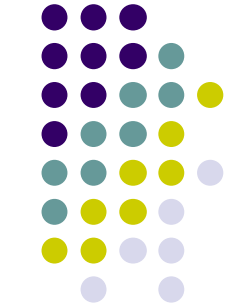
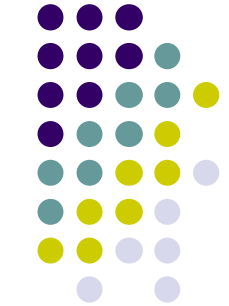


G6: Web-Zerbitzuak. Deskribapena eta protokoloak

Rosa Arruabarrena, Xabier Arregi, Jose Ángel Vadillo
LSI, UPV/EHU

- Wikipedia:
  - Web-zerbitzuak (Web Services)
  - SOAP (Simple Oriented Application Protocol)
  - WSDL (Web Services Description Language)
  - SOA (Service Oriented Architecture)
  - SaaS (Software as a Service)
  - IaaS (infrastructure as a Service)
  - PaaS (Platform as a Service)
  - REST (Representational State Transfer)
- http://www.w3schools.com/xml/xml_services.asp
- http://www.w3.org/2002/ws/Activity

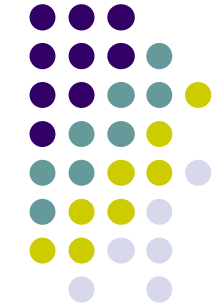
Helburuak



- Bereziki, SOAP-en oinarritutako Web-zerbitzuen funtsezko kontzeptuen sarrera

- Web-zerbitzuen argitalpen eta kontsumoarekin erlazionaturik dauden printzipio eta teknologien sarrera egin:
  - **WSDL** eta **SOAP**

Web-zerbitzuak. Zer dira?

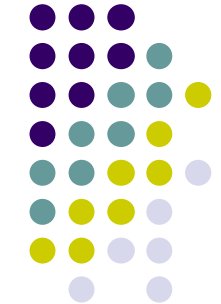


“Δ” Zerbitzu bat

- urrunetik atzi daitekeen funtzionalitate diskretu bat da
- eta modu independentean aplikatu eta eguneratu daiteke,
- adibidez, kreditu-lerro baten laburpena online

- Web-zerbitzuak zer dira?
  - software-piezak dira
  - beste **aplikazioek** erabil ditzakete
  - Protokolo estandarren bidez

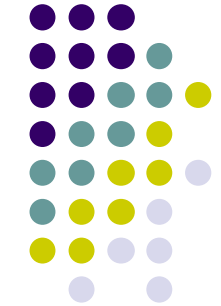
Web-zerbitzuak. Zer dira? (II)



- Protokolo estandarren bidez, beste aplikazioek erabil ditzakete
  - Aplikazioen arteko datu-trukea gertatzen da
    - Aplikazio horiek programazio-lengoaia desberdinetan idatzita egon daitezke, sistema eragile desberdinetan, kokapen fisiko desberdinetan...

- Garapen eredu bat ahalbidetzen dute, non weba erabiliz, urruneko prozeduren deien integrazioa/erabilpena egiten duten.
  - Erabiltzaile interfaze gabeko web-guneak bezala imajina genitzake

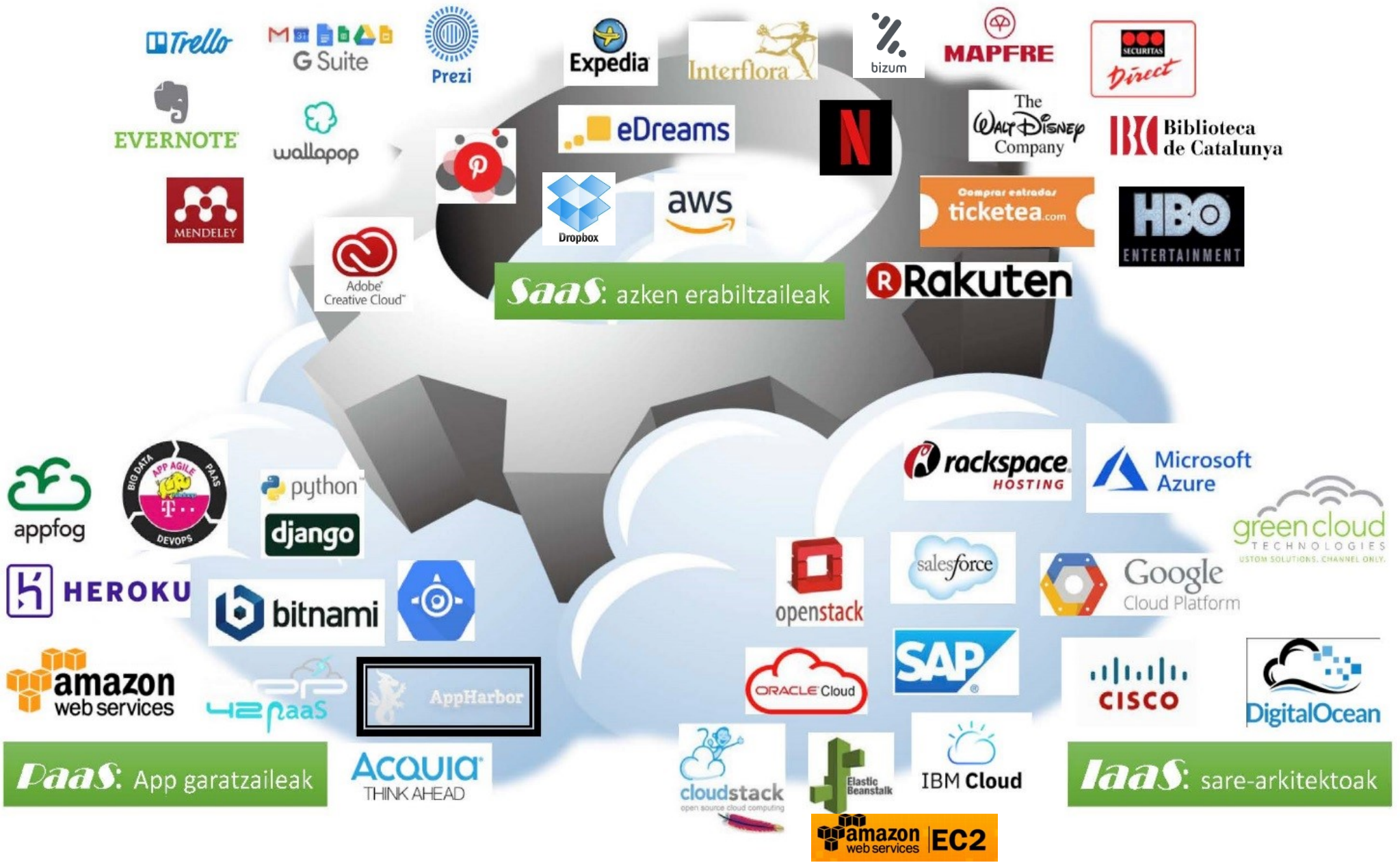
Zer dira? Zertarako? (III)



- Web-zerbitzuak auto-deskribatu eta auto-definitu egiten dira
- XML da komunikaziorako eta deskribapenerako erabiltzen den lengoaia nagusia.
  - SOAP eta XML ulertzen duen edozein bezerok atzi ditzake WZ
- Estandarren erabilpena sustatzen du
- Mundu mailako sistema banatuak sor litezke, ezarrita dauden plataformetatik independente, baita teknologi eta hornitzaileetatik independente ere.

