

Session id: 36636

# ORACLE 9iAS FORMS DEPLOYMENT : MULTIPLE OC4J INSTANCES

Inderpal S. Johal



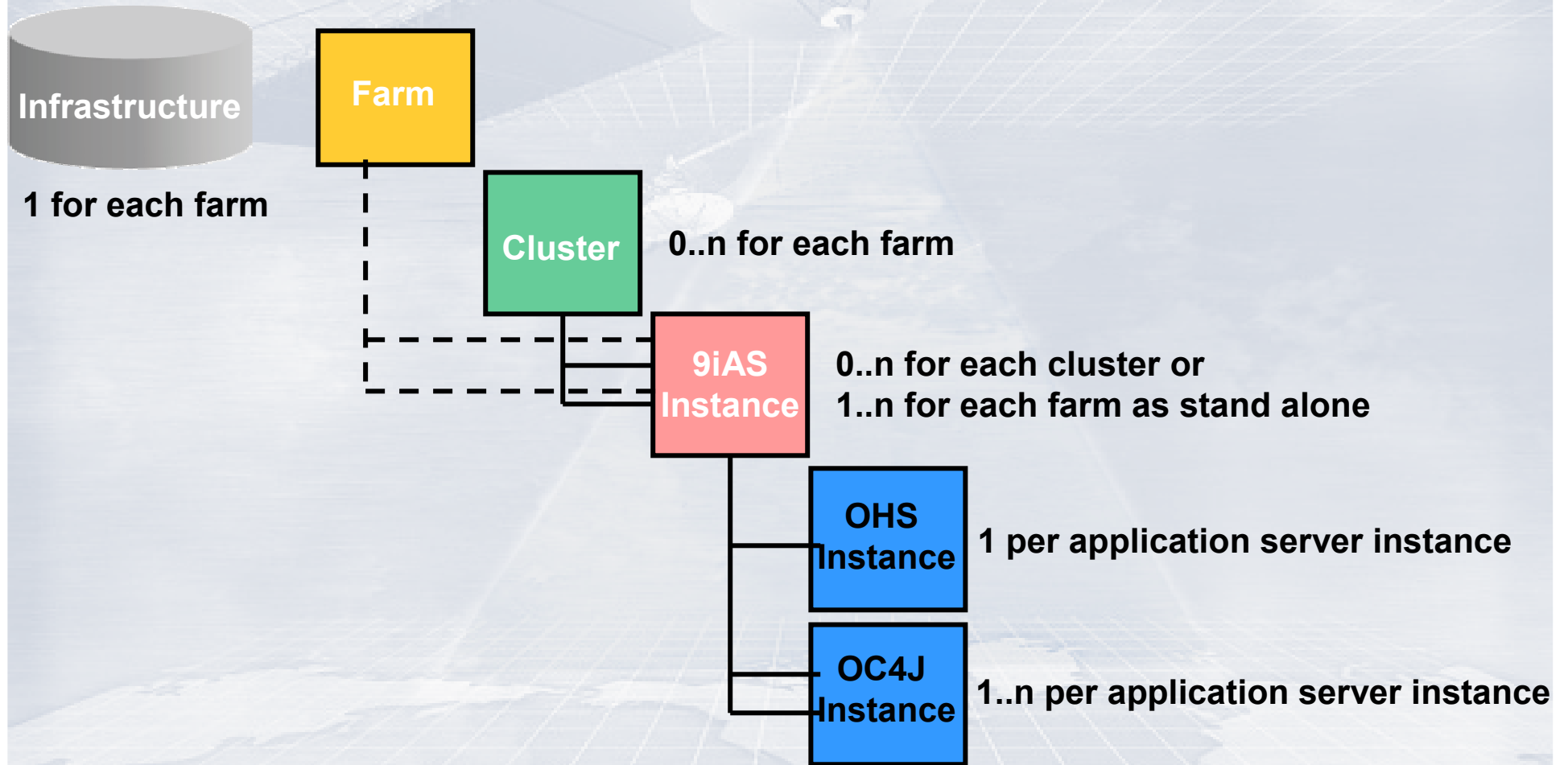
DATA SOFTECH INC.  
Complete Database Solution Provider



# AGENDA

- **Java 2 Enterprise Edition (J2EE) Basics**
- **Oracle 9iAS Containers for J2EE (OC4J) Basics**
- **Oracle 9iAS Architecture**
- **Oracle 9iAS Forms Services Components**
- **Forms Services Configuration Files**
- **Forms Services Management**
- **Demo for Configuration and Load balancing**
- **Questions & Answers**
- **Don't Forget the Online Survey**

# Oracle 9iAS Terms



# Forms Runtime Engine

- It is a process created on the Application Server as **ifweb90** on Windows, **f90webm** on UNIX
- Provides communication between the client and database through Oracle 9i Net services.
- Executes all Application logic and processing
- Load forms executables into memory like .fmx, .plx that contain the application code



# Forms Services Configuration Files

## ■ Oracle HTTP Listener Config Files



- Httpd.conf → \$OH/Apache/Apache/conf
- Oracle\_apache.conf → \$OH/Apache/Apache/conf
- Mod\_oc4j.conf → \$OH/Apache/Apache/conf
- Forms90.conf → \$OH/forms90/server

## ■ Forms Services Config files



- Formsweb.cfg → \$OH/forms90/server
- Default.env → \$OH/forms90/server
- Base\*.htm → \$OH/forms90/server
- Forms90app.ear → \$OH/forms90/j2ee
- Registry.dat → \$OH/forms90/java/oracle/forms/registry

## ■ OC4J Config Files



- Web.xml

# Distributed Configuration Management (DCM)

- DCM manages configuration by propagating the cluster-wide configuration for the application server instances and its components.
- The files are located under the directory: `$ORACLE_HOME/dcm`
- Instance configuration is persisted into the Configuration Repository in the database.
- Command line utility `dcmctl`

# DCMCTL utility

- Stop and respectively restart all configured OC4J instances from the command line:

```
$> dcmctl stop -co OC4J_BI_Forms  
$> dcmctl restart -co OC4J_BI_Forms
```

- Stop and respectively restart the OHS instance home from the command line:

```
$> dcmctl stop -ct ohs  
$> dcmctl restart -ct ohs
```

- Other useful DCM Help and Error commands:

```
$> dcmctl help  
$> dcmctl getState -v  
$> dcmctl getError ADM-906007
```

# Oracle Process Manager Notification [OPMN]

- OPMN consists of the following two components:
  - Oracle Process Manager
  - Oracle Notification System
- Oracle Process Manager uses the configuration files `opmn.xml` and `ons.conf`.
- The files are located under the directory:  
`$ORACLE_HOME/opmn/conf/`

### Enter Network Password



Please type your user name and password.

Site: indy.pnnewswire.com

Realm: enterprise-manager

User Name: ias\_admin



Password: xxxxxxxx

Save this password in your password list

OK

Cancel

## Application Servers

Name	Status	Farm	Oracle Home	CPU Usage (%)	Memory Usage (MB)
<a href="#">openworldDB.indy.pnnewswire.com</a>		Unavailable	C:\ora9iasdb		
<a href="#">openworldIAS.indy.pnnewswire.com</a>		Unavailable	C:\ora9ias	1	28.176



**Application Servers**

Farm > Application Server:openworldIAS.indy.prnewswire.com

**Application Server: openworldIAS.indy.prnewswire.com**

Refreshed at Wednesday, September 3, 2003 12:28:00 PM EDT

**General**



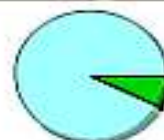
Stop All

Restart All

Start All

Status **Partially Up**  
 Host [indy.prnewswire.com](http://indy.prnewswire.com)  
 Oracle Home **C:\ora9ias**  
 Farm [indy.prnewswire.com.1521.iasdb1](http://indy.prnewswire.com.1521.iasdb1)

**CPU Usage**



Application Server (0%)  
 Idle (92%)  
 Other (8%)

**Memory Usage**



Application Server (0% 0MB)  
 Free (18% 84MB)  
 Other (82% 417MB)

**System Components**

[Create OC4J Instance](#)

Start

Stop

Restart

Delete

Select	Name	Status	Uptime (days)	CPU Usage (%)	Memory Usage (MB)
<input type="radio"/>	<a href="#">BC4J</a>				
<input checked="" type="radio"/>	<a href="#">Clickstream Collector</a>				
<input type="radio"/>	<a href="#">Forms</a>				
<input type="radio"/>	<a href="#">HTTP Server</a>				
<input type="radio"/>	<a href="#">OC4J_BI_Forms</a>				
<input type="radio"/>	<a href="#">OC4J Demos</a>				



[Preferences](#) [Help](#)

[Targets](#)

## Create OC4J Instance

Enter the name of the OC4J instance you wish to create

\* OC4J instance name

[Cancel](#)

[Create](#)

[Targets](#) | [Preferences](#) | [Help](#)



[Preferences](#) [Help](#)

[Targets](#)



## Confirmation

OC4J instance "OC4J\_TEST90" was created.

OK

[Targets](#) | [Preferences](#) | [Help](#)

# ORACLE Enterprise Manager

[Preferences](#) [Help](#)

**Targets**

## Application Servers

Farm > Application Server:openworldIAS.indy.prnewswire.com

### Application Server: openworldIAS.indy.prnewswire.com

Refreshed at Wednesday, September 3, 2003 12:28:00 PM EDT

#### General



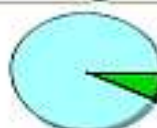
Stop All

Restart All

Start All

Status **Partially Up**  
 Host [indy.prnewswire.com](#)  
 Oracle Home **C:\ora9ias**  
 Farm [indy.prnewswire.com.1521.iasdb1](#)

#### CPU Usage



Application Server (0%)  
 Idle (92%)  
 Other (8%)

#### Memory Usage



Application Server (0% 0MB)  
 Free (18% 84MB)  
 Other (82% 417MB)

### System Components

[Create OC4J Instance](#)

Start

Stop

Restart

Delete

Select	Name	Status	Uptime (days)	CPU Usage (%)	Memory Usage (MB)
<input type="radio"/>	<a href="#">BC4J</a>				
<input checked="" type="radio"/>	<a href="#">Clickstream Collector</a>				
<input type="radio"/>	<a href="#">Forms</a>				
<input type="radio"/>	<a href="#">HTTP Server</a>				
<input type="radio"/>	<a href="#">OC4J_BI_Forms</a>				
<input type="radio"/>	<a href="#">OC4J_TEST90</a>				

# ORACLE Enterprise Manager

[Preferences](#) [Help](#)

Targets



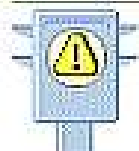
## Confirmation

"OC4J\_TEST90" has been started.

OK

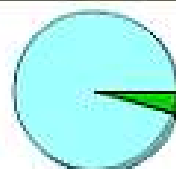
[Targets](#) | [Preferences](#) | [Help](#)

### General



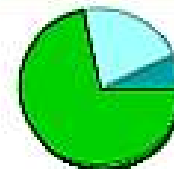
Status **Partially Up**  
 Host [indy.prnewswire.com](http://indy.prnewswire.com)  
 Oracle Home **C:\ora9ias**  
 Farm [indy.prnewswire.com.1521.iasdb1](http://indy.prnewswire.com.1521.iasdb1)

### CPU Usage



Application Server (0%)  
 Idle (95%)  
 Other (5%)

### Memory Usage



Application Server (7% 34MB)  
 Free (21% 108MB)  
 Other (72% 370MB)

## System Components

Select	Name	Status	Uptime (days)	CPU Usage (%)	Memory Usage (MB)
<input type="radio"/>	<a href="#">BC4J</a>				
<input checked="" type="radio"/>	<a href="#">Clickstream Collector</a>				
<input type="radio"/>	<a href="#">Forms</a>				
<input type="radio"/>	<a href="#">HTTP Server</a>		0.009	0	34.082
<input type="radio"/>	<a href="#">OC4J_BI_Forms</a>				
<input type="radio"/>	<a href="#">OC4J_Demos</a>				
<input type="radio"/>	<a href="#">OC4J_home</a>				
<input type="radio"/>	<a href="#">OC4J_Portal</a>				
<input type="radio"/>	<a href="#">OC4J_TEST90</a>				

## Application Servers

Farm > [Application Server: openworldIAS.indy.prnewswire.com](#) > OC4J\_TEST90

## OC4J\_TEST90

Refreshed at Wednesday, September 3, 2003 12:40:48 PM EDT

### General



Status **Up**  
 Start Time **Unavailable**  
 Virtual Machines **Unavailable**

Stop

Restart

### Status

CPU Usage (%) **Unavailable**  
 Memory Usage (MB) **Unavailable**  
 Heap Usage (MB) **Unavailable**

### JDBC Usage

Open JDBC Connections **Unavailable**  
 Total JDBC Connections **Unavailable**  
 Active Transactions **Unavailable**  
 Transaction Commits **Unavailable**  
 Transaction Rollbacks **Unavailable**

### Response - Servlets and JSPs

Active Sessions **Unavailable**  
 Active Requests **Unavailable**  
 Request Processing Time (secs) **Unavailable**  
 Requests per Second **Unavailable**

## Deployed Applications

### Default Application

Name default  
 Path **application.xml**

### Applications

Deploy EAR file

Deploy WAR file

Previous  Next

Select	Name	Path	Parent Application	Active Requests	Request Processing Time (secs)	Active EJB Methods
No applications deployed						



## Deploy Application: Select Application

Select the J2EE application (.ear file) to be deployed.

J2EE Application

Specify a unique application name for this application.

Application Name

Step 2 of 8



## Deploy Application: URL Mapping for Web Modules

A web module needs to be mapped to an URL pattern in the default web site before it can be accessed. The following table lists all the web modules found in your application. Specify the URL mapping for each of these modules.

Name	URL Binding
Forms 9i Services	* <input type="text" value="/TEST"/>

[Cancel](#)

[Back](#)

Step 3 of 8

[Next](#)

[Finish](#)

# Additional Steps

```
$ cd $ORACLE_HOME/forms90
```

```
$ mkdir TEST
```

```
$ cp $OH/forms90/test.fmx $OH/forms90/TEST
```

```
$ cd $ORACLE_HOME/forms90/server
```

```
$ cp formsweb.cfg formsTest90.cfg
```

```
<<<formsTest90.cfg>>
```

```
working directory=/oracle/9iAS/forms90/TEST
```

```
form=test.fmx
```

```
ServerURL=/TEST/I90servlet
```

```
Serverhost=devindy.prnewswire.com
```

# WEB.XML

\$OH/j2ee/OC4J\_TEST90/applications/TEST90/forms90web/WEB-INF

<init-param>

<param-name>configFileName</param-name>

<param-value>

**/oracle/9iAS/forms90/server/formsTest90.cfg**

</param-value>

</init-param>

<context-param>

<param-name>configFileName</param-name>

<param-value>

**/oracle/9iAS/forms90/server/formsTest90.cfg**

</param-value>

</context-param>

# FORMS90.CONF

Added the Following entries in forms90.conf file located in  
\$ORACLE\_HOME/forms90/server

**Oc4jMount /TEST OC4J\_TEST90**

**Oc4jMount /TEST/f90servlet OC4J\_TEST90**

**Oc4jMount /TEST/f90servlet/\* OC4J\_TEST90**

**Oc4jMount /TEST/l90servlet OC4J\_TEST90**

**Oc4jMount /TEST/l90servlet/\* OC4J\_TEST90**

**Restart the OHS [ Oracle HTTP Server ]**

# Restart OHS and OC4J

This can be done by using the “dcmctl” or OEM

## DCMCTL Commands

```
$ dcmctl stop -co OC4J_TEST90
```

```
$ dcmctl stop -ct ohs
```

```
$ dcmctl getstate -v
```

```
$ dcmctl start -ct ohs
```

```
$ dcmctl start -co OC4J_TEST90
```

```
$ dcmctl getstate -v
```

