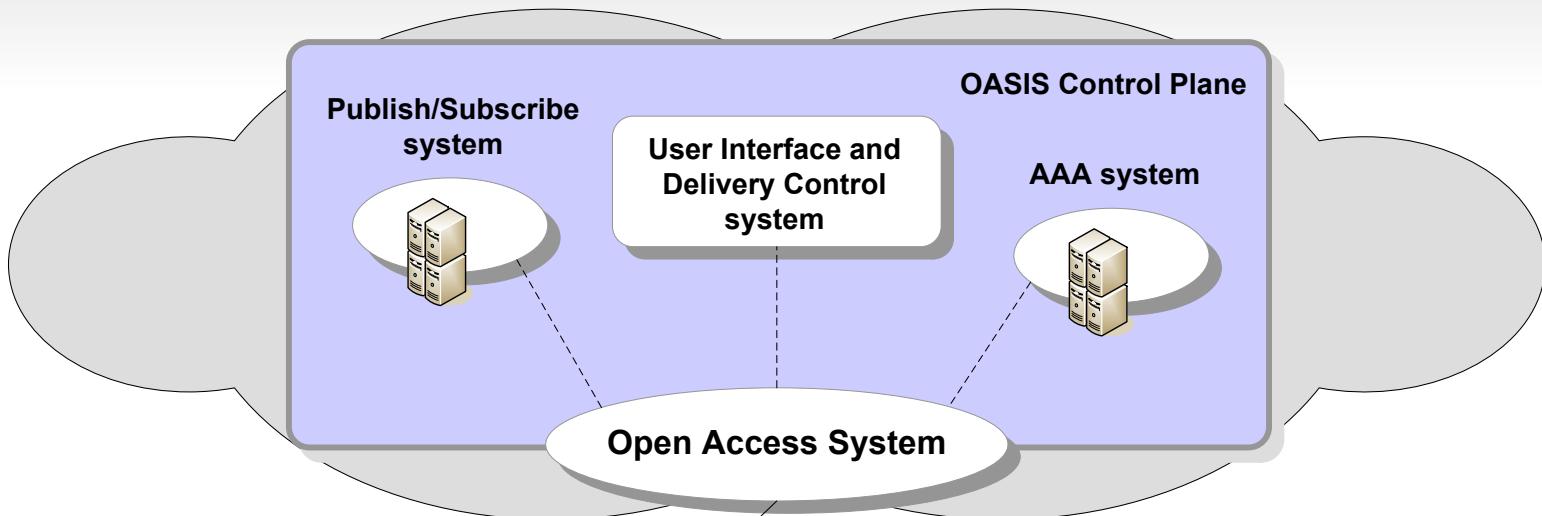
# Delivery of digital media

OASIS



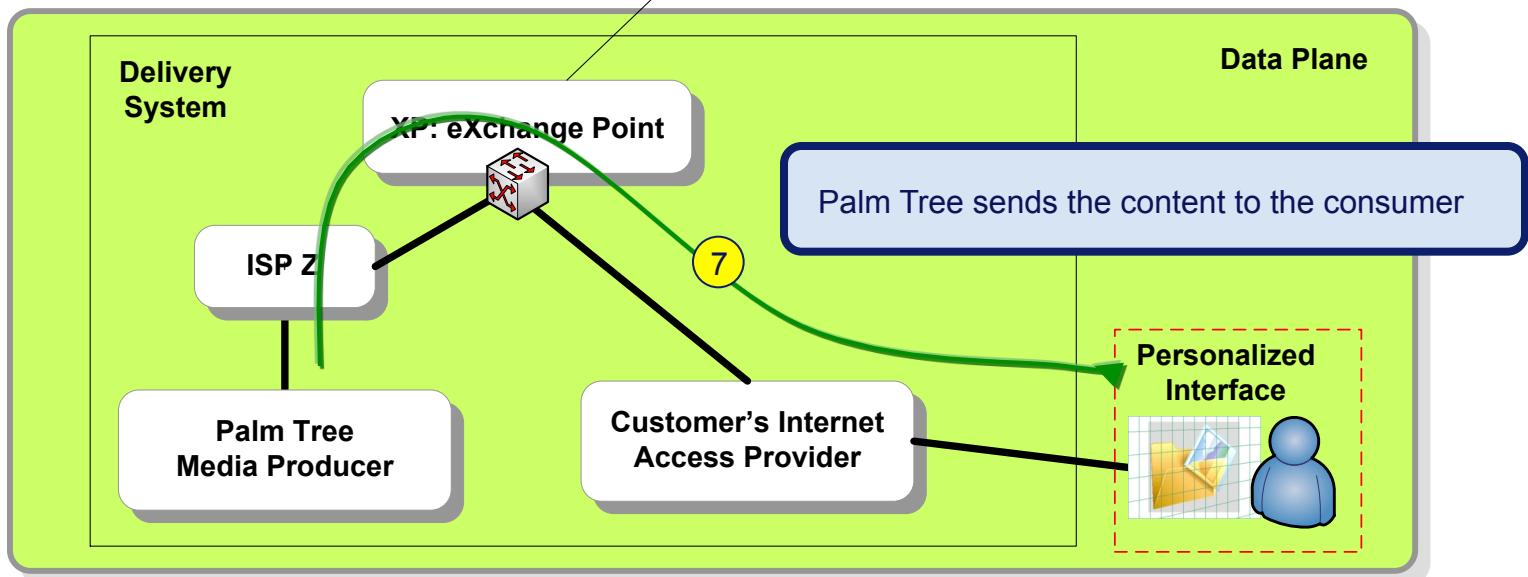
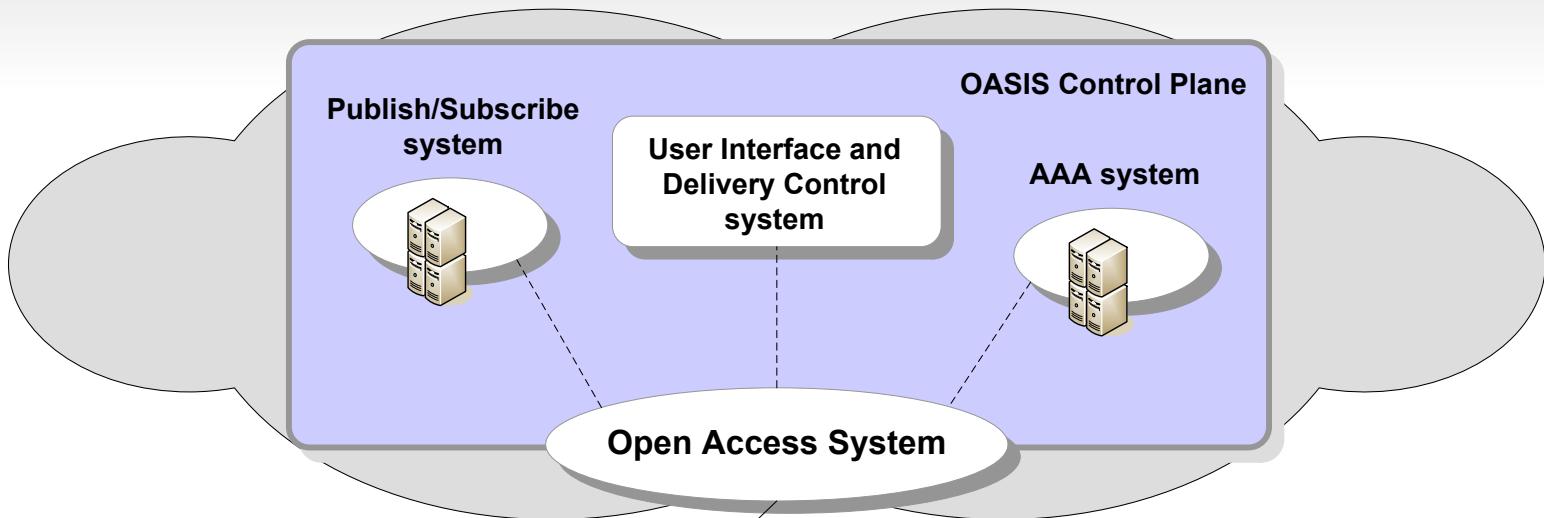
# Delivery of digital media