Abantailak

- Elkarrekintza errazten dute (lengoaiatik independente bai eta plataformatik ere)
- Estandarren hedapena sustatzen dute
- Aplikazioen integrazioa sistema banatuetan errazten dute
- Berrerabilpena errazten dute kapsulaketa (interfazea) bidez
- Negozio aukerak zabaltzen dituzte


Trello
G Suite
Prezi
Expedia
Interflora
bizum
MAPFRE
Securitas Direct
EVERNOTE
wallapop
eDreams
The Walt Disney Company
Biblioteca de Catalunya
MENDELEY
Dropbox
aws
Comprar entradas ticketea.com
HBO ENTERTAINMENT
Adobe Creative Cloud
SaaS: azken erabiltzaileak
Rakuten
rackspace HOSTING
Microsoft Azure
appfog
python
django
green cloud TECHNOLOGIES
HEROKU
bitnami
openstack
salesforce
Google Cloud Platform
amazon web services
42 PaaS
AppHarbor
ORACLE Cloud
SAP
CISCO
DigitalOcean
PaaS: App garatzaileak
ACQUIA THINK AHEAD
cloudstack
Elastic Beanstalk
IBM Cloud
IaaS: sare-arkitektoak
amazon web services EC2

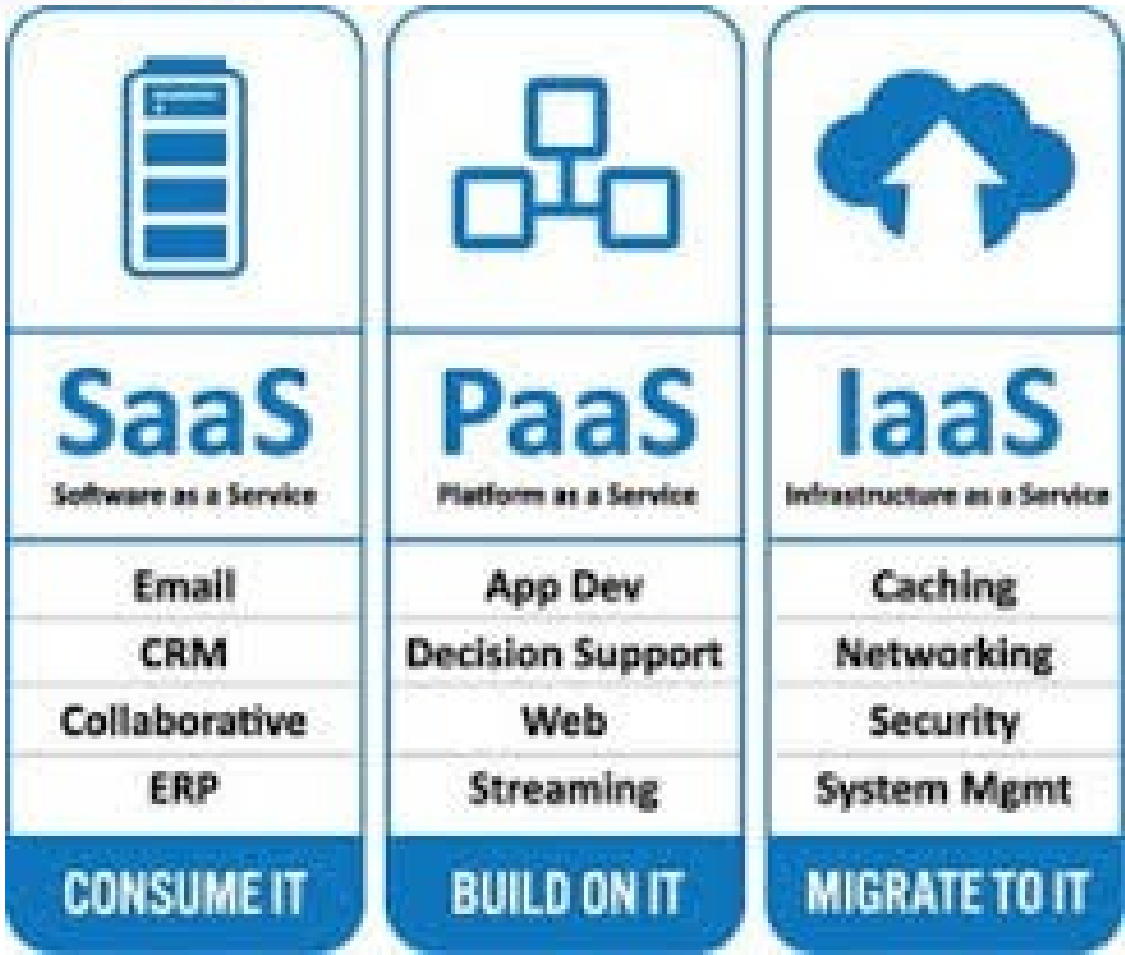
Three layers of cloud computing

Software-as-a-service (SaaS)
Finished applications that you rent and customize

Platform-as-a-service (PaaS)
Developer platform that abstracts the infrastructure, OS, and middleware to drive developer productivity

Infrastructure-as-a-service (IaaS)
Deployment platform that abstracts the infrastructure

http://www.coinsaround.com



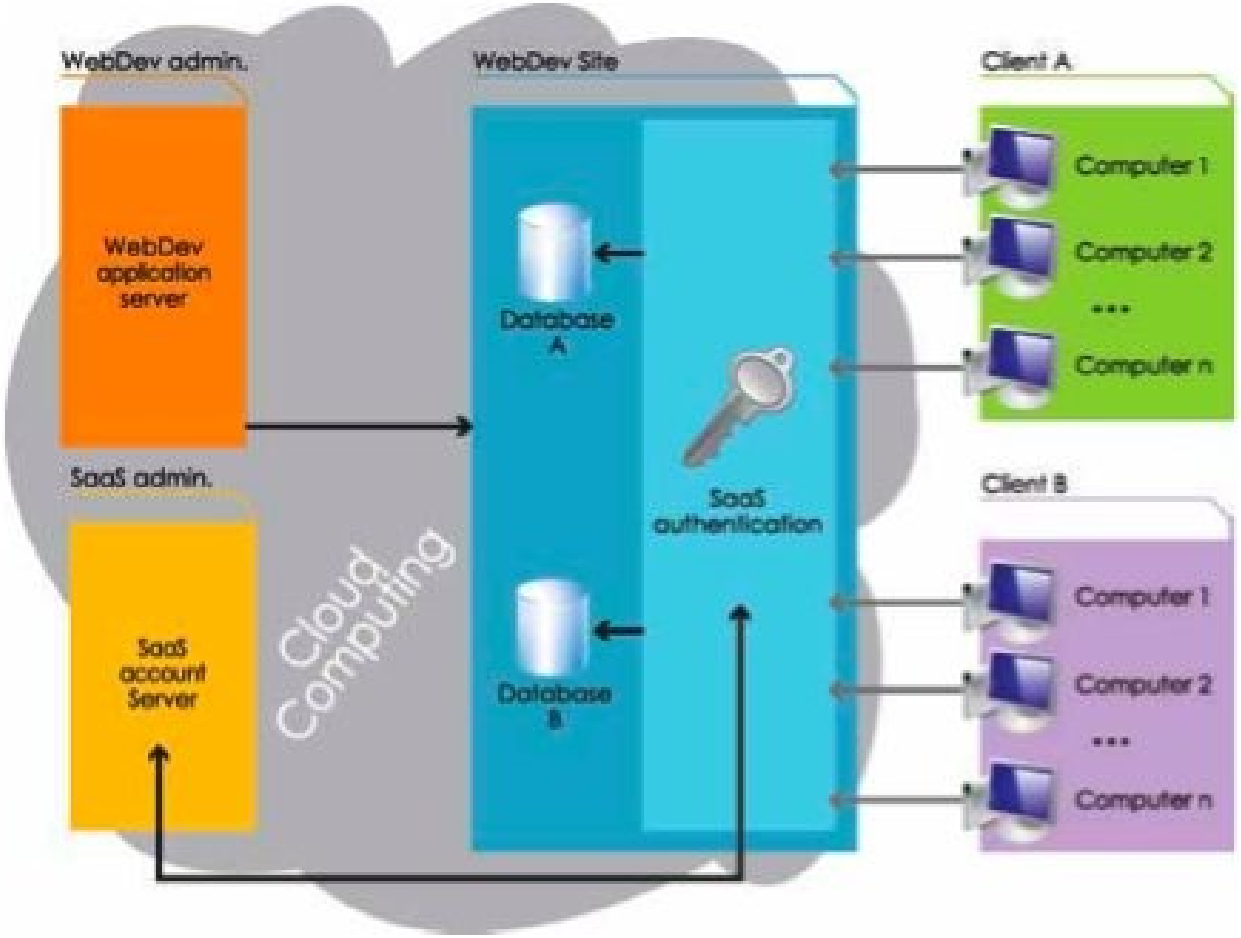
Web-zerbitzuen kategoriak (Cloud computing)