Window



Welcome to Oracle9iAS Forms Services

**Installed successfully!**

**Oracle9iAS Forms Services**

Oracle9iAS Release 2

Forms Services version 9.0.2.7.0

OK



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**FORMS**

**DEPLOYMENT**

**One-Machine Solution**

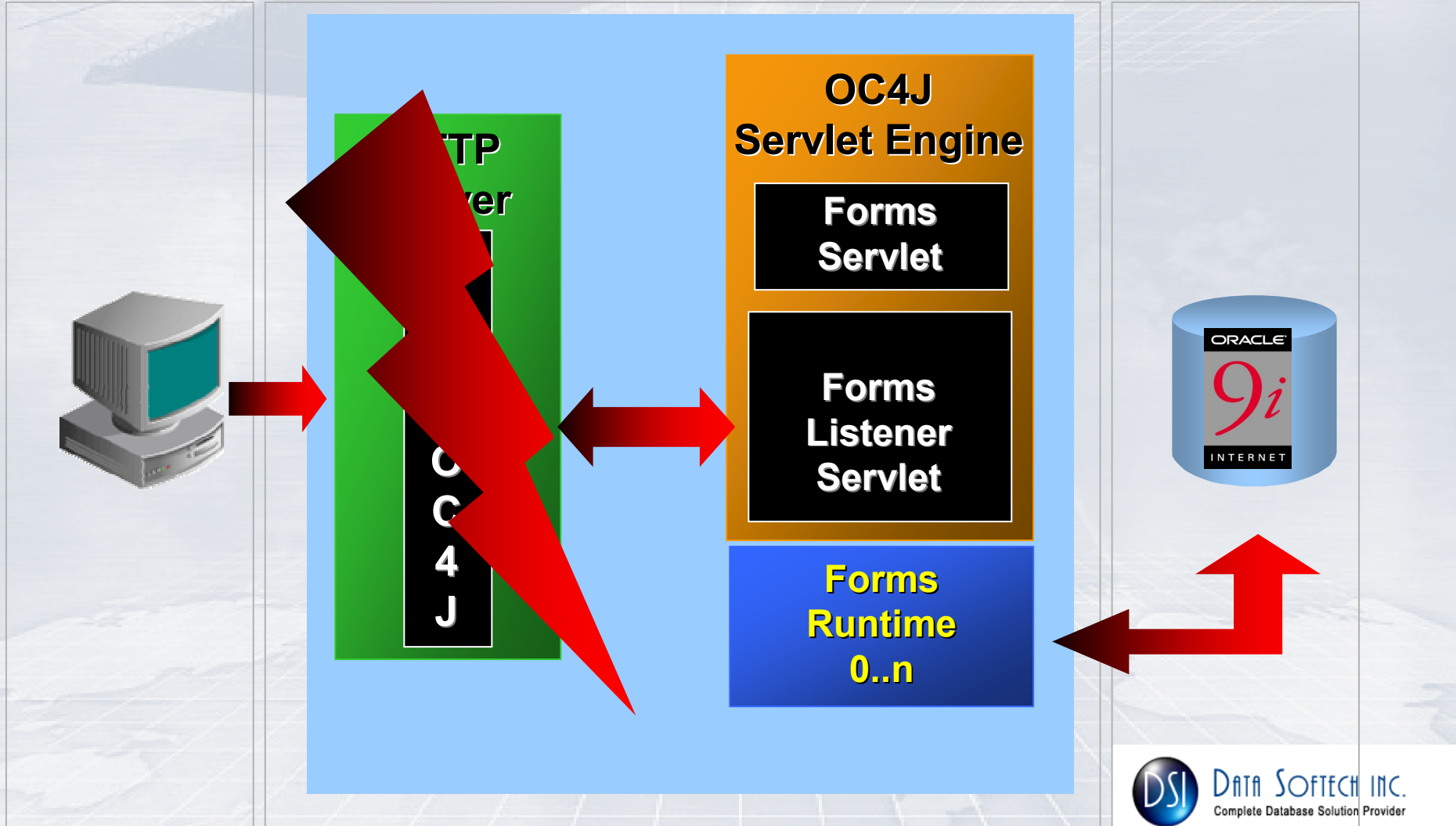
**Simplest Configuration**

# Forms Deployment → 1 Machine Configuration

Client Tier

Application Tier

Db tier

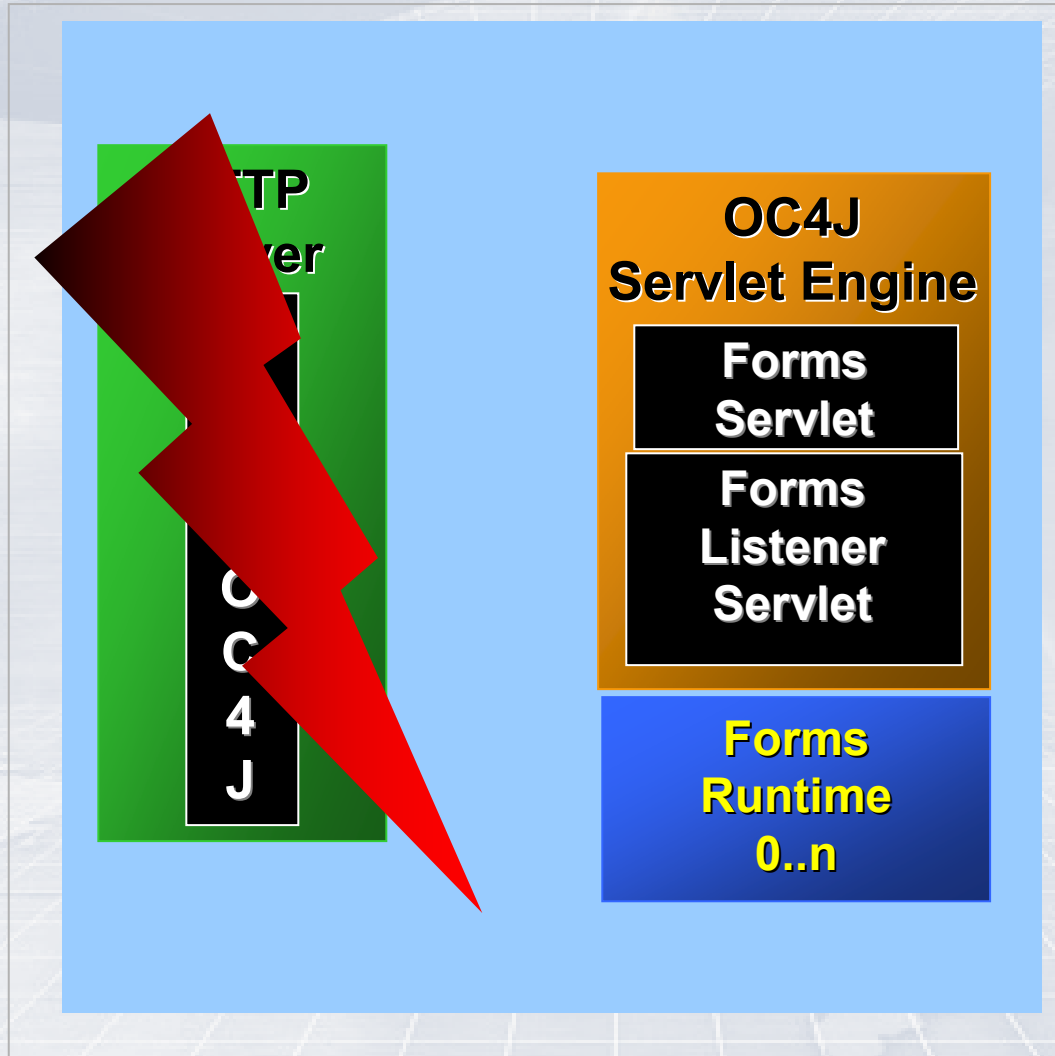


# Forms Deployment → 1 Machine Configuration

Client Tier



Application Tier



Db tier

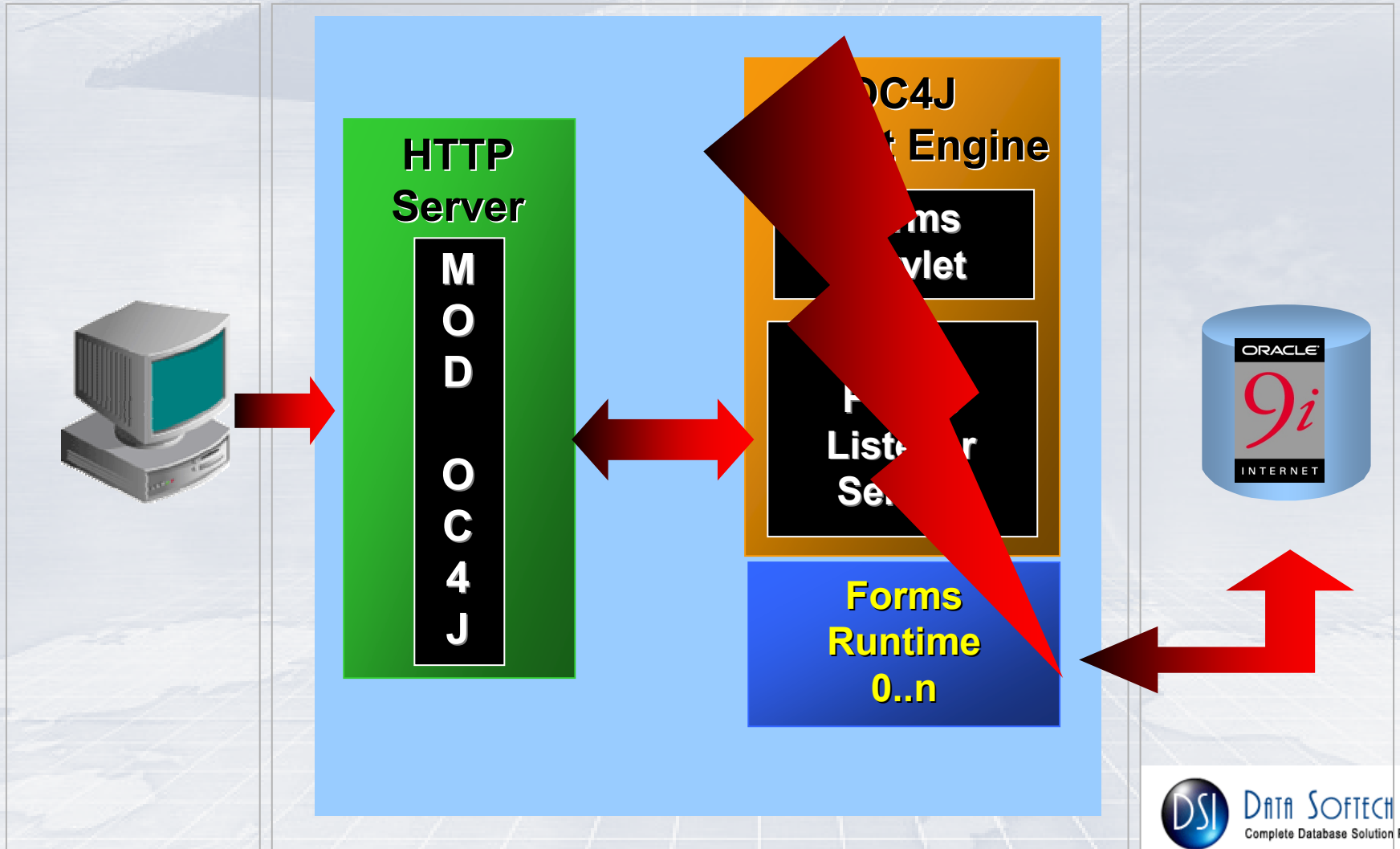


# Forms Deployment → 1 Machine Configuration

Client Tier

Application Tier

Db tier

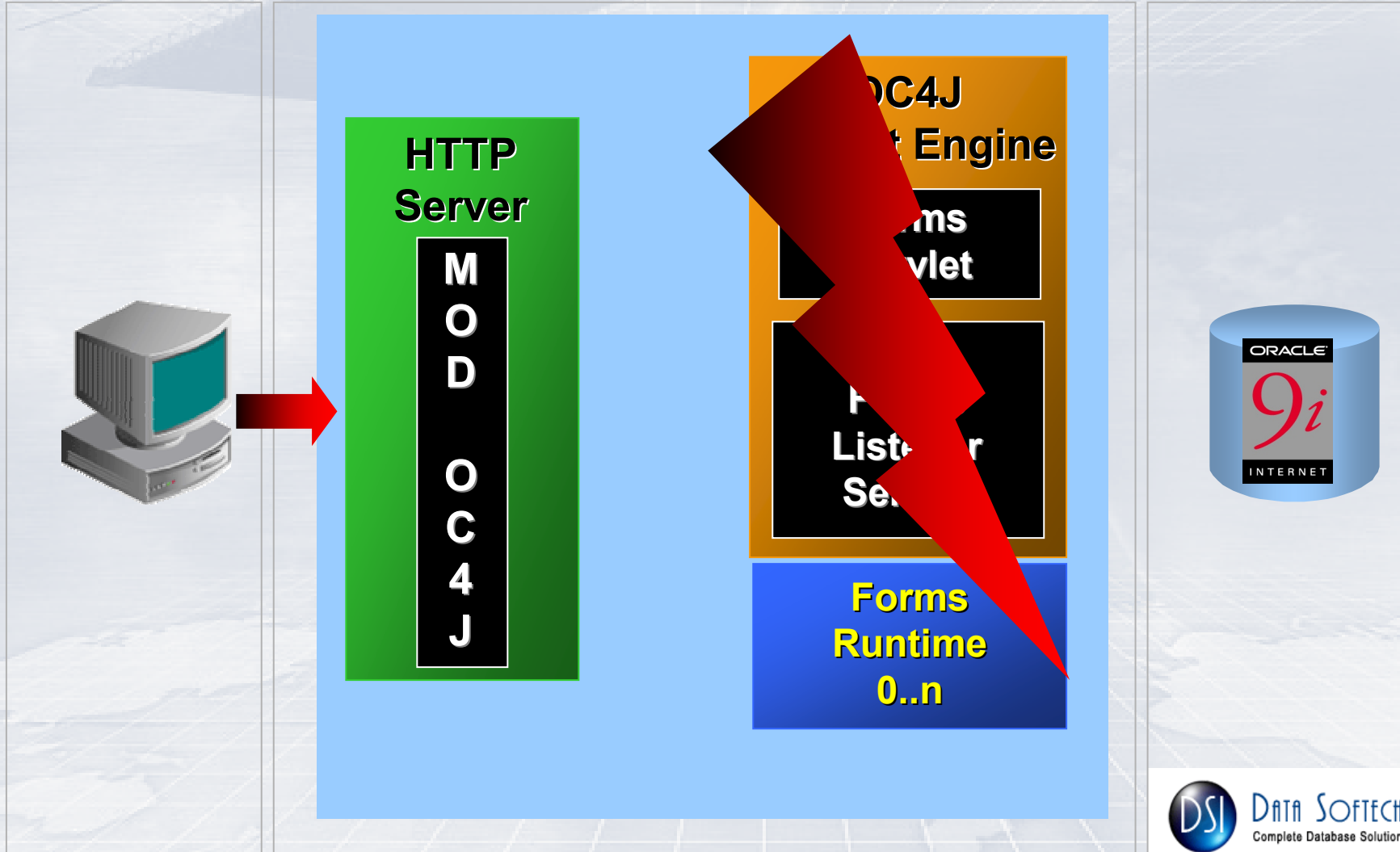


# Forms Deployment → 1 Machine Configuration

Client Tier

Application Tier

Db tier

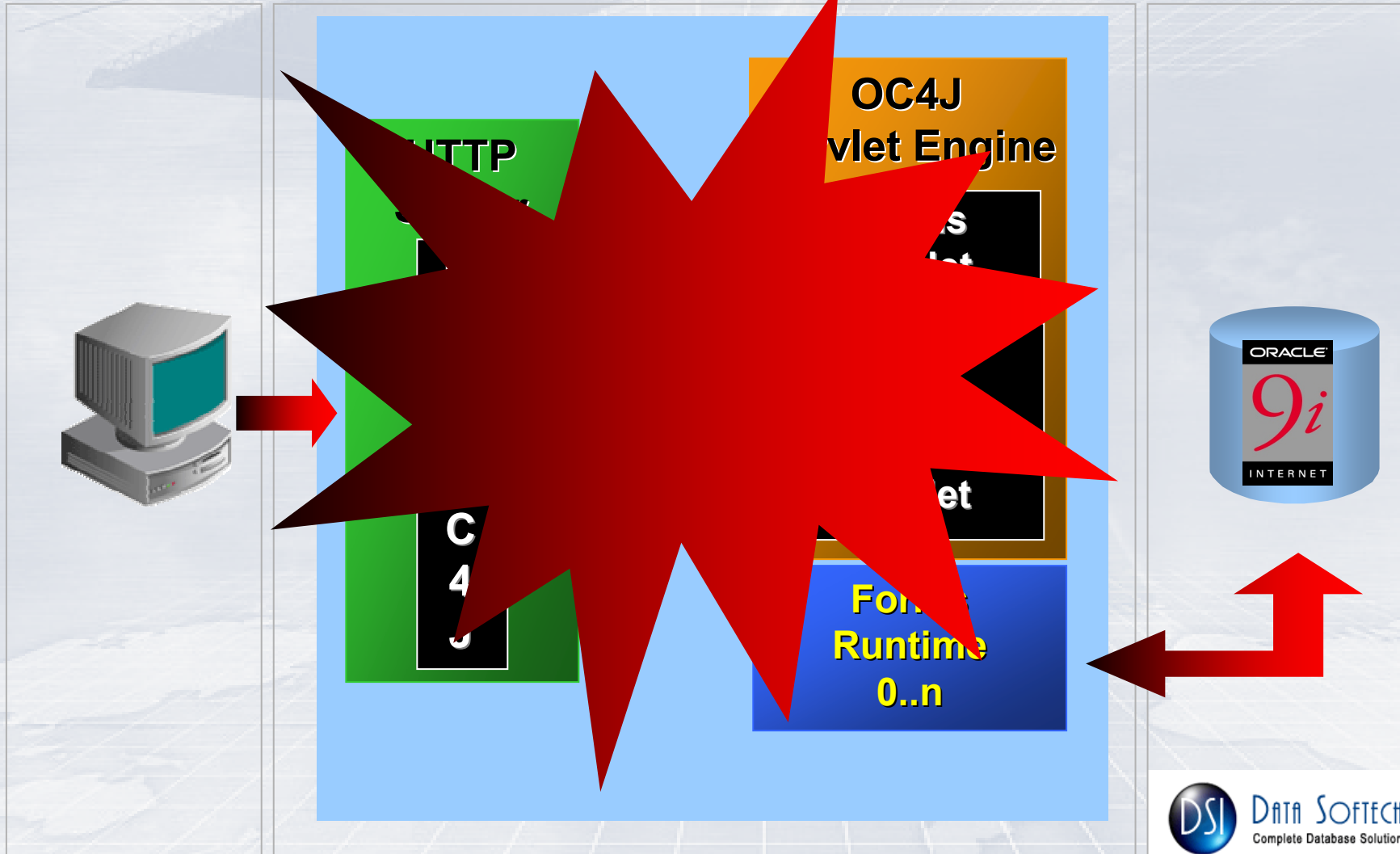


# Forms Deployment → 1 Machine Configuration

Client Tier

Application Tier

Db tier



# Forms Deployment → 1 Machine Configuration

Client Tier



Application Tier

HTTP  
Server  
M  
O  
D  
O  
C  
4  
J

OC4J  
Servlet Engine

Forms  
Servlet

Forms  
Listener  