## OASIS



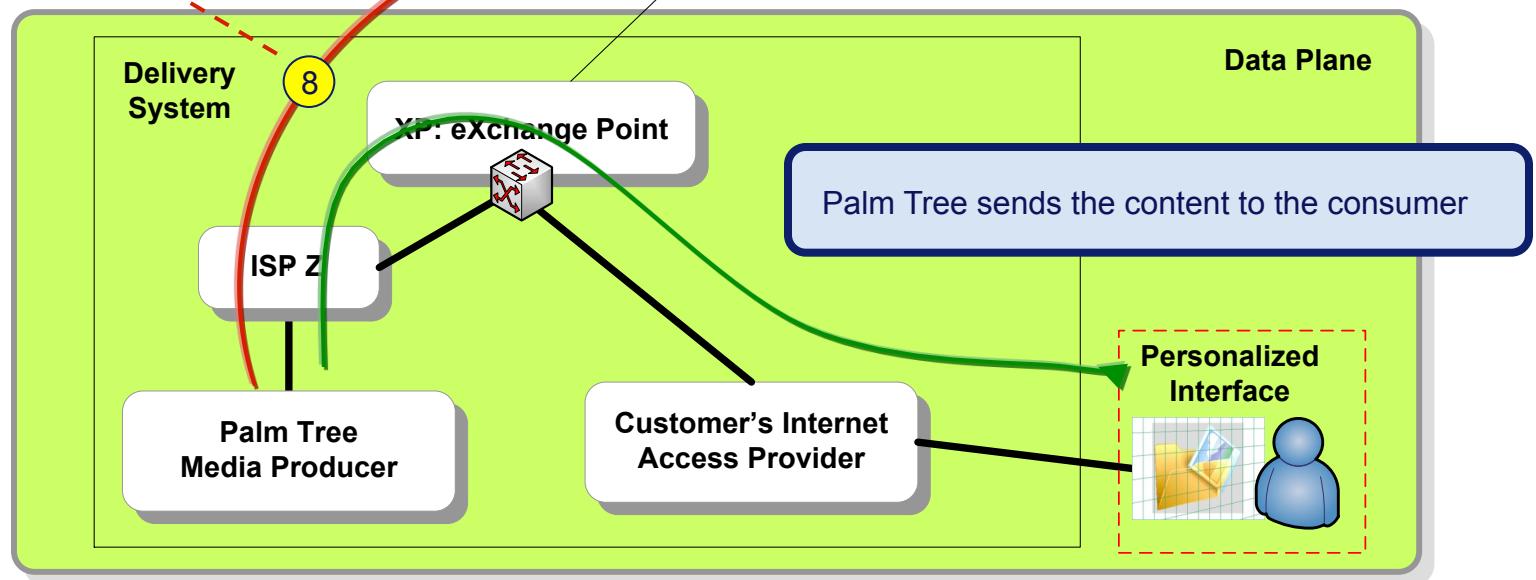
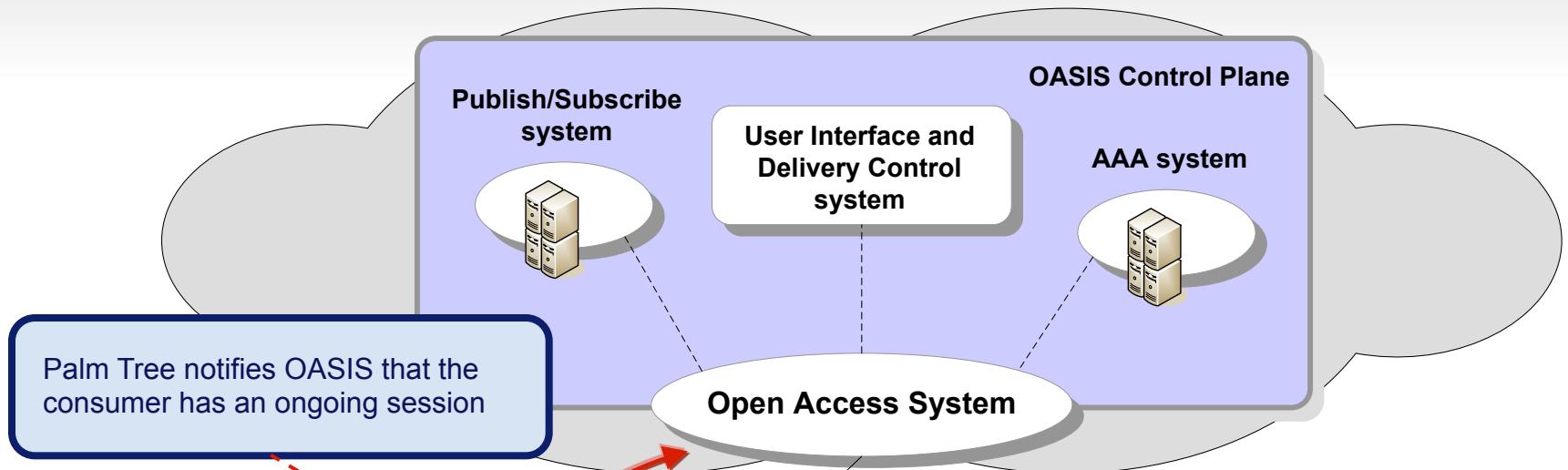
# Delivery of digital media

## OASIS



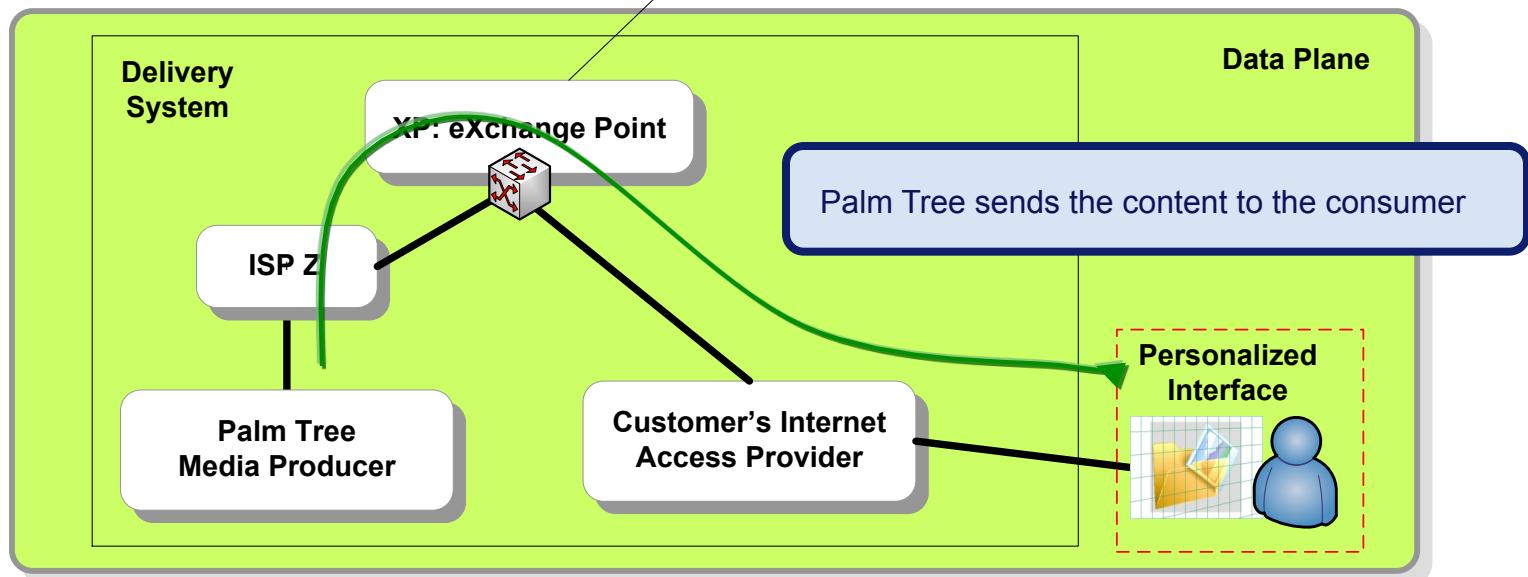
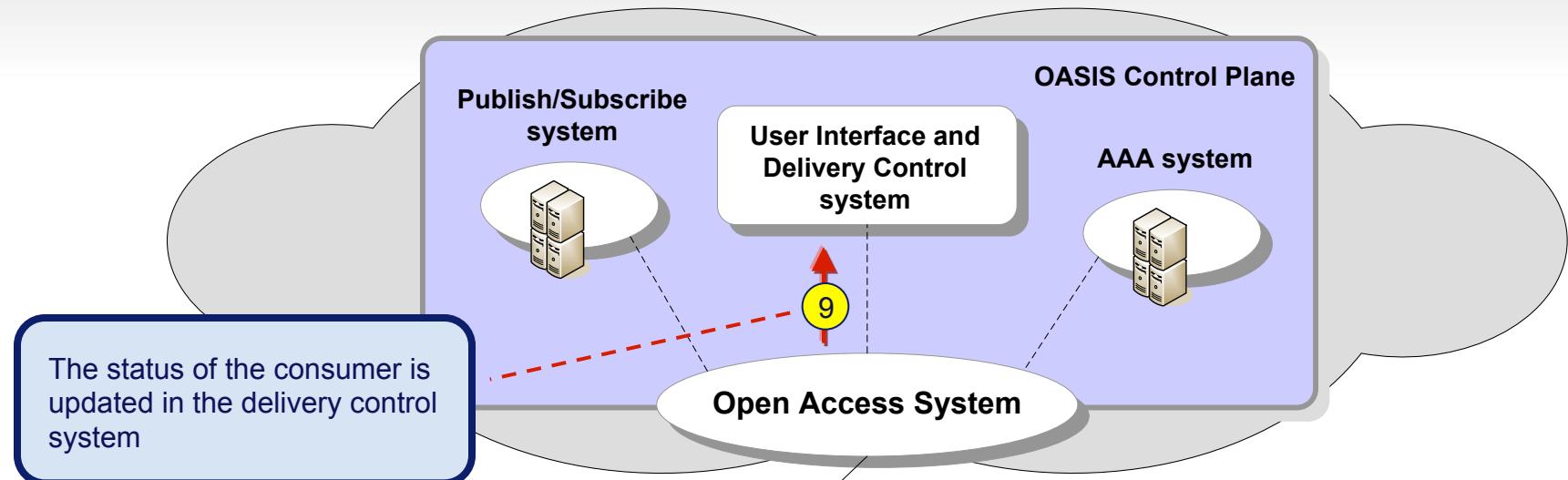
# Delivery of digital media

