Liberty Series: WebSphere Liberty Profile Deployment Topologies

Session AAI-1526

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Impact2014

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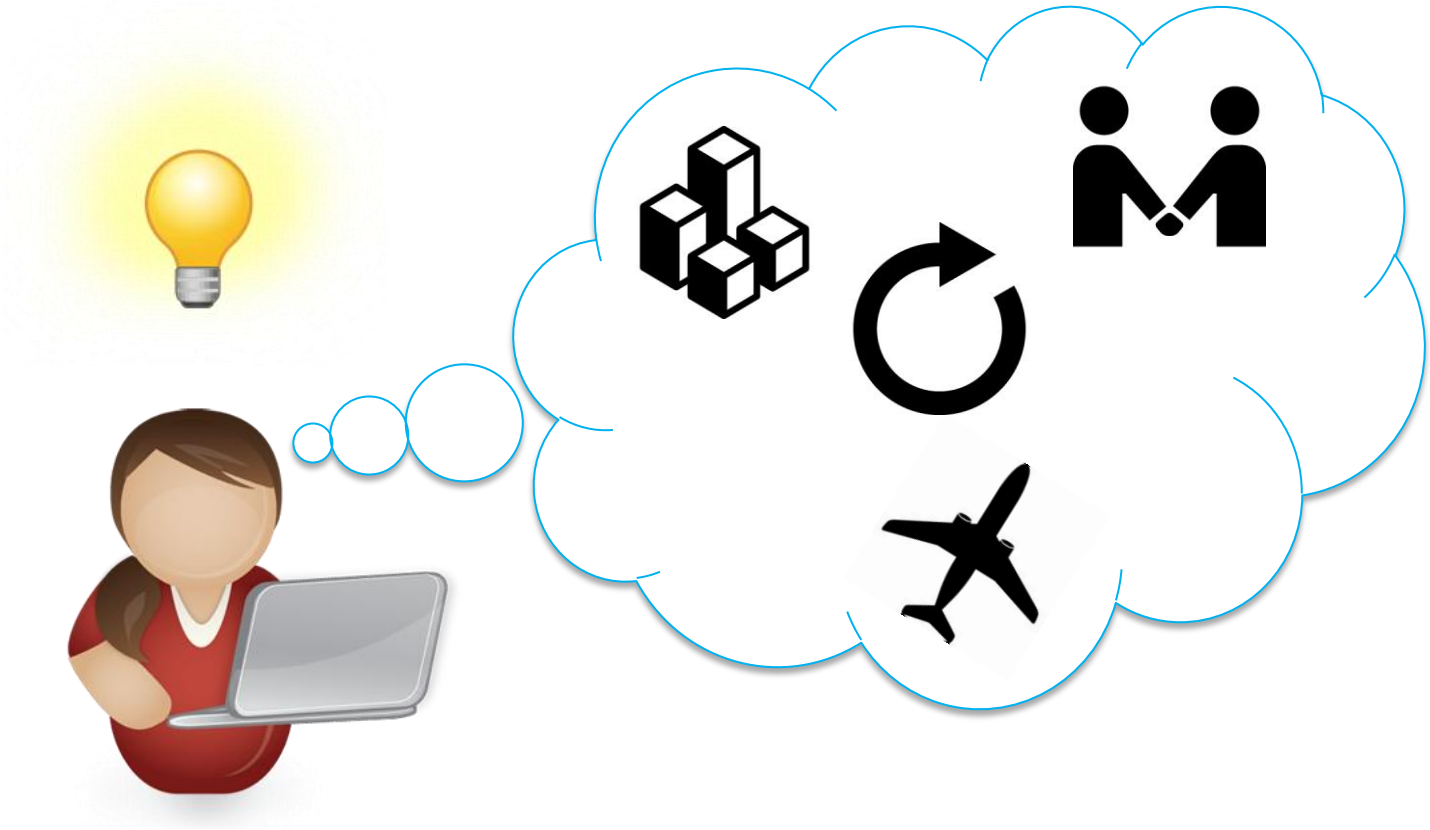
This is a story about Judy…

Judy

Judy has an idea…

Judy

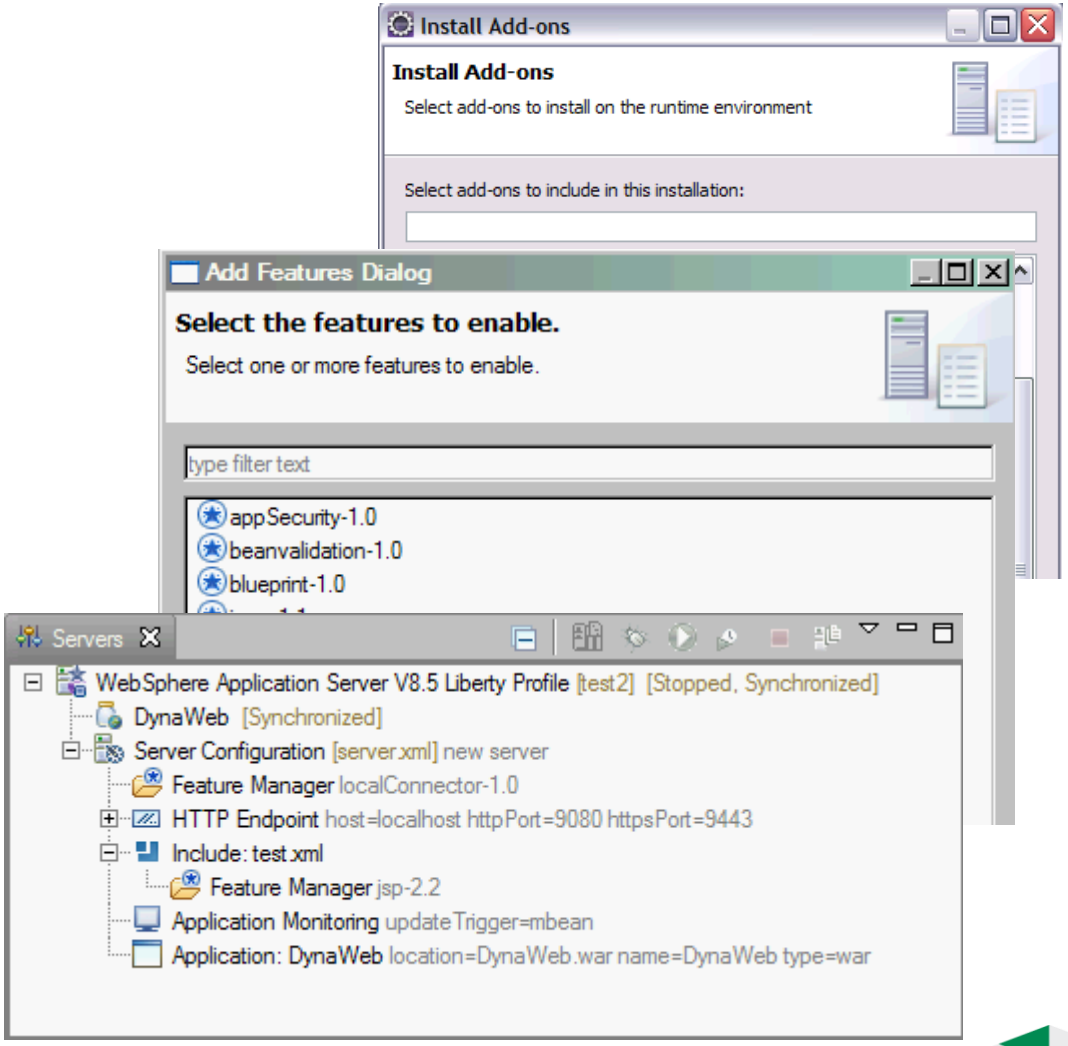
… for the next killer application.



