

A China BP Embraces Liberty in PowerLinux Virtualization Solution

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About the Speakers

- **LinQuan(Shawn) Jiang** – jianglq@cn.ibm.com
 - WebSphere Development Manager, CDL, IBM
 - Focus on WebSphere Application Server development including WAS CE and Liberty Profile.
- **ZhuangYan Hao**– haozy@teamsun.com.cn
 - 25 years working experience in computer technology, have a deep research on cloud computing technology, currently serves as TEAMSUN vice president, responsible for IBM's business.
- **TieBao(Matt) Ma** – matiebao@cn.ibm.com
 - Senior Managing Consultant, Smarter Cities BP Enablement Leader, WW WebSphere Business Partners, IBM.
- **Lei(Rex) Wang** – wanglsh@cn.ibm.com
 - WebSphere Liberty Profile developer, CDL, IBM
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 - WebSphere Persona tester, CDL, IBM

Agenda

- TeamSun and Camp Box
- Liberty Profile
- Camp Box + Liberty Profile

Teamsun and Camp Box

Teamsun Profile

Company Overview:

- As a China's leading integrated IT service provider, Beijing Teamsun Technology Co., Ltd is the first domestic localized IT service provider with its service network across Greater China and part of the Southeast Asia.
- Businesses cover IT product service, development of application software, system integration, value-added distribution and other IT services across cloud computing, Mobile Internet , Internet of Things and Information Security
- Customer portfolio covers Telco, FSS, Transportation, Public, including China Mobile, China Unionpay, ICBC, China post group, General Administration of Quality Supervision, Ministry of Public Health, Beijing Government, China Petroleum Pipeline Bureau, Sinopec, CNPC, etc.

Key Stats

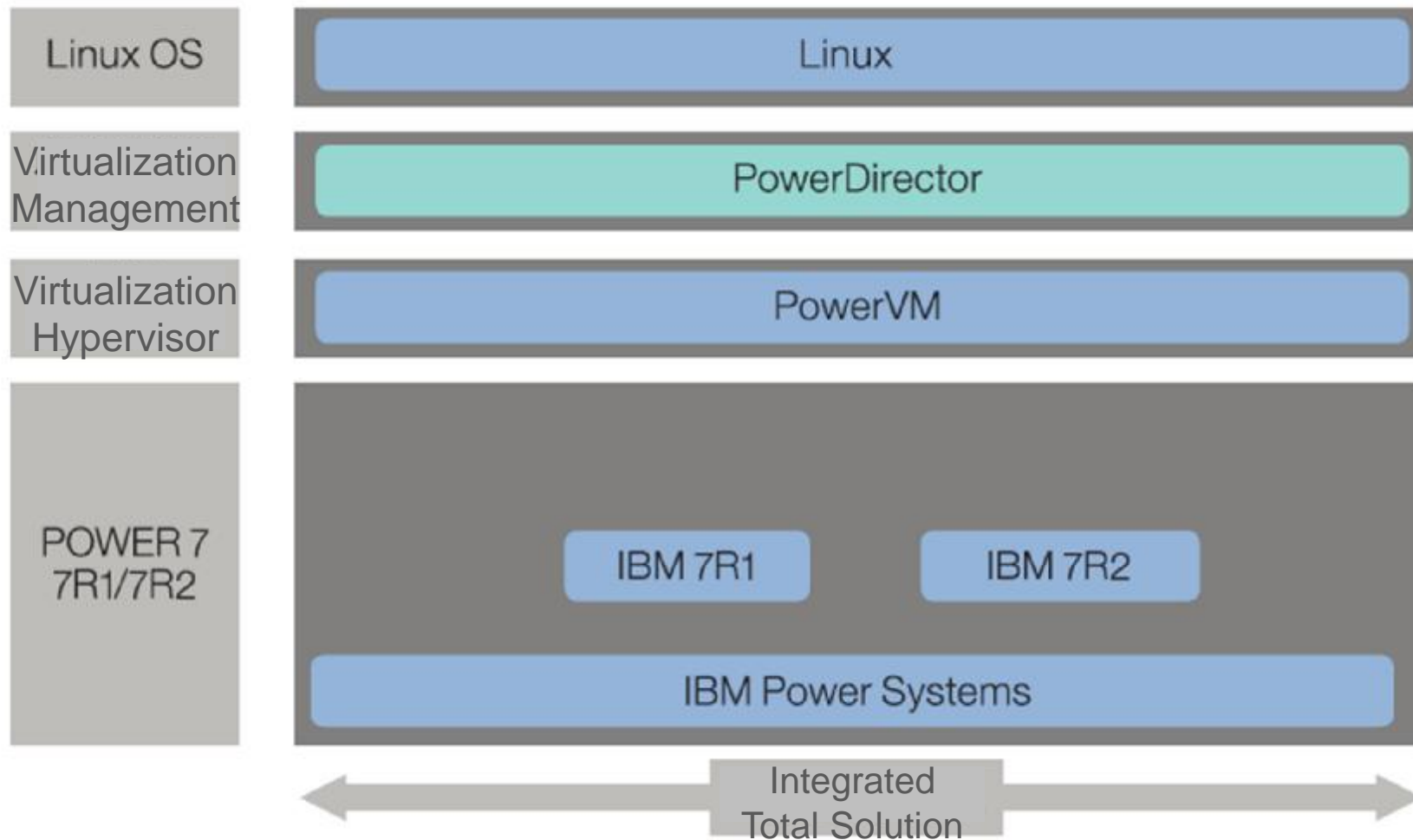
Year Founded:	1998
Status:	Public
CEO:	Liankui HU
Exchange:	2 listed companies, Teamsun at SH(600410) and ASL at HK(00771)
2011 Rev. (Growth):	\$801M (25%)
Website:	http://www.teamsun.com.cn
Headquarters:	Beijing, China
Location:	40+ subsidiaries and branches
Employees:	5,000 +