## OASIS



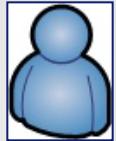
# Delivery of digital media

## OASIS



# OASIS brings new possibilities ...

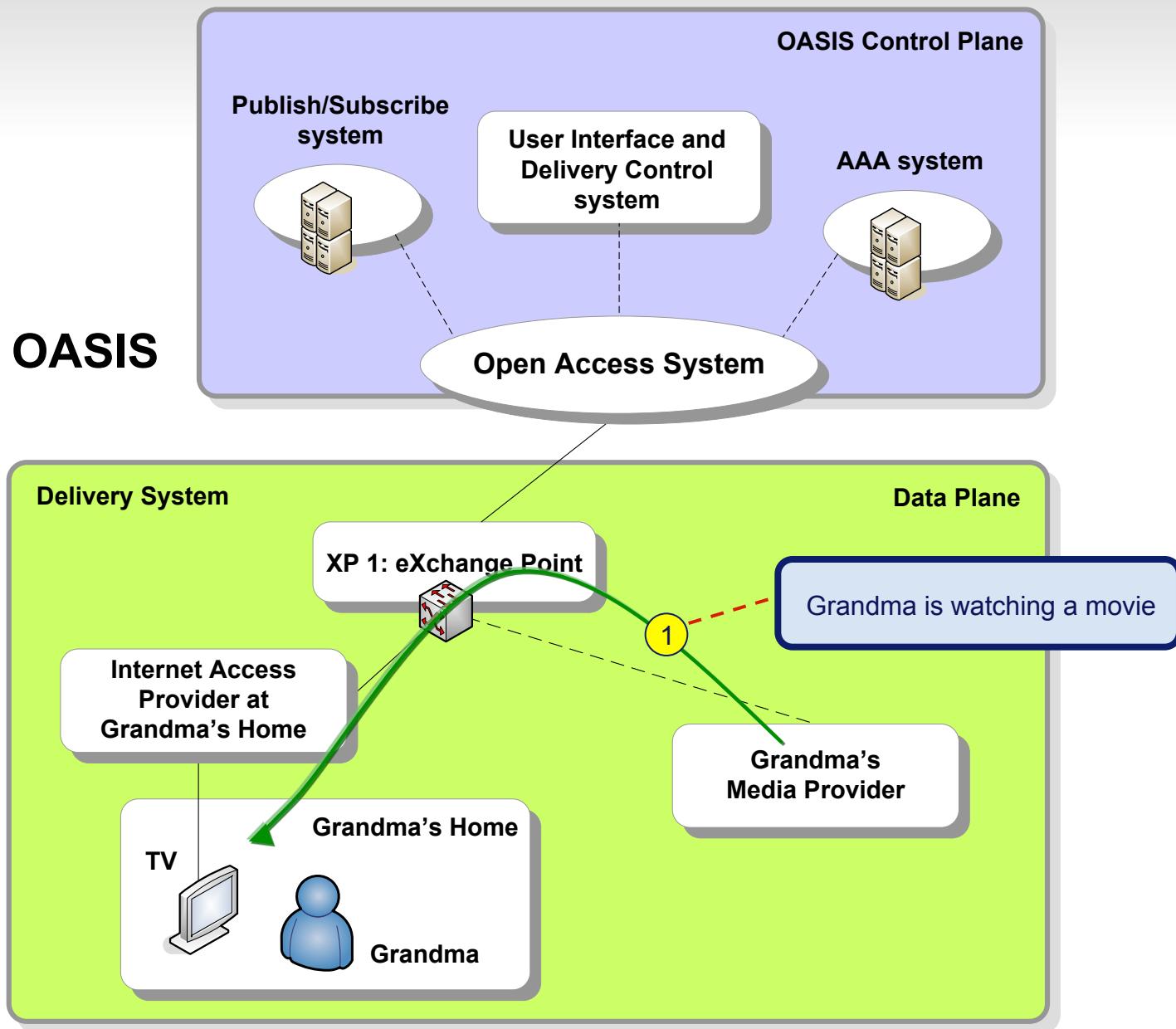
- ❖ Application Layer Handover (anytime/anywhere)
- ❖ Example: entertainment



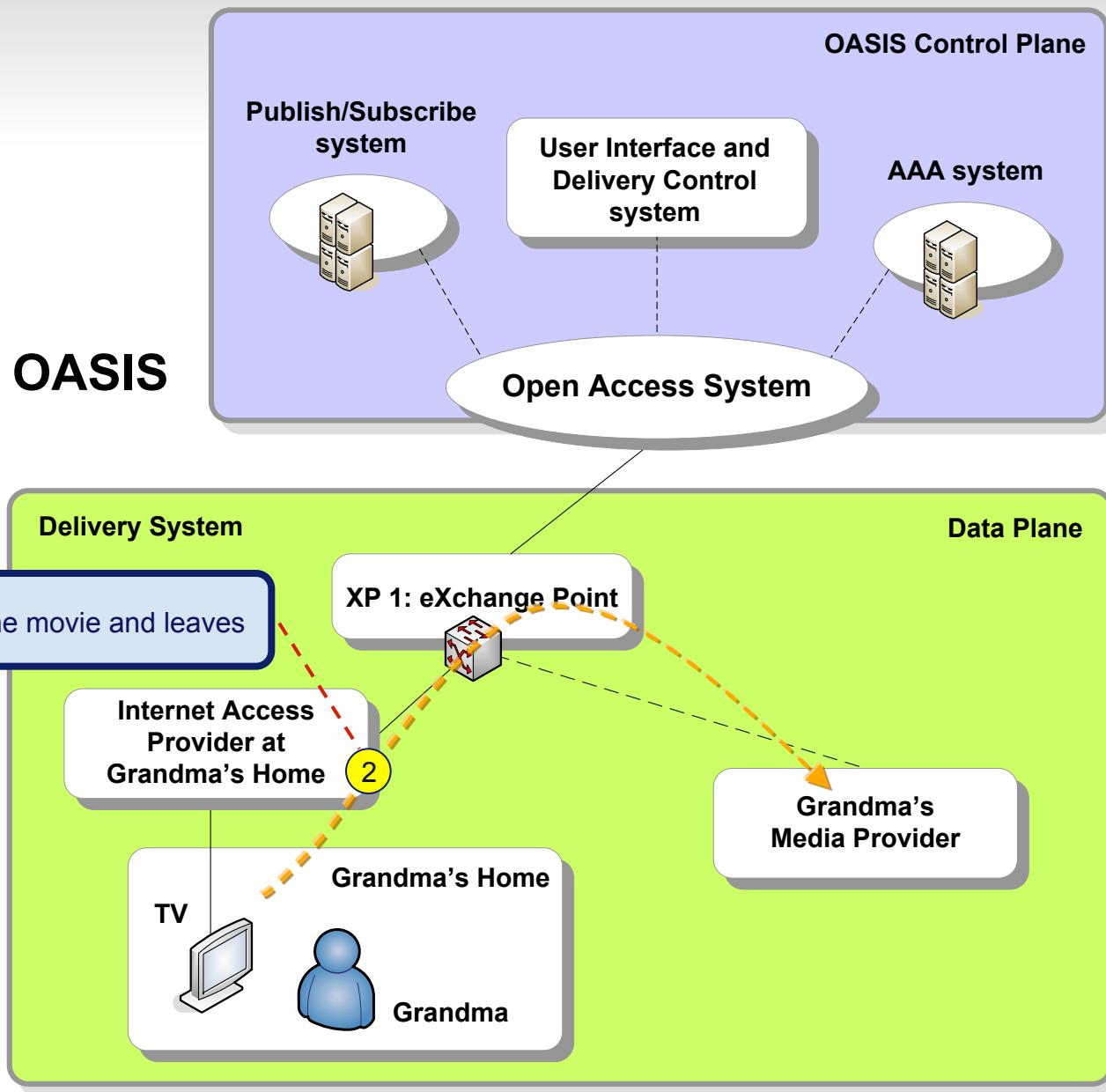
**Grandma** is watching a movie at home through OASIS, but she needs to leave. She pauses the movie and leaves. Some hours later at her sister's place she turns on the TV set; she logs in to OASIS, and her personal menu pops up, i.e., exactly the same menu that she sees at home; she chooses the movie that she was watching earlier at home, and resumes the movie exactly from where she set the pause.

From Grandma's perspective, there is no difference between her personal experience while consuming digital media at home or at her sister's place.

