

# Web Services on Google App Engine

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# Agenda

- Introducing Force.com platform
- Clouds Connect
- Building the Bridge
  - Introducing WSC
  - Using Partner Library
- Building Hello World
  - Run in Java
  - Create a new Account in Force.com
- Product Catalog Demo
- Entertainment Demo by Appirio
- Q&A



Sales  
Cloud

Service  
Cloud

Your  
Cloud



Unlimited Real-Time  
Customization



Granular Security  
& Sharing



Programmable  
Cloud Logic



Real-Time Workflow  
& Approvals



Programmable  
User Interface



Real-Time Mobile  
Deployment



Real-Time  
Websites



Real-Time  
Content Library



Real-Time  
Analytics



850+ Integrated  
Applications



ISO 27001  
Certified Security

**>99.9%**

Proven  
Reliability



Proven,  
Real-Time Scalability

**<300ms**

Real-Time Query  
Optimizer



Real-Time  
Upgrades

**>100 million  
API calls/day**

Proven  
Real-Time integration



Real-Time Sandbox  
Environments



Salesforce to  
Salesforce



3 Global Data Centers  
& Disaster Recovery

**trust**

Real-Time Transparent  
System Status



Multi-Tenant Kernel

# Build and Run Any App on Force.com

## Build on Our Cloud Platform:

Complete set of tools  
Build fast

Salesforce Apps

850+ ISV  
Apps

110,000 Custom  
Apps



## Run on Our Real-Time Infrastructure:

Multi-tenant architecture  
Trusted, Proven, Secure



## Painless, No Hassle Upgrades

28 Major Releases  
Every Customization &  
Integration Automatically  
Upgraded  
Always have the Latest  
Innovations & Technology

“Multi-tenant application platforms represent the **state of the art foundation for cloud-based business applications.**”