Servlet

Forms  
Runtime  
0..n

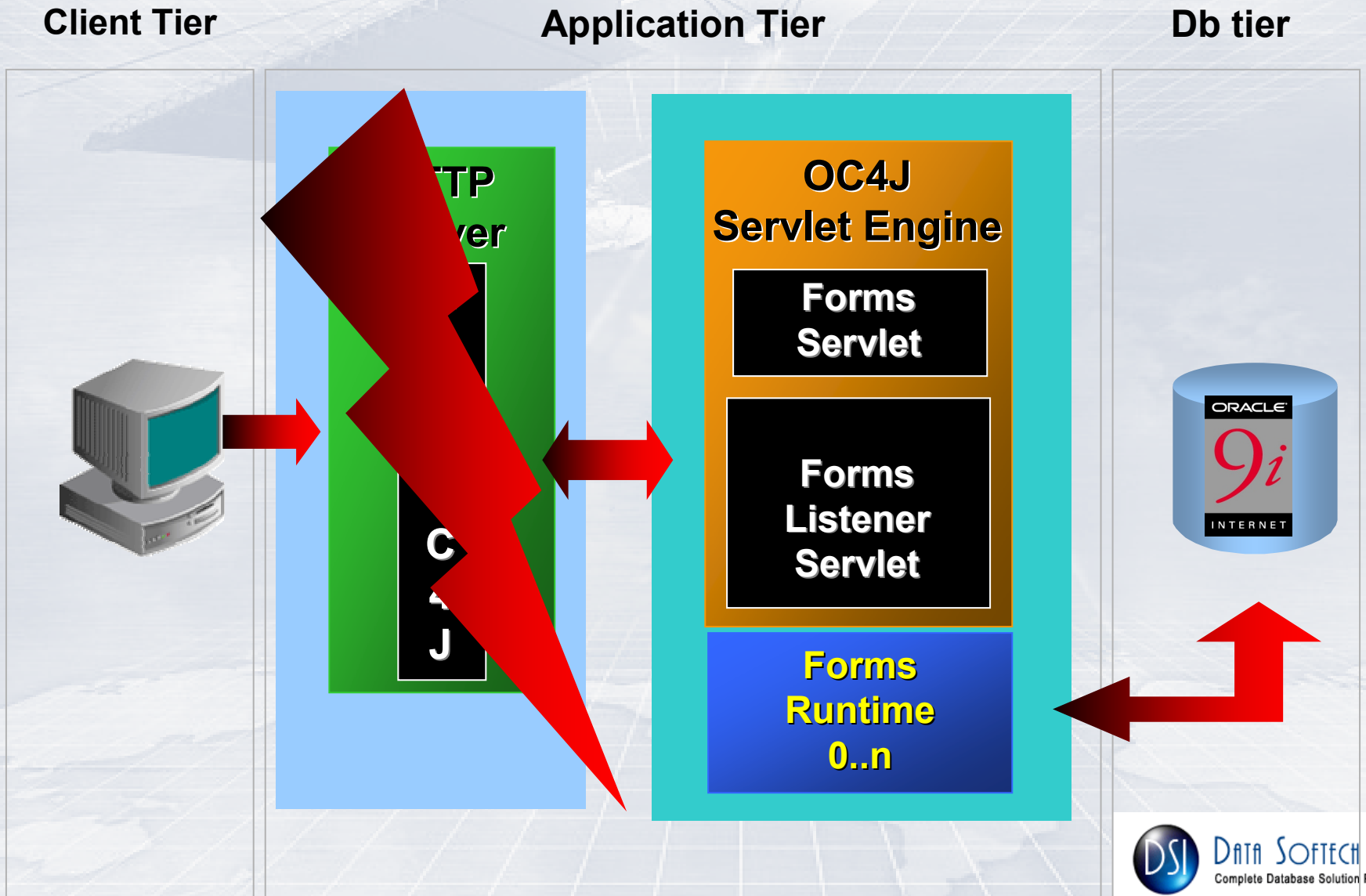
Db tier



**FORMS  
DEPLOYMENT**

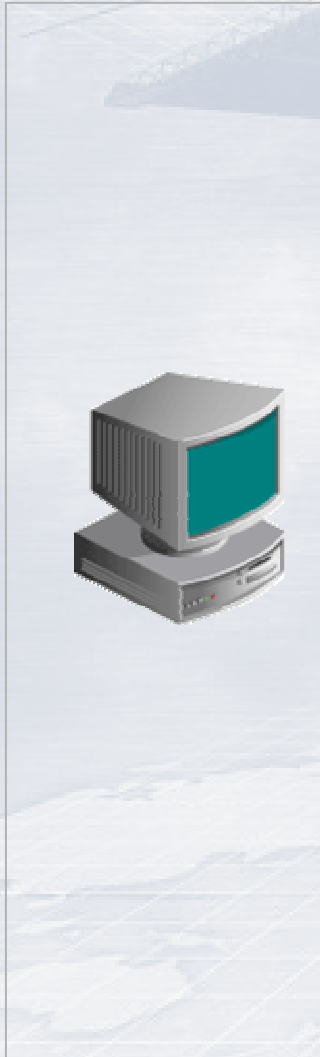
**Two-Machine Solution**

# Forms Deployment → 2- Machine configuration

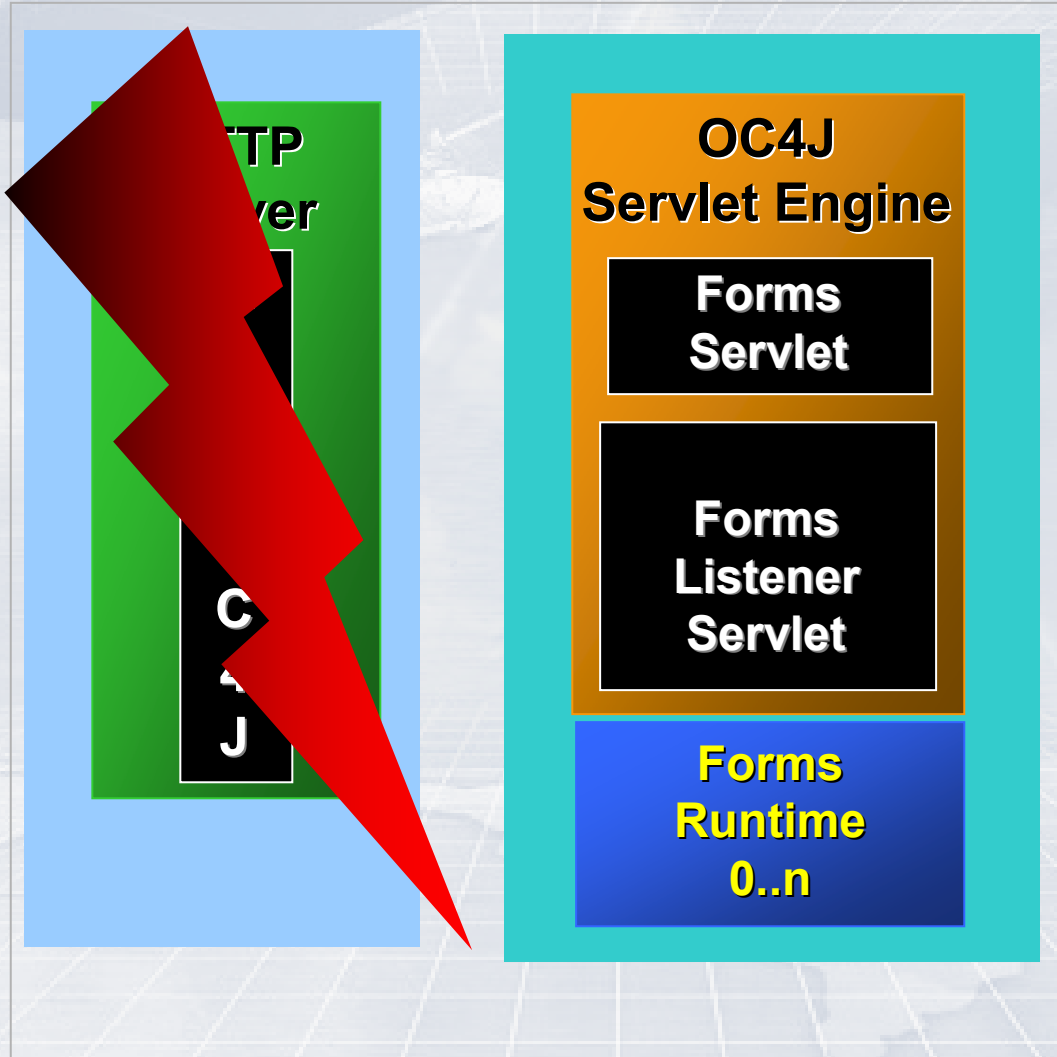


# Forms Deployment → 2- Machine configuration

Client Tier



Application Tier



Db tier

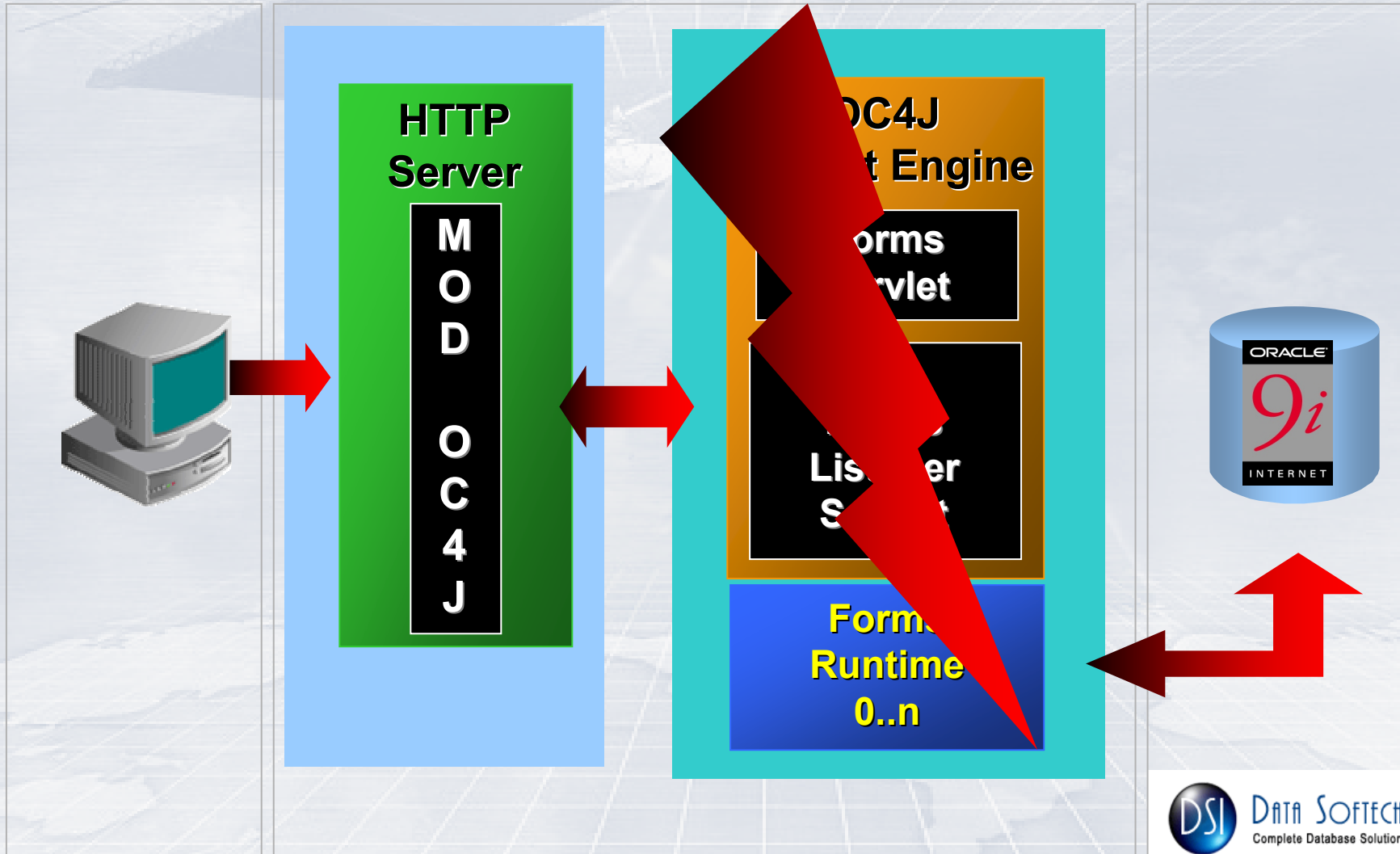


# Forms Deployment → 2- Machine configuration

Client Tier

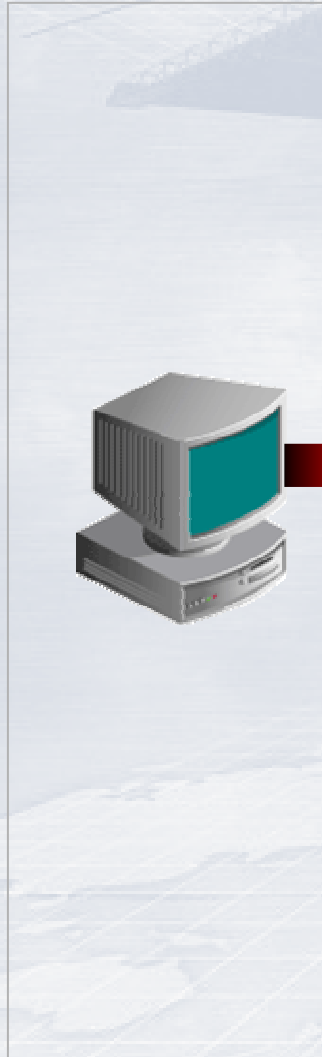
Application Tier

Db tier

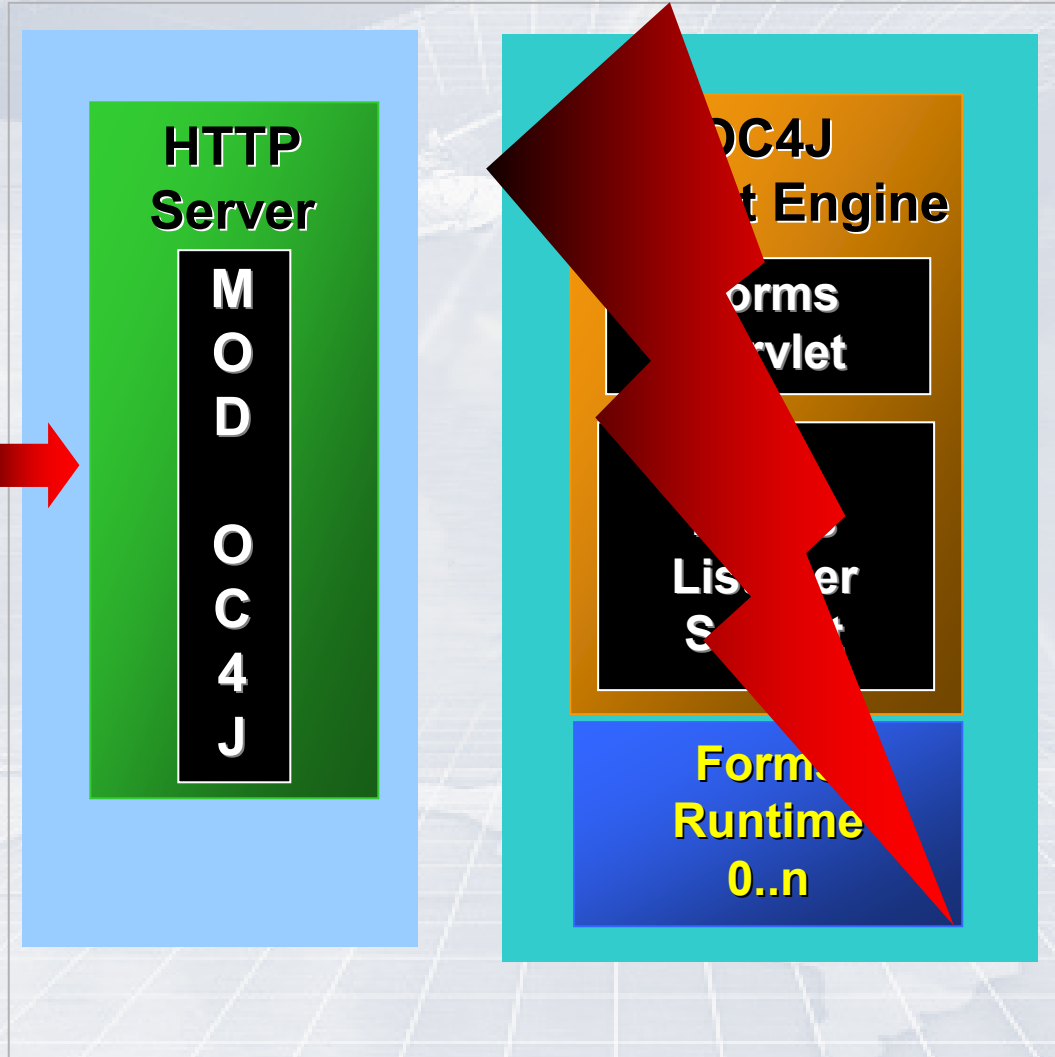


# Forms Deployment → 2- Machine configuration

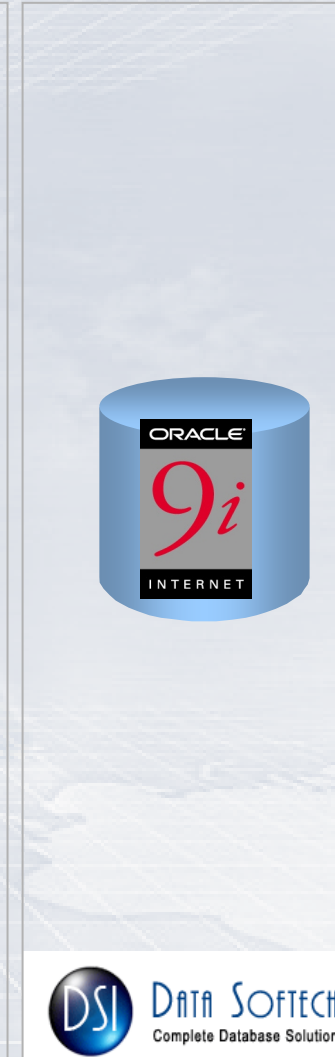
Client Tier



Application Tier



Db tier



# 2 Machine Configuration on OHS

## Configure MOD\_OC4J in OHS server to point to servlet engine on other machine

- Put the Following entry in  
\$OH/Apache/Apache/conf/httpd.conf under the mod\_alias.c

```
AliasMatch ^/forms90/java/(.*) "/oracle/oranotinf/forms90/java/$1"  
AliasMatch ^/forms90/jinitiator/(.*) "/oracle/oranotinf/jinit/$1"  
AliasMatch ^/forms90/html/(.*) "/oracle/oranotinf/tools/web90/html/$1"
```