- **Plataforma** zerbitzuak (**PaaS**)
  - Hostinger (000webhost), MS Azure, Google App Engine,…
  - Plataformak eta ostatua gure garapenak gauzatzeko/egikaritzeko

- **Azpiegitura** zerbitzuak (**IaaS**)
  - Amazon Web Services-EC2 (Elastic)
  - Hodeian makina birtualak erabiltzeko, plataforma propioak konfiguratzeko,…

HTTP --- Hodeiaren esku (Rarruabarrena, GAUR8, 2018.06.16)

SaaS
(Softwarea zerbitzu bat bezala ulertua)



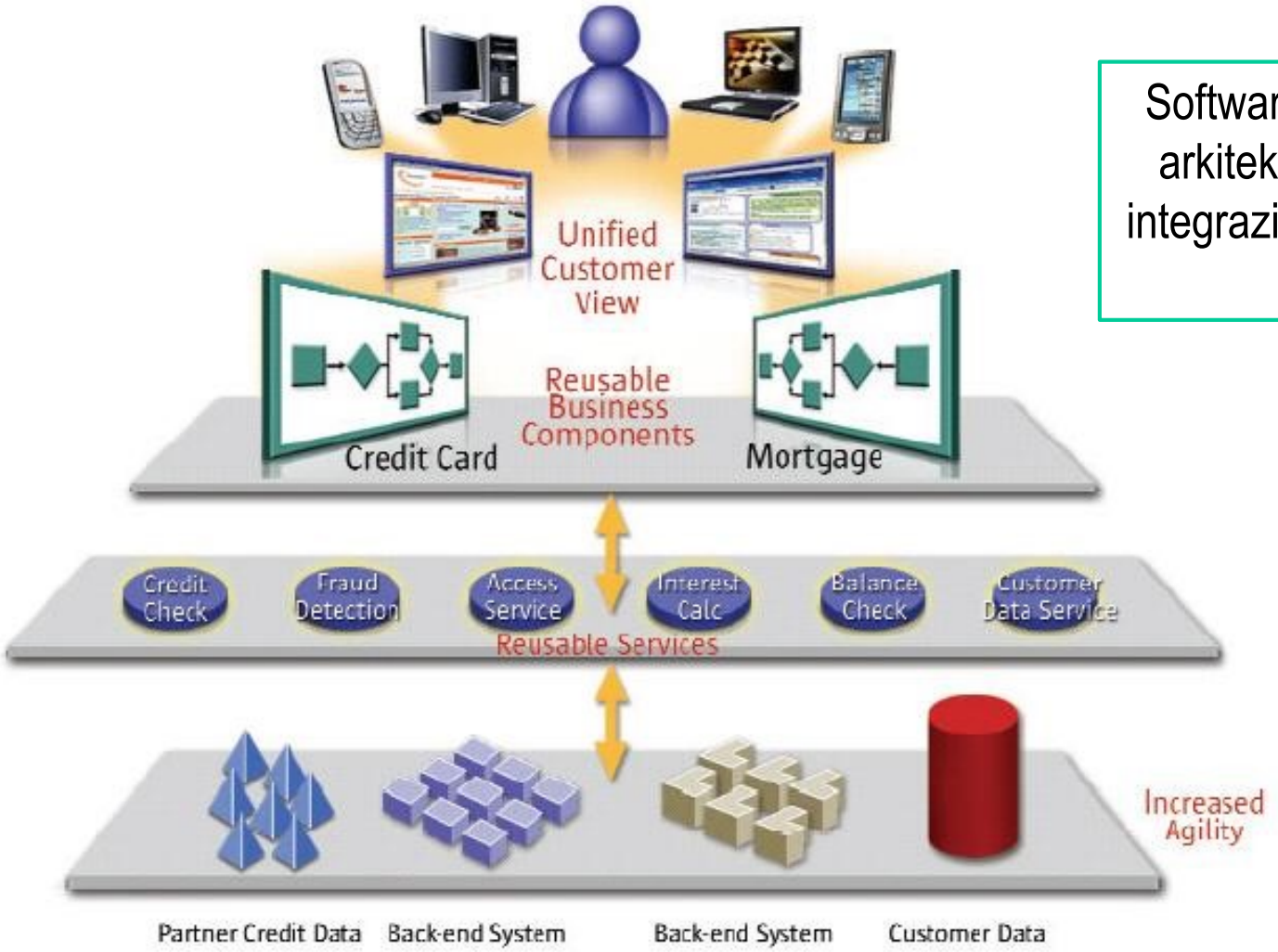
Adib.:
- Google Docs (ofimatika)
- Google Drive, Dropbox
- Prezi.com (aurkezpenak)
- Netflix

Lizentzia sistema baztertzen, erabilpenagatik ordaintzen da

http://www.lordzealon.com

SOA arkitektura.

Zerbitzuetara Orientatutako Arkitektura



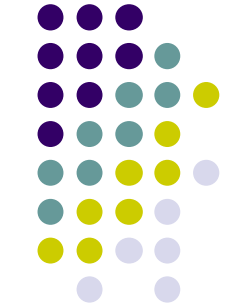
Softwarearen garapenerako arkitektura, web-zerbitzuen integrazioan eta elkarrekintzan oinarritzen da

http://soa-e-interoperabilidad.tk

Web-zerbitzuetan oinarritutako negozio-ereduen adibideak

- Web-zerbitzu komertzialen merkatua
  - http://www.strikeiron.com/
    - https://www.informatica.com/products/data-quality/data-as-a-service/free-trials/
  - http://www.fraudlabs.com/
  - http://openweathermap.org
  - http://www.webservicex.net
  - …

Web-zerbitzuen bizitza-zikloa

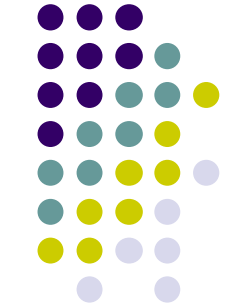


- **Sorrera eta garapena**
  - **Balio** bat **gehitzen** duten **negozioen arauak eta prozesuen identifikazioan** oinarrituak
  - **Prozesu horien atzipena gauzatzeko interfazeen** definizioa
  - Interfaz horien deskribapena modu **estandarrean webeko softwarearen garapenerako industriarentzat**

- **Erakusketa publikoa**
  - Interesgarri gerta dakiokeen **komunitateak** ikusgai eta ulergai izan ditzaten interfaze horiek argitaratzea komenigarria da

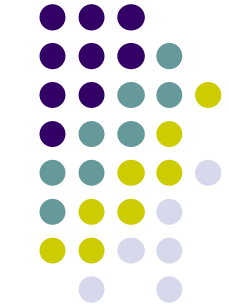
- **Erabilpena**
  - **Zerbitzuen eskaerak onartu** behar dira (eta dagozkien erantzunak ekoitzi) web-eko **protokolo estandarrak erabiliz**
  - Onartutako eskaera estandarren arteko eta web-zerbitzuen inplementazioen arteko erlazioa ezarri behar da