**Gartner**



***The Fast Way to Build in the Cloud***



Real-Time Workflow  
& Approvals



Programmable User  
Interface



Real-Time Mobile  
Deployment



Real-Time  
Websites



Real-Time  
Content Library



Real-Time  
Analytics



AppExchange



Programmable  
Cloud Logic



Granular Security  
& Sharing

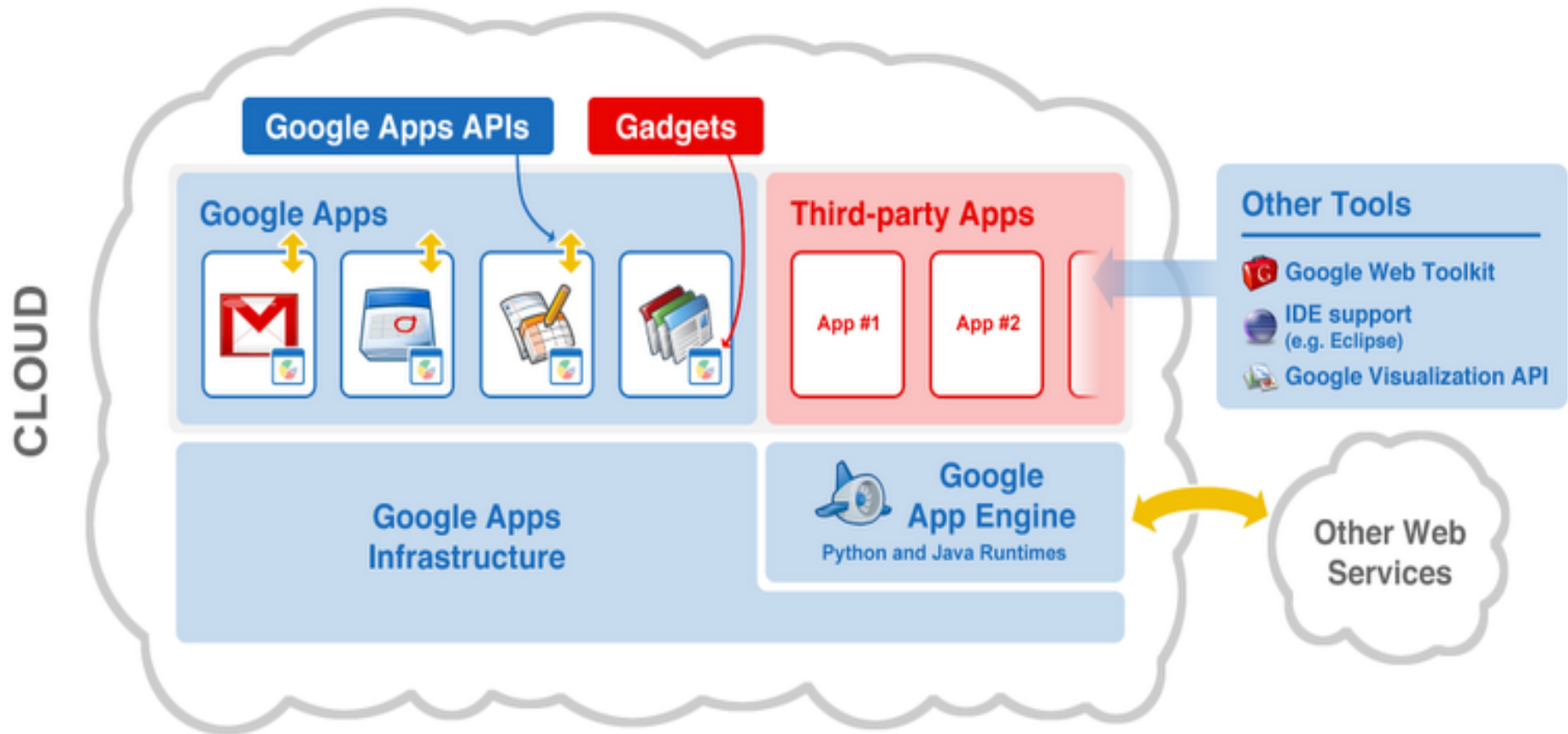


Unlimited Real-Time  
Customization



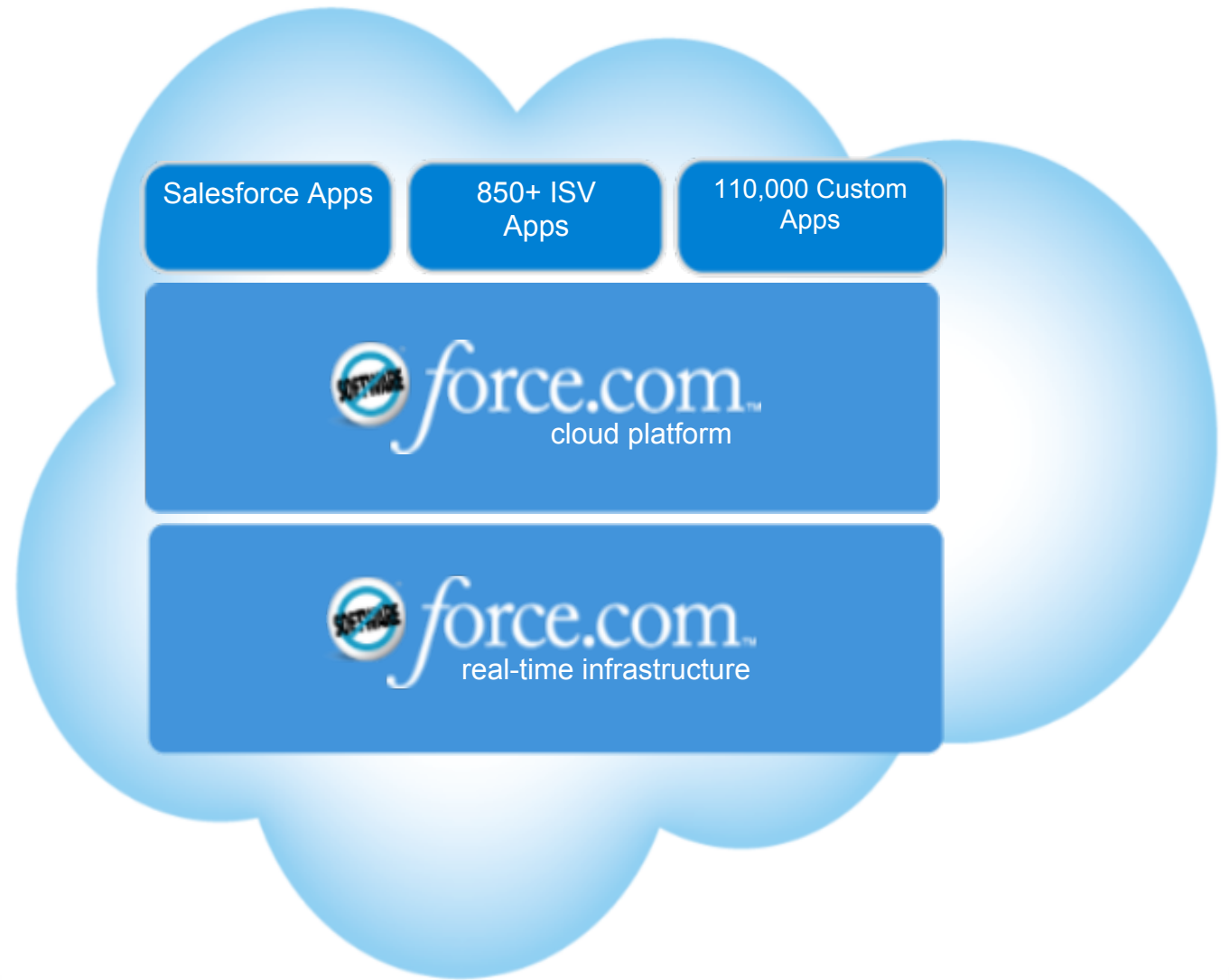
# Clouds Connect

Google's cloud architecture



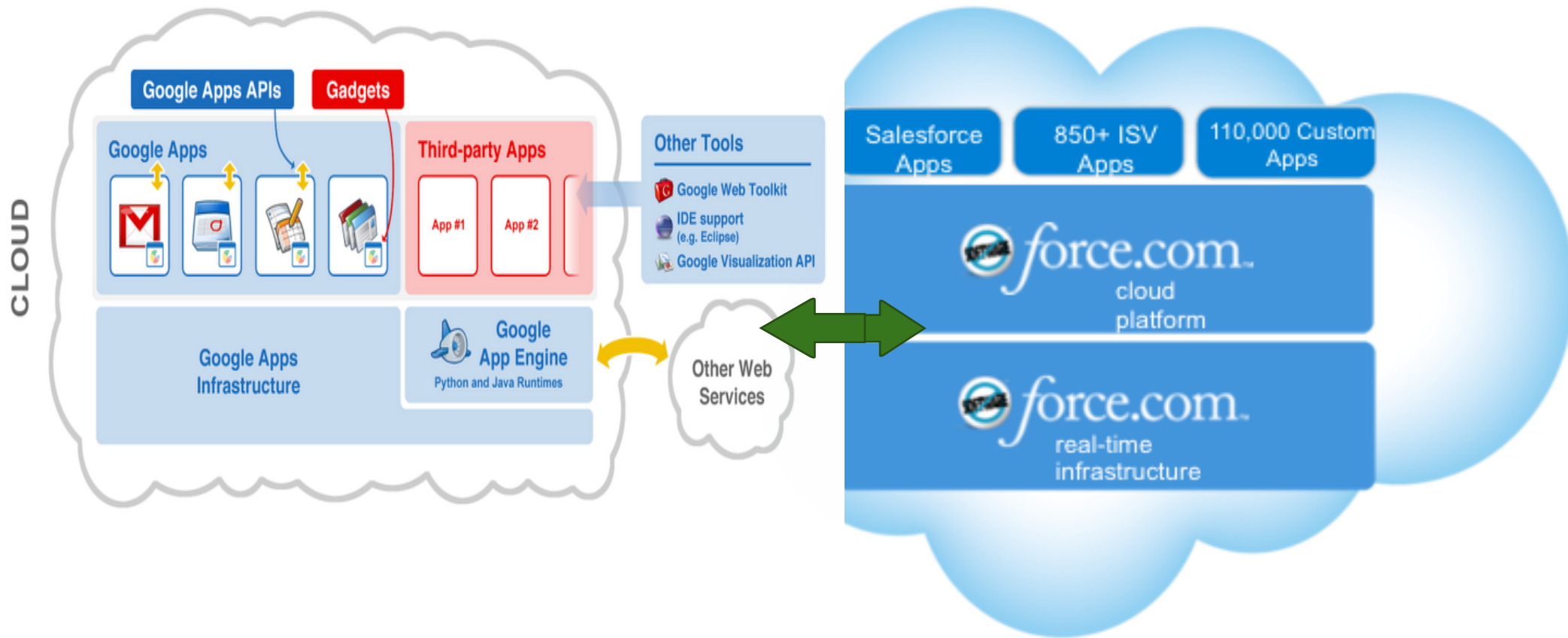
# Clouds Connect

Salesforce.com's cloud architecture



# Clouds Connect

What is gained by connecting the clouds?



