



**OpenClovis**

# OpenClovis Introduction

May 2010

# OpenClovis Corporate Background

- Founded in 2002 as Clovis Solutions
- May 2006, changed to OpenClovis for open source business model
- USD\$30M invested on Products
- Product Release 4.0 is mature and shipping
- Over 20+ paying customers
- Headquartered in Petaluma, CA
  - **Facility also in Bangalore, India**
  - **Experience staff in systems**
- Partnerships with major industry players such as SUN, HP, Huawei, IBM, Oracle, WindRiver, Radisys, Emerson, etc.



# Why customers choose OpenClovis?

- Most mature SAF compliant middleware
- A suite of tools accelerates application development lifecycle based on OpenClovis
- Meets scalability and performance requirements
- Technical staff with extensive system development background
- Extensive Test automation with proven product quality
- Superb technical support capability
- Scalable Platform Support Package (PSP) architecture
- Key differentiation middleware features:
  - ISSU, Dynamic HA, Dynamic modeling, group membership, extensive logging
- Maximum support of hardware, CPU, OS configurations
  - Mixed-OS, mixed-CPU-arch and mix-endianess

# Our Customers



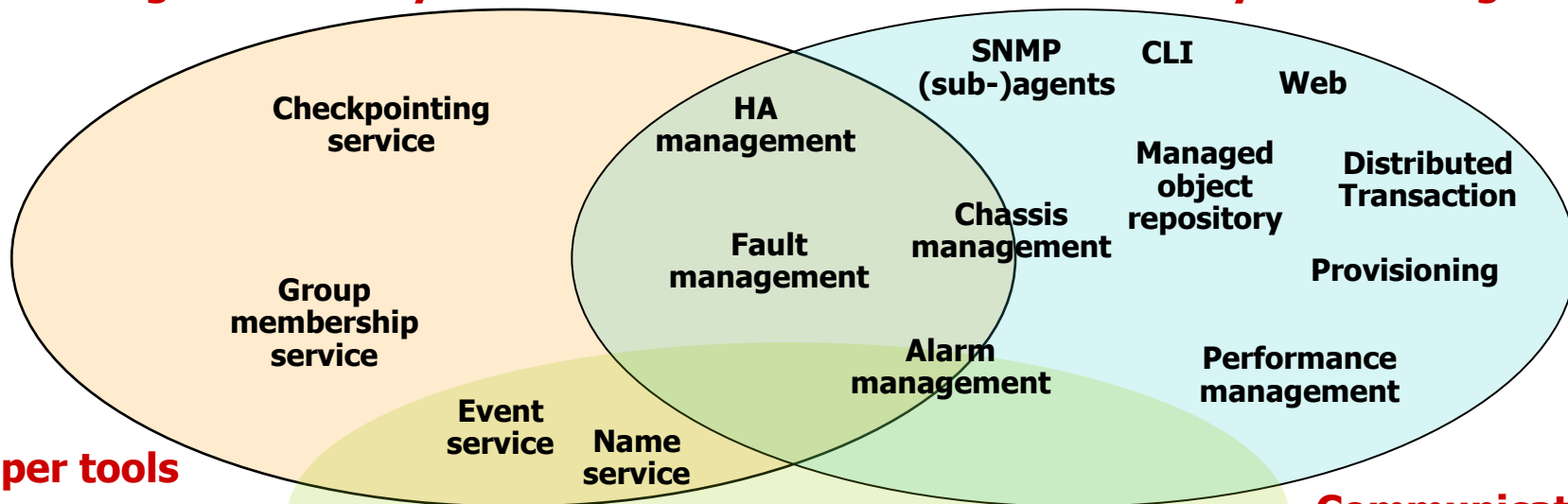
Tier-1 Japanese  
WiMAX solution  
Provider