Diseinu baten adibidea, non web-zerbitzuen erabilpena aukera egin litekeen



- Ingurunea: e-commerce zerbitzu bat garatu eta ezarri nahi da, eta bertako salmenta kreditu txartelak bidez gauzatu
  - Arazo eratorria: kreditu txartelen identifikatzaileetan gerta liteke iruzurrezko erabilpena egitea norbaitek
  - Errekerimendua: erosketa aginduak iragaztea, eta kreditu-txartelaren identifikazioan iruzurra egiten ari dela susmoa balego
  - IP helbide, kreditu txartel edota kutxa entitateen inguruan informazioa eman dezaketen web-zerbitzu desberdinetara jotzen da
    - http://www.fraudlabs.com/contact.aspx

Diseinu baten adibidea, non web-zerbitzuen erabilpena aukera egin litekeen (II)



- Ingurunea: Web Sistemak irakasgaiaren erabiltzaileen erregistroari funtzionalitate berri bat gehitu nahi da
  - Errekerimendua: Zerbitzuak konprobatu beharko du erregistratu nahi duen ikasleak EHU matrikulatu egon behar duela.
  - Funtzionalitatea ematen duten web zerbitzu bat edo gehiago aztertzen dira. Adib.:

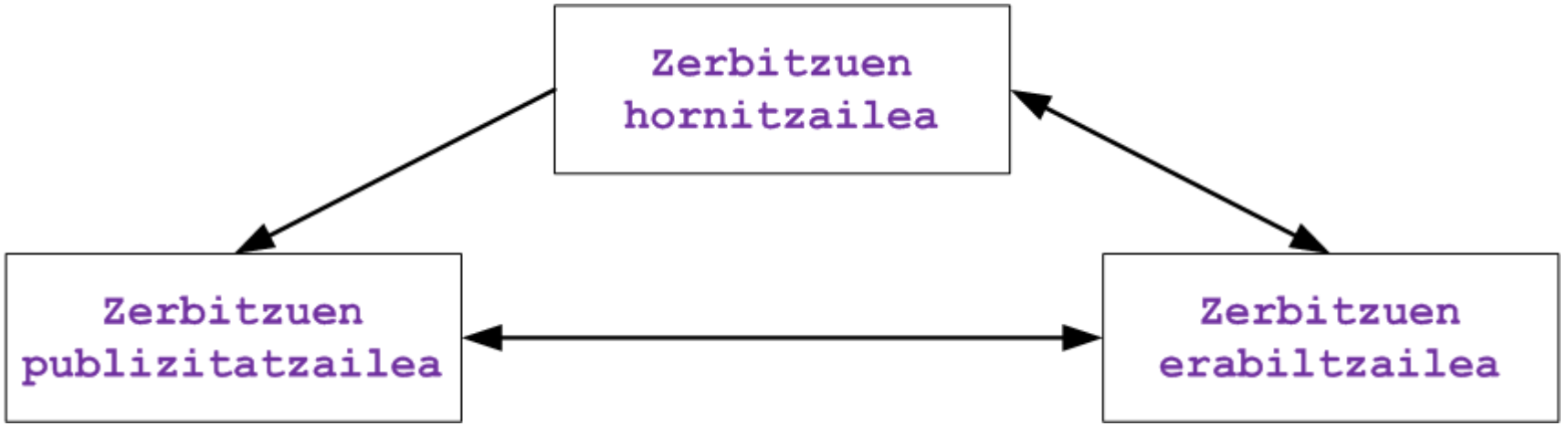
http://ehusw.es/rosa/webZerbitzuak/egiaztatuMatrikula.php?wsdl

  - Zerbitzua programatu beharko genuke. Adib, beste makina batetik kontsumitzen dugu (proba001@ikasle.ehu.eus):

https://wsjiparsar.000webhostapp.com/webZerbitzuak/soapBezEgiaztatuMatrikula.php

Nola erabil genezake web-zerbitzu bat?

- Zeintzuk zerbitzu daude erabilgarri?
- Web-zerbitzu zehatz batekin nola ezartzen da komunikazioa?
- Goazen aurrera … exekuta zaitez!



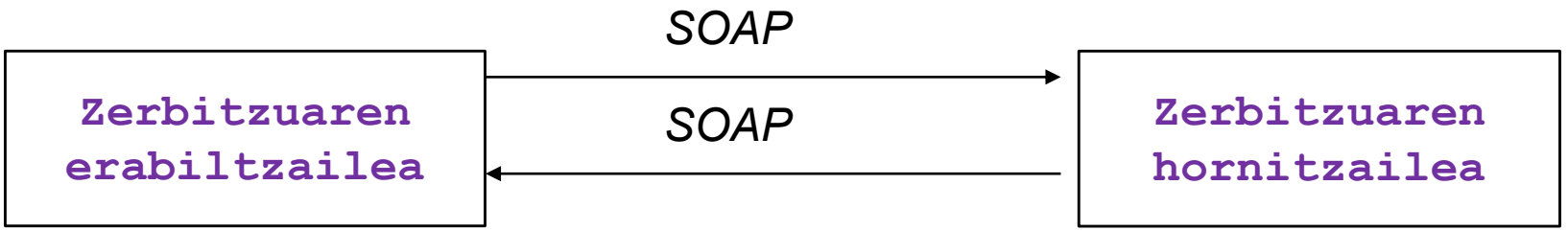
Web-zerbitzuak deskribatzeko eta kontsumitzeko web estandarrak

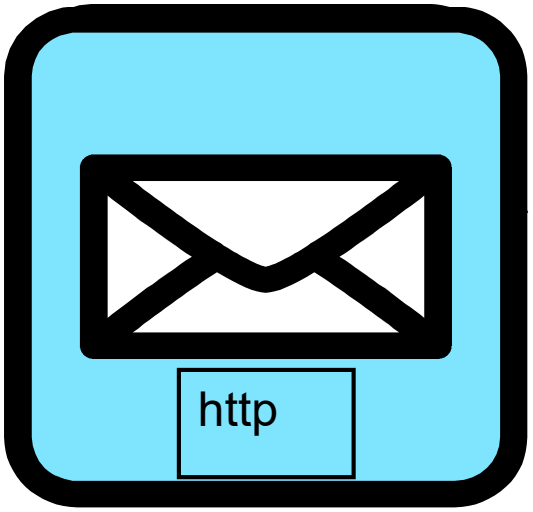
- SOAP-WSDL-~~UDDI~~ eredua
  - Web-zerbitzuen deskribapena eta kontsumoa egiteko eredu bat hiru estandarretan oinarritzen dena
  - SOAP (Simple Object Access Protocol)

    XML erabiliaz deskribatzen da
  - WSDL (Web Services Description Language)

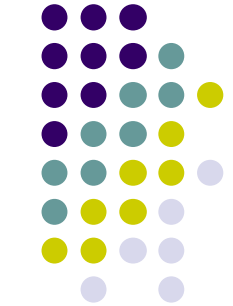
    “Kontratua” defini ahal izateko (emango duen zerbitzuaren hitza). Zer eta nola eska litekeen, zer eta nola erantzungo den
  - ~~UDDI (Universal Description, Discovery and Integration)~~

Web-zerbitzu baten “kontsumoa”



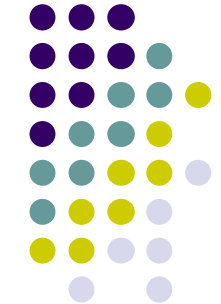


SOAP:
Simple Object Access Protocol



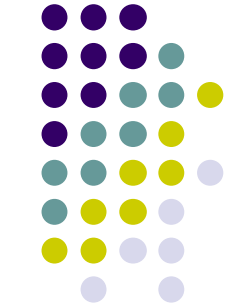
- Komunikazio-protokoloa
- Aplikazioen arteko komunikazioetarako
- Plataforma-independentea
- Lengoaia-independentea
- SOAP **mezuak** bidaltzeko formatua da
- Internet bidez komunikatzen da (**HTTP)**
- XMLn oinarritua: sinplea eta hedagarria
- Suhesiak saihesteko aukera
- Estandarra izan dadin W3Cren babesa du
  - http://www.w3.org/TR/soap/