- by placing the Following entry in  
\$OH/Apache/Apache/conf/mod\_oc4j.conf under the  
mod\_oc4j.c

Oc4jMount /forms90	instance://my1.com:OC4J_BI_Forms
Oc4jMount /forms90/f90servlet	instance://my1.com:OC4J_BI_Forms
Oc4jMount /forms90/f90servlet/*	instance://my1.com:OC4J_BI_Forms
Oc4jMount /forms90/l90servlet	instance://my1.com:OC4J_BI_Forms
Oc4jMount /forms90/l90servlet/*	instance://my1.com:OC4J_BI_Forms

- Restart the OHS

# 2 Machine Configuration changes

- Good alternative in the absence of powerful single machine
- OHS can be used to support other application without affecting the CPU or memory resources for Forms services
- This is not a High availability or Load balancing solution

**FORMS  
DEPLOYMENT**

**Load Balancing Solution**

**#1**

# Load Balancing Approach

- There are two ways to make the Mod\_oc4j Load balancing
  - Increasing OC4J process
  - Adding more OC4J instances

In addition,

- You can use External Load balancer [ h/w or s/w based] which can balance the Load among HTTP server
- Use combination of External Load balancer and Mod\_OC4J load balancing

# Multiple OC4J Processes

This can be done by using OEM

- OEM Website [ <http://My.com:1810> ]
- Select the **Mid tier Instance**
- Select the OC4J instance like **OC4J\_BI\_Forms**
- Select **Server Properties**
- Under Multiple VM Configuration, Increase the number of processes

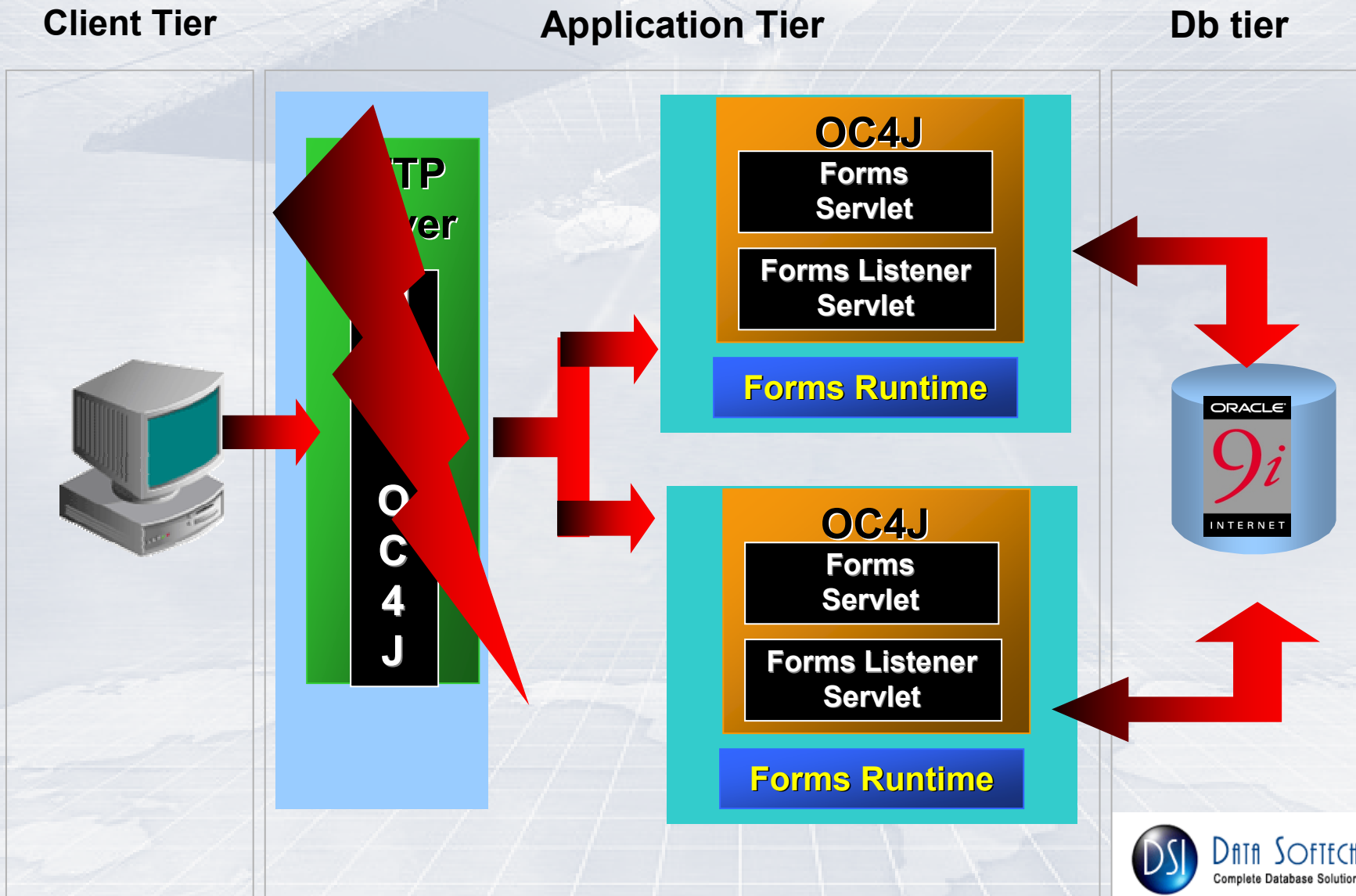
This will create the following

- Add the Entries for Island in **\$OH/opmn/conf/opmn.xml**
- Create additional folder(s) in **\$OH/j2ee/OC4J\_BI\_Forms/application-deployments/forms90app**

# OC4J Processes Vs Instances

- Good Starting point is to Add 1 OC4J processes for every 2-3 CPUs.
- A single OC4J processes is found to use 70% of the Resources on four processor system
- Adding high number of OC4J processes can degrade the performance and so be added in increment
- Multiple OC4J instances can result in higher throughput and shorter response time , even on single-processor system
- If running multiple Application on a system, then a combination of Multiple OC4J instances with multiple OC4J processes can be used