Notes: Market data as of Aug 1st, 2012; 1 USD = 6.35 RMB

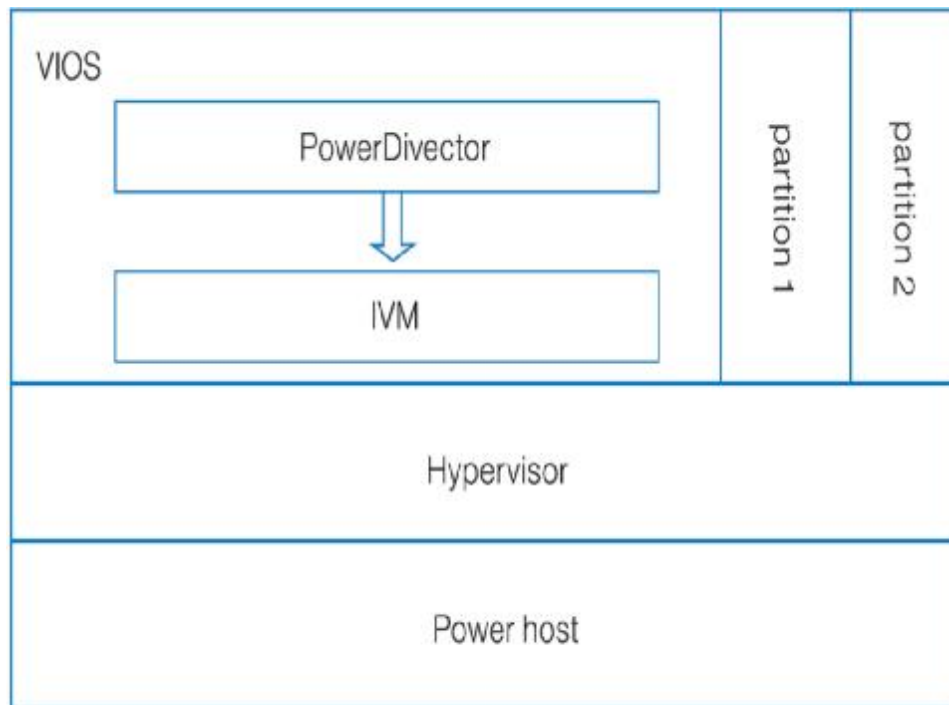
Cloud Strategy ---

- Teamsun announced "Winning Action" cloud strategy. Its IaaS Management Platform was adopted in multi telco companies. Key client industries - Telco, FSS, Education, Mfg, energy & transport. Aggressive in in-organic growth to build Cloud capability - ASL, Mocha (SW), i-sprint (security) while extending its presence to ASEAN market, aiming to become a leading Cloud provider in Asia Pacific. In addition, it's raised large capital from equity market for Cloud related Cloud R&D, and market development.

About CAMP (Create A Market for Power)



Power Director



- VM Management
 - VM Creation
 - VM Operation
- Image Management
 - ISO Upload and Delete
 - VM to Template
- Platform Management
 - Platform Registration/Rename/Delete
- Volume Management
 - Volume Registration and Delete
- Others
 - User Management
 - Task management
 - Log Management
 - Multi-Language Support

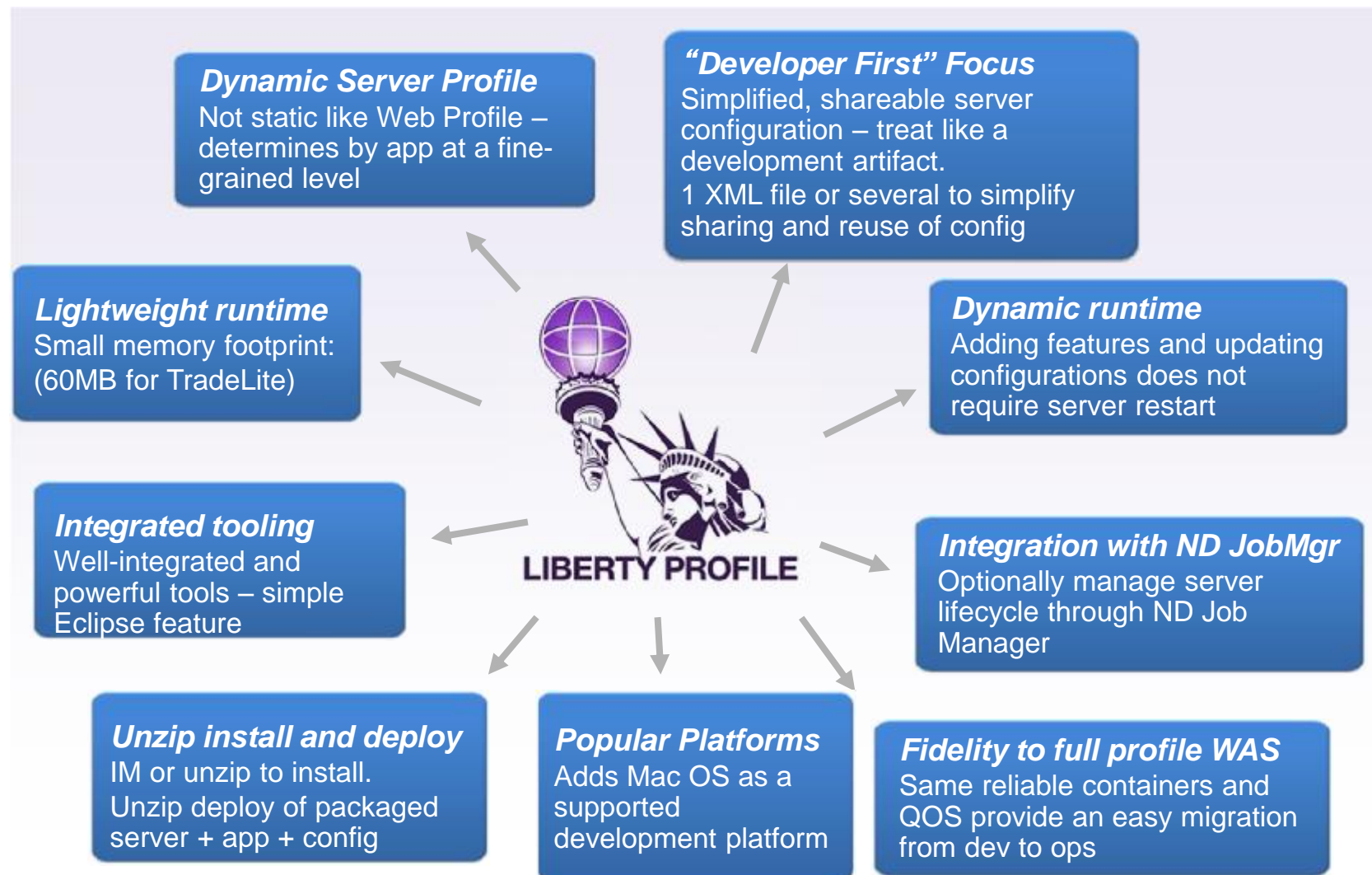
Technology & Biz value of bundling Liberty with CAMP