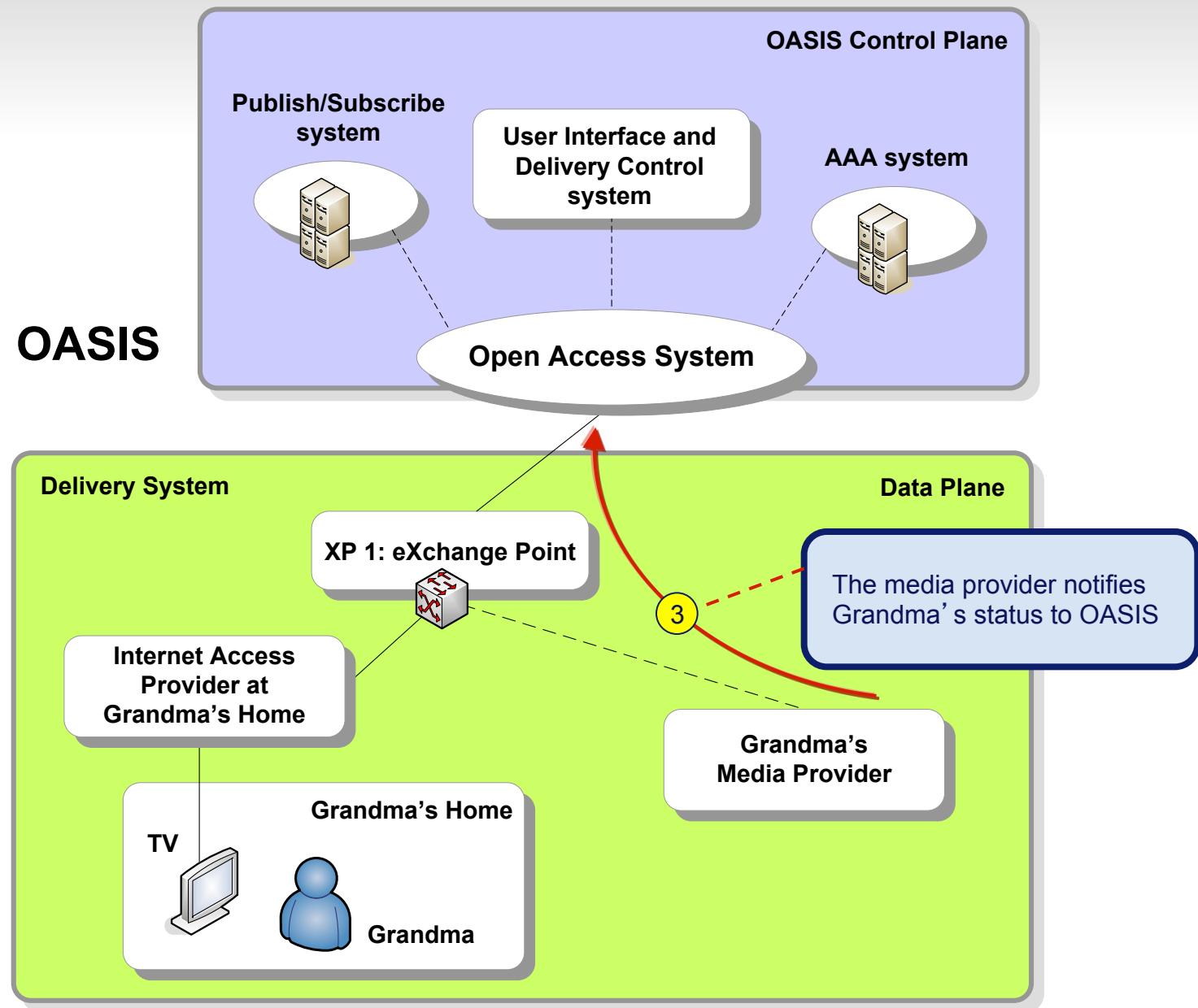
# Application layer handover (Grandma's example)



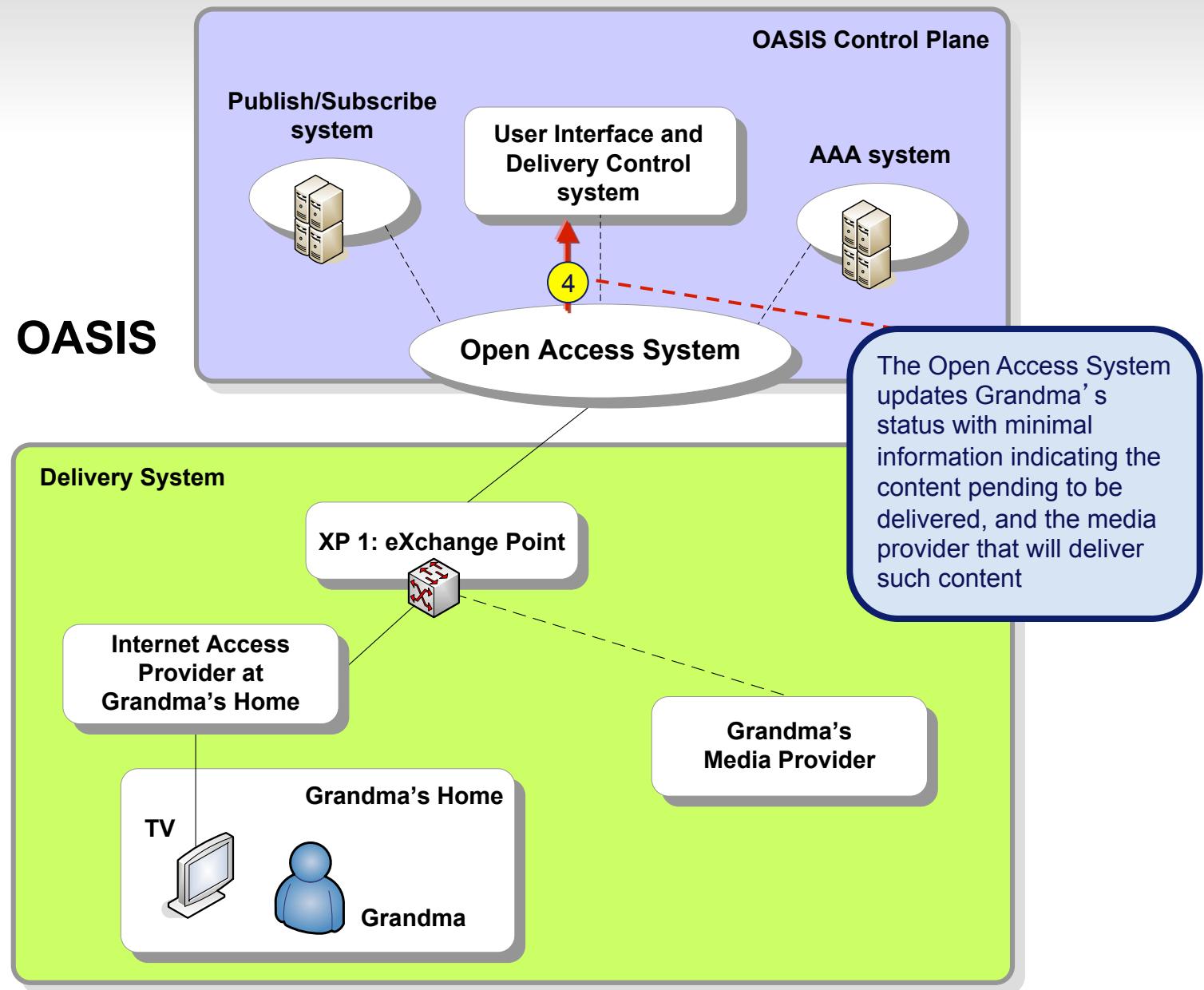
# Application layer handover (Grandma's example)



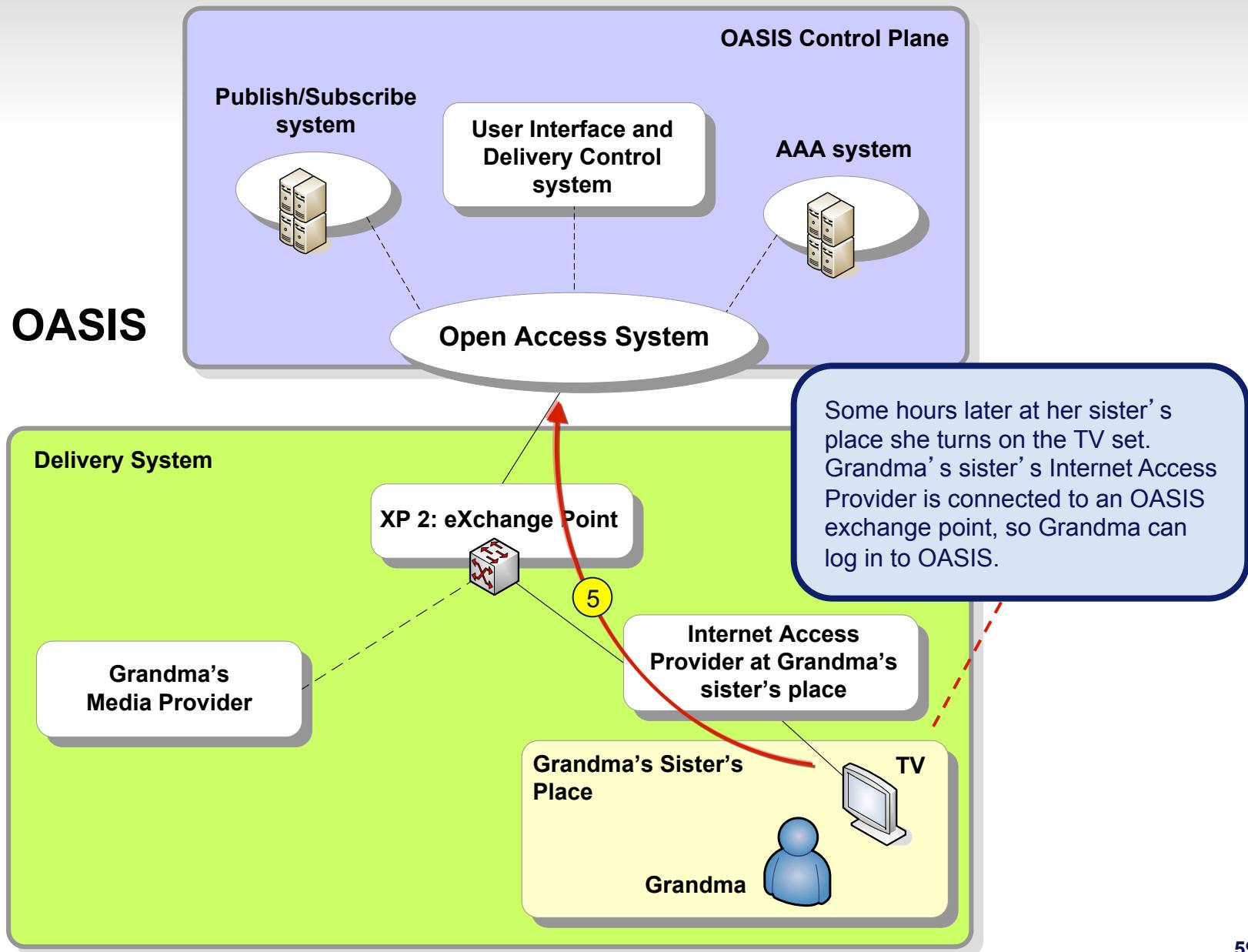
# Application layer handover (Grandma's example)