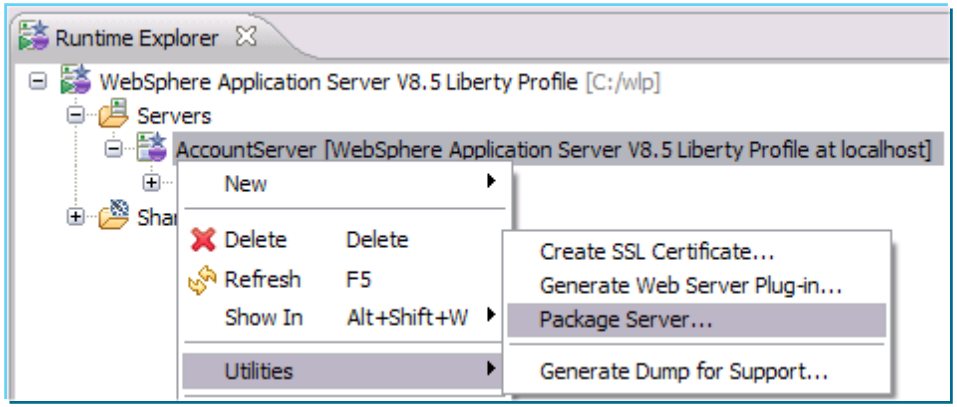
Judy

Judy uses WDT and Liberty to prototype her idea…

Judy



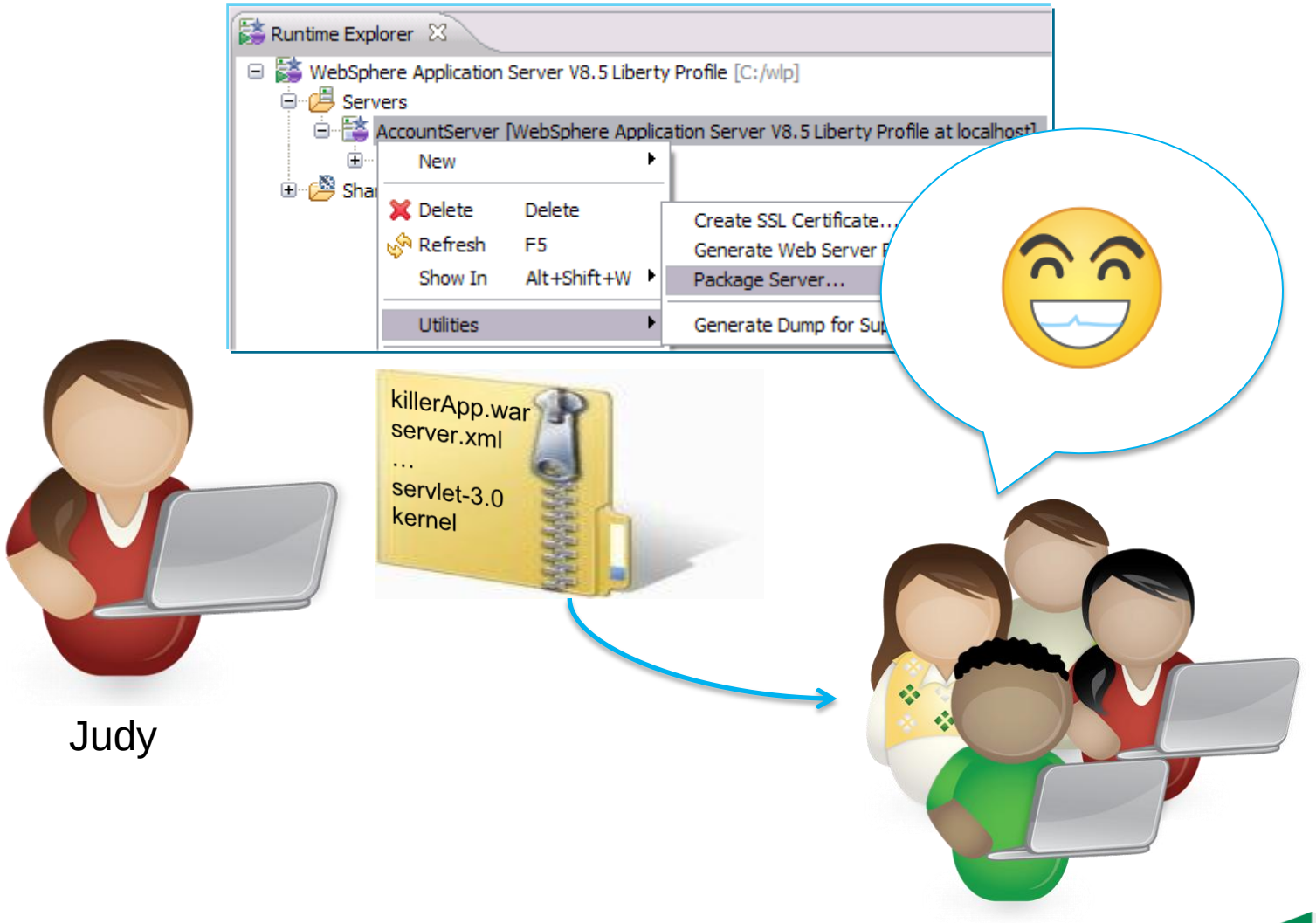
… and uses a package to share it with her team.



Judy

server package testServer …

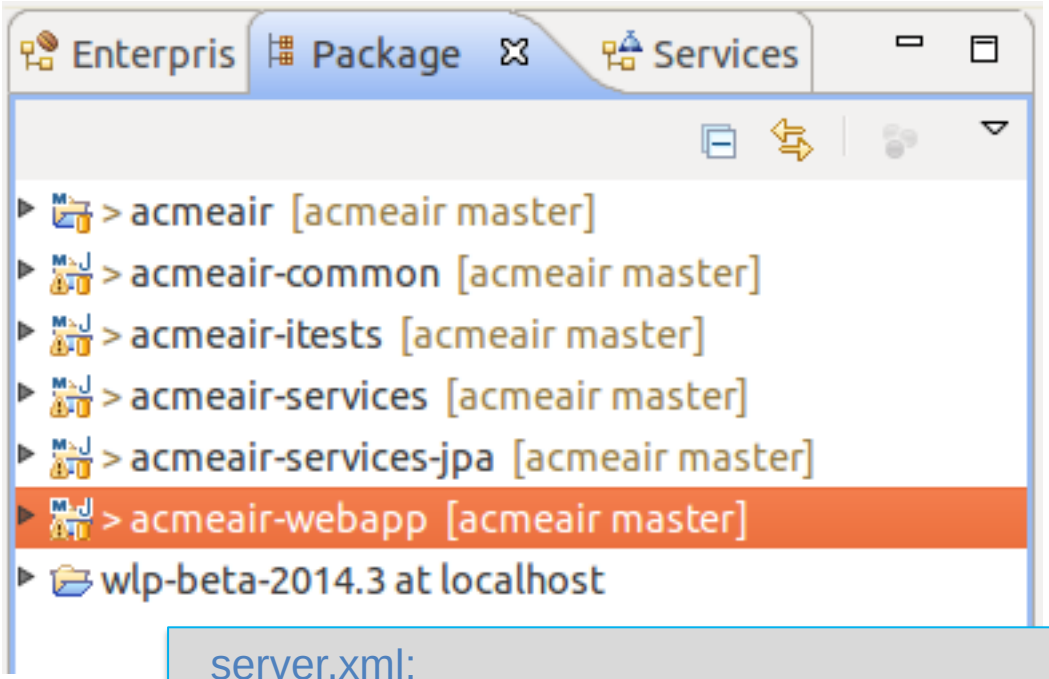
They love it!


Runtime Explorer
WebSphere Application Server V8.5 Liberty Profile [C:/wlp]
Servers
AccountServer [WebSphere Application Server V8.5 Liberty Profile at localhost]
New
Delete Delete
Refresh F5
Show In Alt+Shift+W
Utilities
Create SSL Certificate...
Package Server...
killerApp.war
server.xml
...
servlet-3.0
kernel
Judy

Judy checks in the app and server configuration…

- Variables are used to account for machine differences

Judy



server.xml:

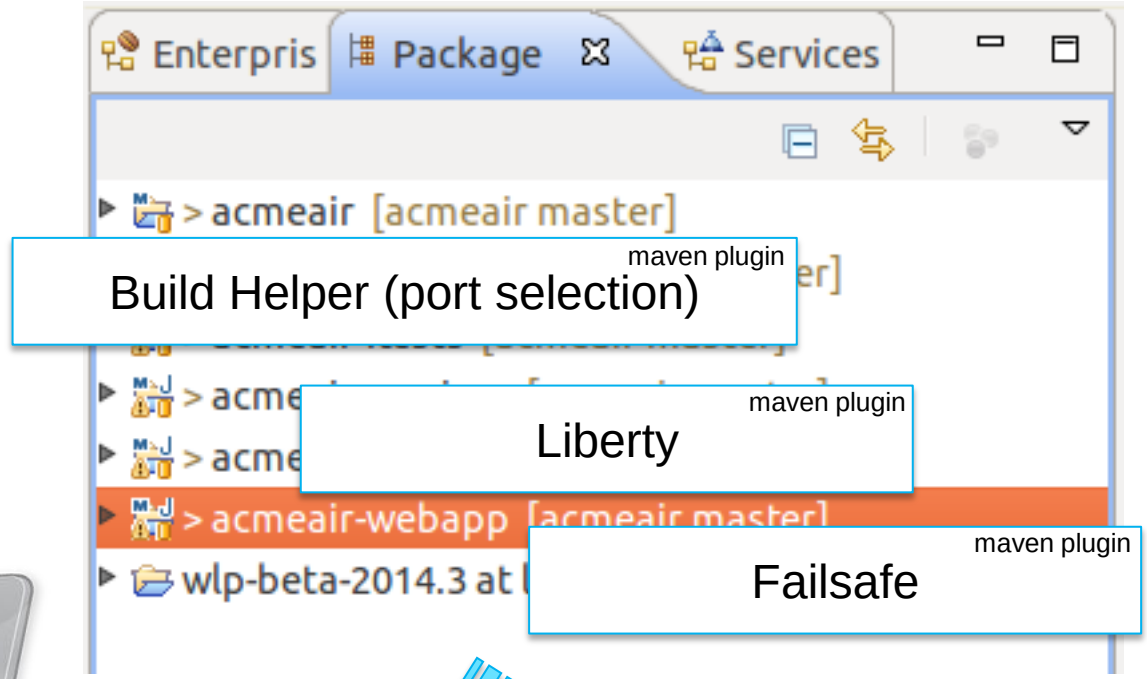
```
<httpEndpoint id="defaultHttpEndpoint"
              httpPort="${wlp.http.port}" />
```

bootstrap.properties:

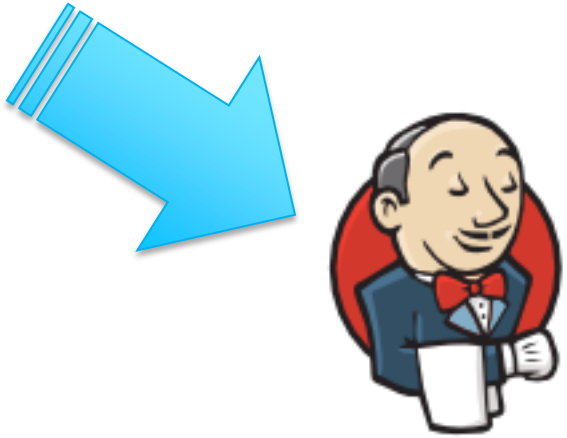
```
wlp.http.port=9081
```

… and uses maven and Jenkins for continuous integration

- Maven plugins populate variables and control the server for testing



Judy



Time for a pilot! Better get ready …

- Add HTTP Session persistence
  - Start with a simple database backend

server.xml:

```
<include location="${shared.config.dir}/httpSessionPersistence.xml" />
```

liberty → HTTP sessions → DB

bootstrap.properties:

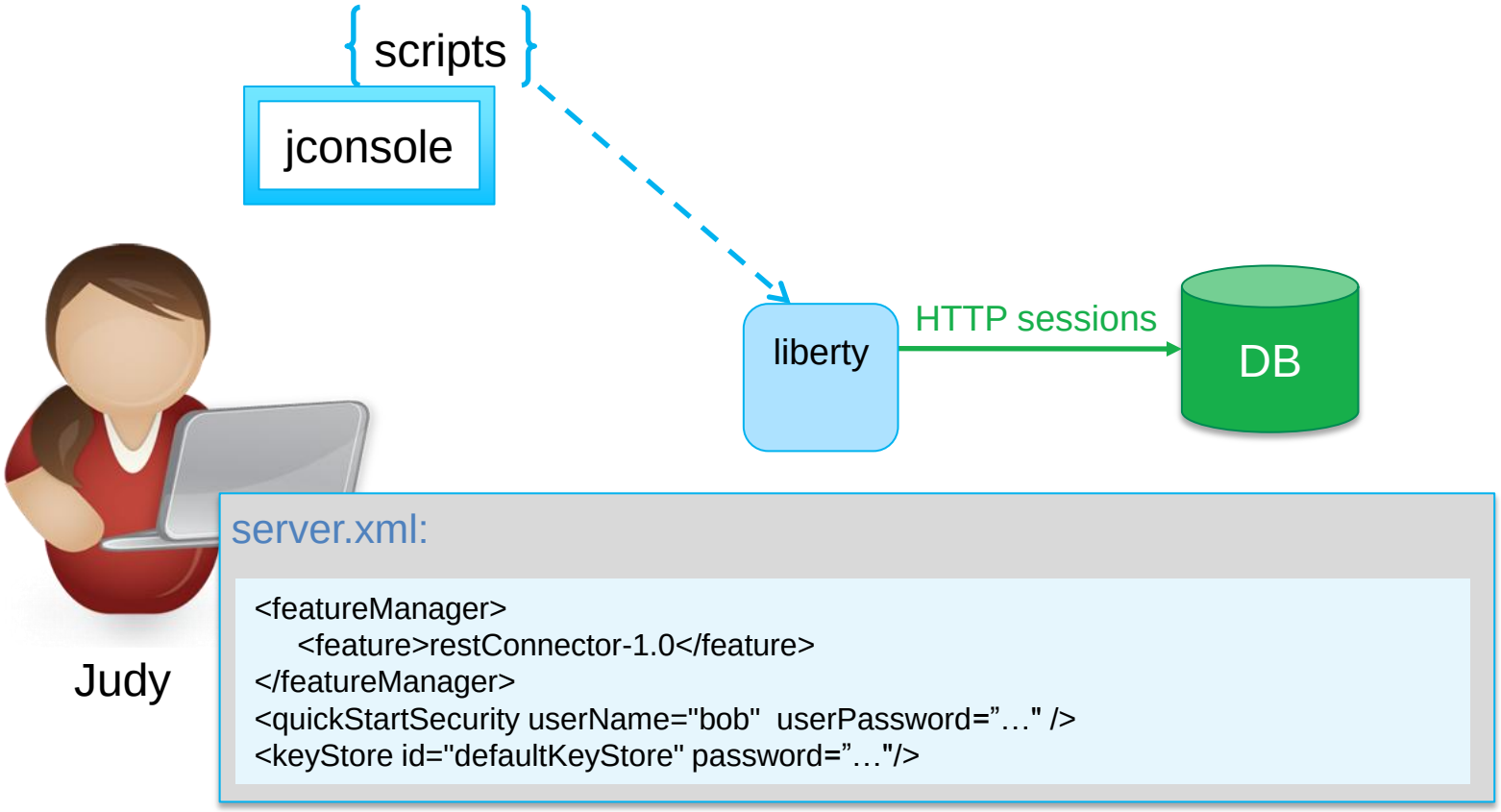
```
cloneId=uniqueX
```

httpSessionPersistence.xml:

```
<featureManager>
  <feature>sessionDatabase-1.0</feature>  …
</featureManager>
<dataSource id="SessionDS" …/>
 <httpSessionDatabase id="SessionDB" dataSourceRef="SessionDS" …/>
 <httpSession cloneId="${cloneId}"…/>
```