- **Deep Embedded with WAS Liberty into CAMP Box**
- **Market Proposition: Power Linux+ TeamSun Virtualized System SW + Liberty VS X86 + Linux + VMWare + Tomcat**
- **Product**
 - Cloud App Server VS Virtualized Server
 - Commercial VS Opensource
 - Integrated and Optimized Product with Single Partnership
- **Technology**
 - Lightweight, Module Based, Dynamic Configuration
 - Easy to setup, config and deploy
 - Central Management, Lower Maintenance Cost
 - Support Cloud App and Deployment
 - Optimized on IBM Power and Linux
- **Business Value**
 - Faster the product development cycle and Minimize R&D and Purchase costs
 - Developers and users' stickness
 - Build Channel Ecosystem and Industry Install Base for Teamsun

Liberty Profile

lightweight WAS “Liberty” Profile

-- A highly composeable, dynamic Server profile



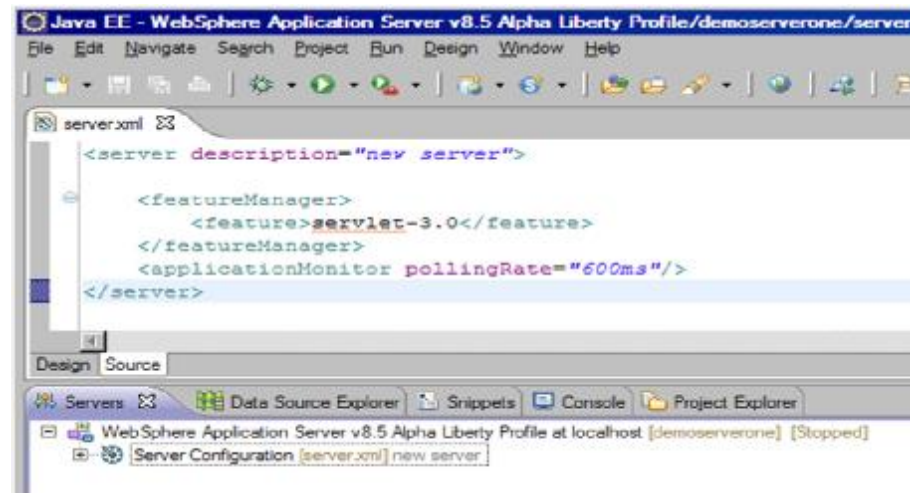
Sparse, simple and flexible configuration

- **Simplest case: one XML file for all server config**
 - Config can be componentized at any level of granularity, from 1 file to many.
 - Team development: keep the application and configuration components together.

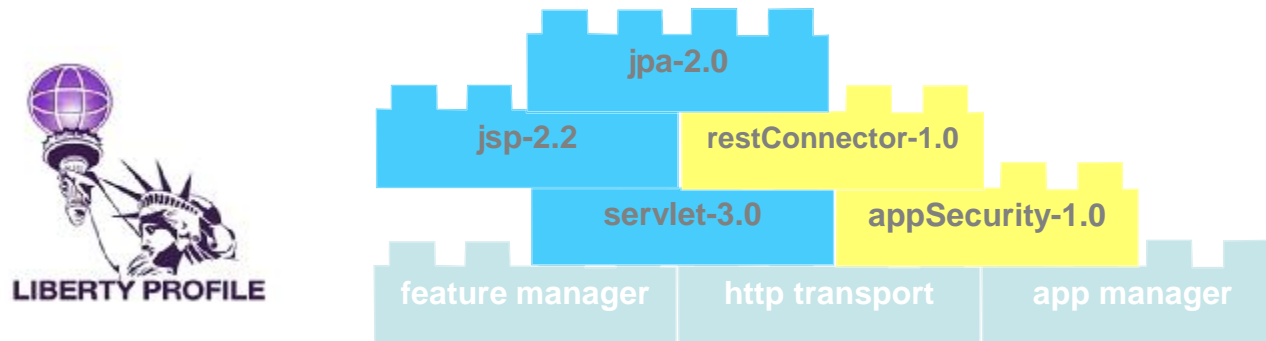
```
<server>
  ...
  <include location="http://hurgsa.ibm.com/~irobins/
                                config/blog.sample.xml" />
  <include location="${shared.config.dir}/datasource.xml" />
</server>
```

server.xml

- **Eclipse-based editor**
 - Directly edit XML
 - Pretty GUI Design view
 - Ø pull down boxes
 - Ø radio buttons
 - validation