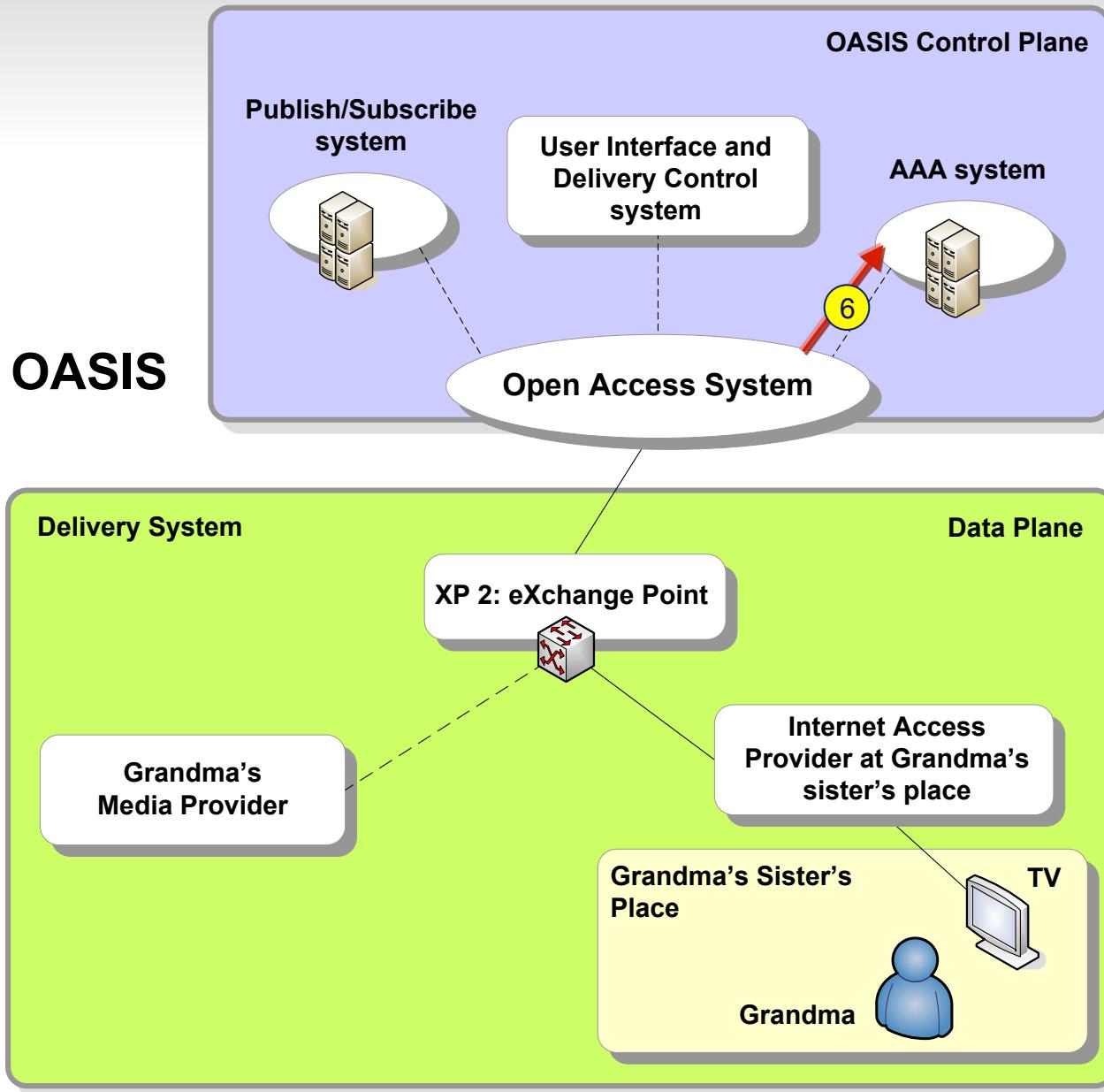
# Application layer handover (Grandma's example)



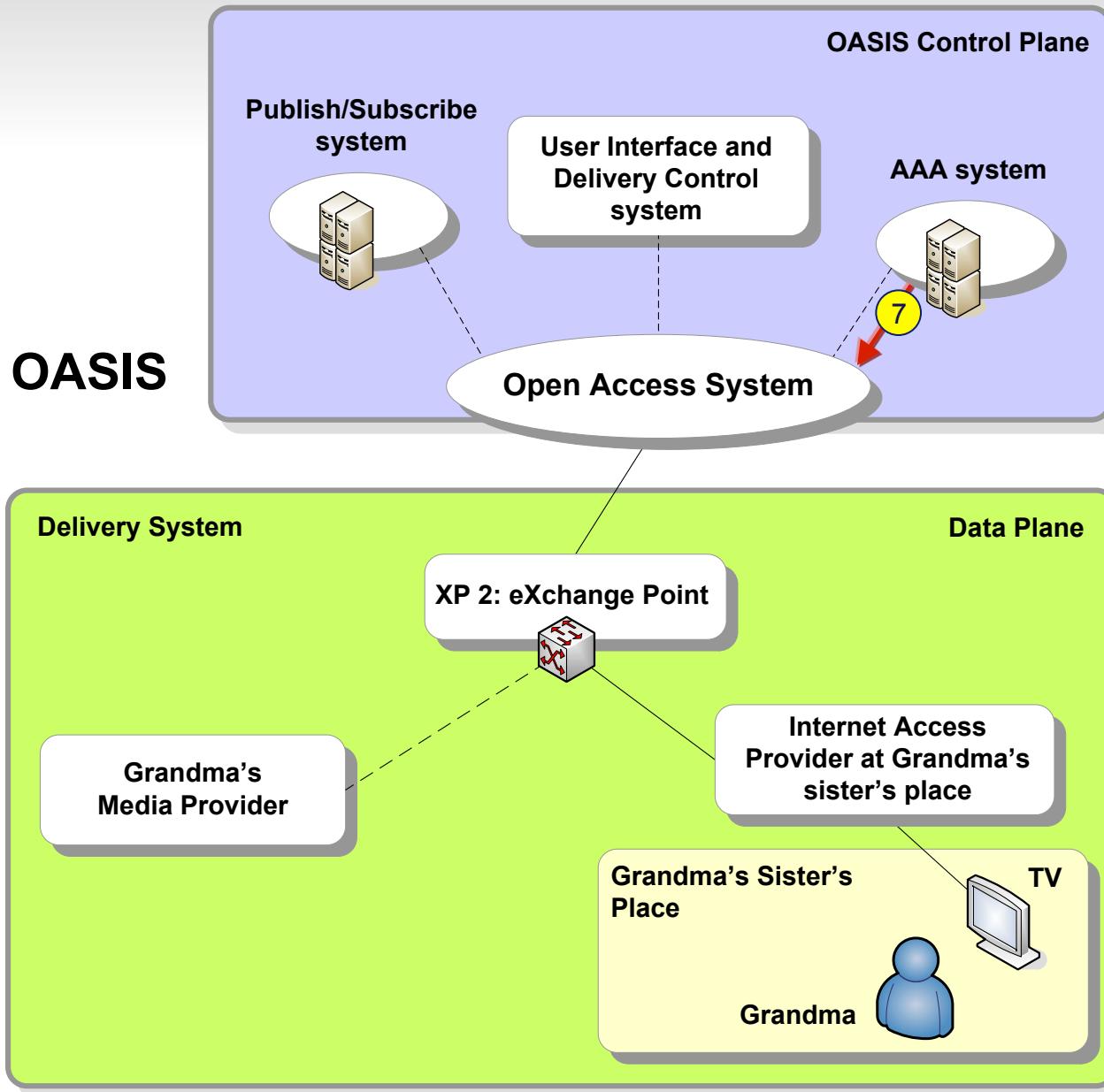
# Application layer handover (Grandma's example)