# Clouds Connect - the Bridge

Google  
App Engine

Web  
Service  
Client

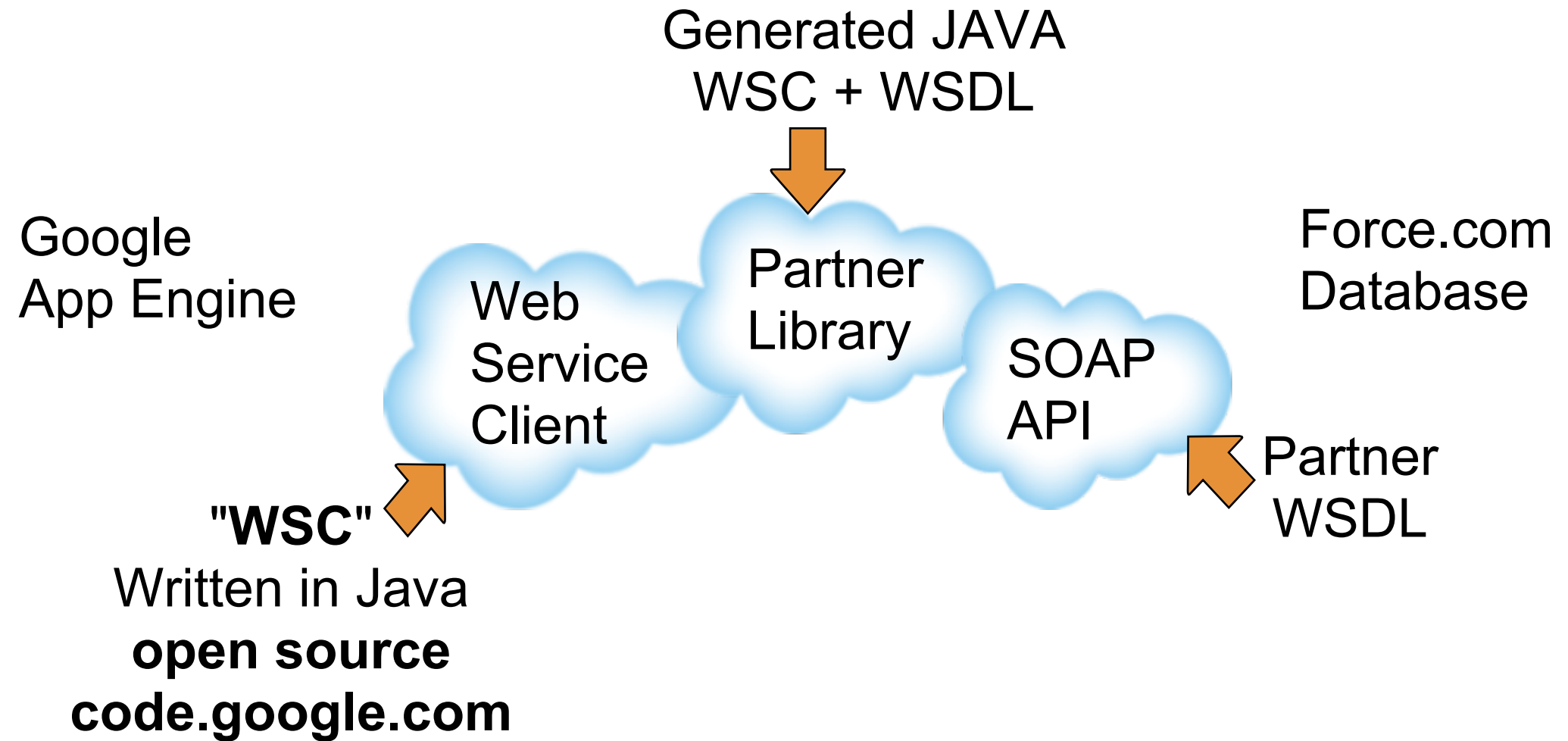
Partner  
Library

SOAP  
API

Force.com  
Database



# Clouds Connect - the Bridge



# Force.com SOAP API



- Basic CRUD operations

- Create
- Read
- Update
- Delete

- Special operations

- login
- SendEmail
- ConvertLead

- MetaData Operations

- Create Table (custom object)
- Create Field
- Create Tab

Exposed as a WSDL

```
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All Rights Reserved  
-->  
- <definitions targetNamespace="urn:partner.soap.sforce.com">  
  - <types>  
    - <schema elementFormDefault="qualified" targetNamespace="urn:partner.soap.sforce.com">  
      <import namespace="urn:partner.soap.sforce.com"/>  
      <!-- Dynamic sObject -->  
      - <complexType name="sObject">  
        - <sequence>  
          <element name="type" type="xsd:string"/>  
          <element name="fieldsToNull" type="xsd:string" nillable="true"/>  
          <element name="Id" type="tns:ID" nillable="true"/>  
          <any namespace="##targetNamespace" minOccurs="0" maxOccurs="unbounded" type="xsd:anyType"/>  
        </sequence>  
      </complexType>  
    </types>  
  </definitions>
```

# Web Services Client (WSC) for App Engine



- Open source Java client for Web Services
  - High performance
  - Streaming interface
- Available on code.google.com
  - <http://code.google.com/p/sfdc-wsc/>
- Provides **WSDL Parsing**
  - Generates Partner Library
  - Works with any doc/literal WSDL
  - support for several schema types
    - date,datetime,string,base64,etc..
- Provides **Transport** methods
  - using `UrlFetch()` in App Engine

# Web Services Client Transport



Web  
Service  
Client

Partner  
Library

SOAP  
API

```
public InputStream getContent() throws IOException {
    InputStream in;
    try {
        successful = true;
        // payload comes from bytes written to the output stream
        this.request.setPayload( output.toByteArray() );

        // go get that soap
        HTTPResponse resp = connection.fetch( this.request );
        if (resp.getResponseCode() != 200) {
            successful = false;
        }

        byte[] bytes = resp.getContent();

        in = new ByteArrayInputStream(bytes);
    }
}
```

# Web Services Client Parsing



- WSDL compiler generates Java
  - Library of objects and methods
  - for read and write with the api
  - *Not* specific to Force.com

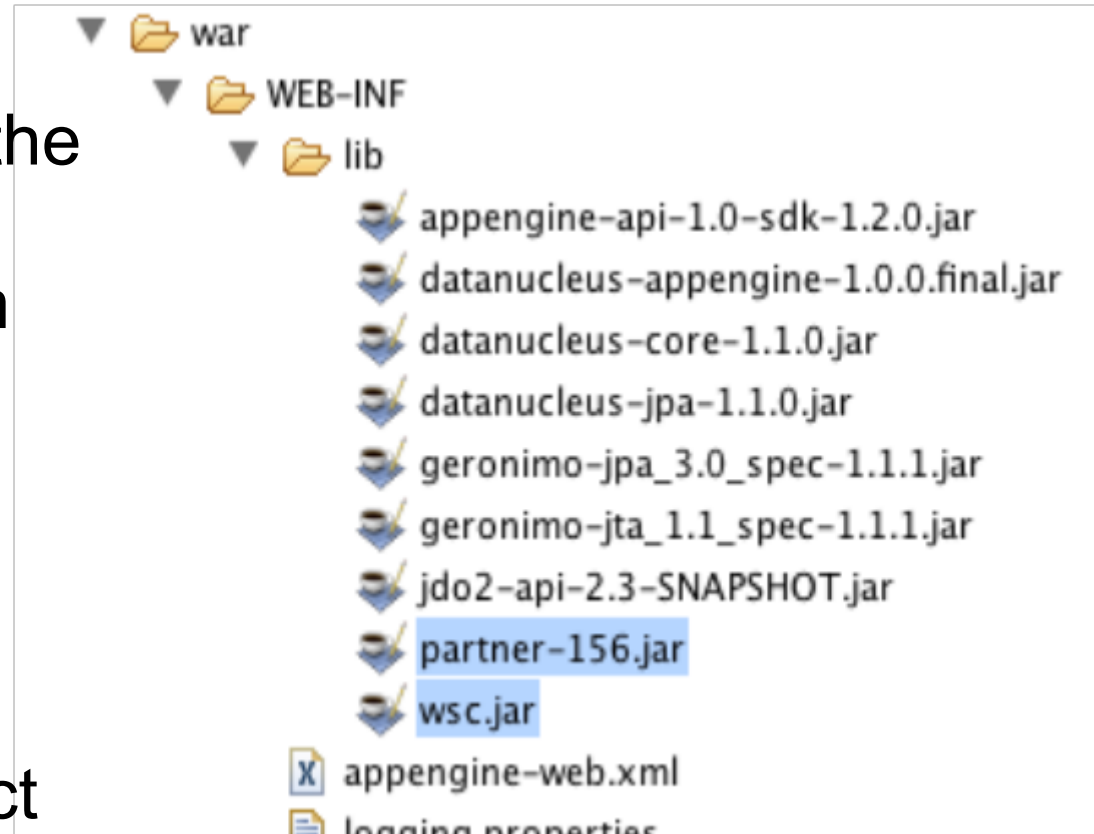
The syntax for running wsdlc is:

```
java -classpath WSC_HOME/lib/wsc.jar \  
com.sforce.ws.tools.wsdlc [WsdlFile] \  
[output-jar-file]
```