Highly Composable/Dynamic runtime



- Updates to configuration of running server are effective immediately.
- Add/remove apps dynamically by drag/drop to monitored directory.

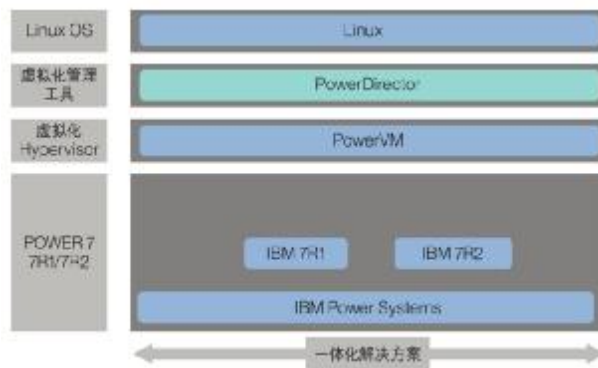
“Camp Box + Liberty Profile” Evaluation

About CAMP – Power Linux Configuration

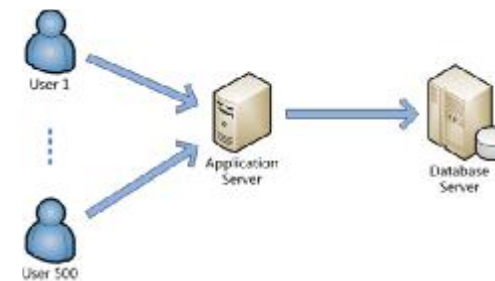
	PowerLinux 7R1		PowerLinux 7R2	
	8246-L1C	8246-L1S	8246-L2C	8246-L2S
Operating System				
2U Storage Drawer (EXP24S, f/c EL1S or 5887)	n/a	August 24, 2012	n/a	Yes
4U PCI-e Expansion Drawer (10 PCIe or 10 PCIe + 18 SFFs)	n/a	n/a	n/a	July 20, 2012
POWER7 Architecture	8-core 3.55 GHz		8-core 3.55 GHz 8-core 3.3 GHz	
Planar	Single Socket		Dual Socket	
DDR3 Memory	8 / 16 / 32 GB options 32GB to 128 GB		8 / 16 / 32 GB options 32GB to 256 GB	
12X I/O loop, PCI-e drawers	n/a, no I/O expansion		n/a	7/20/12 (max of 2)
Base Ethernet	4-port, 1 gigabit			
SAS SFF Bays	Up to 6 HDD or SSD			
PCIe Gen2 Slots	5 PCIe x8 Gen2 Low Profile, plus x4 Gen2 slot for LAN adapter			
Integrated SAS/SATA	Yes / RAID 0/10 std (RAID 5/6 opt)			
GX++ Slots	One		Two (One shared)	
Integrated Ports	3 USB, 2 Serial, 2 HMC			
DVD bay	1 slim-line			
Tape/RDX bay	1 Half Height (Optional)			
Virtualization Mgmt.	IVM / HMC			
Red. Power, Cooling	Yes, default configuration		Yes	
EnergyScale	Thermal Power Management Device (TPMD)			
Warranty	3 Years			

Evaluation Model

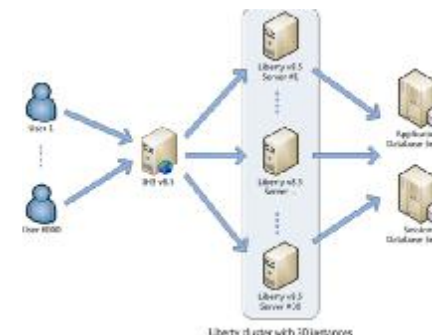
- Prepare Liberty Power Linux Image
- Use PowerDirector to create VMs for evaluation on Camp Box



- Single node evaluation via comparing tomcat and liberty performance.