Time for a pilot! Better get ready …

- Add the REST connector feature to allow JMX management



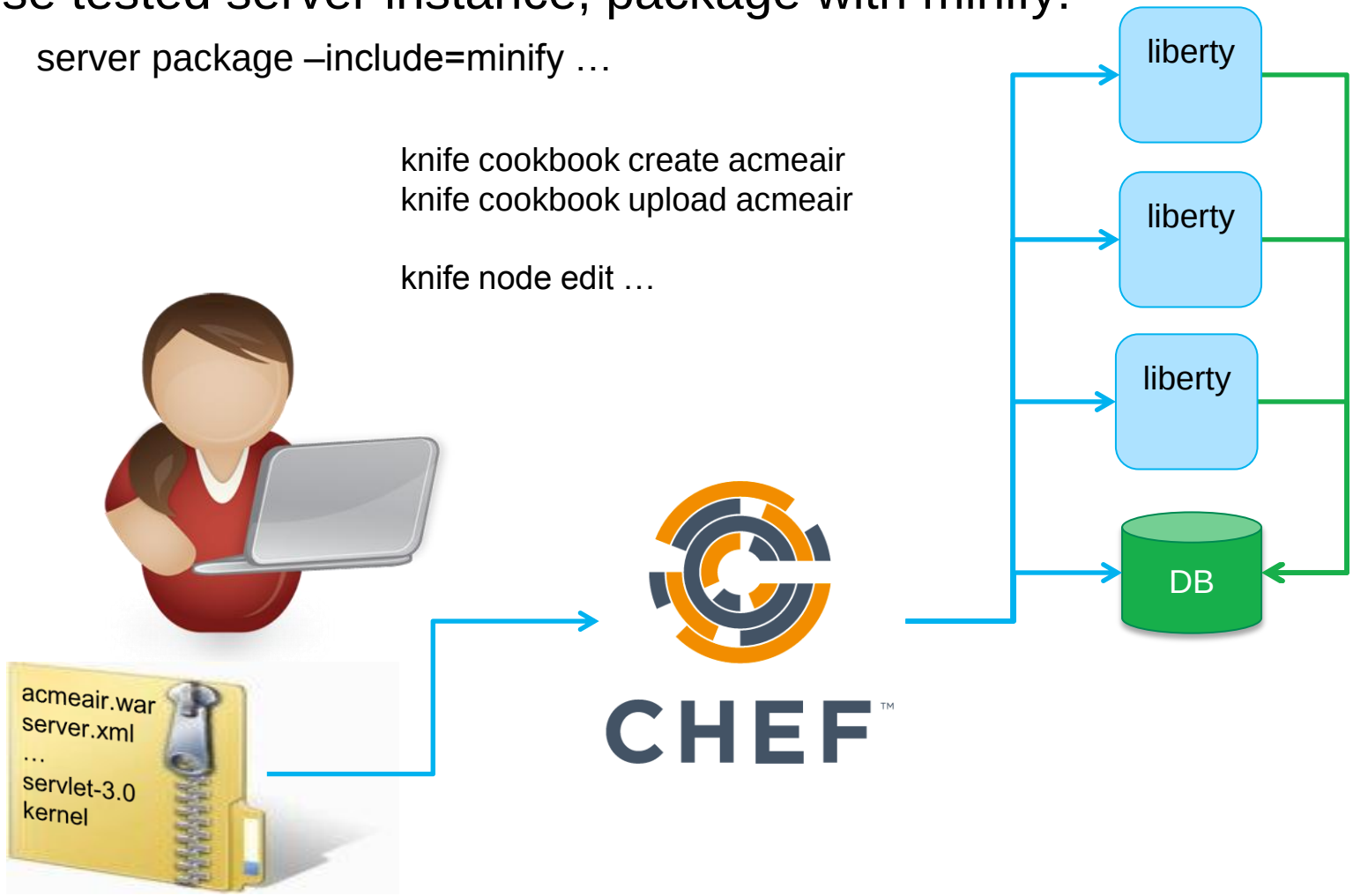
Use Chef to deploy a few instances…

- Use tested server instance, package with minify:

  server package –include=minify …

  knife cookbook create acmeair
  knife cookbook upload acmeair

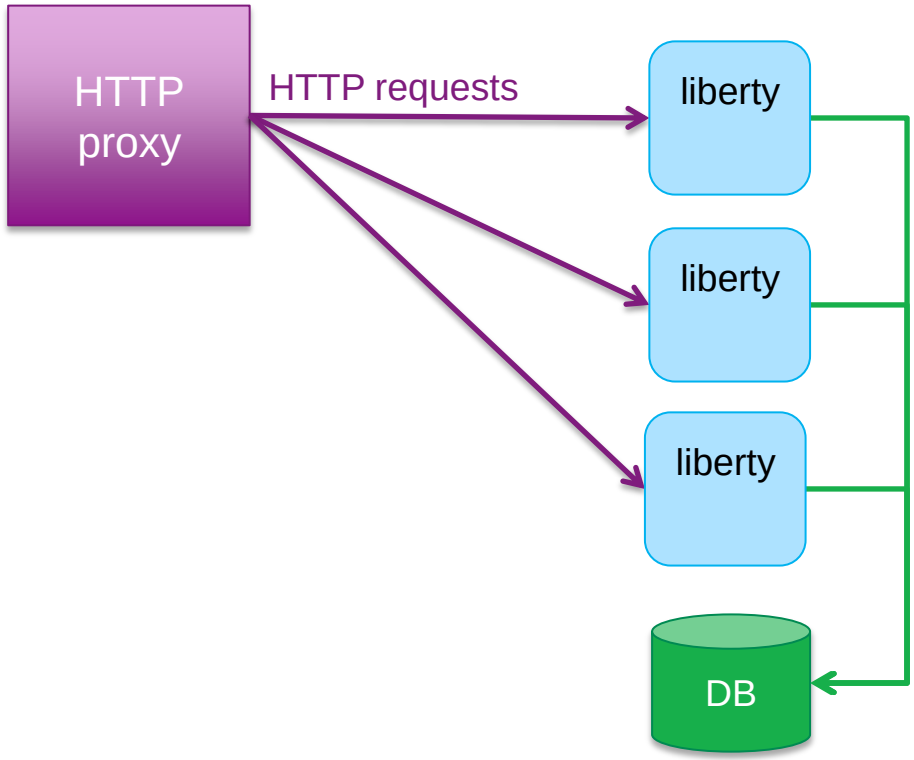
  knife node edit …



… and then set up a load-balancing proxy

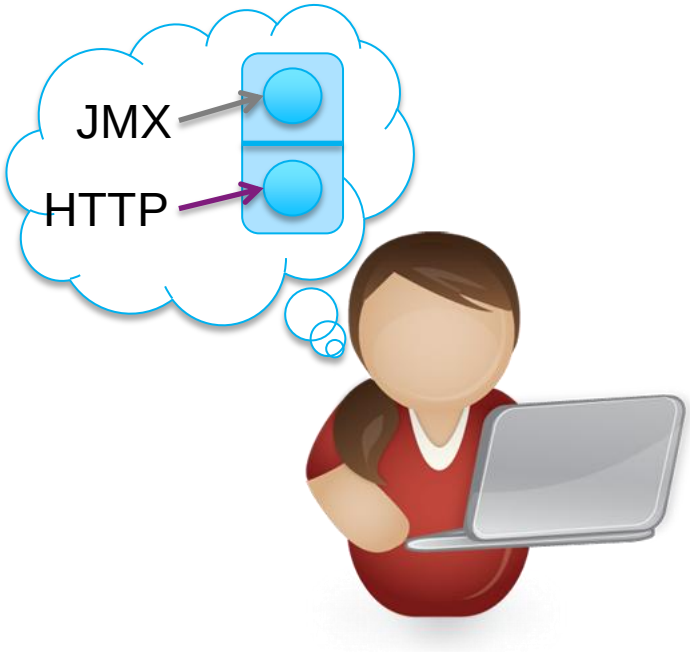
- Use a load-balancing proxy (like IHS and the WAS IHS plugin) to spray HTTP requests across several servers

Judy



Isolate the externally accessible apps

- Configure Virtual Hosts to isolate the application from other (internal/administrative) traffic.



Judy

server.xml:

```
<httpEndpoint id="appEndpoint"
      host="*"
      httpPort="${app.http.port}"
      httpsPort="${app.https.port}" />

<virtualHost id="default_host">
   <allowFromEndpoint>defaultHttpEndpoint</allowFromEndpoint>
</virtualHost>

<virtualHost id="applicationHost">
   <hostAlias>*:${app.http.port}</hostAlias>
   <hostAlias>*:${app.https.port}</hostAlias>
   <allowFromEndpoint>appEndpoint</allowFromEndpoint>
</virtualHost>

<pluginConfiguration httpEndpointRef="appEndpoint" />
```