# Forms Deployment → Load Balance Configuration

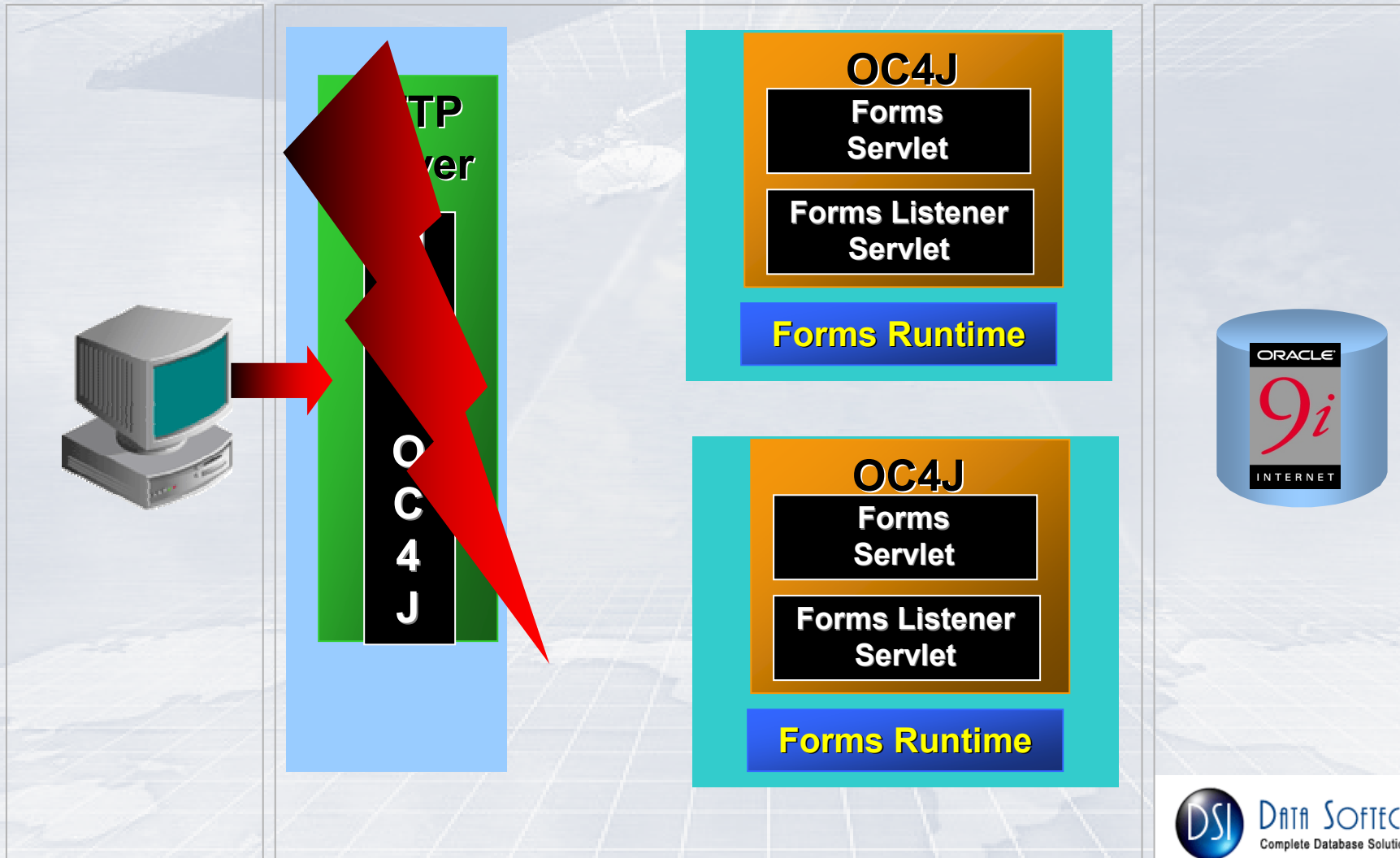


# Forms Deployment → Load Balance Configuration

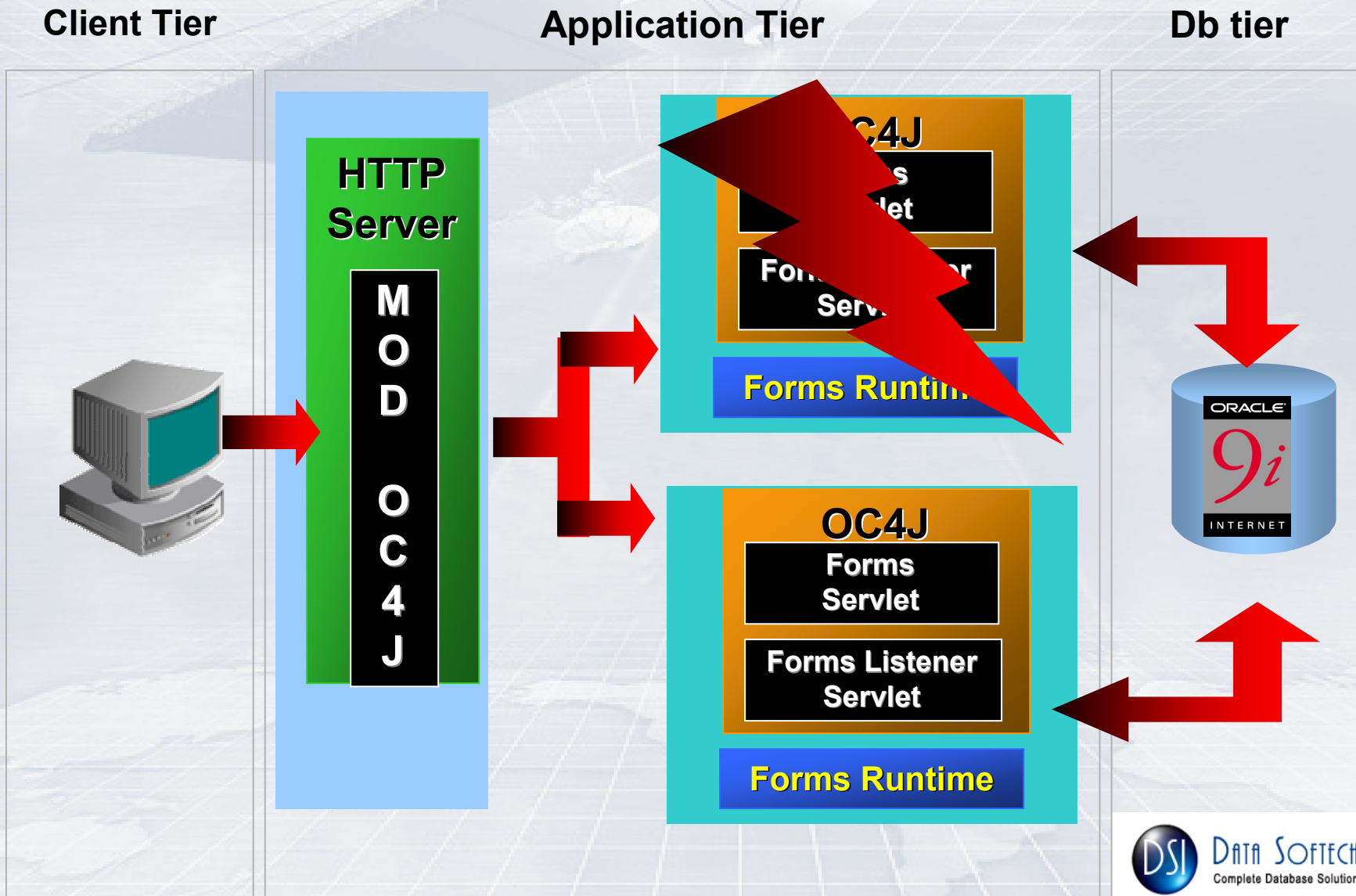
Client Tier

Application Tier

Db tier



# Forms Deployment → Load Balance Configuration

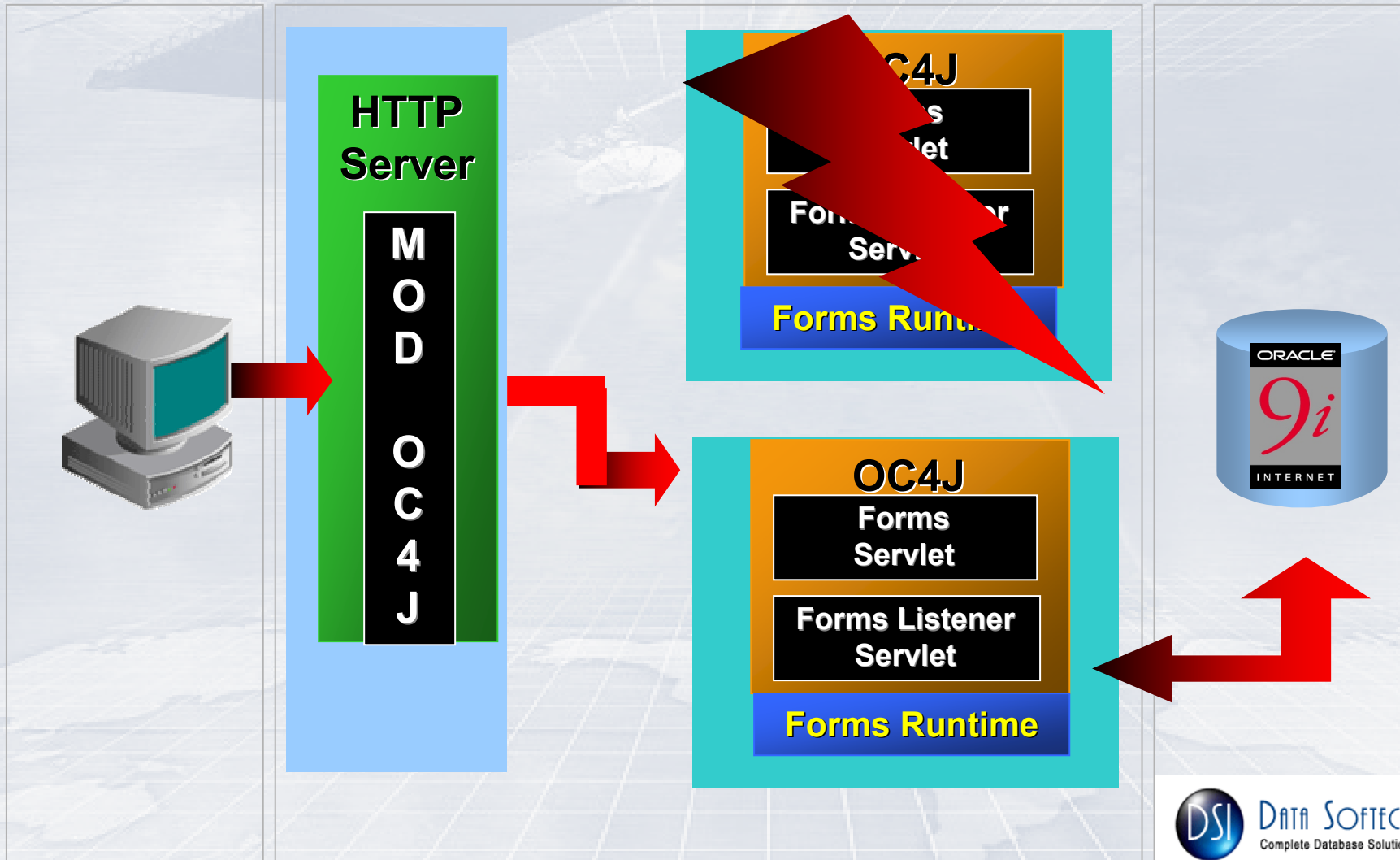


# Forms Deployment → Load Balance Configuration

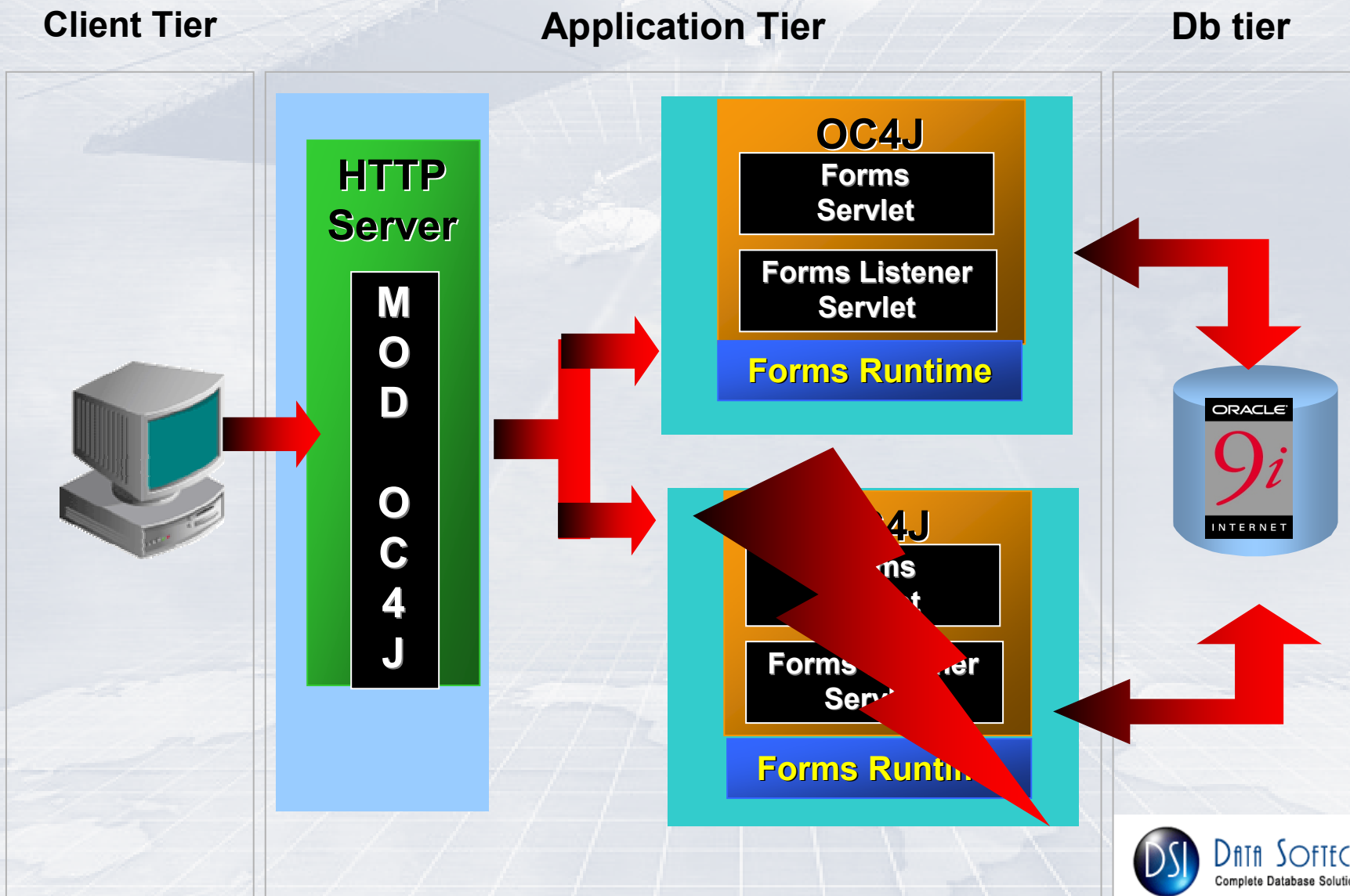
Client Tier

Application Tier

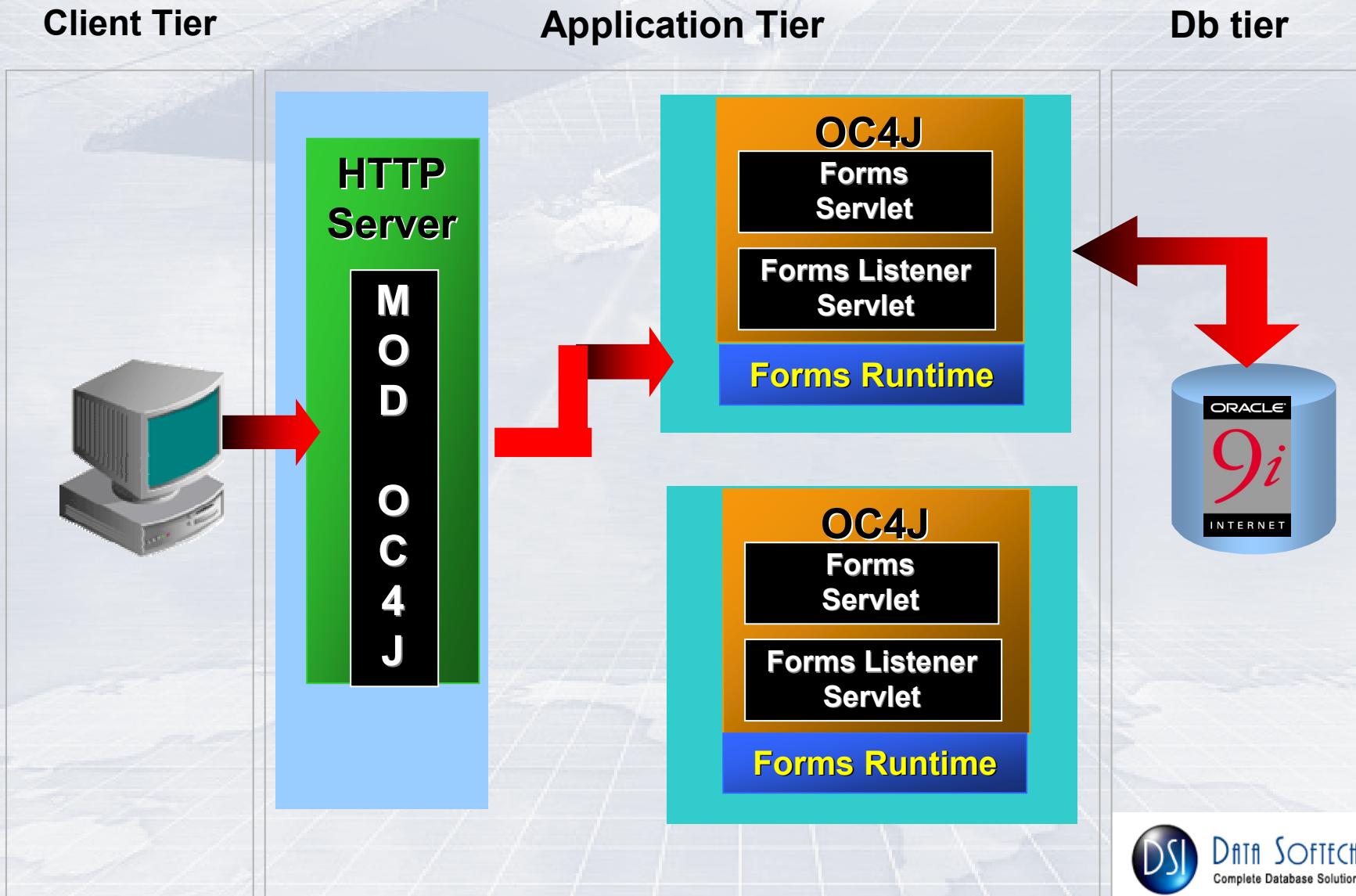
Db tier



# Forms Deployment → Load Balance Configuration



# Forms Deployment → Load Balance Configuration



# Forms Deployment → Load Balance Configuration

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```
AliasMatch ^/forms90/java/(.*) "/oracle/oranotinf/forms90/java/$1"  
AliasMatch ^/forms90/jinitiator/(.*) "/oracle/oranotinf/jinit/$1"  
AliasMatch ^/forms90/html/(.*) "/oracle/oranotinf/tools/web90/html/$1"
```

- by placing the Following entry in  
\$OH/Apache/Apache/conf/mod\_oc4j.conf under the  
mod\_oc4j.c

```
Oc4jMount /forms90           instance://my1.com:OC4J_BI_Forms,my2.com:OC4J_BI_Forms  
Oc4jMount /forms90/f90servlet instance://my1.com:OC4J_BI_Forms,my2.com:OC4J_BI_Forms  
Oc4jMount /forms90/f90servlet/* instance://my1.com:OC4J_BI_Forms,my2.com:OC4J_BI_Forms  
Oc4jMount /forms90/l90servlet instance://my1.com:OC4J_BI_Forms,my2.com:OC4J_BI_Forms  
Oc4jMount /forms90/l90servlet/* instance://my1.com:OC4J_BI_Forms,my2.com:OC4J_BI_Forms