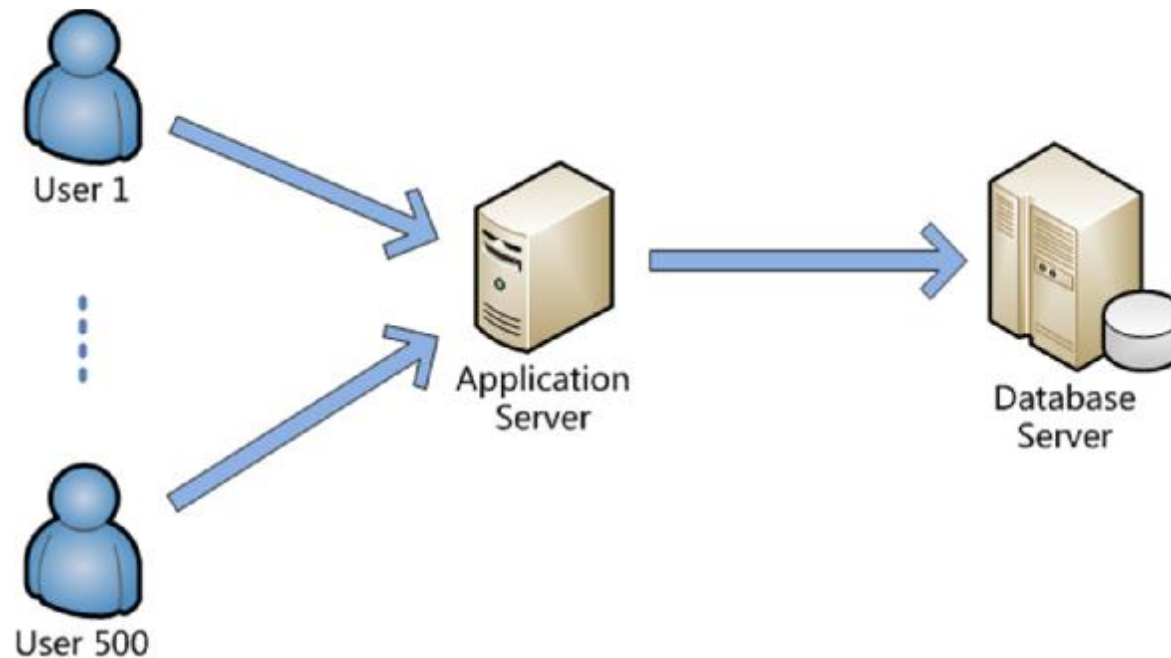


- Liberty clustering capability evaluation on Camp Box.



Liberty VS. Tomcat - Single Node Evaluation on Campbox

- **Topology:**
 - Simulate 500 end users to send requests to application server.



Liberty VS. Tomcat - Single Node Evaluation on Campbox

- **Target:** Liberty v8.5 **VS.** Tomcat v7.0.12
- **Environment:**

Application Server

CPU: 1 CPU Power LPAR
Memory: 3.5G memory
OS: Redhat Linux 5.8
JDK: IBM JDK 1.6 PPC64 SR11

Database Server

CPU: 5 CPU Power LPAR
Memory: 24G memory
OS: Redhat Linux 5.8
DB: IBM DB2 enterprise 9.7

- **Conditions:**
 - No JDK parameter set before Liberty and Tomcat start
 - Set the same tread pool size for Liberty and Tomcat
 - Same initial data in DB2 (10000 stocks, 5000 users)

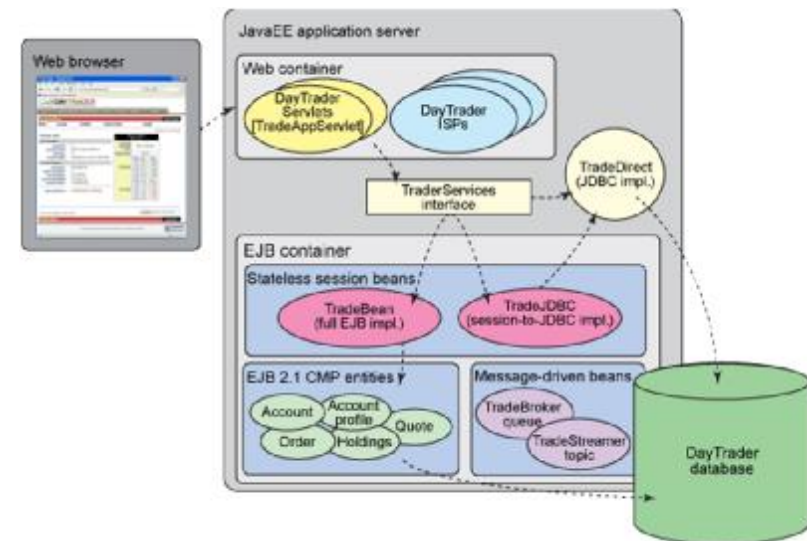
Testing application and the Load Distribution

- **TradeLite**

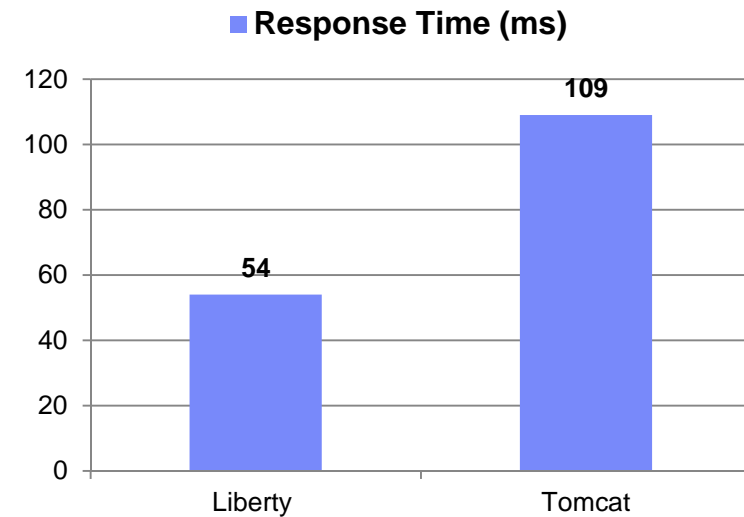
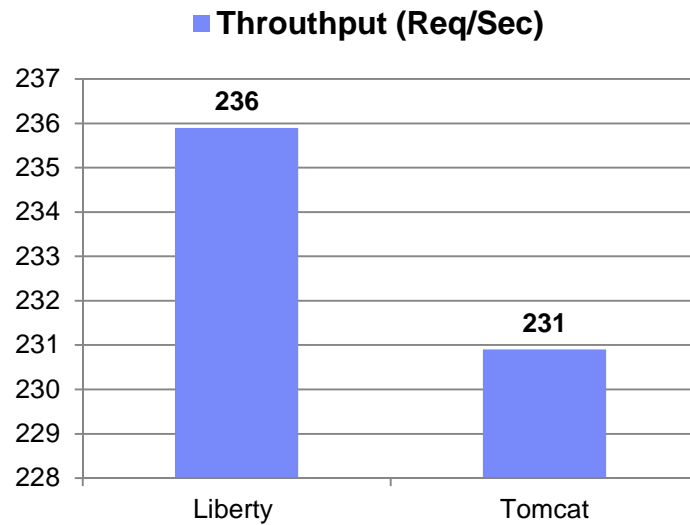
- An open source stock trading application in apache community
- User can customize the registered user number and stock numbers in the system.
- Typical scenarios include login, stock query, account update, buy/sell stock, transaction query, logout.