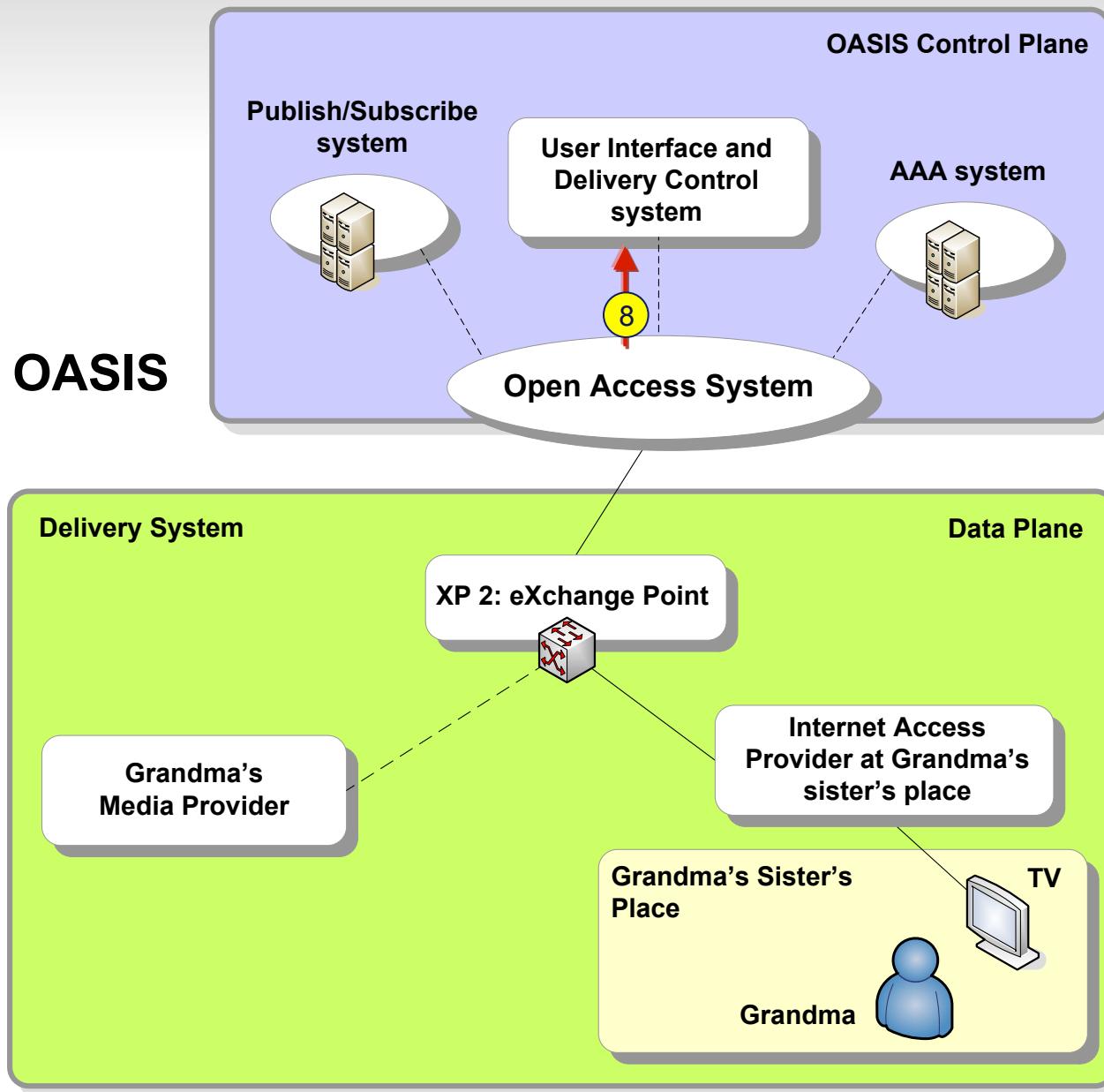
# Application layer handover (Grandma's example)



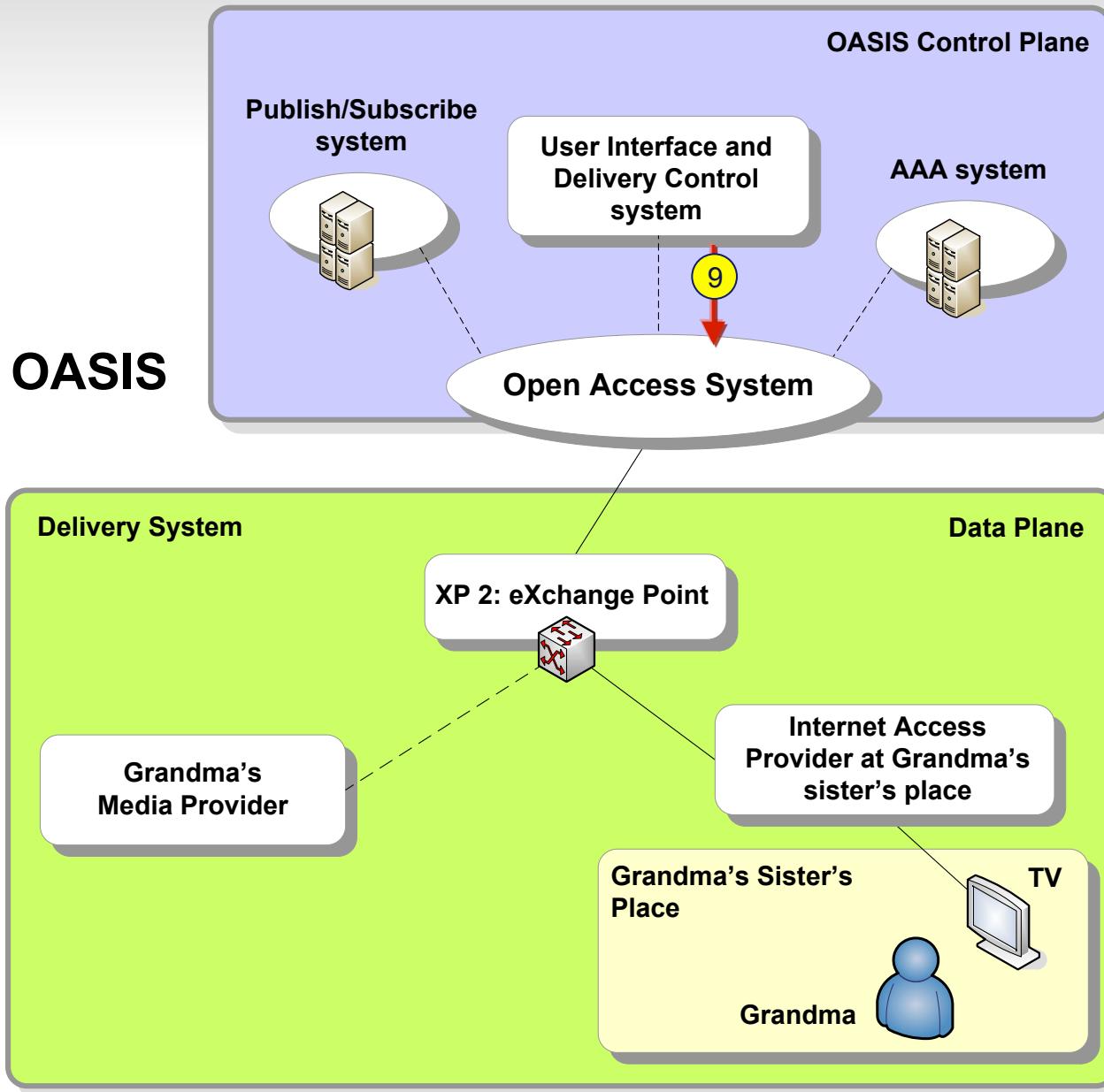
# Application layer handover (Grandma's example)



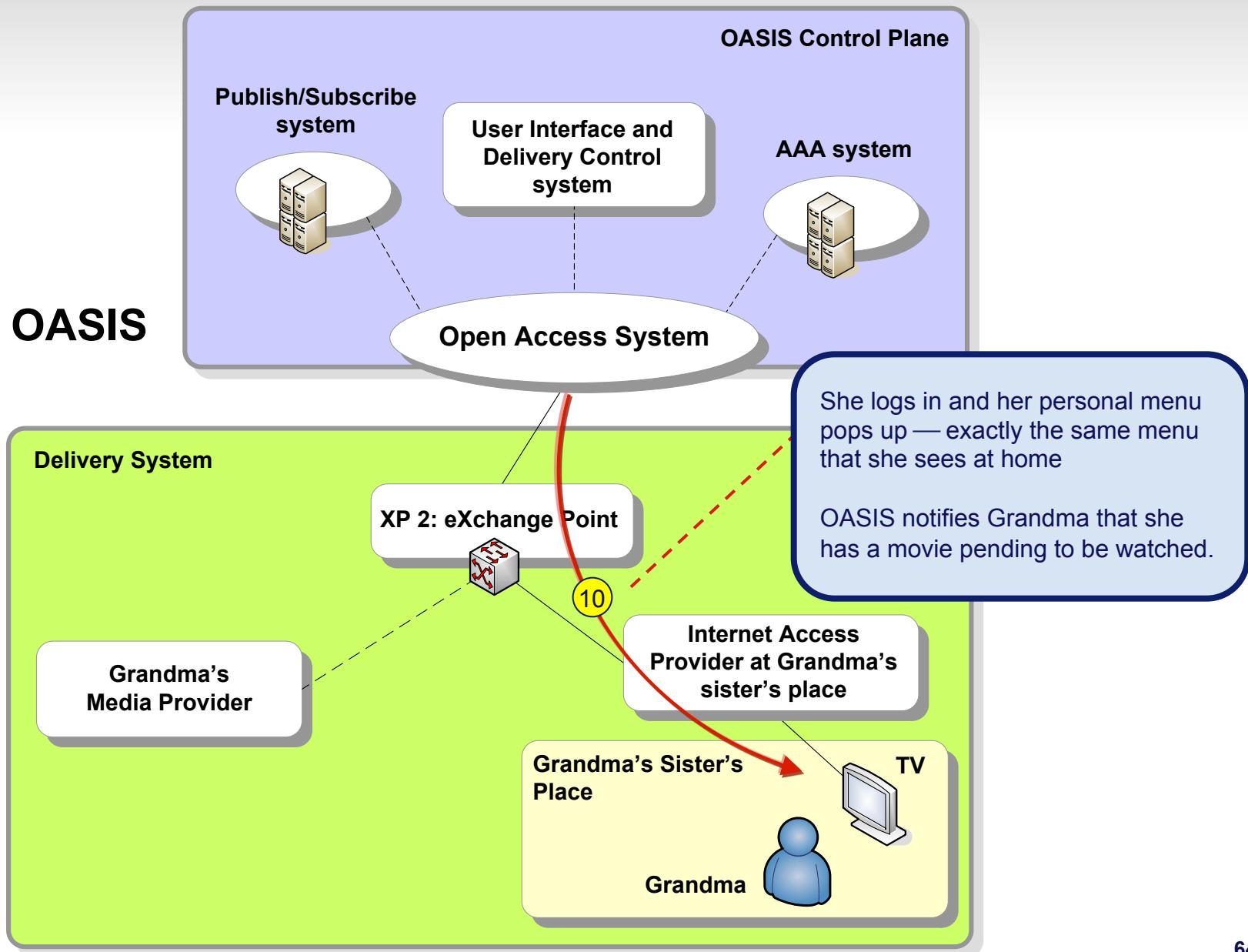
# Application layer handover (Grandma's example)