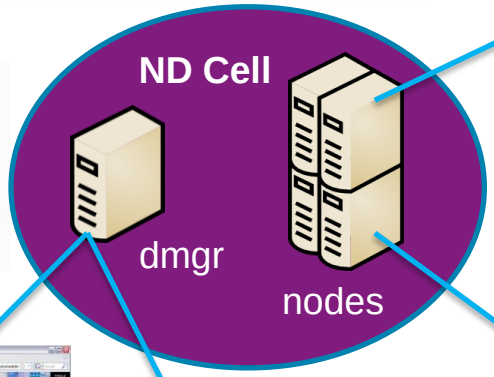
Ibm-web-bnd.xml

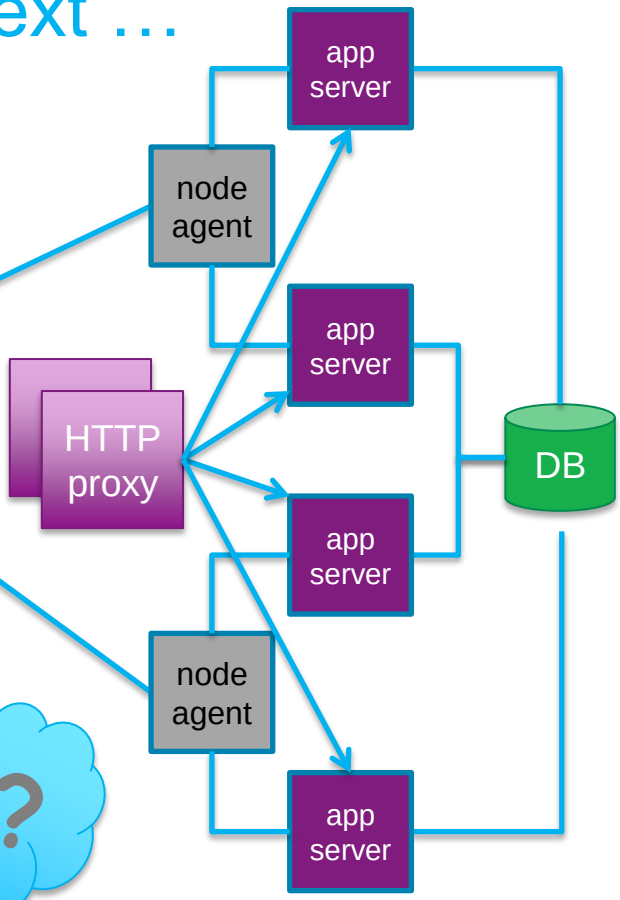
```
<virtual-host name="applicationHost" />
```

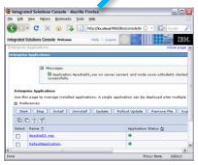
Pilot is a big success! Production next …

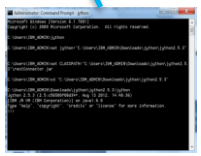
Judy

Management says:
"make it happen"









- Need to deploy to production.
- Need to fit into existing management practices.
- Need to conform to strategic direction (lightweight containers).

- How do you manage Liberty apps in ND cell?

Managing Liberty Apps in ND Cell – 2 Options

- Cross-deploy apps to from Liberty to Full Profile
  - One-way programming model fidelity
  - 100% operational consistency

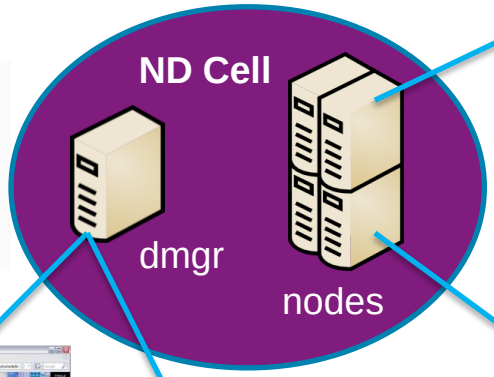
Judy

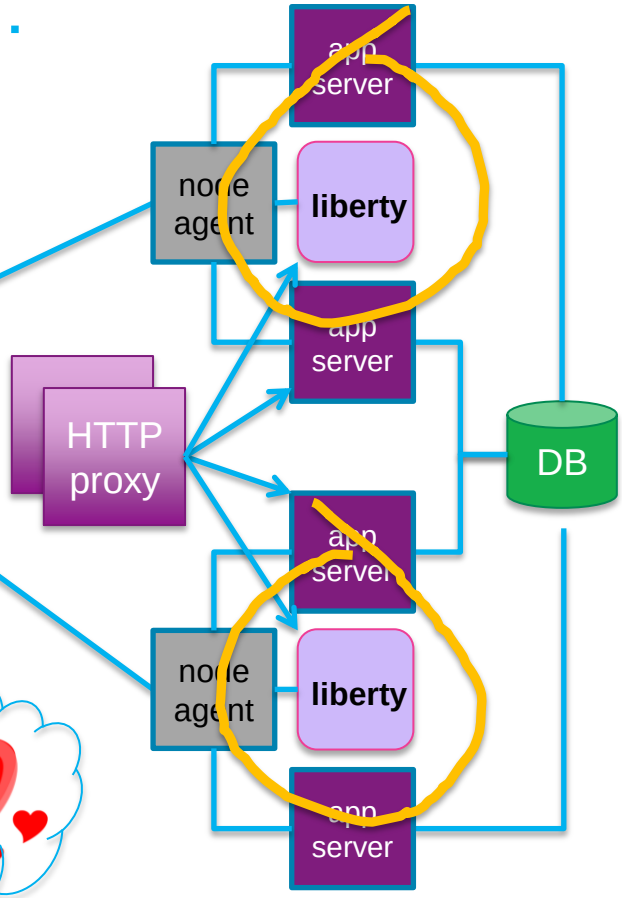
- Manage Liberty profiles *as integral part* of ND Cell !
  - Built on Intelligent Management Middleware Server support
    - Available v8.5.5.1
  - Basic console/scripting access to Liberty
    - config access (i.e. server.xml)
    - lifecycle (start/stop/status)
    - log access (messages.log, etc)
  - Optional dynamic clusters for Liberty
  - This is "Liberty Assisted Lifecycle" support

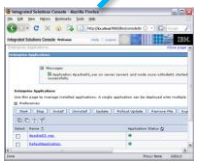
Liberty Assisted Lifecycle Support …

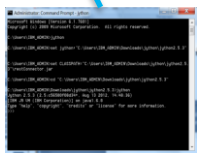
Judy

Wow ! You can do *that ?!*









- Liberty in the ND cell gives operations similar to WAS full profile.
- Perfect way to integrate operational practice across both profiles types.

We love the operational consistency!

Judy's application is wildly popular!