- **The scripts assumes**

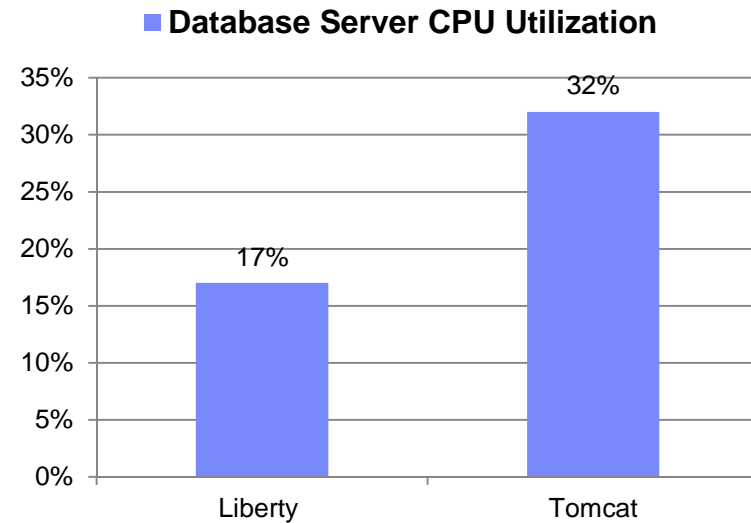
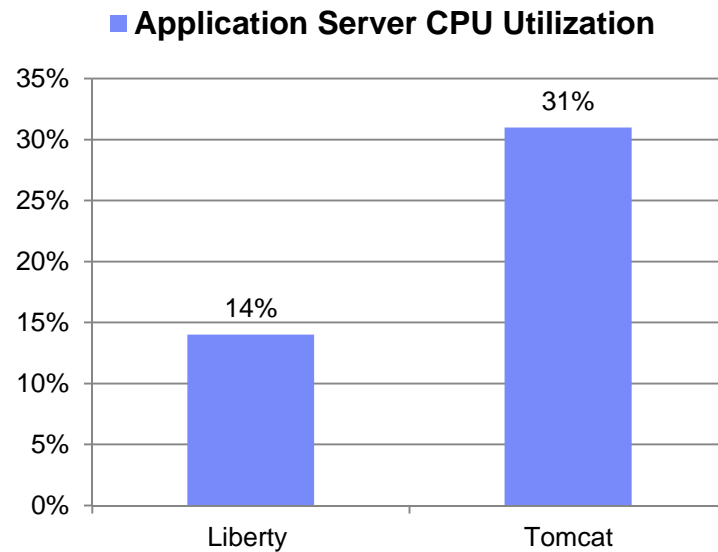
- 20% load on home page
- 14% load on account page
- 8% load on sell/buy page
- 12% load on portfolio page
- 40% load on quote page
- 2% load on register page
- 4% load on logoff page
- Sum the above up equals 100%



Liberty VS Tomcat - Throughput&Response Time In Camp Box

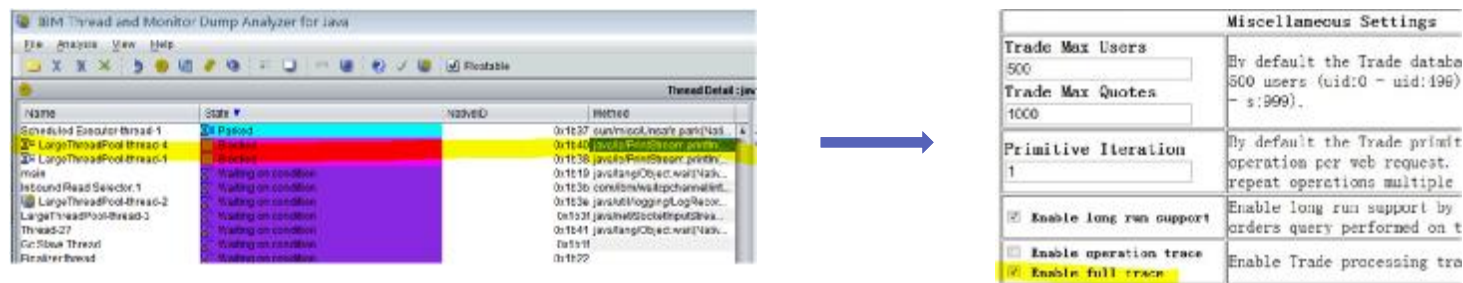


Liberty VS Tomcat - Hosting Server CPU Utilization



Tuning during the single instance evaluation

- Turn off the tradelite applicatoin console trace to remove the huge burden of the frequently IO to console.log in disk.