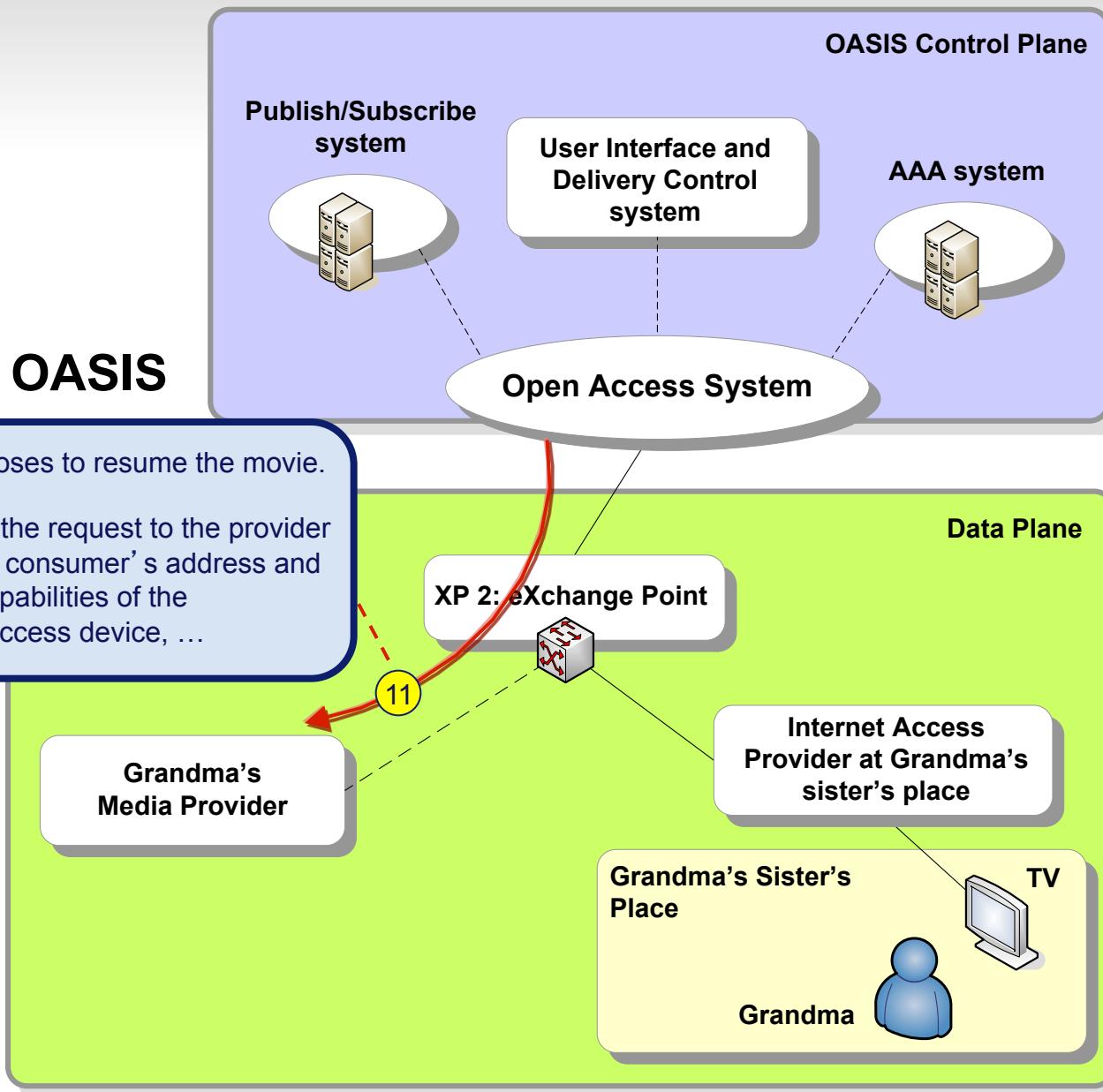
# Application layer handover (Grandma's example)



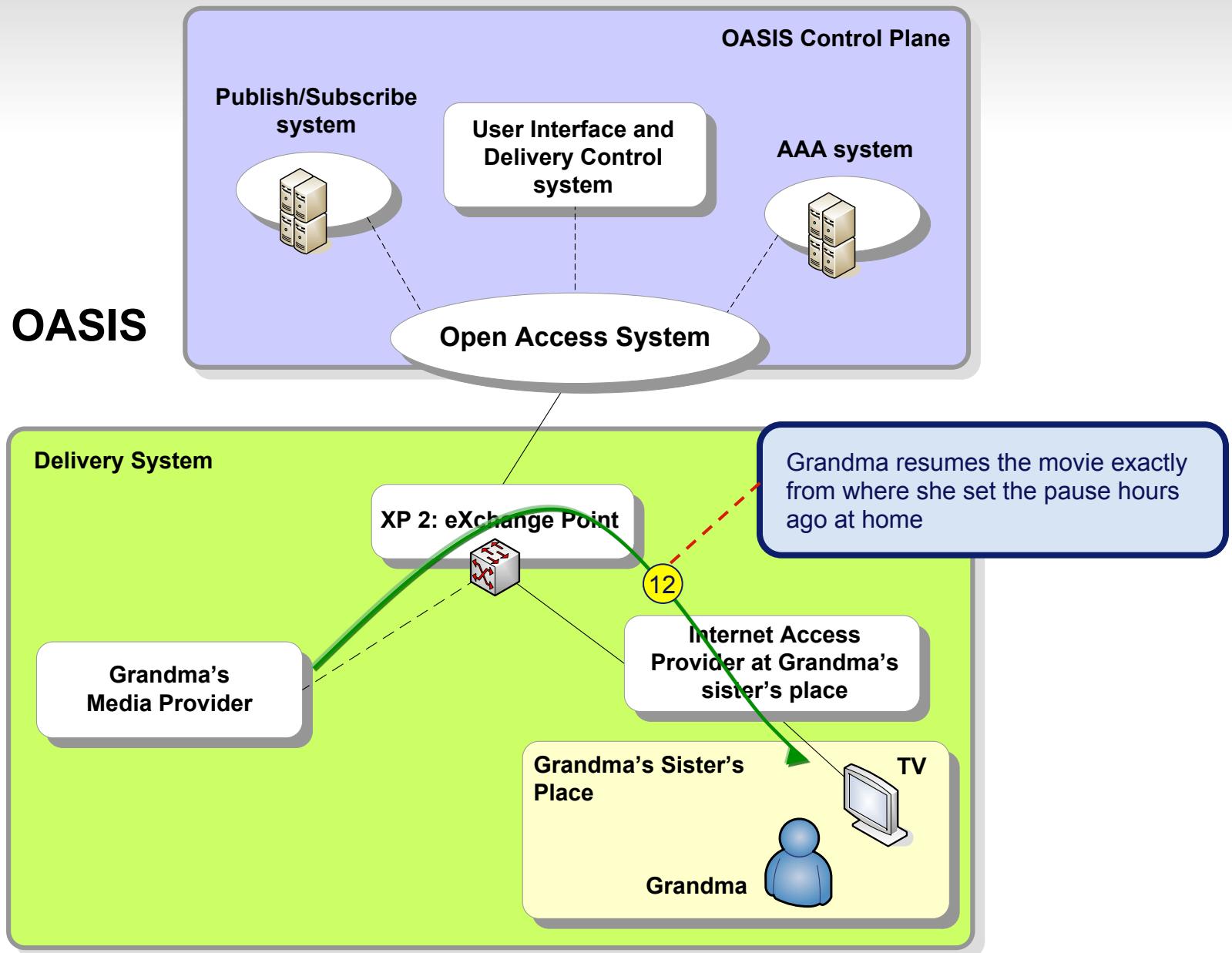
# Application layer handover (Grandma's example)