```

- Restart the OHS

## Forms Deployment → Load Balance Configuration

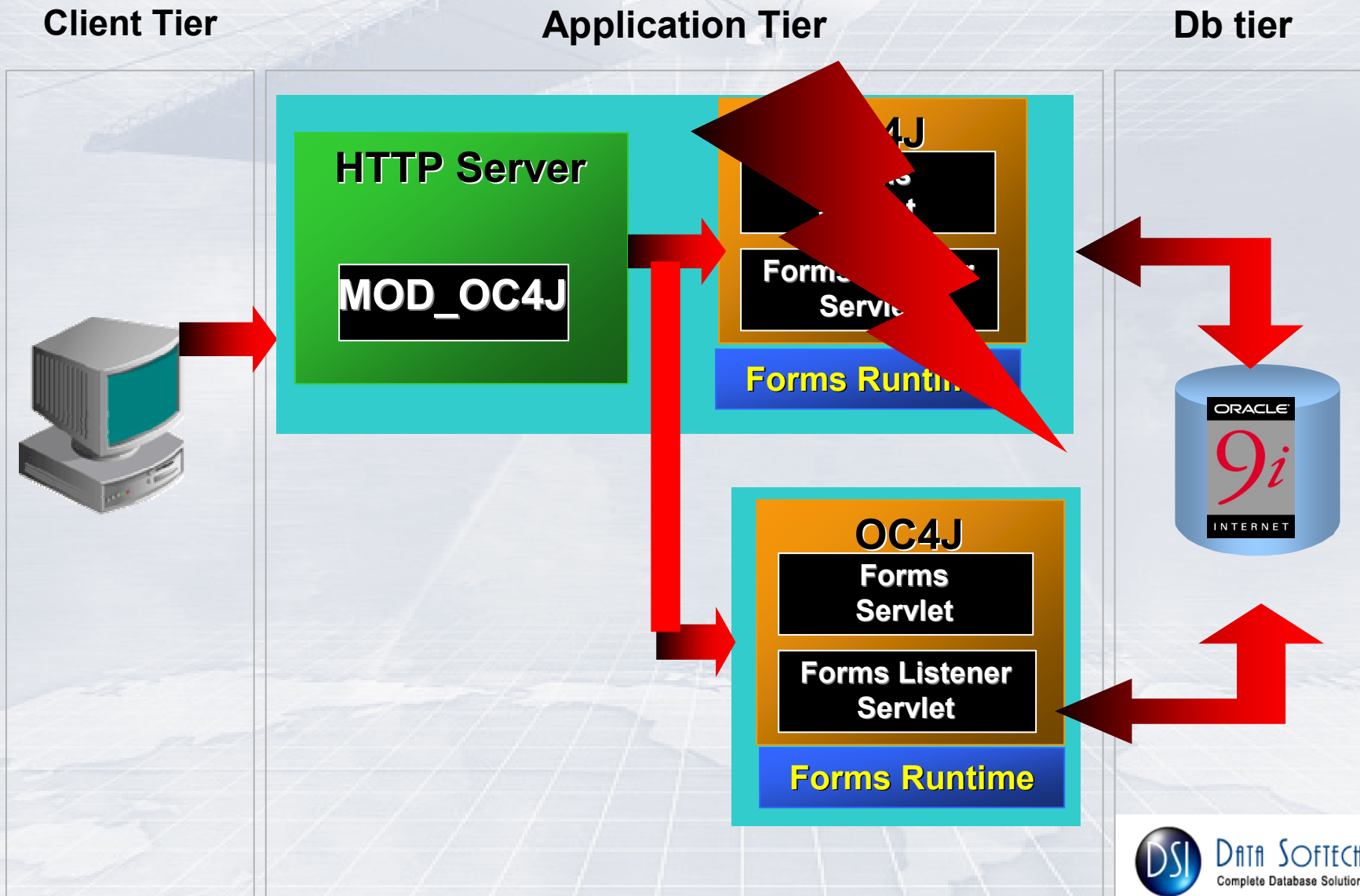
- Load balancing only occurs for the first request as if the OC4 instance is down, session state is not preserved.
- Forms Services OC4J instance failure can be bypassed but the HTTP server Failure result in loss of production
- May overload remaining machine but can be avoided by adding more forms services
- Note that in 9iAS Release 2 , OPMN restart OC4J servlet engines if stopped due to OS reason
- This is not a High availability or Load balancing solution

**FORMS  
DEPLOYMENT**

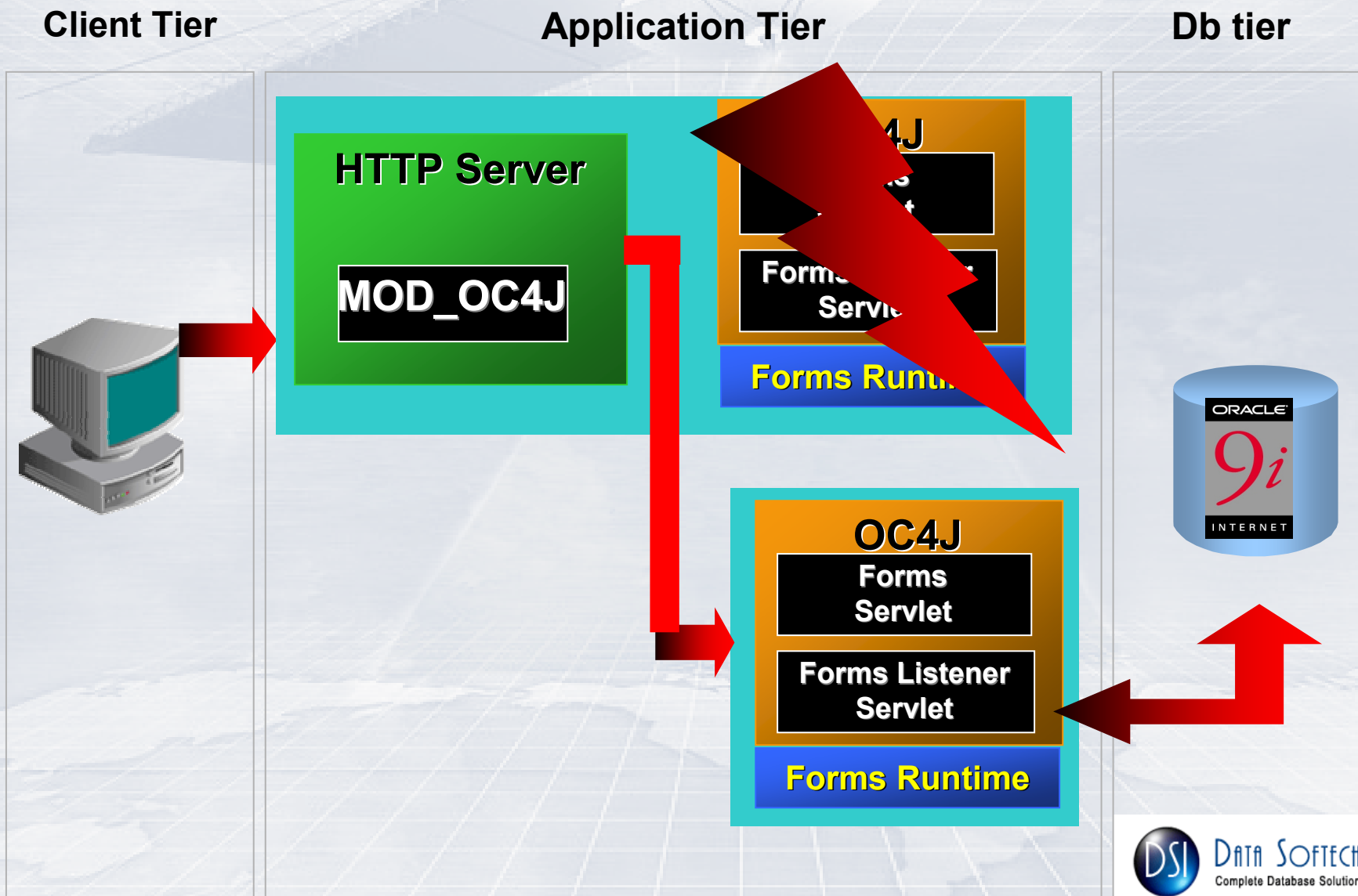
**Load Balancing Solution**

**#2**

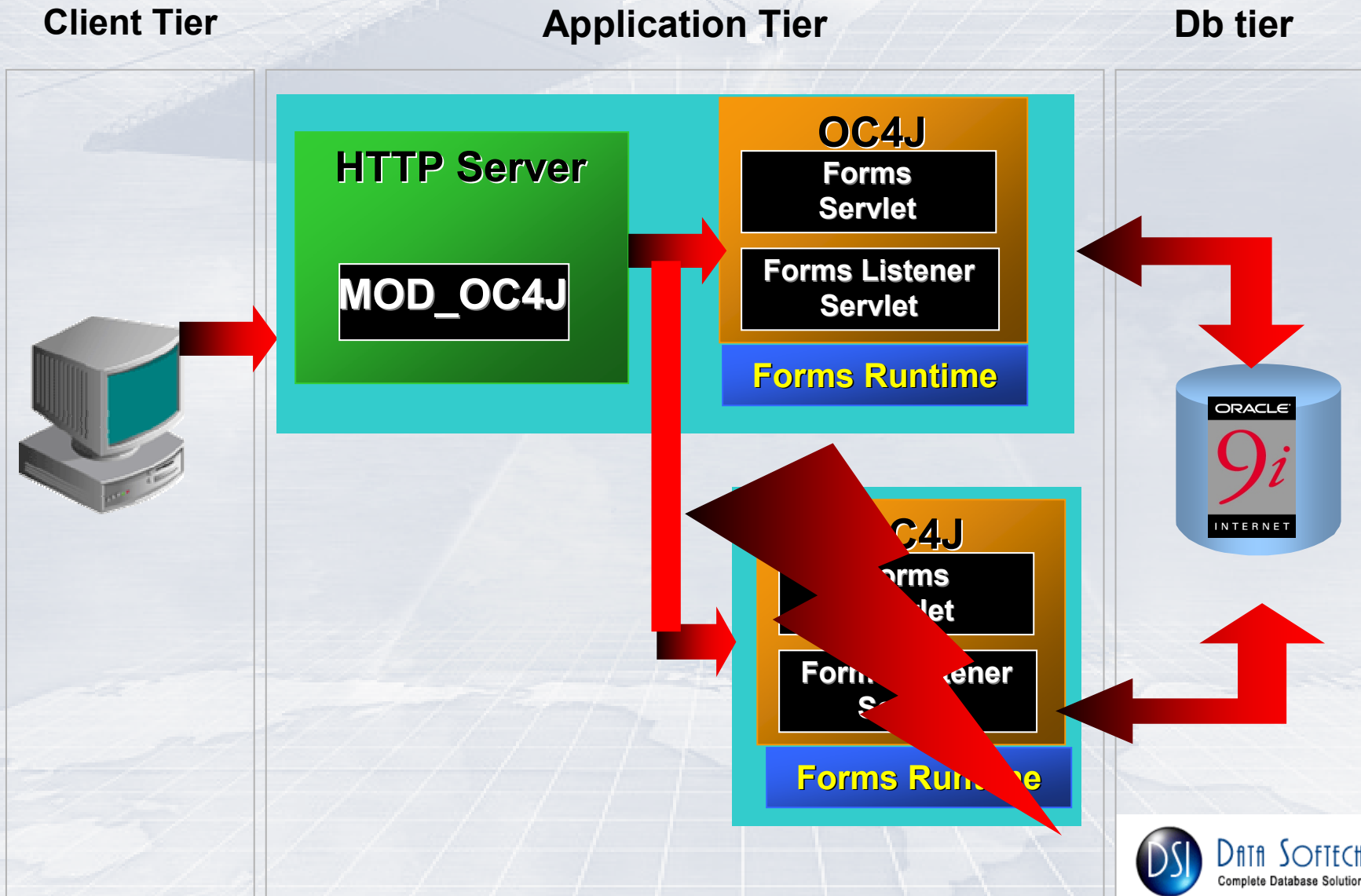
# Forms Deployment → Load Balance Configuration



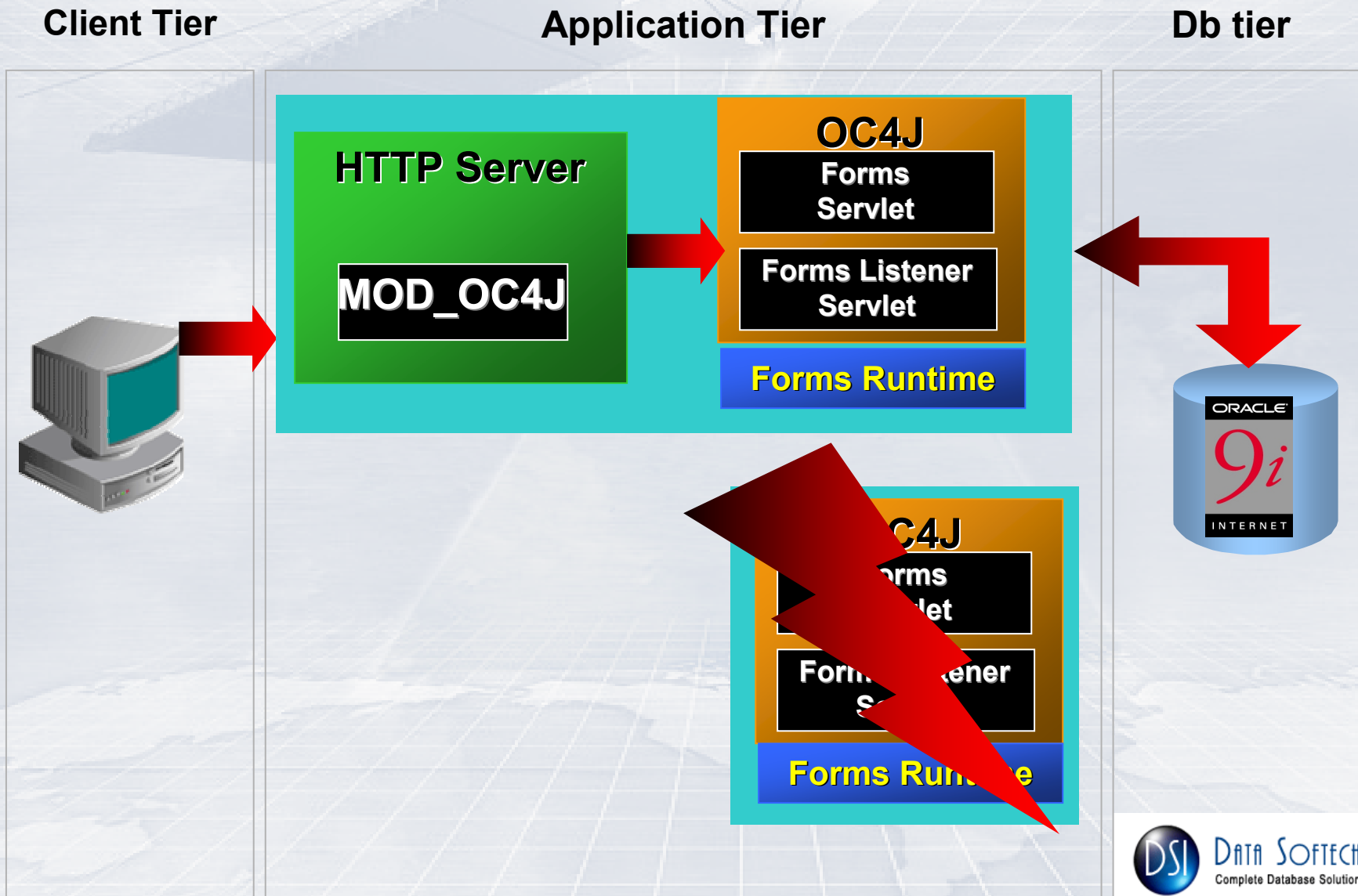
# Forms Deployment → Load Balance Configuration



# Forms Deployment → Load Balance Configuration



# Forms Deployment → Load Balance Configuration



# Forms Deployment → Load Balance Configuration

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- Put the Following entry in  
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```
AliasMatch ^/forms90/java/(.*) "/oracle/oranotinf/forms90/java/$1"  
AliasMatch ^/forms90/jinitiator/(.*) "/oracle/oranotinf/jinit/$1"  
AliasMatch ^/forms90/html/(.*) "/oracle/oranotinf/tools/web90/html/$1"
```