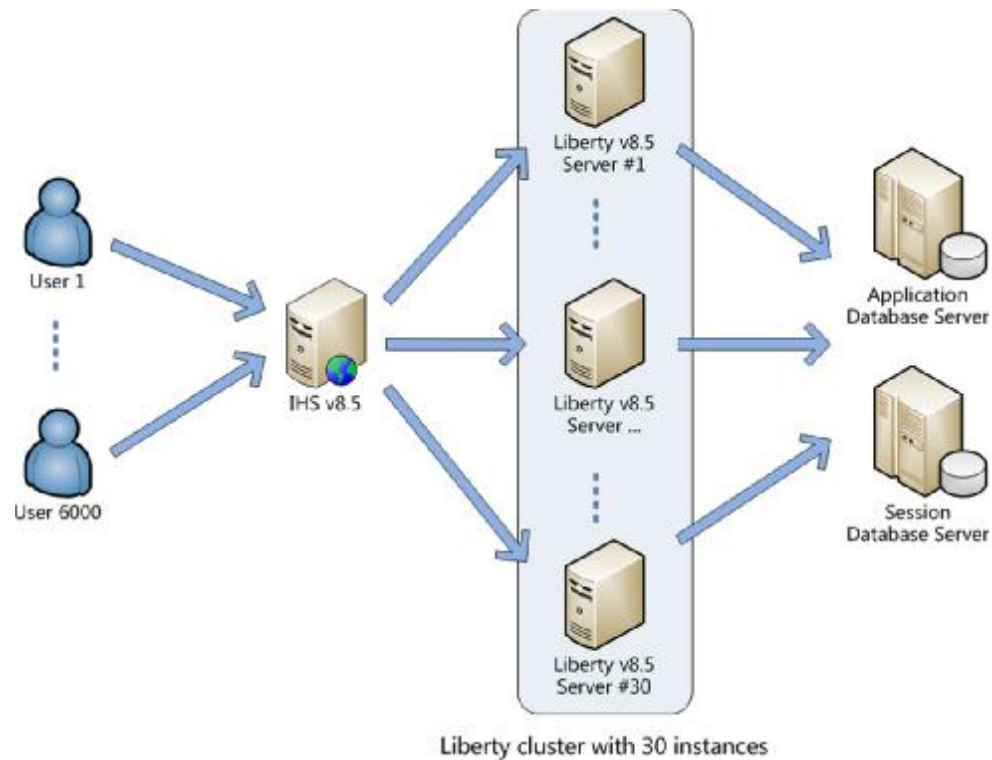
- For Request simulation engine host, change open files handles(ulimit -n) to a large number to avoid the cap of outbound requests.

Liberty VS Tomcat on Camp Box - Conclusion

- Liberty outperform tomcat with near half CPU utilization on Power based CampBox.
- Which will increase the resource utilization rate and decrease the TOC remarkably if the user chooses Liberty in Camp Box for JAVA EE scenario.
- Liberty Profile is becoming stronger per new functionality in 8.5.5.
- Customer can purchase optional BP support or IBM support.
- Customer will get strong enterprise upgrade option due to High fidelity between WAS Liberty profile and full profile.

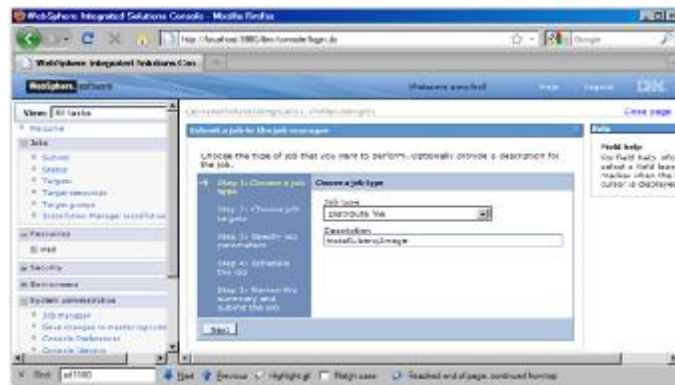
Liberty Cluster Capability Evaluation on CampBox

- Topology



- Simulate 6000 end users send requests to the cluster concurrently.
- How to manage the 30 Liberty instances easily ?

Leverage WebSphere ND Job Manager to manage multiple nodes



WebSphere ND Job Manager

Unzip embedded server image
onto remote hosts



Start, stop and view
servers from central point



ND Job Manager Function Summary

- Optionally manage Liberty server life cycle through WAS ND Job Manager
- Acts as a single point of management for
 - **Agentless** install using operating system user id
 - Start/stop server instance
- Register target hosts and create groups
- Submit jobs against targets or group :
 - inventory/status: discover what's on the target host and their current status
 - install/uninstall of liberty profile archives
 - start/stop liberty application servers
 - Copy files to/from remote targets
 - Execute commands on remote targets
 - Generate and merge plugin configuration
- Querying and understanding what's in the environment
- Simple server status:
 - Out of the box: status current to last status job
 - Configure serverstatus-1.0 feature if manual start/stop is used
 - Note: status not updated automatically on server crash

Liberty Cluster Capability Evaluation

- 30 Liberty Profile instances, each one runs on 1 CPU LPAR on Campbox.
- Use IBM HTTP Server as load balancer among these 30 Liberty instances.
- The TradeLite application in the 30 Liberty instances share the same application database.
- Add a new database for session replication so that the liberty cluster could persist the sessions of each instance and support seamless failover.

```
<dataSource id="SessionDS" jdbcDriverRef="DB2JCC" jndiName="jdbc/session"
transactional="true">
  <properties databaseName="sessions" driverType="4" password="teamsun"
portNumber="50000" serverName="172.30.126.42" user="db2inst1"/>
</dataSource>
<httpSessionDatabase id="SessionDB" dataSourceRef="SessionDS"/>
<httpSession storageRef="SessionDB" cloneId="{cloneId}"/>
```