# Functional Scope of OpenClovis

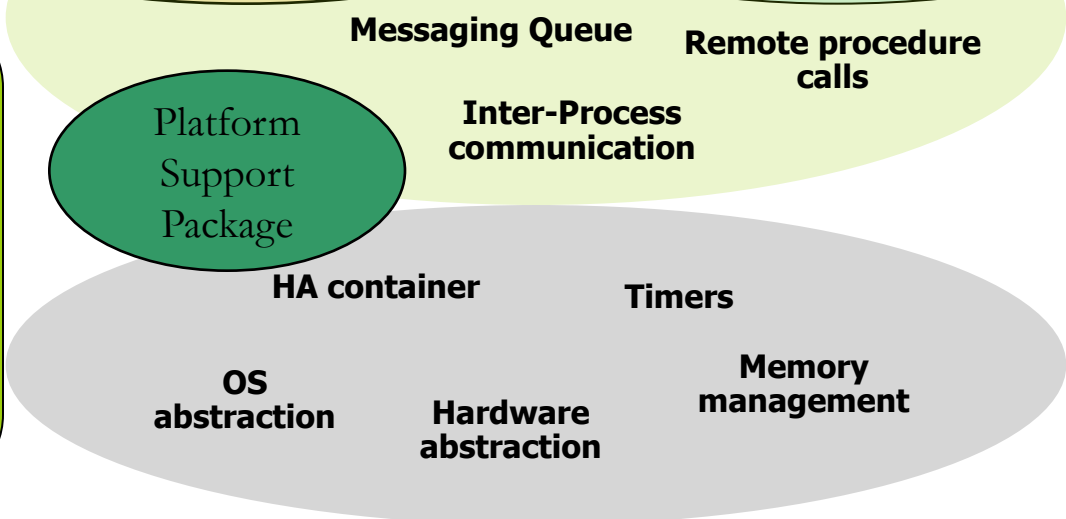
## SAF High Availability

## System Management

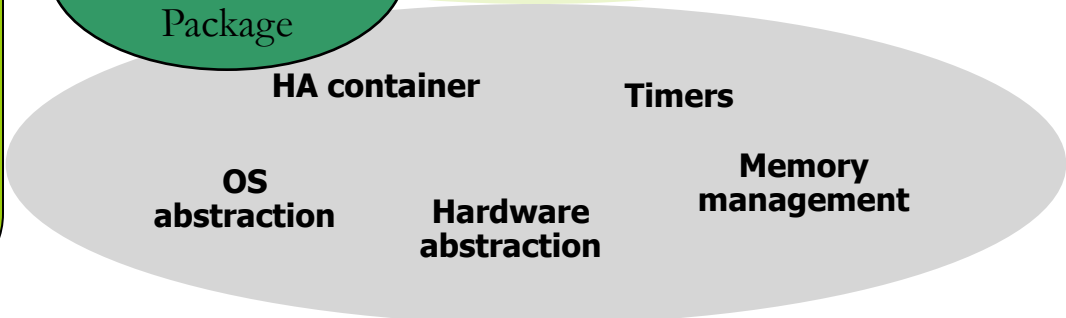


## Developer tools

- Full IDE Tool kit
- Run-time Director
- Test Automation Tool
- Sys and bin Logging
- Debug CLI
- Crash-safe Recovery



## Communication infrastructure

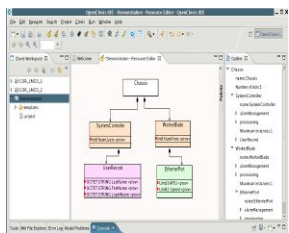


## Basic infrastructure

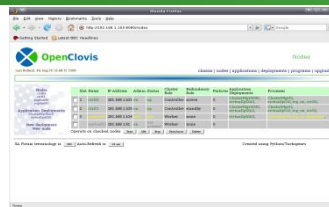
# OpenClovis Value Proposition

Support for your entire development lifecycle

Design/Development



Runtime



Testing



Platform Support Package (PSP)

ASP Run-time Director

IDE

SAF HA Modeling

SAF IMMS Modeling

SNMP MIB Import

Code Generation

Build tools

Run-time Debugging

Integrated Development Environment

ASP

SNMP/CLI/XML/NetConf

In Memory Transactional Database

Alarm & Fault Mgmt

SAF HA (AIS, CKPT, CLM, EVT)

Debug Infrastructure (CLI, runtime debug)