Her organization plans for growth …

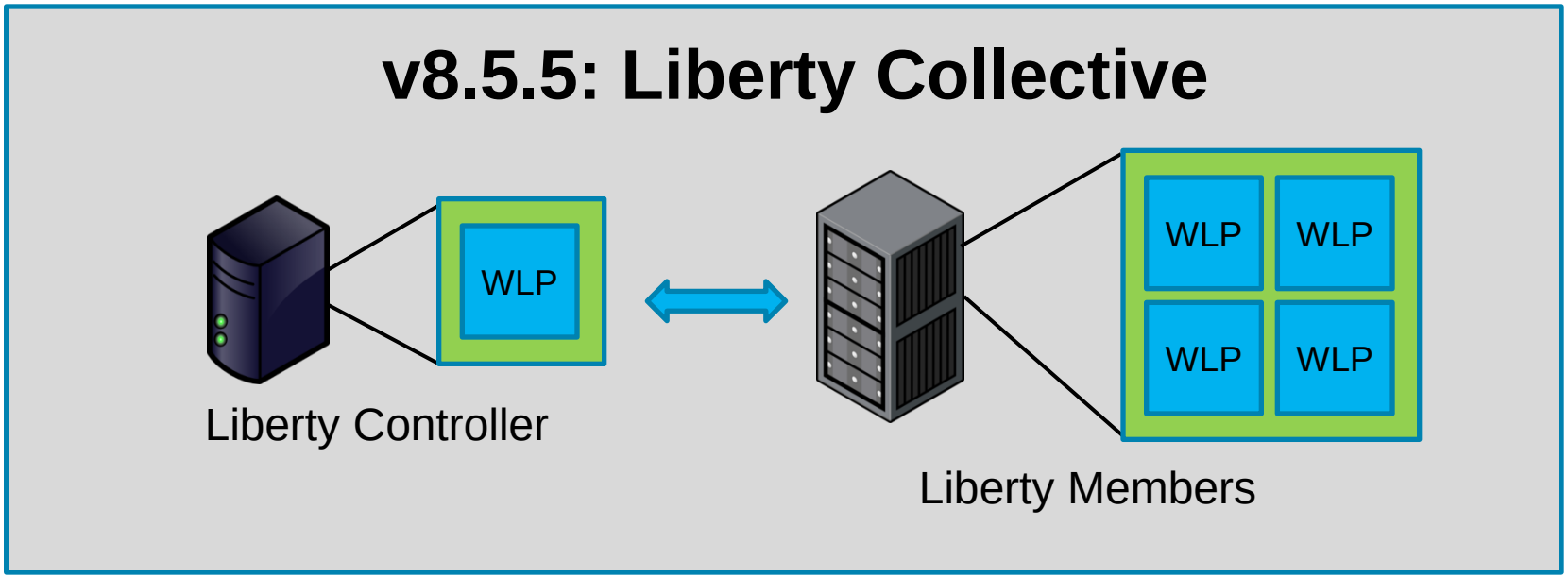
Judy

Judy

Liberty Collective Primer

Liberty Collective: Next Generation Management

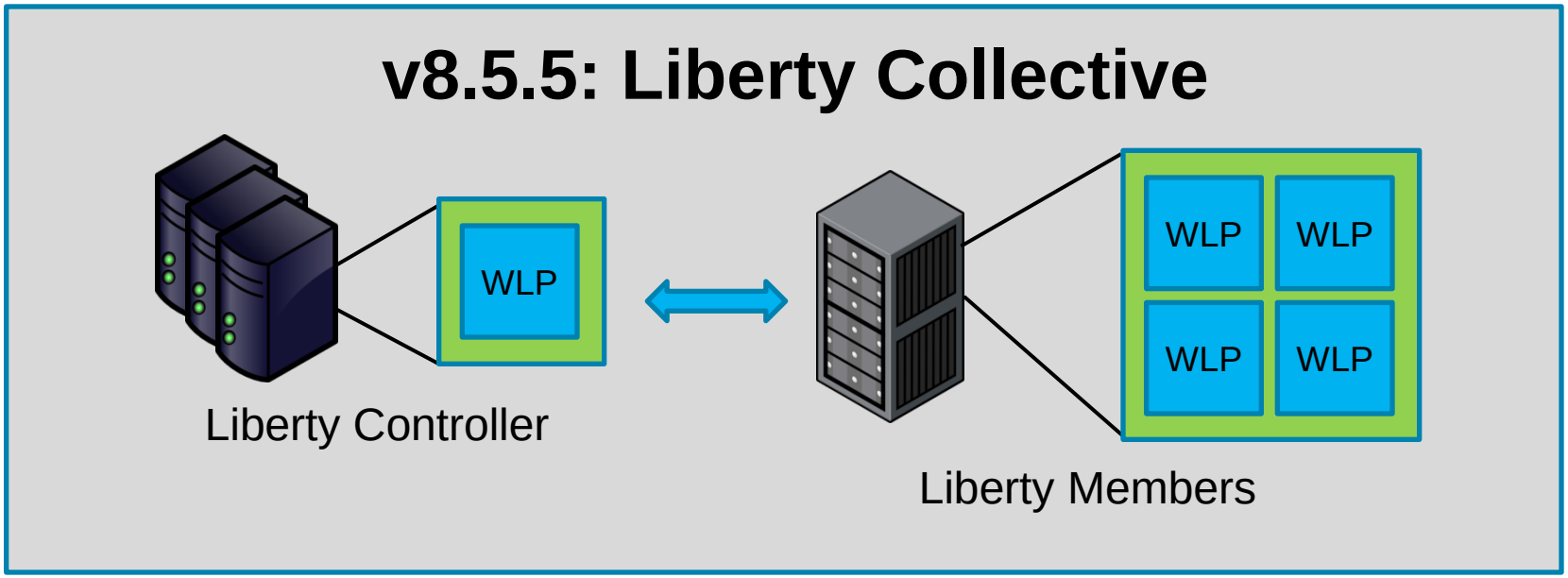
WLP=WebSphere Liberty Profile



- Liberty Collective: **NEW** multi-server administrative domain architected exclusively for Liberty!

Liberty Collective: Next Generation Management …

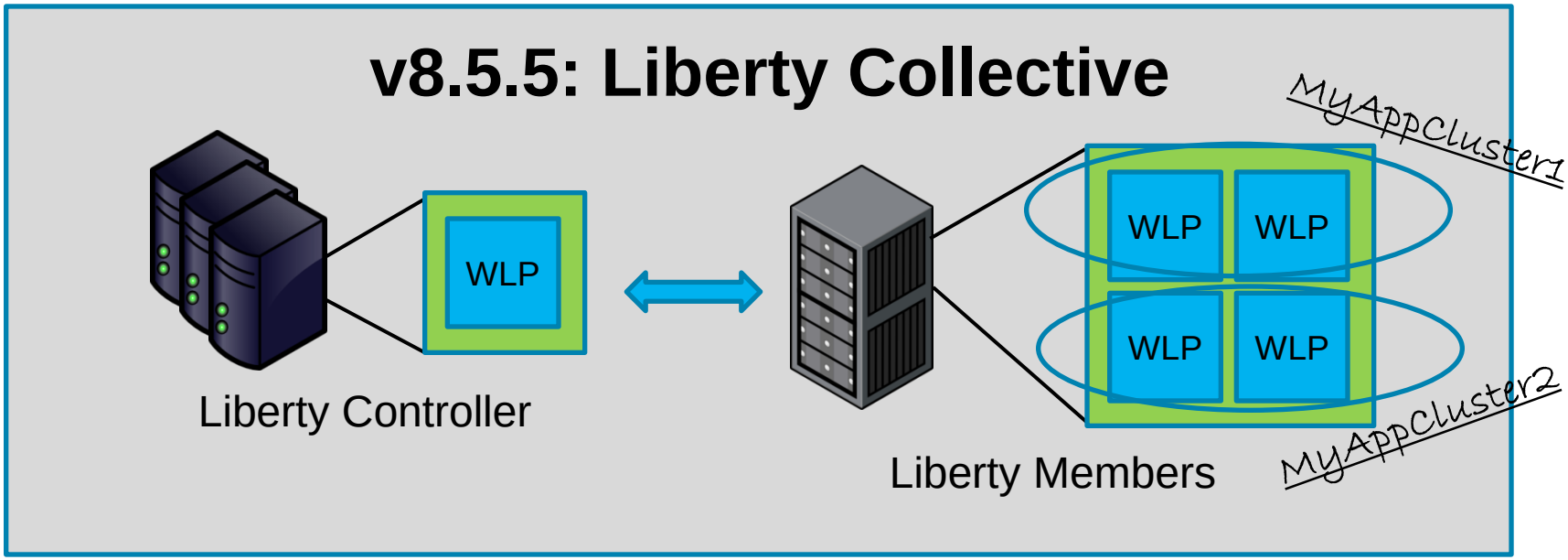
WLP=WebSphere Liberty Profile



- Liberty Collective: **NEW** multi-server administrative domain architected exclusively for Liberty!
- Liberty Controller: **NEW** scalable admin server built on Liberty.

Liberty Collective: Next Generation Management …

WLP=WebSphere Liberty Profile



- Liberty Collective: **NEW** multi-server administrative domain architected exclusively for Liberty!
- Liberty Controller: **NEW** scalable admin server built on Liberty.
- Liberty Clusters: **NEW** support for Liberty cluster management.

Principles of Liberty Collective

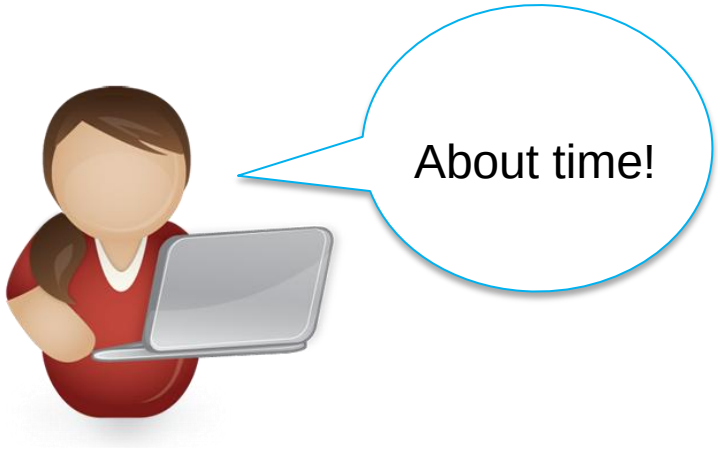
- **Standards-based admin API**
  - Built on JMX (MBeans).
  - Works with common tools (Jconsole, Jython, etc).
- **Loosely-coupled**
  - Exploits Liberty composable server model.
  - App servers can easily and quickly be moved in and out of collective.
- **Distributed Cache Model**
  - Admin server (controller) is config/state cache.
  - Doubles as bi-directional JMX proxy.
- **Distributed Configuration**
  - App Server owns its own config.
  - App Servers cache sparse config and state in controller.
- **Scalable, Resilient Admin Domain**
  - Highly Available admin server (replica model)
  - Agentless

Capabilities Comparison

= cell advantage

= collective advantage

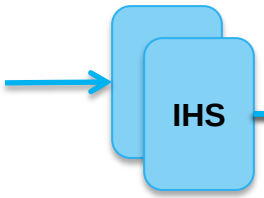
Capability	Liberty ND Cell	Liberty Collective
Lightweight	No	**Yes**
Setup speed	Low	**High**
Memory use	High	**Low**
Reconfigurability	Low	**High**
Domain Scalability	Low	**High**
Admin Scalability	Low	**High**
Liberty deploy	No	**Yes**
Admin HA	Yes	Yes
Static clusters	Yes	Yes
Health Manager	Yes	No (for now)
Dynamic clusters	Yes	No (for now)
Extends existing env	Yes	No

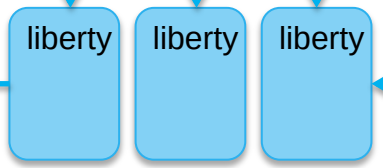


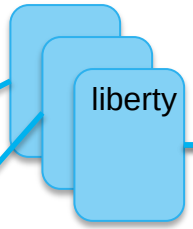
Judy

Now back to our story …

So the Infrastructure Team sets up a Liberty Collective!