Liberty Cluster Capability Evaluation

- **Target:**
 - Evaluate Liberty Cluster with 30 nodes in CampBox.
- **Environment:**

IHS

CPU	4 CPU Power LPAR
Memory	24G memory
OS	Redhat Linux 5.8
Http Server	IHS v8.5

Application Database Server

CPU	5 CPU Power LPAR
Memory	24G memory
OS	Redhat Linux 5.8
DB	IBM DB2 enterprise 9.7

Application Server

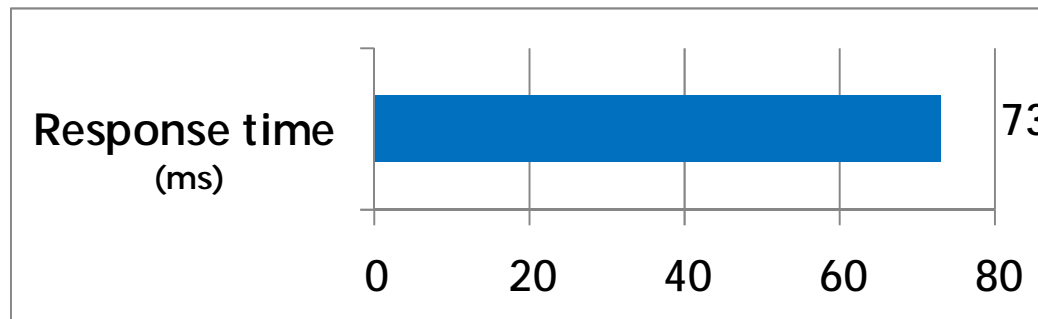
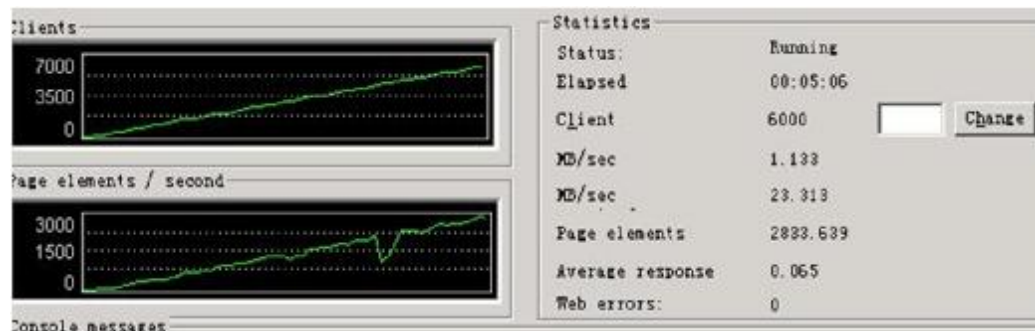
CPU	1 CPU Power LPAR
Memory	3.5G memory
OS	Redhat Linux 5.8
JDK	IBM JDK 1.6 PPC64 SR11

Session Database Server

CPU	3 CPU Power LPAR
Memory	24G memory
OS	Redhat Linux 5.8
DB	IBM DB2 enterprise 9.7

Liberty Cluster Capability Evaluation

- Throughput increased linearly as long as the concurrent end users number growth. With health response time



Tuning involved during the clustering evaluation

- Turn off the tradelite application console trace to remove the huge burden of the frequently IO to console.log in disk.
- Open file handles (ulimit -n) tuning for both request engine server and http server.
- Change MaxClients setting in IBM HTTP Server from default(600) to a higher number to avoid single point bottle neck.

```
<IfModule worker.c>  
...  
MaxClients 600  
...  
</IfModule>
```

- For plugin-cfg.xml setting for each liberty node to avoid node limitation:

```
<Server CloneID="s60" ConnectTimeout="20" ExtendedHandshake="false"  
MaxConnections="300" Name="server60" ServerIOTimeout="9000"  
WaitForContinue="false">  
  <Transport Hostname="xx.xx.xx.xx" Port="80" Protocol="http"/>  
</Server>  
ConnectTimeout: set property timeout make sure all request will be handled  
MaxConnections: set this value larger than concurrency user  
ServerIOTimeout: set this value to give server enough time for IO operation
```

Tuning involved during the clustering evaluation

- For DB2, change connection limit from default 800 to a larger number to avoid the DB2 bottleneck.

```
db2 update db cfg for sessions using MAXAPPLS 2700
```

- Avoid “SQL0964C The transaction log for the database is full” DB exception via enlarging the number and size of log file.

```
db2 update db cfg for sessions using LOGFILSIZ 65535  
db2 update db cfg for sessions using LOGPRIMARY 10
```

Summary



- Teamsun is a strong IBM BP, aiming to become a leading Cloud provider in Asia Pacific.
- **Camp Box + TeamSun Virtualized System SW** is one of Teamsun major solution to the customer.
- Liberty Profile works well on this platform, can be potential value add for Java EE focus customers.
 - Comparing to Tomcat, Liberty Consume 50%~ resource with better performance on Camp box. This will in turn increase the TOC remarkably for Campbox JAVA EE scenario.
 - Liberty can work with ND job manager and IHS to provide clustering capability.
 - Faster the product development cycle and Minimize R&D and Purchase costs
 - Developers and users' stickiness
 - Build Channel Ecosystem and Industry Install Base for BP

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