# Partner Library



- Generated Java JAR file
- Contains each **object** from the WSDL
- Contains each **method** from the WSDL
- Links with
  - Your App Engine App
  - Transport classes from WSC.JAR
- Exposes a Connection object to use in your application



# Partner Library

## Hello World program



Web  
Service  
Client

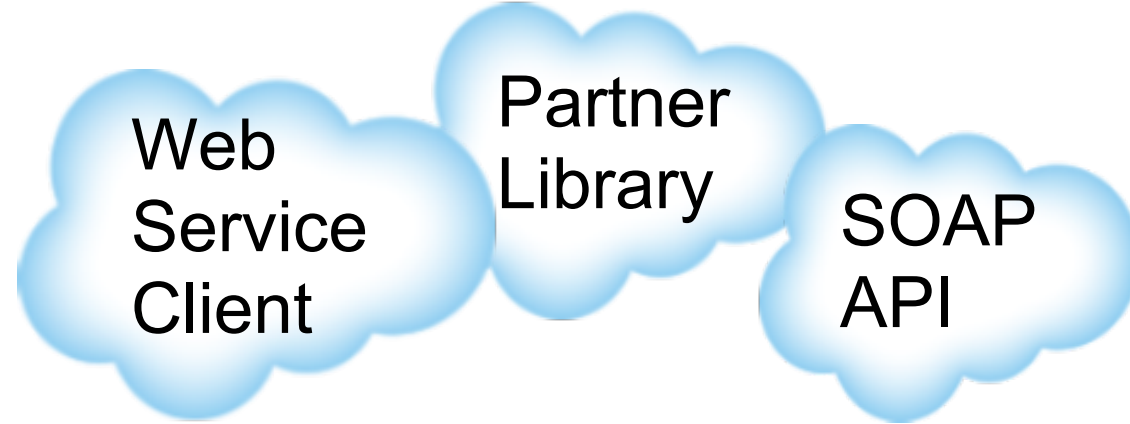
Partner  
Library

SOAP  
API

```
public class PartnerClient {  
    private PartnerConnection connection;  
  
    public PartnerClient() throws ConnectionException {  
        ConnectorConfig config = new ConnectorConfig();  
        config.setUsername(username); config.setPassword(password);  
        connection = Connector.newConnection(config);  
        createAccount();  
    }  
  
    private void createAccount() throws ConnectionException {  
        SObject account = new SObject();  
        account.setType("Account");  
        account.setField("Name", "Hello World");  
        account.setField("Phone", "123 555 3455");  
        connection.create(new SObject[]{account});  
    }  
  
    public static void main(String[] args) throws ConnectionException {  
        new PartnerClient();  
    }  
}
```