- by placing the Following entry in  
\$OH/Apache/Apache/conf/mod\_oc4j.conf under the  
mod\_oc4j.c

```
Oc4jMount /forms90 instance://my1.com:OC4J_BI_Forms,my2.com:OC4J_BI_Forms  
Oc4jMount /forms90/f90servlet instance://my1.com:OC4J_BI_Forms,my2.com:OC4J_BI_Forms  
Oc4jMount /forms90/f90servlet/* instance://my1.com:OC4J_BI_Forms,my2.com:OC4J_BI_Forms  
Oc4jMount /forms90/l90servlet instance://my1.com:OC4J_BI_Forms,my2.com:OC4J_BI_Forms  
Oc4jMount /forms90/l90servlet/* instance://my1.com:OC4J_BI_Forms,my2.com:OC4J_BI_Forms
```

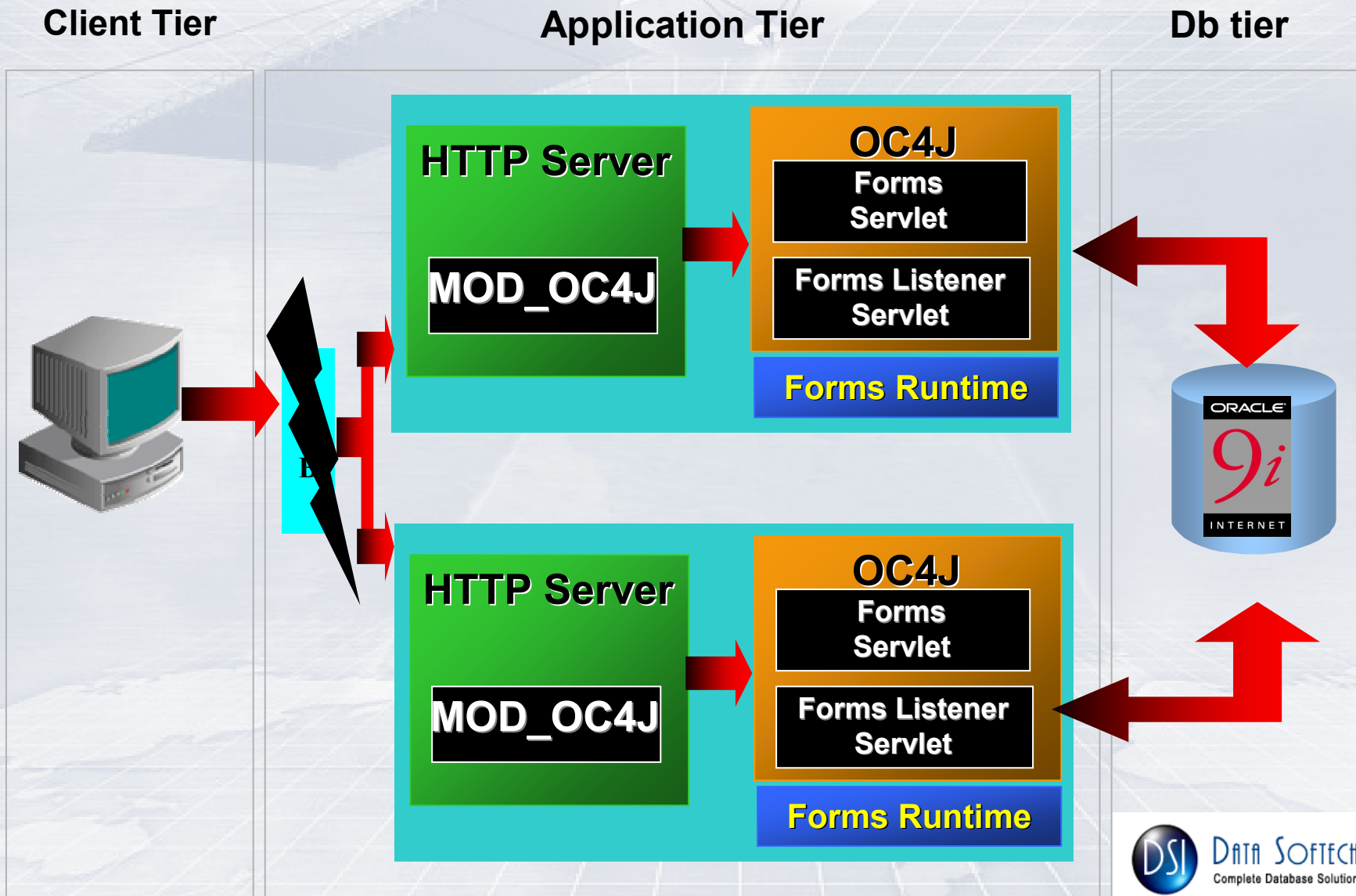
- Restart the OHS

**FORMS  
DEPLOYMENT**

**Load Balancing Solution  
Using Load Balancer**

**#1**

# Forms Deployment → External Load Balancer

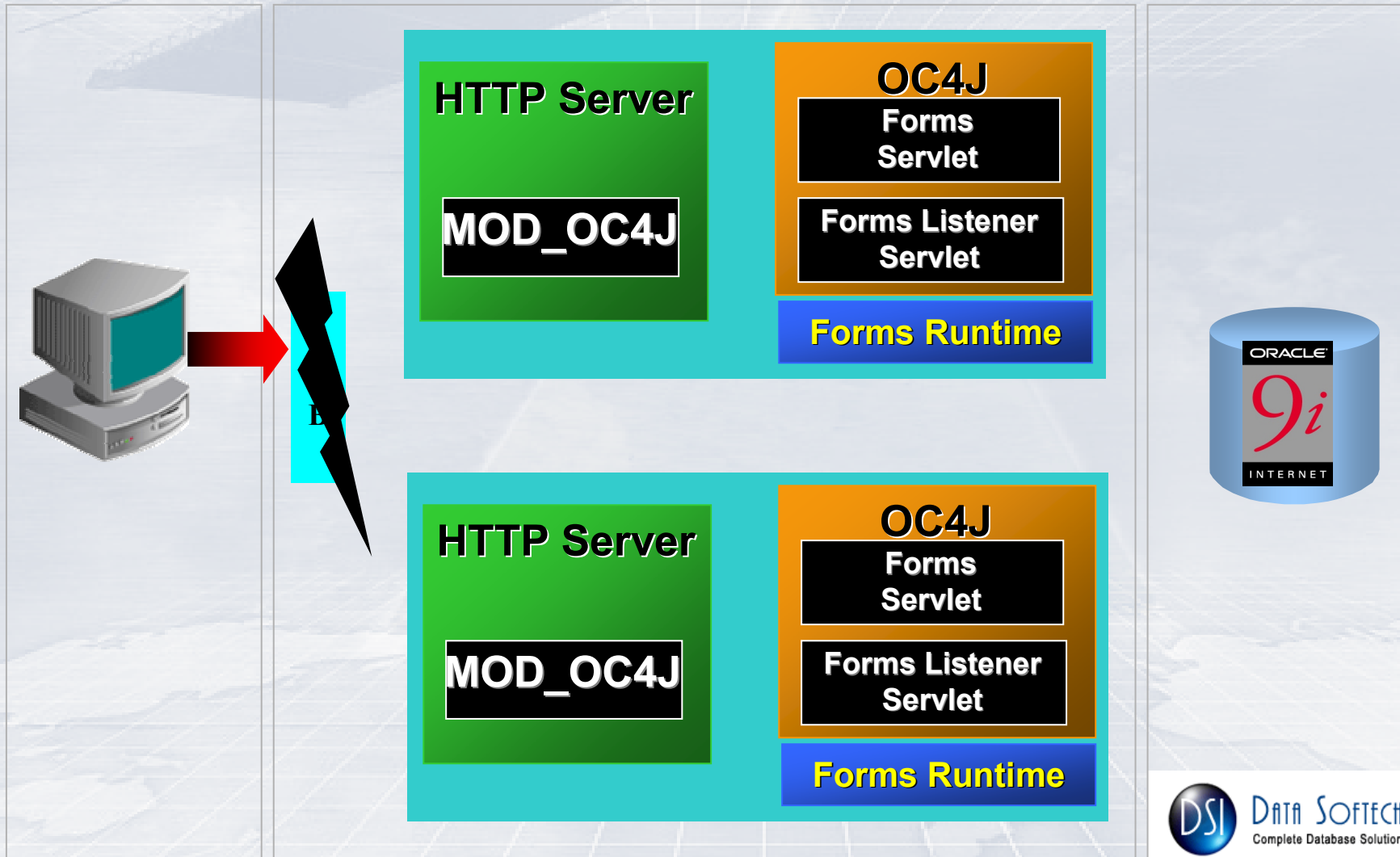


# Forms Deployment → External Load Balancer

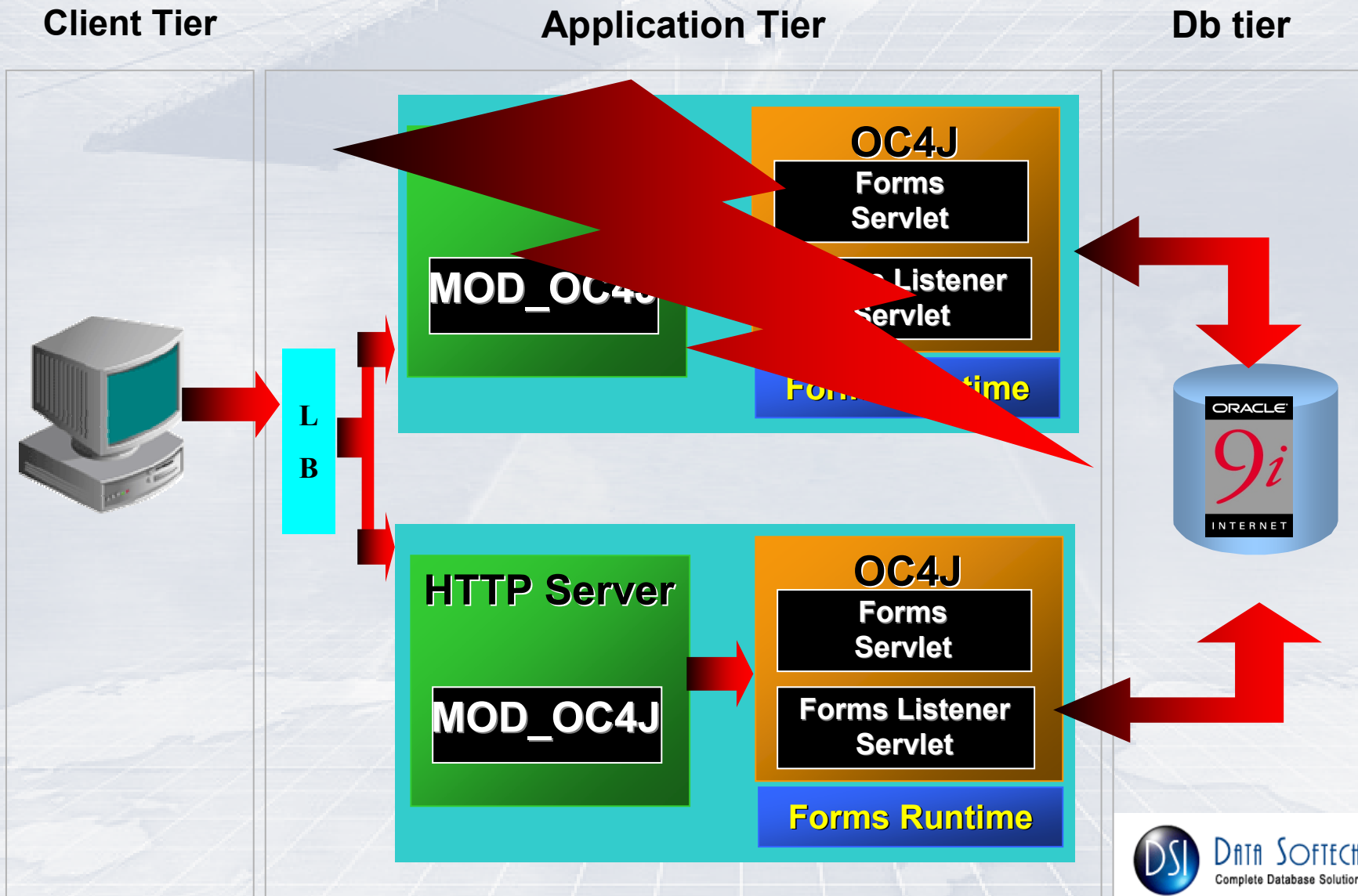
Client Tier

Application Tier

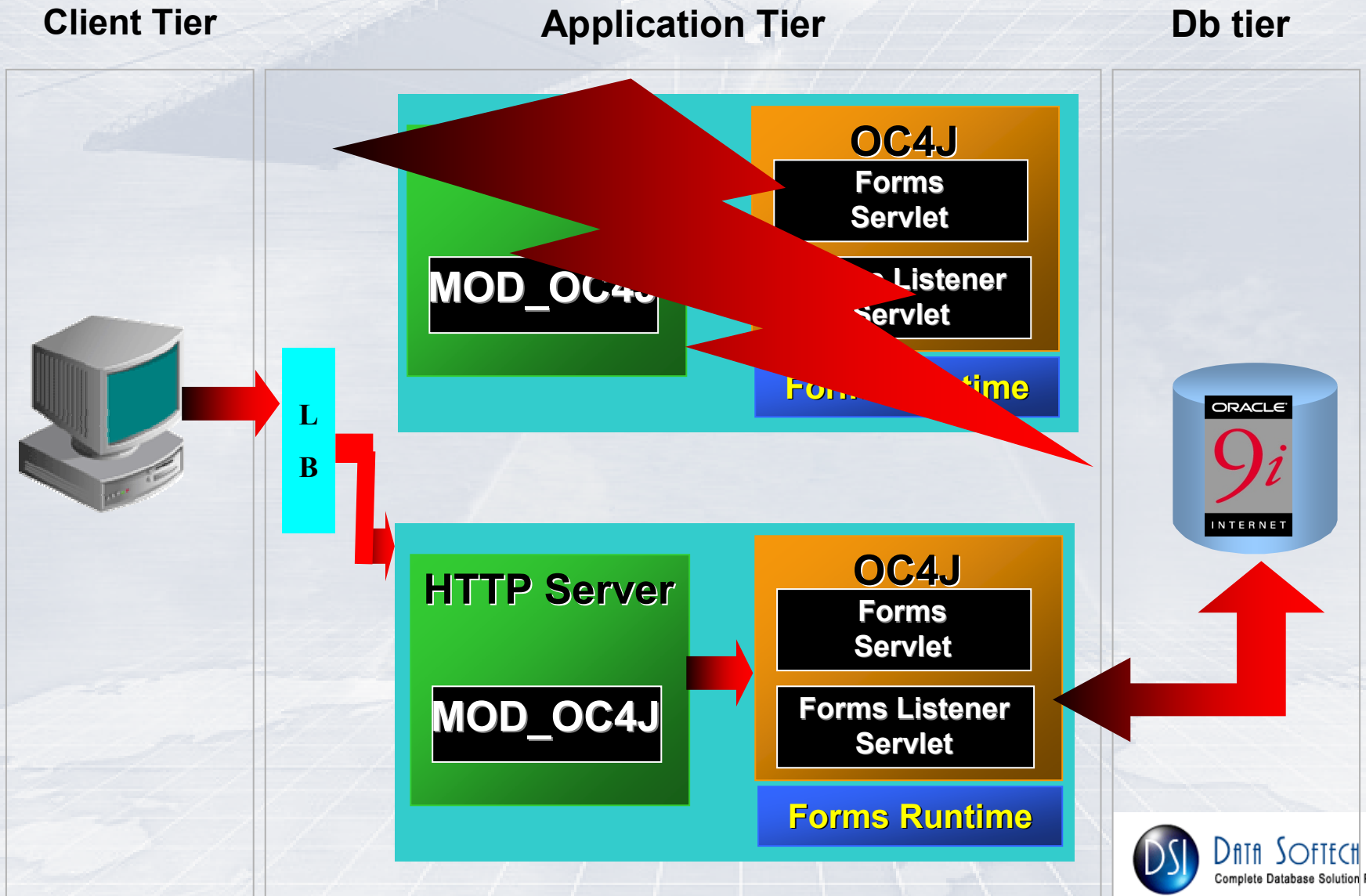
Db tier



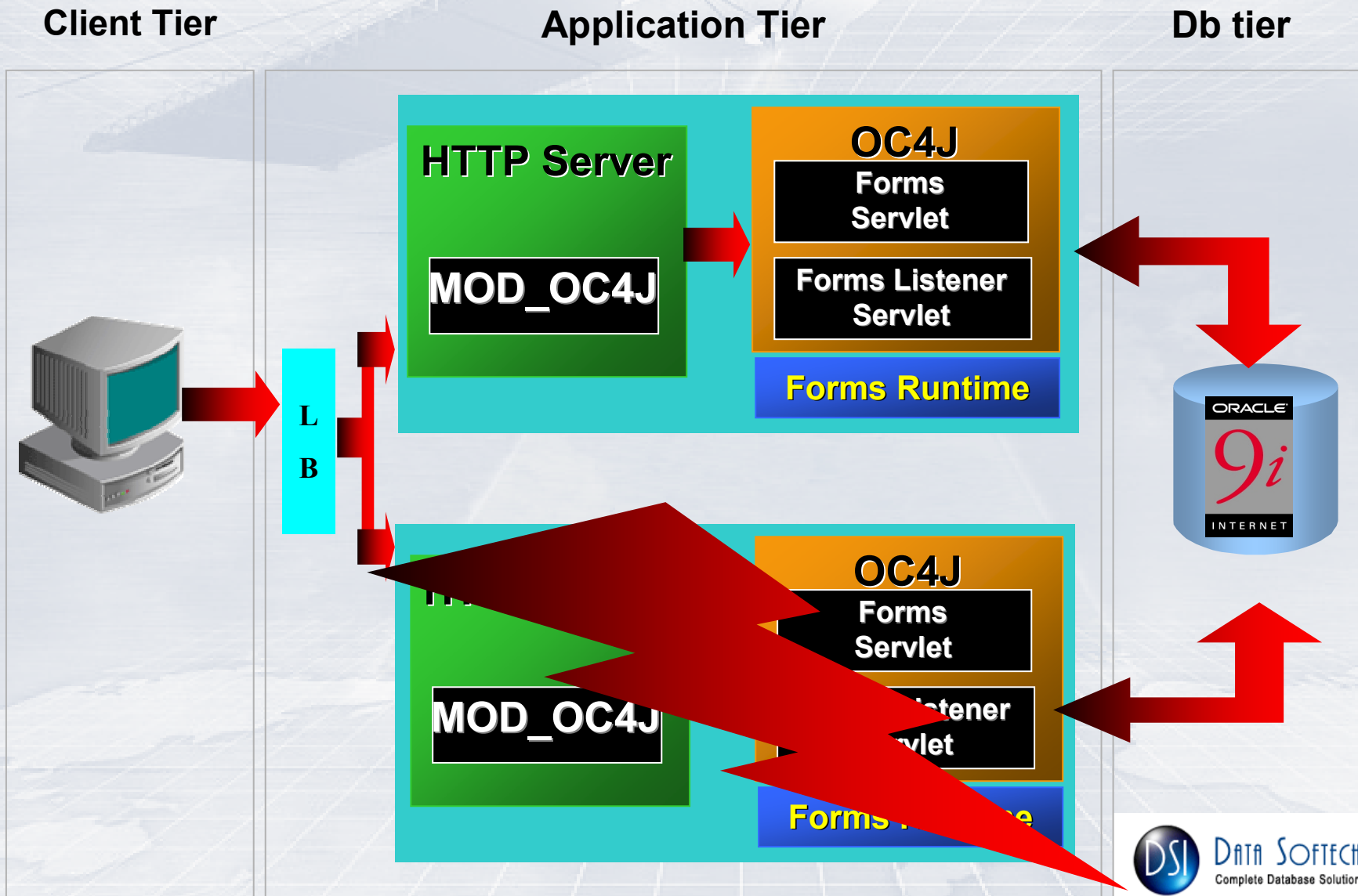
# Forms Deployment → External Load Balancer



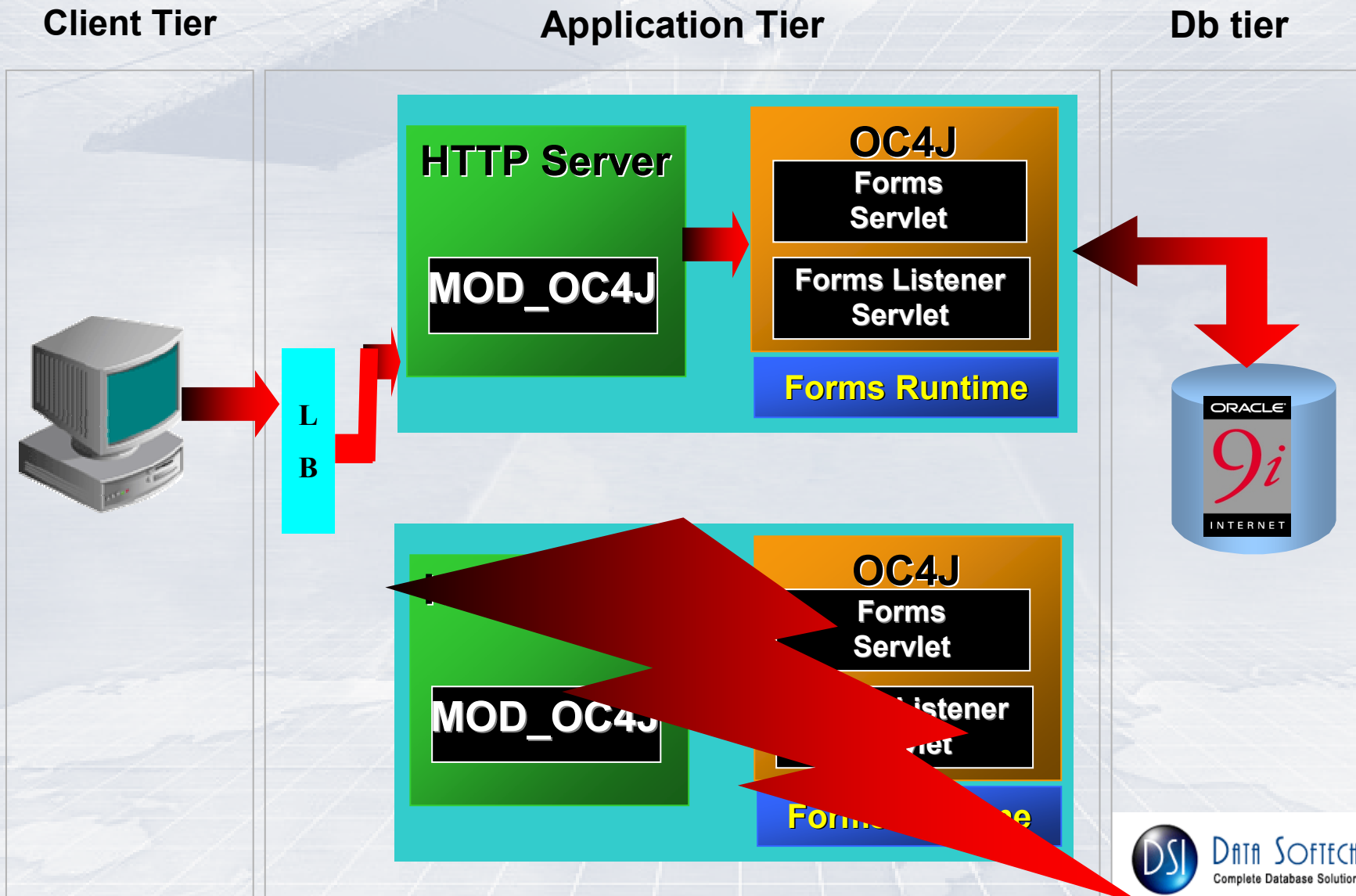
# Forms Deployment → External Load Balancer



# Forms Deployment → External Load Balancer



# Forms Deployment → External Load Balancer

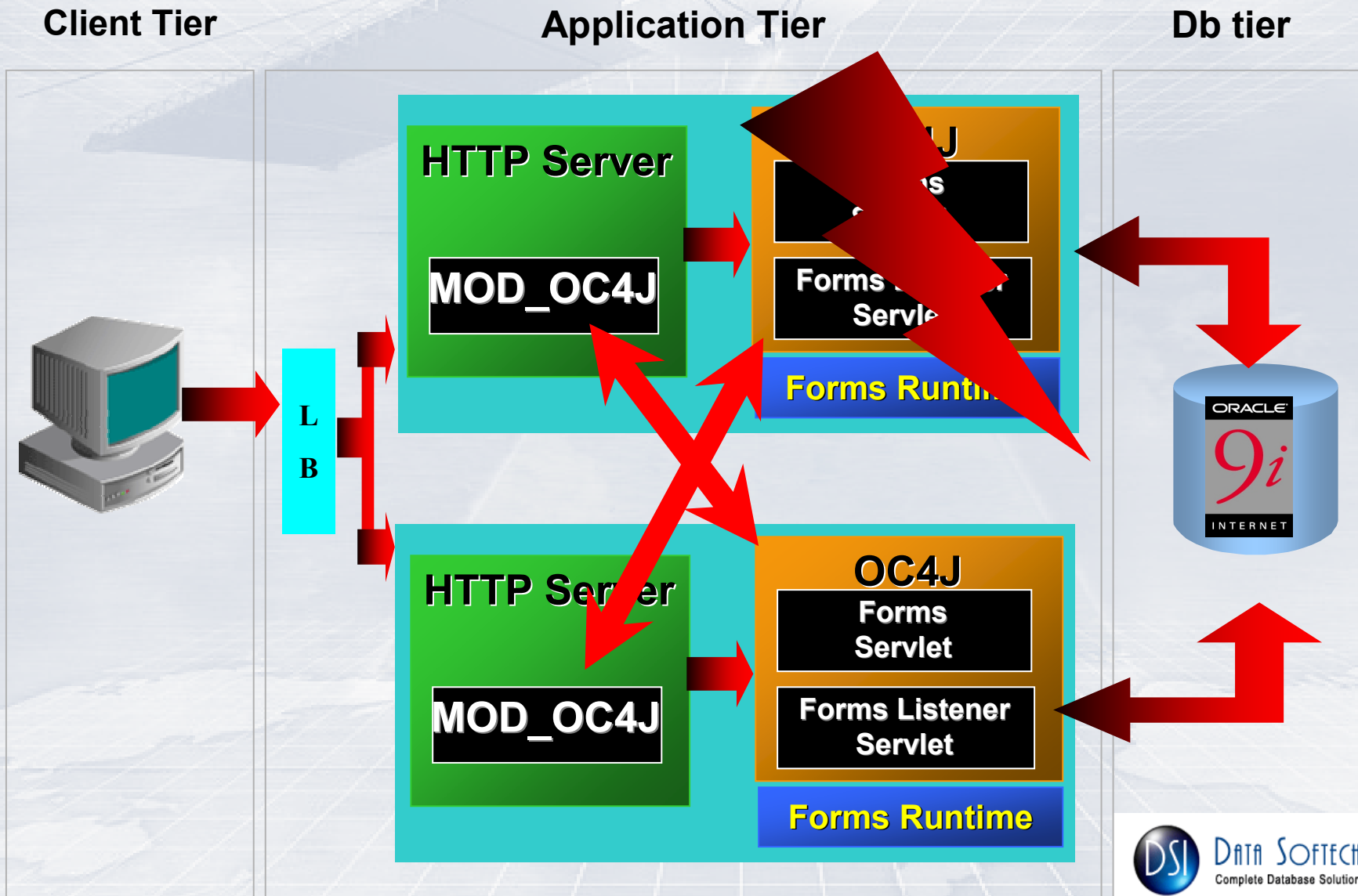


**FORMS  
DEPLOYMENT**

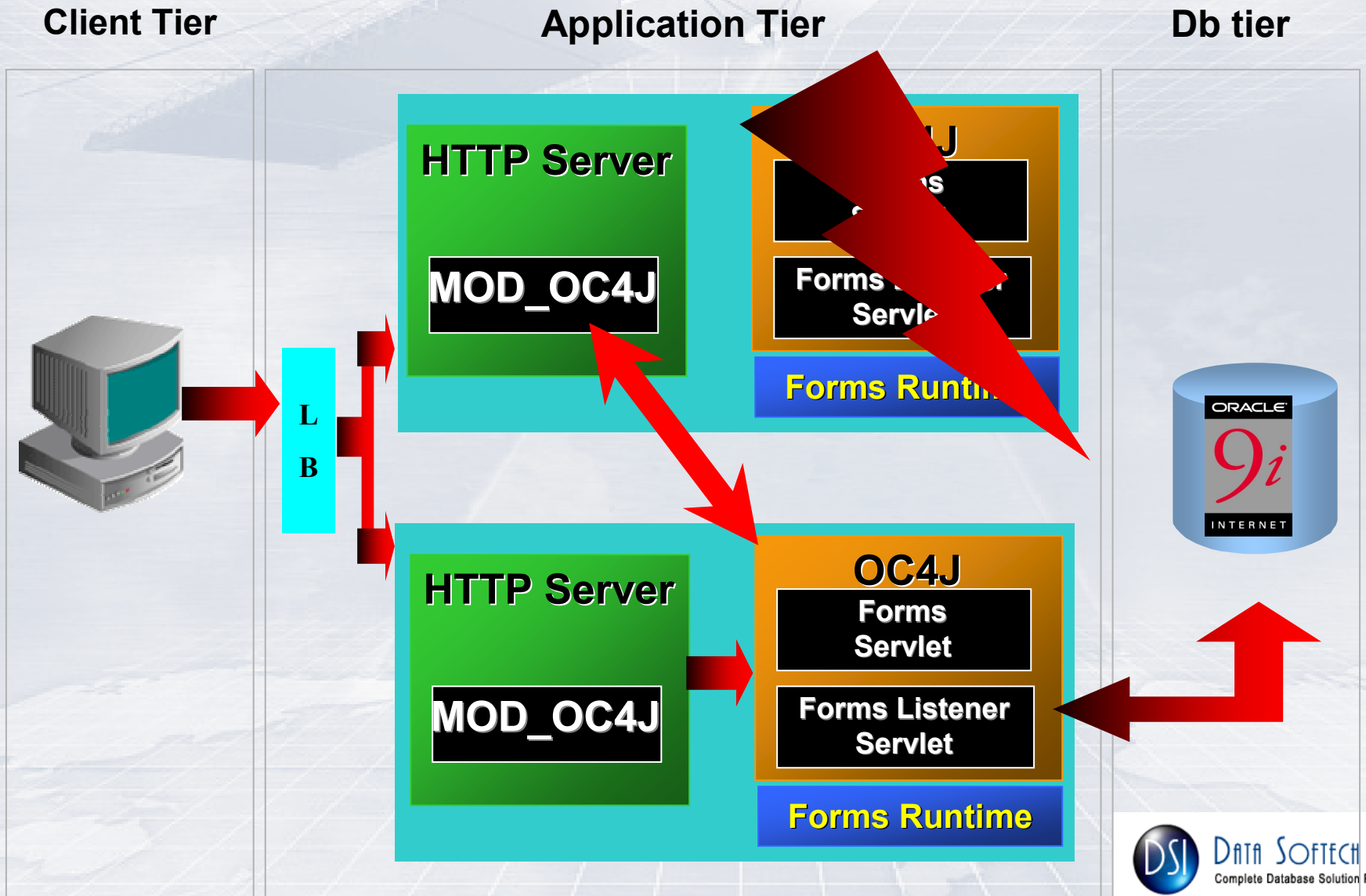
**Load Balancing Solution  
Using Load Balancer**