SOAP mezuen sintaxia



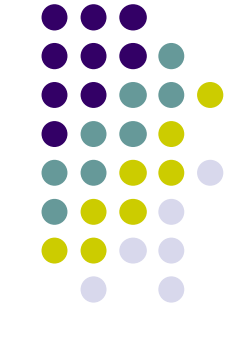
- SOAP *mezua* XML dokumentua da, honako *elementu* hauek dituena:
  - Gutun-azala (***`envelope`****): Elementu* nagusia, XML dokumentua SOAP mezua dela adierazten du
  - Goiburukoa (***`header`****):* Goiburuko informazioa
  - ***`Body`****:* Deiaren eta erantzunaren informazioa
  - ***`Fault`***: Erroreak eta egoerari buruzko informazioa

SOAP *eskaera* baten sintaxia
(SOAP **request**)



```
POST /InStock HTTP/1.1
Host: www.example.org
Content-Type: application/soap+xml; charset=utf-8
Content-Length: nnn

<?xml version="1.0"?>
<soap:Envelope
xmlns:soap="http://www.w3.org/2001/12/soap-envelope"
soap:encodingStyle="http://www.w3.org/2001/12/soap-encoding">

<soap:Body xmlns:m="http://www.example.org/stock">
  <m:GetStockPrice>
    <m:StockName>IBM</m:StockName>
  </m:GetStockPrice>
</soap:Body>

</soap:Envelope>
```

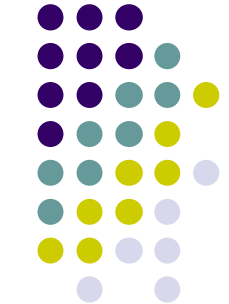
SOAP *Erantzun* baten sintaxia (SOAP **response**)



```
HTTP/1.1 200 OK
Content-Type: application/soap+xml; charset=utf-8
Content-Length: nnn

<?xml version="1.0"?>
<soap:Envelope
xmlns:soap="http://www.w3.org/2001/12/soap-envelope"
soap:encodingStyle="http://www.w3.org/2001/12/soap-encoding">

<soap:Body xmlns:m="http://www.example.org/stock">
  <m:GetStockPriceResponse>
    <m:Price>34.5</m:Price>
  </m:GetStockPriceResponse>
</soap:Body>

</soap:Envelope>
```

WSDL

Web Services Description Language



- WSDL zehaztapena XML dokumentu bat da web-zerbitzu bat deskribatzen duena.
  - Zerbitzua non dagoen, eta eskaintzen dituen metodoak erakusten ditu (interfazea)
- W3C gomendioa da, hark sustatua
  - *http://www.w3.org/TR/wsdl20/*

- https://footballpool.dataaccess.eu/info.wso?WSDL
- http://www.elguille.info/net/WebServices/CelsiusFahrenheit.asmx?WSDL

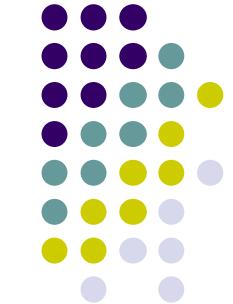
WSDL dokumentuak

Lau *elementu* nagusi:

- <***portType***>: Klase kontzeptuaren pareko; eragiketak (metodoak) eta sarrera/irteerako 'mezuak' deskribatzen ditu. *Hau da, eragiketa multzo bat biltzen du, deskribatutako zerbitzuak eskaintzen dituenak*.
- <***message***>: eragiketen datuen deskribapena. *Hau da, eragiketa baten sarrera-irteerako mezuen definizio motatua.*
  - 'mezu' bakoitzak <***part***> bat edo gehiago eduki dezake. Part *elementu* horiek *funtzio-dei tradizionalen parametroekin pareka* daitezke.
- <***types***>: web-zerbitzuan erabiltzen diren datu-moten definizioak. XML eskema batean erabilitakoen berdinak erabiltzen dira.

- <***binding***>: `portType` jakin baterako protokoloa eta datu-formatua

WSDL: egitura (adibidea)



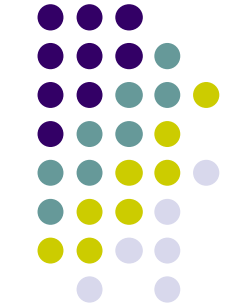
```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<definitions xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema" ……

<types>
    <xsd:schema targetNamespace="http://localhost/nusoap-0.9.5/samples">
    <xsd:import namespace="http://schemas.xmlsoap.org/soap/encoding/" />
    <xsd:import namespace="http://schemas.xmlsoap.org/wsdl/" /> </xsd:schema>
</types>
<message name="batuRequest">
  <part name="x" type="xsd:int" />
  <part name="y" type="xsd:int" />
</message>
<message name="batuResponse">
  <part name="z" type="xsd:int" />
</message>
<portType name="batuPortType">
    <operation name="batu">
     <input message="tns:batuRequest" />
     <output message="tns:batuResponse" />
    </operation>
</portType>
……
<service name="batu">
    <soap:address location="http://localhost/proba/php/batuZerbitzua.php" />
</service>
```

localhost:1234/proba/php/batuZerbitzua.php?wsdl

This XML file does not appear to have any style information associated with it. The document tree is shown below.


```
<definitions xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi=
xmlns:SOAP-ENC="http://schemas.xmlsoap.org/soap/encoding/" xmlns:tns="http://localhost:1234/proba/php/batuZerbitzua.php?wsdl" x
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/" xmlns="http://schemas.xmlsoap.org/wsdl/" targetNamespace="http://localhost:1234/p
 ▼<types>
  ▼<xsd:schema targetNamespace="http://localhost:1234/proba/php/batuZerbitzua.php?wsdl">
     <xsd:import namespace="http://schemas.xmlsoap.org/soap/encoding/"/>
     <xsd:import namespace="http://schemas.xmlsoap.org/wsdl/"/>
    </xsd:schema>
  </types>
 ▼<message name="batuRequest">
    <part name="x" type="xsd:int"/>
    <part name="y" type="xsd:int"/>
  </message>
 ▼<message name="batuResponse">
    <part name="z" type="xsd:int"/>
  </message>
 ▼<portType name="batuPortType">
  ▼<operation name="batu">
     <input message="tns:batuRequest"/>
     <output message="tns:batuResponse"/>
    </operation>
  </portType>
 ▼<binding name="batuBinding" type="tns:batuPortType">
    <soap:binding style="rpc" transport="http://schemas.xmlsoap.org/soap/http"/>
  ▼<operation name="batu">
     <soap:operation soapAction="http://localhost/proba/php/batuZerbitzua.php/batu" style="rpc"/>
    ▼<input>
       <soap:body use="encoded" namespace="http://localhost:1234/proba/php/batuZerbitzua.php?wsdl" encodingStyle="http://schema
     </input>
    ▼<output>
       <soap:body use="encoded" namespace="http://localhost:1234/proba/php/batuZerbitzua.php?wsdl" encodingStyle="http://schema
     </output>
    </operation>
  </binding>
 ▼<service name="batu">
  ▼<port name="batuPort" binding="tns:batuBinding">
     <soap:address location="http://localhost:1234/proba/php/batuZerbitzua.php"/>
    </port>
  </service>
</definitions>
```

NuSOAP liburutegia



- SOAPn oinarritutako web-zerbitzuak sortzeko eta kontsumitzeko PHP liburutegia da
- WSDL fitxategiak erabiliz edo erabili gabe lan egiteko aukera ematen du
- Web-zerbitzuaren zehaztapen fitxategien (WSDL) sorrera **automatikoa** ahalbidetzen du
- SOAP zehaztapenen xehetasunak ezkutatzen ditu, SOAPRequest eta SOAPResponse klaseen instantziak sortuz.