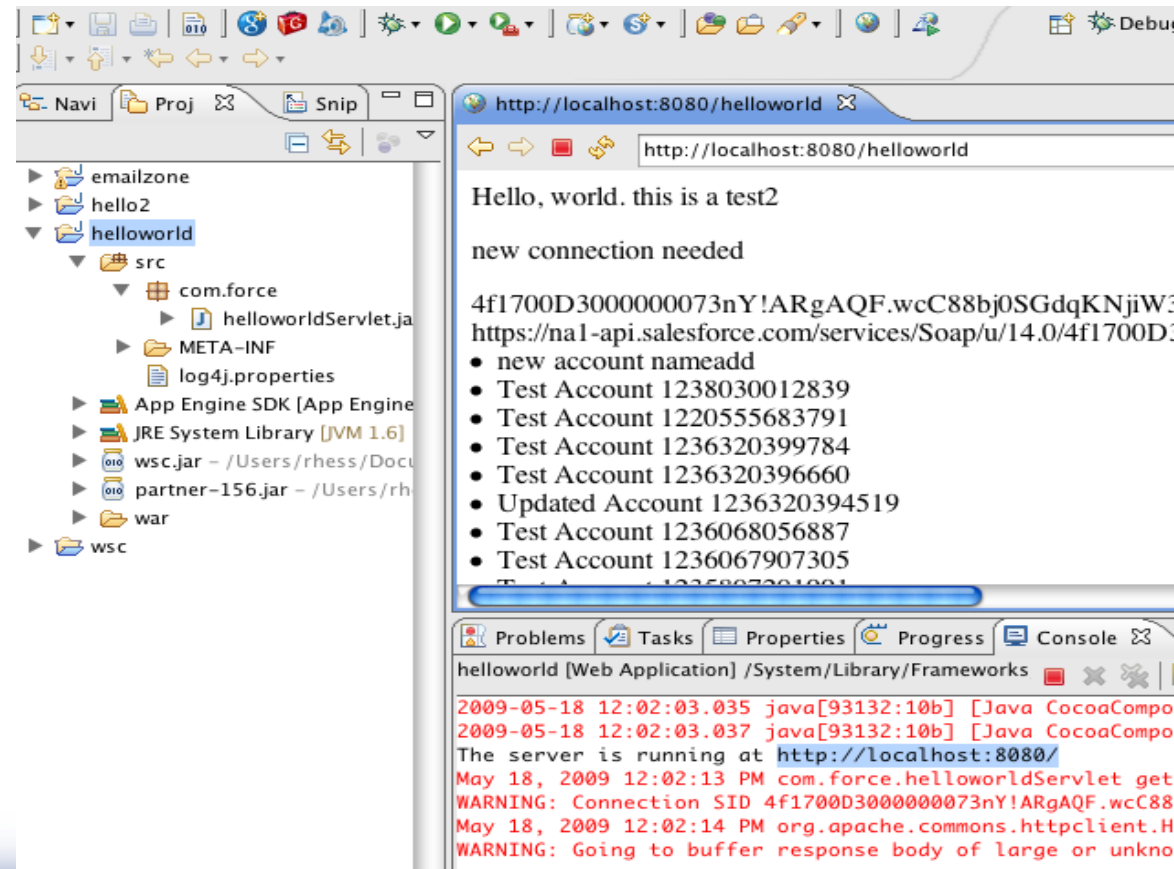
# Partner Library

## Hello World program



Let's put it all together  
This is the first of three  
demos today:

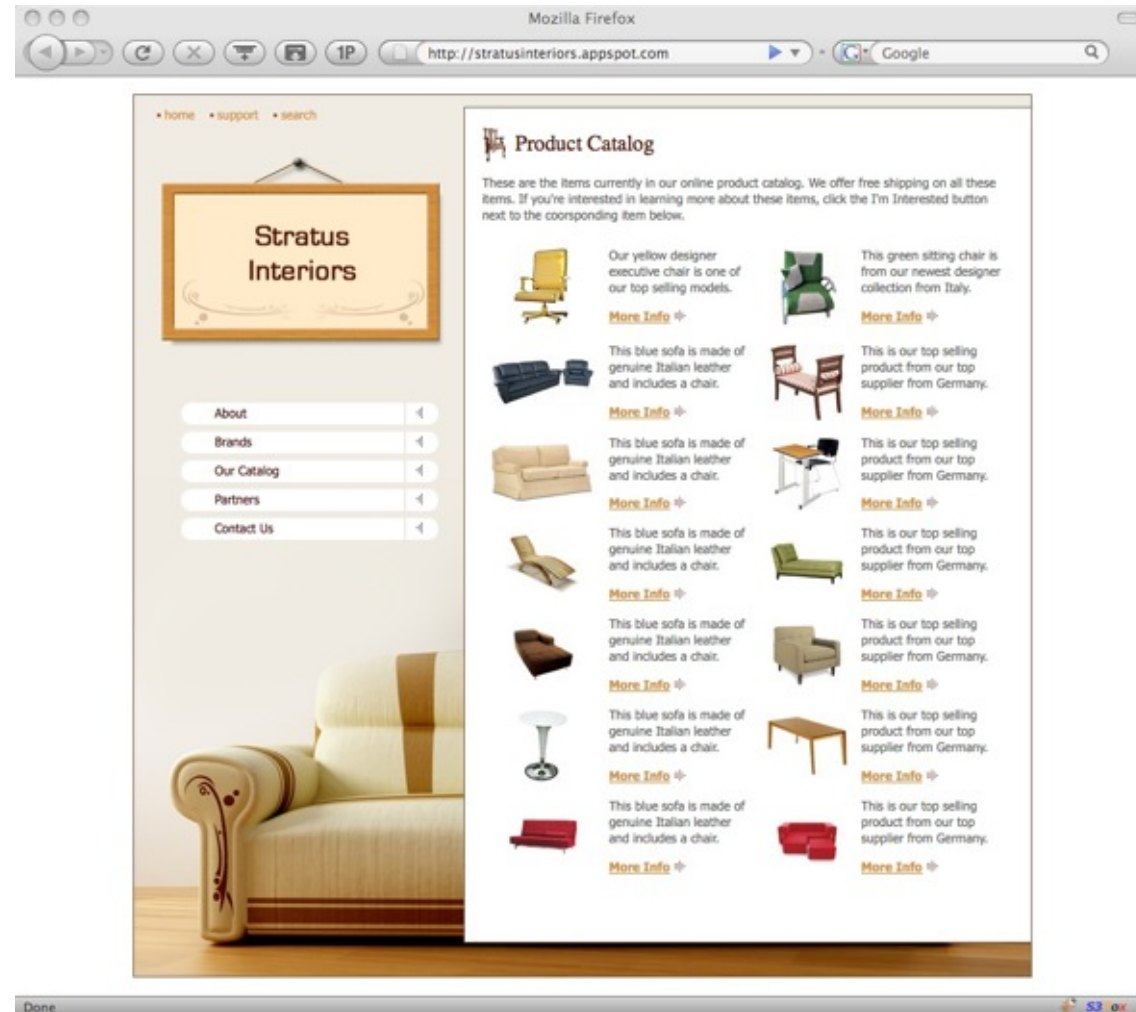
1. Hello World
2. Product Catalog demo
3. Partner Demo



# Product Catalog Demo

The customer will come to a web catalog that allows them to view products and inquire about additional details regarding the particular item.