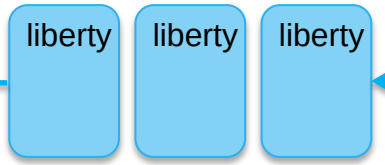


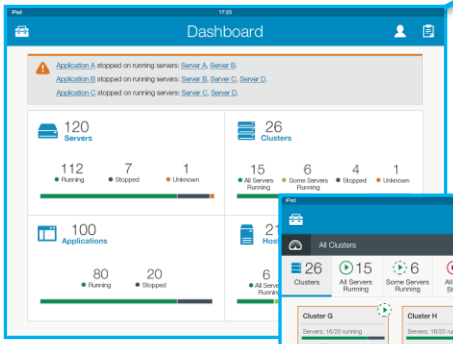


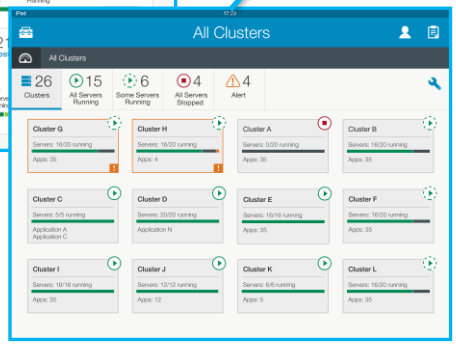


cluster members

controllers





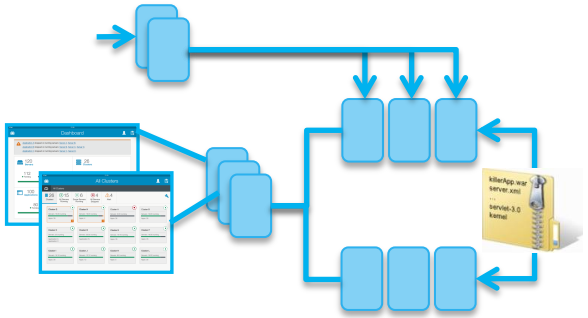


Liberty Admin Center

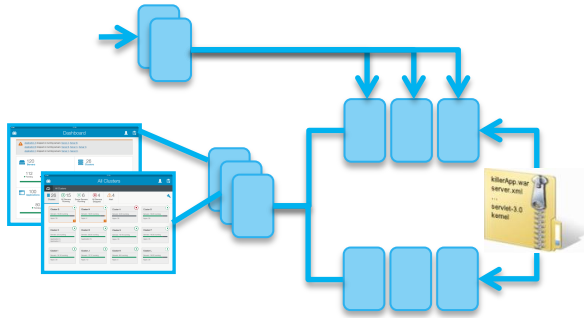
- Certified massive scalability
- Easy/Flexible configuration
- Scalable/HA ops/monitoring

… and several others! There are considerations…

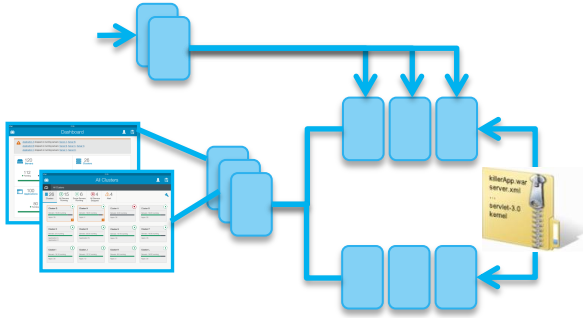
- How to integrate development and production?
- How to manage deployments across multiple environments?
- How to automate creation of new environments?



Pre-prod



Prod-Region-1



Prod-Region-2

So Infrastructure Team weighs deployment options …

CHEF™

- Widely adopted open source deployment automation.

IBM SCP/SCO

- IBM SmartCloud® Pattern-powered on-premise cloud.

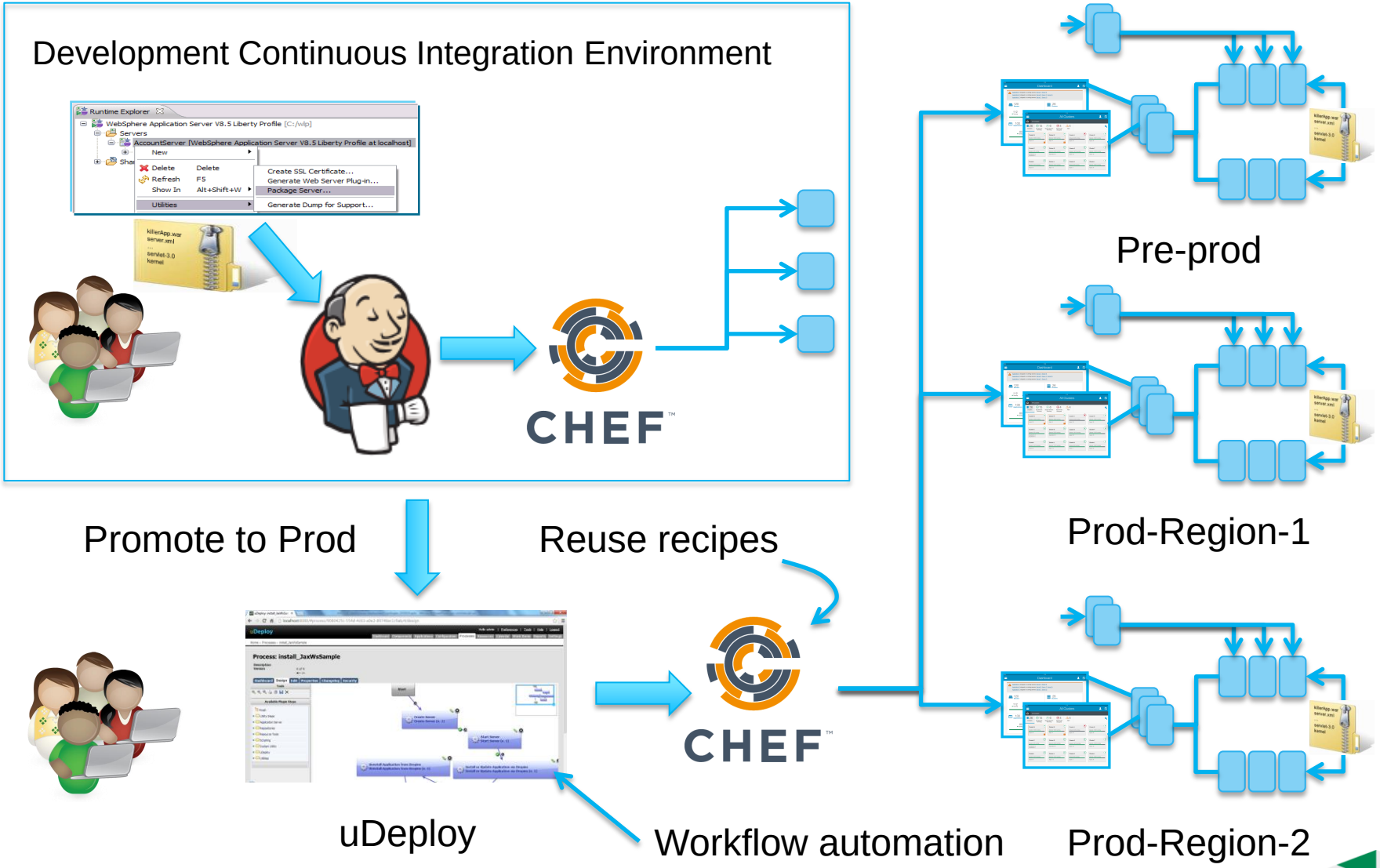
uDeploy

- Powerful workflow modeling and operational control for deployment automation.