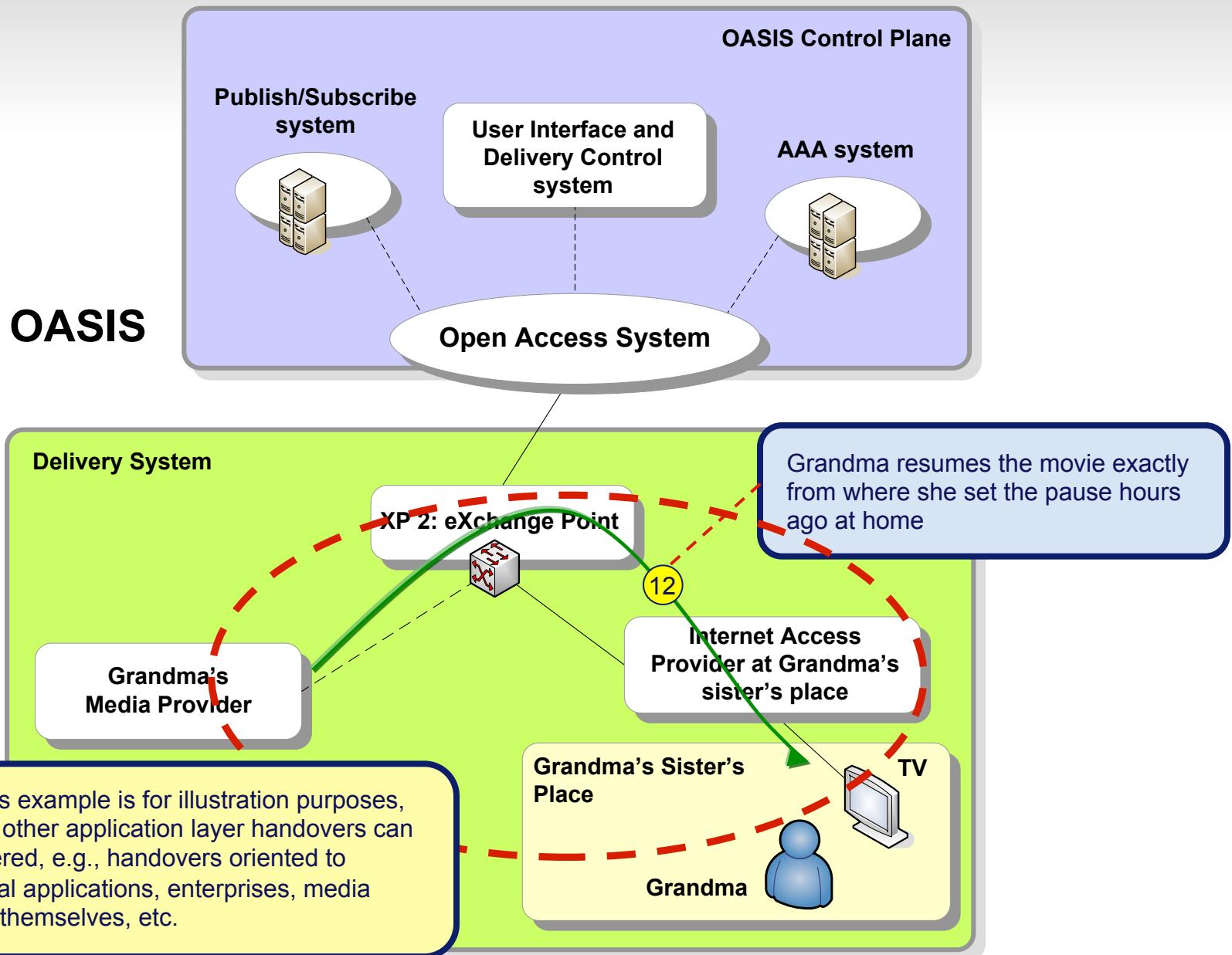
# Application layer handover (Grandma's example)



# Application layer handover (Grandma's example)



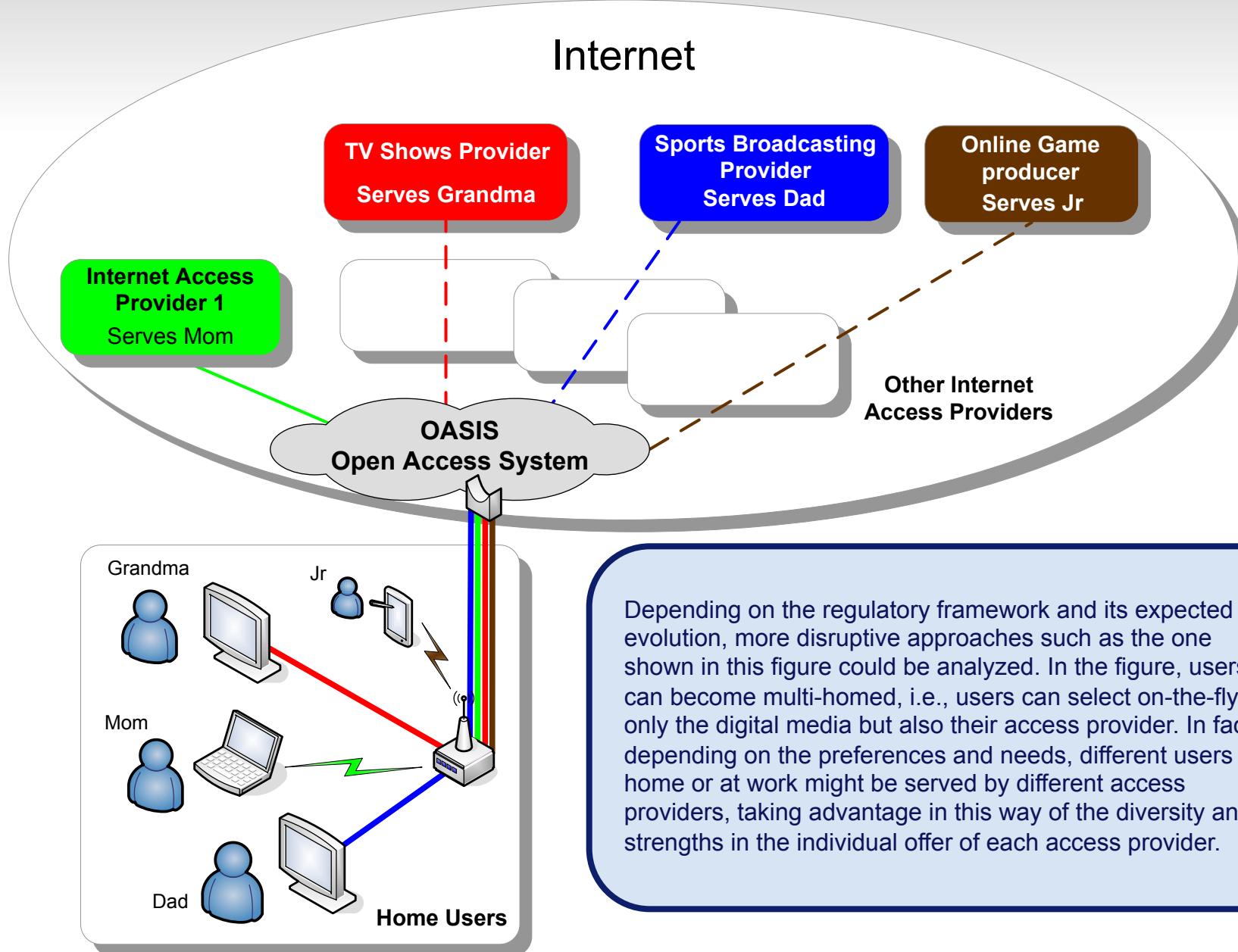
# Application layer handover (Grandma's example)



# Who owns the OASIS Platform?

- ❖ Depending on the regulatory framework of a country, the OASIS platform could be:
  - \* Privately Owned
  - \* A Public Private Partnership (PPP) ... with free services as a “must-have,” such as healthcare and social services, edutainment, remote classroom, ....
  - \* Public (e.g., the XPs belong to a neutral provider)
- ❖ Indeed, depending on the regulatory framework, more disruptive approaches and architectures can be foreseen for OASIS .....

# Depending on the regulatory framework ...



# Contents



Needs



Goals



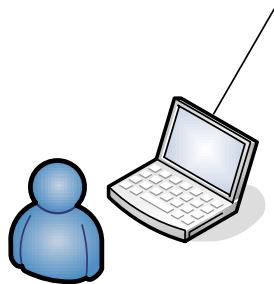
Features



Benefits

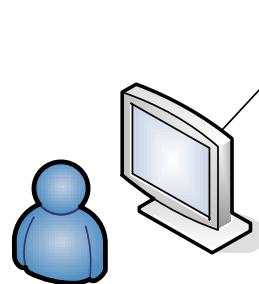
# Impact

# Google



“Best-effort Data”  
+  
Single Interface

# OASIS



“Non-best effort digital media”  
+  
Personalized Access  
and Interface

... OASIS offers the chance to open new markets and hit first in an area where Google has not penetrated yet ... but quite likely will do.

# The Keys

## ❖ Simplicity:

- OASIS operates as a connector between consumers and media and service providers
- XPs interconnecting providers: traffic does not traverse the best-effort Internet.

## ❖ Personalized interfaces:

- To easily search for and select content openly and directly. Much broader offer of digital media than with current 3-play packages, which can be particularly adapted according to the preferences and needs of consumers

# Benefits

- ❖ An enabler to change the behavior and involvement of prosumers, opening the door to a wide range of opportunities, including the arise of new digital products, entire new markets, new business models between providers and prosumers and directly between prosumers, etc.
  
- ❖ OASIS offers new and more sophisticated ways of consuming and experiencing digital media, facilitating the access to the elderly, children, ...

# Expected Outcomes

1. A prototype implementation including:

- The OASIS Open Access System
- The data plane and delivery system
- Personalized interfaces to access, search, and select digital media through OASIS
- Application Layer Handover capabilities within and between fixed and mobile access networks

2. A business model and exploitation map validating the economical viability of the platform ⇒ sustainability and profitability of OASIS and the actors involved