- Catalog app is a GAE/J application
- User interface implemented in Java
- Product data pulled from Salesforce.com
- Inquiries pushed back into Salesforce.com



# Making the Connection

```
SalesforceSessionMgr ssm = new SalesforceSessionMgr();
```

```
ssm.setGlobalUsername(getServletContext().getInitParameter("sforce.username"));  
ssm.setGlobalPassword(getServletContext().getInitParameter("sforce.password"));
```

```
PartnerConnection conn = ssm.getGlobalConnection();
```



# Retrieving the Data

```
QueryResult qr = conn.query("SELECT Id, Description__c, ImageUrl__c FROM  
CatalogEntry__c ORDER BY CreatedDate");
```

```
int numRecords = qr.getSize();  
SObject[] records = qr.getRecords();  
CatalogEntry[] entries = new CatalogEntry[numRecords];  
for (int i=0; i<numRecords; i++) {  
    entries[i] = CatalogEntry.fromSObject(records[i]);  
}
```



## Partner Demo

Iain Valdez  
Product Development

HARRAHS.COM | RESERVATIONS | MY HARRAHS | CASINO LOCATOR | CUSTOMER SERVICE | HOT DEALS  
LAS VEGAS | ATLANTIC CITY | RENO/TAHOE | NEW ORLEANS/GULF | TUNICA | COMPARE CASINOS

**TOTAL REWARDS**  
Where will you play?~

IMPERIAL PALACE • FLAMINGO • PARS • HARRAHS • BALLY'S • RIO • CAESARS PALACE

**APPIRIO**

---

**Your Host**



**Nicole Patterson**  
Personal Concierge  
257 Las Vegas Blvd. 300  
Las Vegas, NV 92105  
Tel: (702) 555-5545  
Fax: (702) 555-5555  
contact@harras.com

**Dear Friends,**

I have some really exciting news just in! Jerry Seinfeld has just announced new dates at Caesars Palace next month and we have some VIP packages that include box seats, dinner for two and a special post-concert meet and greet reception with Jerry! I only have 10 of these special Jerry Seinfeld packages available so please let me know if you are interested in reserving one as soon as possible.

Our office is committed to making sure that you have the most incredible casino vacation experience at all of our Total Rewards(RL) casino resorts nationwide.

Give me a call or send me an e-mail if you're interested in learning about any chartered flights, special events or promotions I may have available. I look forward to assisting you!

Thanks,  


Reservation Request

My Host

Dining Guide

Total Rewards

Weather

Entertainment Guide

Things To Do

---

**Trip Planner**

12345  
Total Rewards ID

Arriving:  Departing:

☐ Accommodations ☐ Spa Services  
☐ Golf ☐ Limousine  
☐ Restaurants ☐ Entertainment

Harrah's Lake Tahoe

Submit Request

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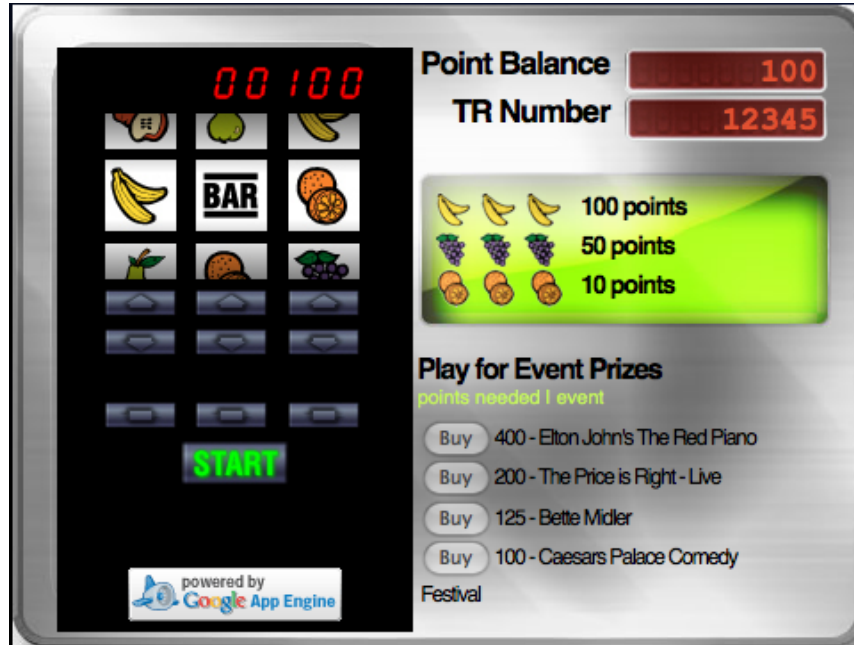
**Start playing now: Win your Trip**



1000 points  
100 points  
10 points

2 tickets  
18 holes  
\$100 chips

# VIP mgmt & slot game on Force.com & Appengine



- Appirio built a Google App Engine powered slot machine game to show how Harrah's could create an engaging experience for VIPs.

- Entertainment applications built on App Engine are easy to build, and easy to scale—perfect for viral distribution



- Harrah's can target VIP gamers wherever they think about gaming (e.g., the slot machine application can be played from an iGoogle page used to plan a trip to Vegas)

# Appirio Slots Demo & IDE

[HARRAH'S.COM](#) | [RESERVATIONS](#) | [MY HARRAH'S](#) | [CASINO LOCATOR](#) | [CUSTOMER SERVICE](#) | [HOT DEALS](#)  
[LAS VEGAS](#) | [ATLANTIC CITY](#) | [RENO/TAHOE](#) | [NEW ORLEANS/ULF](#) | [TUNCA](#) | [COMPARE CASINOS](#)

**TOTAL REWARDS**  
Where will you play?

IMPERIAL PALACE • FLAMINGO • PARIS • HARRAH'S • SALLY'S • RIO • CAESARS PALACE



**Your Host**

**Nicole Patterson**  
Personal Concierge  
357 Las Vegas Blvd., 230  
Las Vegas, NV 92105  
Tel: (702) 555-5545  
Fax: (702) 555-5555  
[contact@harras.com](mailto:contact@harras.com)

**Dear Friends,**

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Give me a call or send me an e-mail if you're interested in learning about any chartered flights, special events or promotions I may have available. I look forward to assisting you!