**#2**

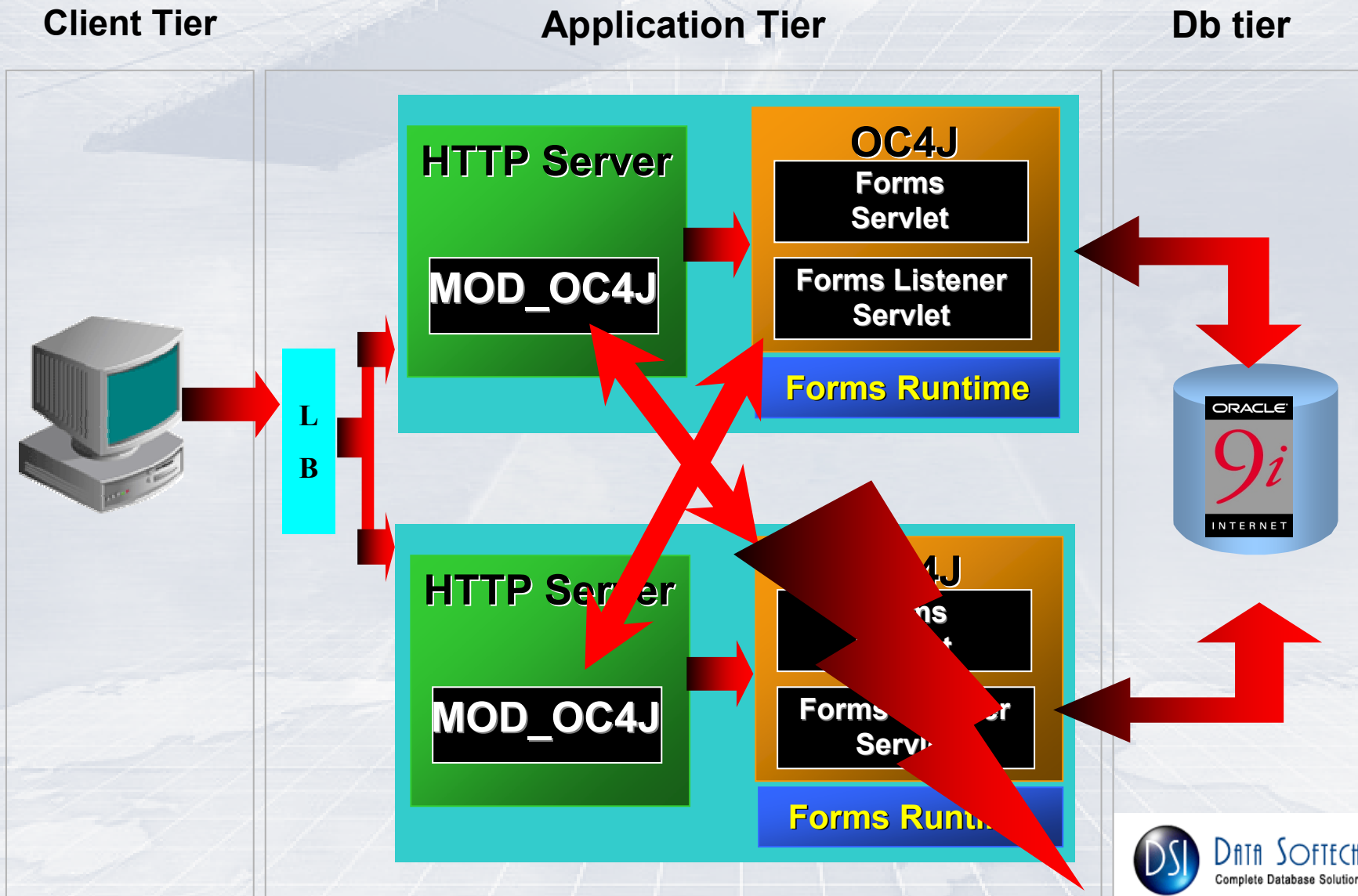
# Forms Deployment → External Load Balancer



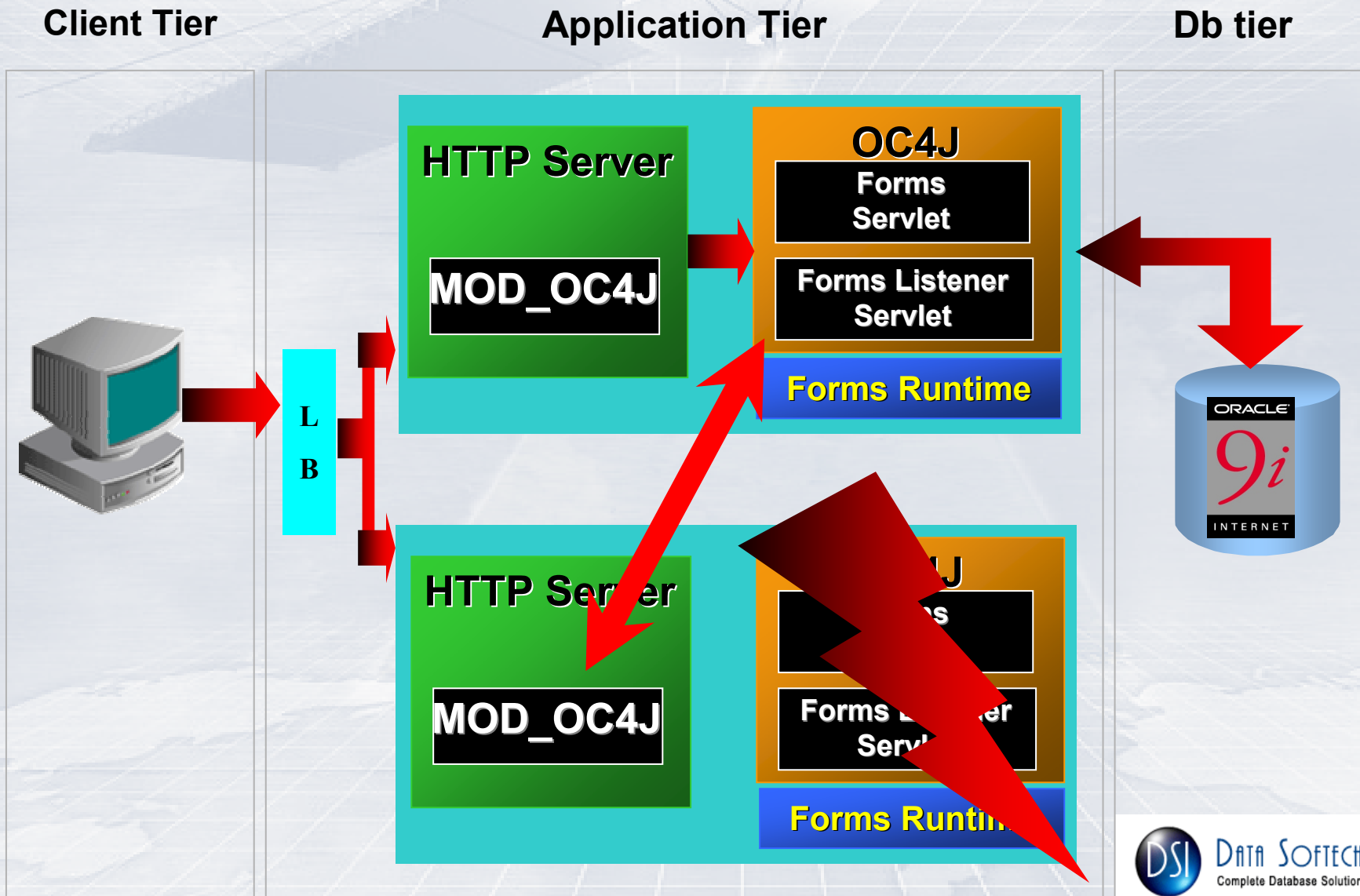
# Forms Deployment → External Load Balancer



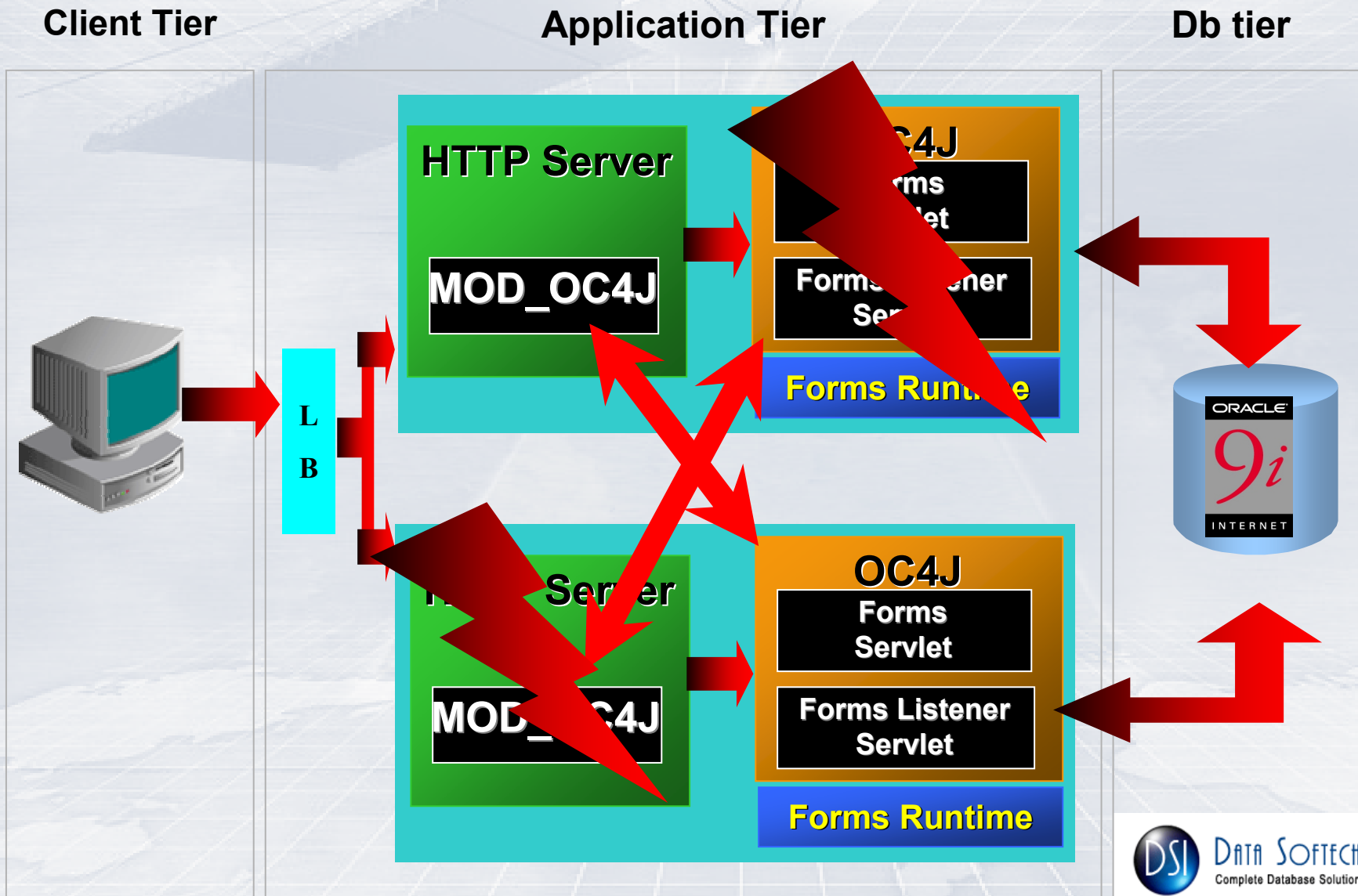
# Forms Deployment → External Load Balancer



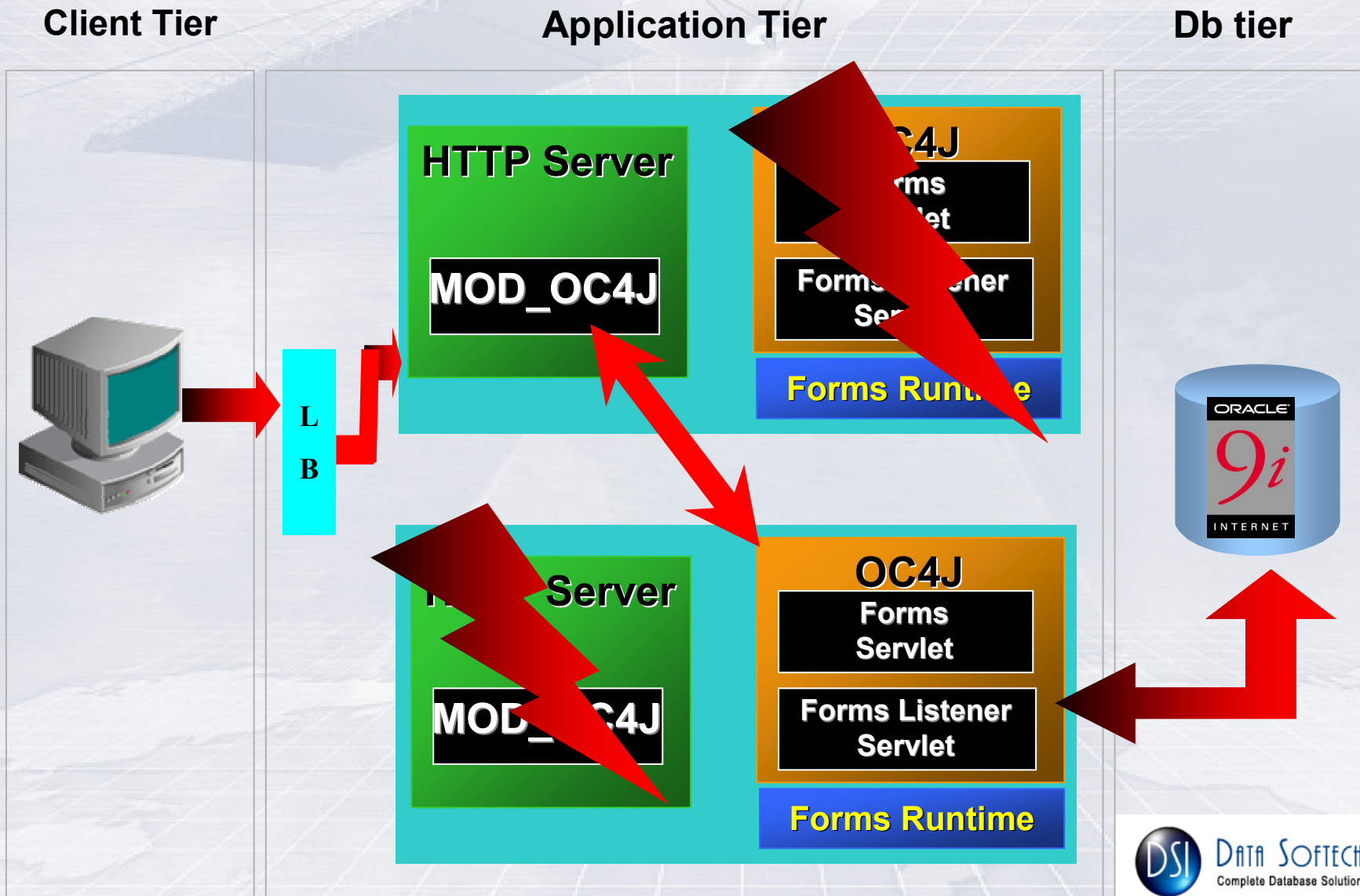
# Forms Deployment → External Load Balancer



# Forms Deployment → External Load Balancer



# Forms Deployment → External Load Balancer





QUESTIONS  
&  
ANSWERS