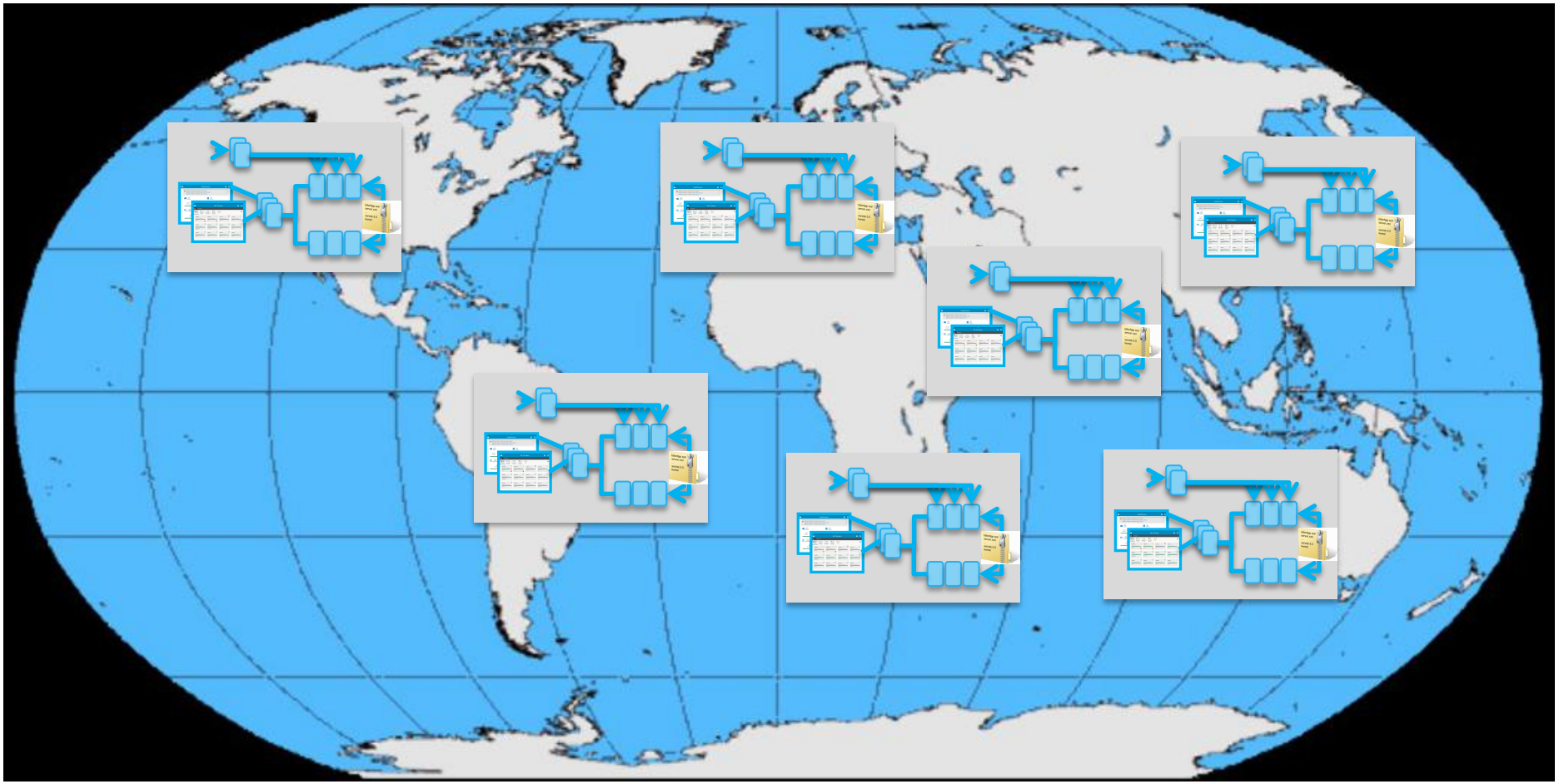
Key Factors for Judy's Organization

- Mix of on-premise and off-premise compute resources.
- Growing business requires rapid build out of new environments.
- Need strong IaaS cloud partner.
- Strong desire to integrate continuous build and production deployment.
- Time to market demands careful reuse of existing practices.

Their New Architecture – Ready for Massive Growth!



Judy's Application Becomes a World-wide Sensation!



With data centers around the globe!

And where's Judy?

Judy

Enjoying the Spoils of Victory!

Questions?

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Other sessions you might like

AAI-1377	Build & Manage a WebSphere Liberty Application Cluster, Including the new Admin Center Tue, 03:45 PM - 06:00 PM, Venetian Murano 3205
AAI-1402	IBM WebSphere Systems Management Update Wed, 10:30 AM - 11:30 AM, Venetian Palazzo N
AAD-2350	DevOps with Liberty, Maven, & Chef Wed, 01:00 PM - 03:15 PM, Venetian Murano 3303
AAI-1524	Rapidly Moving Applications to the IBM WebSphere Liberty Profile Wed, 02:15 PM - 03:15 PM, Venetian Palazzo N
AAI-3265	IBM WebSphere Application Server V8.5 Next - Future of IBM WebSphere Application Server Wed, 03:45 PM - 04:45 PM, Venetian Zeno 4710 Thu, 09:00 AM - 10:00 AM, Venetian Zeno 4707
AAI-3253	Shaping the Direction of the IBM WebSphere Liberty Admin UI Wed, 03:45 PM - 04:45 PM, Venetian Zeno 4703 Thu, 10:30 AM - 11:30 AM, Venetian Zeno 4703

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Backup…

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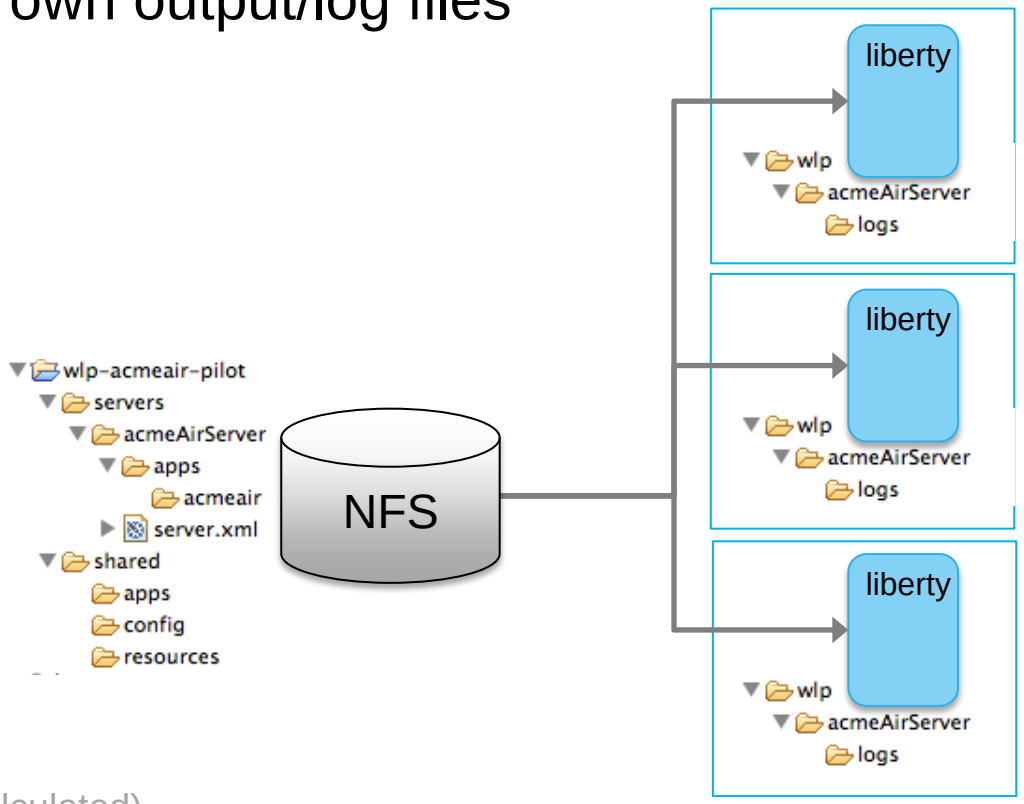
Shared configuration

- Share configuration files between instances
- Each instance has its own output/log files



WLP_INSTALL_DIR=/opt/wlp (calculated)
WLP_USER_DIR=/mnt/nfs/wlp-acmeair-pilot
WLP_OUTPUT_DIR=/var/lib/wlp