NuSOAP

- http://sourceforge.net/projects/nusoap/
  (liburutegiaren deskarga)
- http://www.desarrolloweb.com/manuales/61/
- http://www.slideshare.net/fulvio.corno/web-services-in-php-using-the-nusoap-library

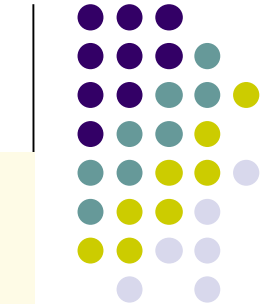
SOAP eredua.
Alderdi onak eta ez hain onak

- SOAP+WSDL ereduko web-zerbitzuen erabilerak kontratu bidezko protokoloa finkatzen du, estandar irekietan oinarrituta

- Hobetzen da komunikazioa, erabilgarritasuna eta plataforma-independente izatea

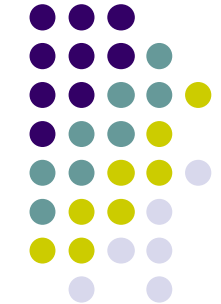
- Baina, zerbitzuaren menpe geratzen da bezeroa, eta kontratua aldatzen bada?

Adibidea1:
SOAP WZ bat eta “batu” metodoaren sorrera



```
<?php
//nusoap.php klasea gehitzen dugu
require_once('../lib/nusoap.php');
require_once('../lib/class.wsdlcache.php');

//soap_server motako objektua sortzen dugu
$ns="http://ehusw.es/rosa/webZerbitzuak/batuZerbitzua.php?wsdl";
$server = new soap_server;
$server->configureWSDL('batu',$ns);
$server->wsdl->schemaTargetNamespace=$ns;

//inplementatu nahi dugun funtzioa erregistratzen dugu
//funtzio bat baino gehiago erregistra liteke …
$server->register('batu',
array('x'=>'xsd:int','y'=>'xsd:int'),
array('z'=>'xsd:int'),
$ns);

//funtzioa inplementatzen da
function batu($x, $y){
return $x + $y;
}

//nusoap klaseko service metodoari dei egiten diogu, behin parametroak
// prestatuta daudela
if (!isset( $HTTP_RAW_POST_DATA )) {
    $HTTP_RAW_POST_DATA =file_get_contents( 'php://input' );
}
$server->service($HTTP_RAW_POST_DATA);
?>
```

`$server->service($HTTP_RAW_POST_DATA);`



- $HTTP_RAW_POST_DATA aldagaiak SOAP eskaerako xml zatia jaso behar du
- **`Service()`** metodoak , XMLa jaso, aztertu, funtzioari dei egiten dio eta erantzuna sortzen du
- **`Service`** metodoari deia egin aurretik aldagai horren instantzia batek existitu behar du, eta deiaren baliokin hasieratuta egon behar du.

```
if ( !isset( $HTTP_RAW_POST_DATA ) )
  $HTTP_RAW_POST_DATA = file_get_contents('php://input');

$server->service($HTTP_RAW_POST_DATA);
```

Adibidea2: batuBezeroa.php
Bezero baten sorrera WZ kontsumatzeko

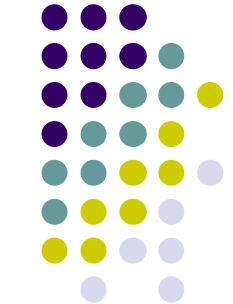
```
<FORM NAME="datuak" ID=" datuak" METHOD="POST">
<input type='text' name='batugai1'></input>
<input type='text' name='batugai2'></input>
<input type='submit' name='batu' value='BATU'></input>
</form>

<?php
//nusoap.php klasea gehitzen dugu
require_once('../lib/nusoap.php');
require_once('../lib/class.wsdlcache.php');

//nusoap_client motadun objektua sortzen dugu. http://www.mydomain.com/server.php
//erabiliko den SOAP zerbitzua non dagoen zehazten url horrek
$soapclient = new
  nusoap_client(http://ehusw.es/rosa/webZerbitzuak/batuZerbitzua.php?wsdl',
  true);

//Web-Service-n inplementatu dugun funtzioari dei egiten diogu,
// eta itzultzen diguna inprimatzen dugu
if (isset($_POST['batugai1'])){
echo '<h1>Batuketa da: ' . $soapclient->call('batu',array( 'x'=>$_POST['batugai1'],
   'y'=>$_POST['batugai2'])). '</h1>';
//echo '<h2>Request</h2><pre>'.htmlspecialchars($soapclient->request, ENT_QUOTES).'</pre>';
//echo '<h2>Response</h2><pre>'.htmlspecialchars($soapclient->response,ENT_QUOTES).'</pre>';

//echo '<h2>Debug</h2>';
//echo '<pre>' . htmlspecialchars($soapclient->debug_str, ENT_QUOTES) . '</pre>';
}
?>
```

Adibidea3: WZ publiko bat kontsumitzen

```
<?php
require_once('lib/nusoap.php');
require_once('lib/class.wsdlcache.php');

//nusoap_client motadun objektua sortzen dugu
//erabiliko den SOAP zerbitzua non dagoen zehazten url horrek
$soapclient = new nusoap_client(https://footballpool.dataaccess.eu/info.wso?WSDL ',true);

//Web-Service-n inplementatuta dagoen funtzio bati dei egiten diogu
$result = $soapclient->call('PlayersWithCardsRanked');

echo "<img src='https://i.eurosport.com/2014/10/29/1341217-28818109-2560-1440.jpg?w=1050'
     height=`200' width=`300'></img> <br/>" ;
echo '<b>ERRUSIAKO 2018 MUNDIALA</b> KARGUAK IZAN DITUZTEN JOKALARIEN RANKINGA<br/>';

for ($i = 0; $i < count($result['PlayersWithCardsRankedResult']['tTeamPlayerCardRankInfo']); $i++) {
 echo utf8_encode($result['PlayersWithCardsRankedResult']['tTeamPlayerCardRankInfo'][$i]['sName'].“--> ");
 echo "<img src='amarilla.jpg' height='30' width='35'></img> " ;
 echo $result['PlayersWithCardsRankedResult']['tTeamPlayerCardRankInfo'][$i]['iYellowCards']."  ";
 echo "<img src='roja.jpg' height='20' width='25'></img> " ;
 echo $result['PlayersWithCardsRankedResult']['tTeamPlayerCardRankInfo'][$i]['iRedCards']. "<br/>";
}
?>
```


http://ehusw.es/rosa/webZerbitzuak/futbolekoTxartelakWZB.php

Zerbitzuak itzultzen duena($result)