Thanks,  
*Nicole Patterson*

Reservation Request

[My Host](#)  
[Dining Guide](#)  
[Total Rewards](#)  
[Weather](#)  
[Entertainment Guide](#)  
[Things To Do](#)

**Trip Planner**

12345  
[Total Rewards ID](#)

Arriving:  Departing:   
☐ Accommodations ☐ Spa Services  
☐ Golf ☐ Limousine  
☐ Restaurants ☐ Entertainment  
Submit Request

**Start playing now: Win your Trip**

00:103

1000 points

100 points

10 points

1000 2 tickets

0800 18 holes

0600 \$100 chips

START

```
Java - helloforce/src/appirio/helloforce/HelloForceServ.java - Eclipse Platform - /Users/iein/dev/workspace

Package Explorer | Hierarchy | HelloForceServ.java

AEDemos [trunk/java/demos]
├── ContactsApi
├── helloforce
│   ├── appirio.helloforce
│   │   └── HelloForceServ.java
│   ├── META-INF
│   │   └── log4j.properties
│   ├── App Engine SDK [appengine-java-sc
│   ├── JRE System Library [JVM 1.6]
│   ├── Referenced Libraries
│   ├── war
│   ├── HelloOrm
│   ├── jdoexamples
│   ├── oAuth
│   └── Recruit

HelloForceServ.java
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public void doGet(HttpServletRequest req, HttpServletResponse resp) throws
{
    UserService userService = UserServiceFactory.getUserService();
    DatastoreService datastoreService = DatastoreServiceFactory.getDatastoreSe
    String requestURI = req.getRequestURI();

    Log.info( requestURI );

    PrintWriter out = resp.getWriter();

    out.println("<html><body>");

    try {
        if ( connection == null ) {
            out.println("<p>new connection needed</p>");
            PartnerClient();
        } else {
            out.println("<p>reuse existing connection");
            out.println( connection.getConfig().getSessionId() );
        }
    } catch ( ConnectionException ce ) {
        log.warning("saw an exception " + ce.getMessage());
    }

    try {
        QueryResult result = connection.query( "select id, name, phone from A
        SObject[] accounts = result.getRecords();

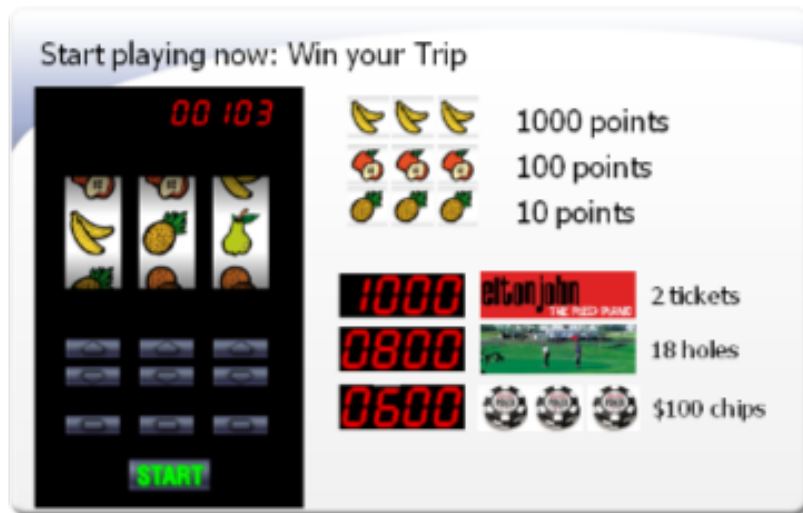
        for (SObject account : accounts) {
            String aName = (String)account.getField("Name");
            out.println("<li>"+ aName + "</li>");
        }
    } catch ( ConnectionException ce ) {
        log.warning(ce.getMessage());
    }

    // Write the submission form and the footer of the page
    out.println("    <form action='"+ requestURI + "' method='post'>");
    out.println("        <div><textarea name='content' rows='3' cols='60'>");
    out.println("            <div><input type='submit' value='Sign Guestbook'></");
    out.println("        </form>");
    out.println("    </body>");
    out.println("</html>");
}

public void doPost(HttpServletRequest req, HttpServletResponse resp) throws IO
{
    PrintWriter out = resp.getWriter();
    out.println("<html><body>");

    log.finest("create salesforce account");
}
```

# Force.com & App Engine - complimentary clouds



## Advantages of building on **App Engine**

- Rich Java developer community & libraries to power consumer-oriented interactive web applications.
- Embed game in multiple contexts, e.g. iGoogle.
- Pay as you go model with auto-scaling.

## Advantages of connecting to **Force.com**

- Prizes won by guests are tracked in Salesforce CRM for delivery upon guest's arrival.
- Play triggers workflow to manage guest experience.
- Track engagement from guests who do not formally book a trip for lightweight followup.

# Q&A -- Learn More

## Landing Page

<http://developer.force.com/appengine>

## Project Repository

<http://code.google.com/p/sfdc-wsc/>