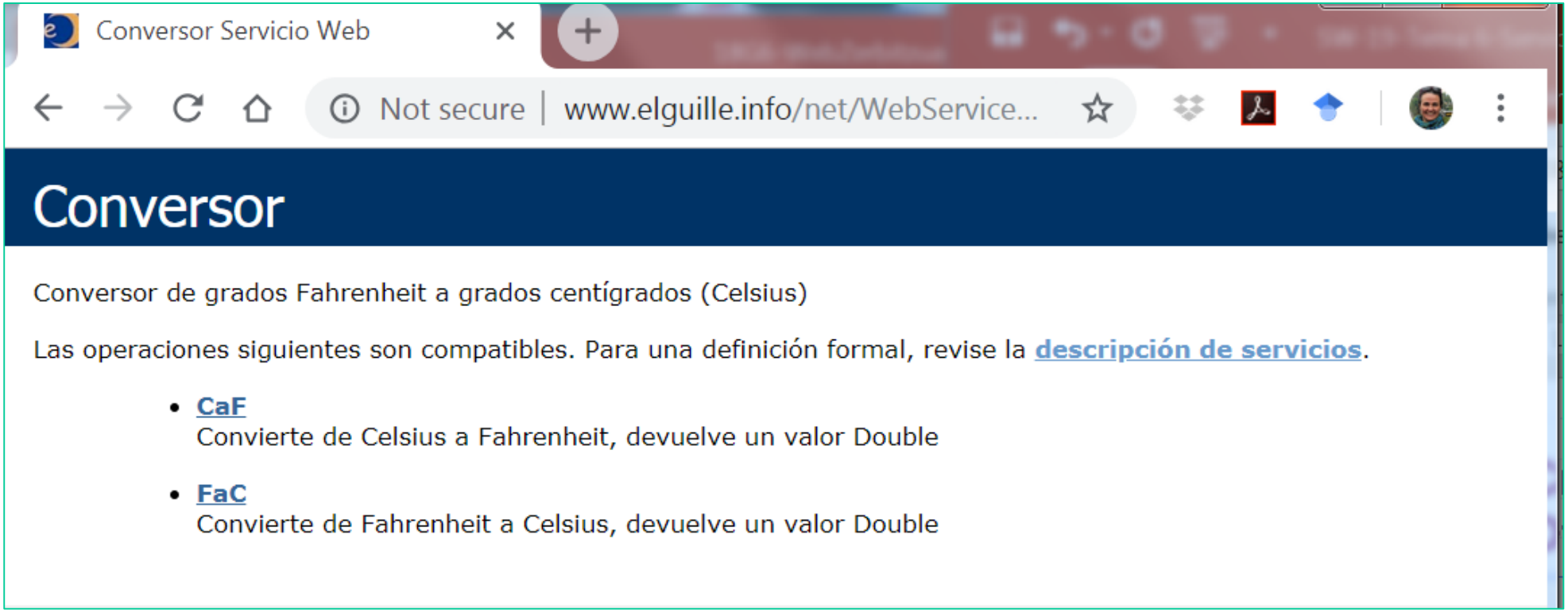
Array ([PlayersWithCardsRankedResult] => Array ([tTeamPlayerCardRankInfo] => Array ([0] => Array ([iRank] => 1 [iID] => 696 [sName] => Igor Smolnikov [iYellowCards] => 2 [iRedCards] => 1) [1] => Array ([iRank] => 1 [iID] => 1539 [sName] => Jérôme Boateng [iYellowCards] => 2 [iRedCards] => 1) [2] => Array ([iRank] => 1 [iID] => 834 [sName] => Sebastian Larsson [iYellowCards] => 3 [iRedCards] => 0) [3] => Array ([iRank] => 4 [iID] => 2271 [sName] => Aleksandar Mitrovic [iYellowCards] => 2 [iRedCards] => 0) [4] => Array ([iRank] => 4 [iID] => 1321 [sName] => Ante Rebic [iYellowCards] => 2 [iRedCards] => 0) [5] => Array ([iRank] => 4 [iID] => 1921 [sName] => Armando Cooper [iYellowCards] => 2 [iRedCards] => 0) [6] => Array ([iRank] => 4 [iID] => 1514 [sName] => Blaise Matuidi [iYellowCards] => 2 [iRedCards] => 0) [7] => Array ([iRank] => 4 [iID] => 1224 [sName] => Carlos Sánchez [iYellowCards] => 1 [iRedCards] => 1) [8] => Array ([iRank] => 4 [iID] => 1186 [sName] => Casemiro [iYellowCards] => 2 [iRedCards] => 0) [9] => Array ([iRank] => 4 [iID] => 2060 [sName] => Cristiano Ronaldo [iYellowCards] => 2 [iRedCards] => 0) [10] => Array ([iRank] => 4 [iID] => 1049 [sName] => Éver Banega [iYellowCards] => 2 [iRedCards] => 0) [11] => Array ([iRank] => 4 [iID] => 867 [sName] => Fabian Schär [iYellowCards] => 2 [iRedCards] => 0) [12] => Array ([iRank] => 4 [iID] => 2432 [sName] => Ferjani Sassi [iYellowCards] => 2 [iRedCards] => 0) [13] => Array ([iRank] => 4 [iID] => 1463 [sName] => Harry Maguire [iYellowCards] => 2 [iRedCards] => 0) [14] => Array ([iRank] => 4 [iID] => 1763 [sName] => Héctor Herrera [iYellowCards] => 2 [iRedCards] => 0) [15] => Array ([iRank] => 4 [iID] => 1725 [sName] => Héctor Moreno [iYellowCards] => 2 [iRedCards] => 0) [16] => Array ([iRank] => 4 [iID] => 1141 [sName] => Jan Vertonghen [iYellowCards] => 2 [iRedCards] => 0) [17] => Array ([iRank] => 4 [iID] => 1047 [sName] => Javier Mascherano [iYellowCards] => 2 [iRedCards] => 0) [18] => Array ([iRank] => 4 [iID] => 2309 [sName] => Jung Woo-young [iYellowCards] => 2 [iRedCards] => 0) [19] => Array ([iRank] => 4 [iID] => 1796 [sName] => Karim El Ahmadi [iYellowCards] => 2 [iRedCards] => 0) [20] => Array ([iRank] => 4 [iID] => 1459 [sName] => Kyle Walker [iYellowCards] => 2 [iRedCards] => 0) [21] => Array ([iRank] => 4 [iID] => 1518 [sName] => Kylian Mbappé [iYellowCards] => 2 [iRedCards] => 0) [22] => Array ([iRank] => 4 [iID] => 1509 [sName] => Lucas Hernández [iYellowCards] => 2 [iRedCards] => 0) [23] => Array ([iRank] => 4 [iID] => 2217 [sName] => M'Baye Niang [iYellowCards] => 2 [iRedCards] => 0) [24] => Array ([iRank] => 4 [iID] => 1338 [sName] => Marcelo Brozovic [iYellowCards] => 2 [iRedCards] => 0) [25] => Array ([iRank] => 4 [iID] => 1346 [sName] => Mario Mandzukic [iYellowCards] => 2 [iRedCards] => 0) [26] => Array ([iRank] => 4 [iID] => 1355 [sName] => Mathias Jorgensen [iYellowCards] => 2 [iRedCards] => 0) [27] => Array ([iRank] => 4 [iID] => 1918 [sName] => Michael Amir Murillo [iYellowCards] => 2 [iRedCards] => 0) [28] => Array ([iRank] => 4 [iID] => 809 [sName] => Mikael Lustig [iYellowCards] => 2 [iRedCards] => 0) [29] => Array ([iRank] => 4 [iID] => 1513 [sName] => N'Golo Kanté [iYellowCards] => 2 [iRedCards] => 0) [30] => Array ([iRank] => 4 [iID] => 2263 [sName] => Nemanja Matic [iYellowCards] => 2 [iRedCards] => 0) [31] => Array ([iRank] => 4 [iID] => 1041 [sName] => Nicolás Otamendi [iYellowCards] => 2 [iRedCards] => 0) [32] => Array ([iRank] => 4 [iID] => 2477 [sName] => Rodrigo Bentancur [iYellowCards] => 2 [iRedCards] => 0) [33] => Array ([iRank] => 4 [iID] => 1306 [sName] => Sime Vrsaljko [iYellowCards] => 2 [iRedCards] => 0) [34] => Array ([iRank] => 4 [iID] => 864 [sName] => Stephan Lichtsteiner [iYellowCards] => 2 [iRedCards] => 0) [35] => Array ([iRank] => 4 [iID] => 1142 [sName] => Thomas Meunier [iYellowCards] => 2 [iRedCards] => 0) [36] => Array ([iRank] => 4 [iID] => 1138 [sName] => Toby Alderweireld [iYellowCards] => 2 [iRedCards] => 0) [37] => Array ([iRank] => 4 [iID] => 883 [sName] => Valon Behrami [iYellowCards] => 2 [iRedCards] => 0) [38] => Array ([iRank] => 4 [iID] => 1229 [sName] => Wílmar Barrios [iYellowCards] => 2 [iRedCards] => 0) [39] => Array ([iRank] => 4 [iID] => 2107 [sName] => Yury Gazinsky [iYellowCards] => 2 [iRedCards] => 0) [40] => Array ([iRank] => 4 [iID] => 1368 [sName] => Yussuf Poulsen [iYellowCards] => 2 [iRedCards] => 0) [41] => Array ([iRank] => 42 [iID] => 1793 [sName] => Achraf Hakimi [iYellowCards] => 1 [iRedCards] => 0) [42] => Array ([iRank] => 42 [iID] => 2264 [sName] => Adem Ljajic [iYellowCards] => 1 [iRedCards] => 0) [43] => Array ([iRank] => 42 [iID] => 2058 [sName] => Adrien Silva [iYellowCards] => 1 [iRedCards] => 0) [44] => Array ([iRank] => 42 [iID] => 1390 [sName] => Ahmed Fathy [iYellowCards] => 1 [iRedCards] => 0) [45] => Array ([iRank] => 42 [iID] => 1389 [sName] => Ahmed Hegazi [iYellowCards] => 1 [iRedCards] => 0) [46] => Array ([iRank] => 42 [iID] => 2394 [sName] => Albin Ekdal [iYellowCards] => 1 [iRedCards] => 0) [47] => Array ([iRank] => 42 [iID] => 2272 [sName] => Aleksandar Prijovic [iYellowCards] => 1 [iRedCards] => 0) [48] => Array ([iRank] => 42 [iID] => 719 [sName] => Aleksandr Golovin [iYellowCards] => 1 [iRedCards] => 0) [49] => Array ([iRank] => 42 [iID] => 1617 [sName] => Alfred Finnbogason [iYellowCards] => 1 [iRedCards] => 0) [50] => Array ([iRank] => 42 [iID] => 1386 [sName] => Ali Gabr [iYellowCards] => 1 [iRedCards] => 0) [51] => Array ([iRank] => 42 [iID] => 1637 [sName] => Alireza .....

Adibidea4: gol gehien sartu dituztenak

```
<?php
require_once('lib/nusoap.php');
require_once('lib/class.wsdlcache.php');

//nusoap_client motadun objektua sortzen dugu
//erabiliko den SOAP zerbitzua non dagoen zehazten url horrek
$soapclient = new nusoap_client(`https://footballpool.dataaccess.eu/info.wso?WSDL',true);

//Web-Service-n inplementatuta dagoen funtzio bati dei egiten diogu
$result = $soapclient->call('TopScorersList');
echo "<div align=center>";
echo "<br/>";

echo "<img src='https://i.eurosport.com/2014/10/29/1341217-28818109-2560-1440.jpg?w=1050'
     height=`200' width=`300'></img> <br/>" ;
echo '<b>ERRUSIAKO 2018 MUNDIALA</b> GOLEATZAILE HANDIEN<br/>';

for ($i = 0; $i <= 4; $i++) {
  echo $result['TopScorersListResult']['tTopScorerTop5'][$i]['iRank'].": ";
  echo utf8_encode($result['TopScorersListResult']['tTopScorerTop5'][$i]['sName']." ");
  echo "Golak:".$result['TopScorersListResult']['tTopScorerTop5'][$i]['iGoals'];
  echo '<br/>';
  }
echo "</div>";
?>
```

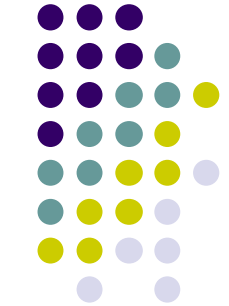

http://ehusw.es/rosa/webZerbitzuak/futbolekoGolelatzaileakWZB.php

WZ bat sorrera .NET erabiliz



http://www.elguille.info/net/WebServices/CelsiusFahrenheit.asmx

SOAP ez diren zenbait WZ

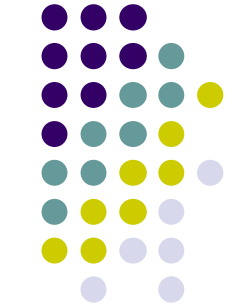


Bai bezeroaren bai zerbitzariaren Geolocalizazioa.
https://ehusw.es/jav/ServiciosWeb/geo.php

Irudiak
https://ehusw.es/jav/ServiciosWeb/pruebaFotosGetFile.php
$json=file_get_contents("http://api.flickr.com/services/feeds/photo
s_public.gne?tags=Donostia&format=json")

Eguraldiaren inguruko info
https://ehusw.es/jav/ServiciosWeb/pruebaTiempoGetFile.php
api.openweathermap.org
(APIKEY behar da, erregistratuz)

Datu konplexuen itzulketa NuSOAP bidez



Bi motatako datuak itzul litezke

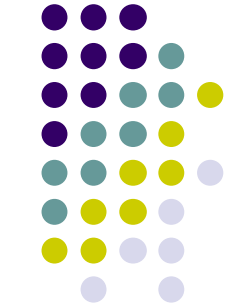
- *struct (erregistroen antzeko)*
  - *Adi:*

http://www.ahowto.net/php/creating-webservice-server-and-client-using-nusoap/

- *Dimentsio anitzeko array-ak*
  - *Adi*

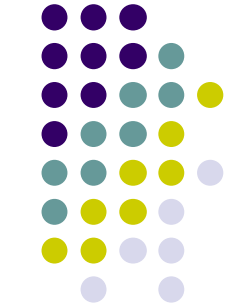
https://beeznest.wordpress.com/2009/03/22/retornar-arrays-con-nusoap/

Adibidea5: “batu” metodoari SOAP eskaera



```
POST /WebSite4/Service.asmx HTTP/1.1
Host: localhost
Content-Type: text/xml; charset=utf-8
Content-Length:
 SOAPAction: "http://www.ehu.es/Batu"

<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XML.../">
   <soap:Body>
    <Batu xmlns="http://www.ehu.es/">
       <bat>6</bat>
       <bi>4</bi>
    </Batu>
   </soap:Body>
</soap:Envelope>
```

Adibidea5: “batu” metodoari SOAP erantzuna

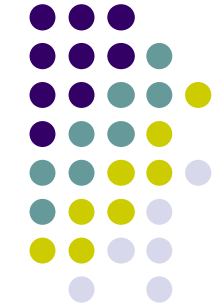


```
HTTP/1.1 200 OK
Content-Type: text/xml; charset=utf-8
Content-Length:

<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XML …/">
<soap:Body>
   <BatuResponse xmlns="http://www.ehu.es/">
    <BatuResult>10</BatuResult>
   </BatuResponse>
</soap:Body>
</soap:Envelope>
```

Helbide interesgarriak

- *SOAP*
  - *www.w3schools.com/webservices/*
- *SOAP eta PHP:*
  - *http://www.php.net/manual/en/book.soap.php*
- *WSDL*
  - *http://www.w3schools.com/xml/xml_wsdl.asp*

Helbide interesgarriak



- http://www.programmableweb.com/

- *REST:*
  - http://rest.elkstein.org/2008/
  - http://net.tutsplus.com/tutorials/other/a-beginners-introduction-to-http-and-rest/
  - http://www.restapitutorial.com/
  - http://blog.ijasoneverett.com/2013/02/rest-api-a-simple-php-tutorial/

- Mashup
  - http://es.slideshare.net/webdirections/javascript-apis-and-mashups