Binary Logging

Runtime Log Viewer

Test automation harness

Applications Services Platform

TAE\*

External Test Robot

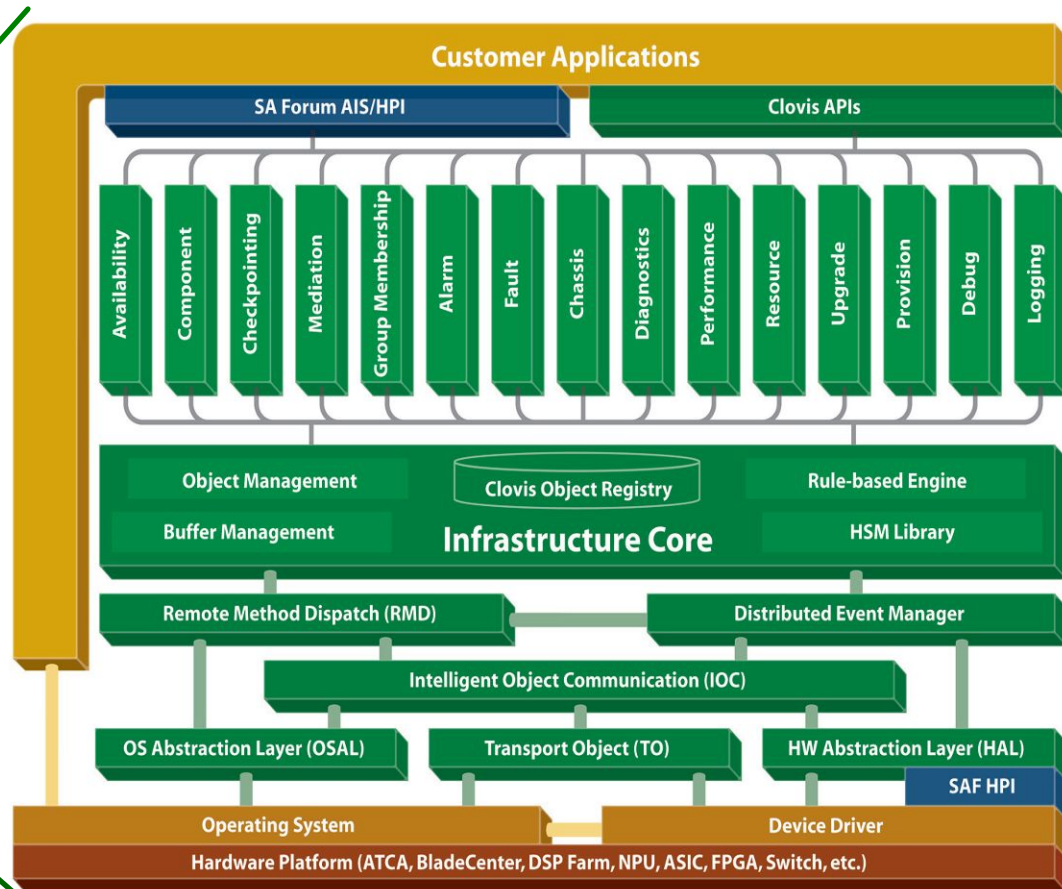
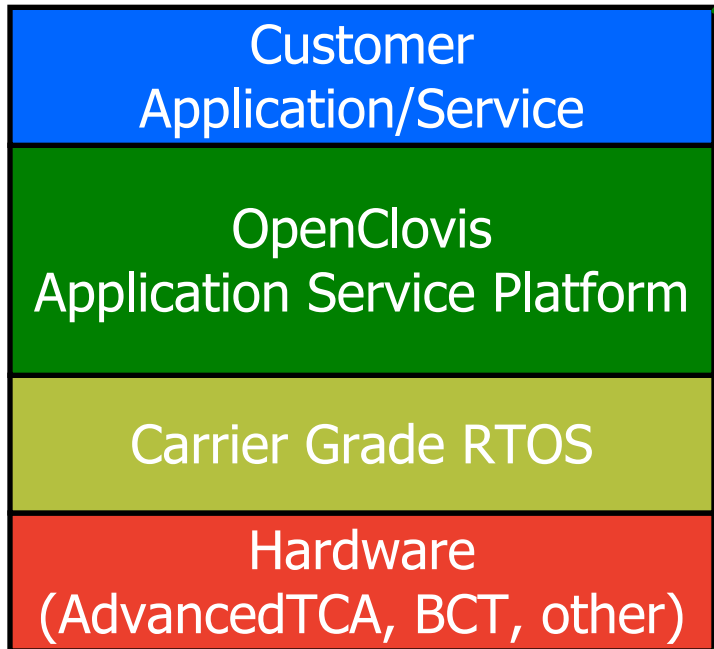
Automated build, load and test applications on multiple target clusters  
Coordinated start/stop of test applications

Centralized collection and reporting of test results

Test Automation Environment

\* 3,000+ test cases automated

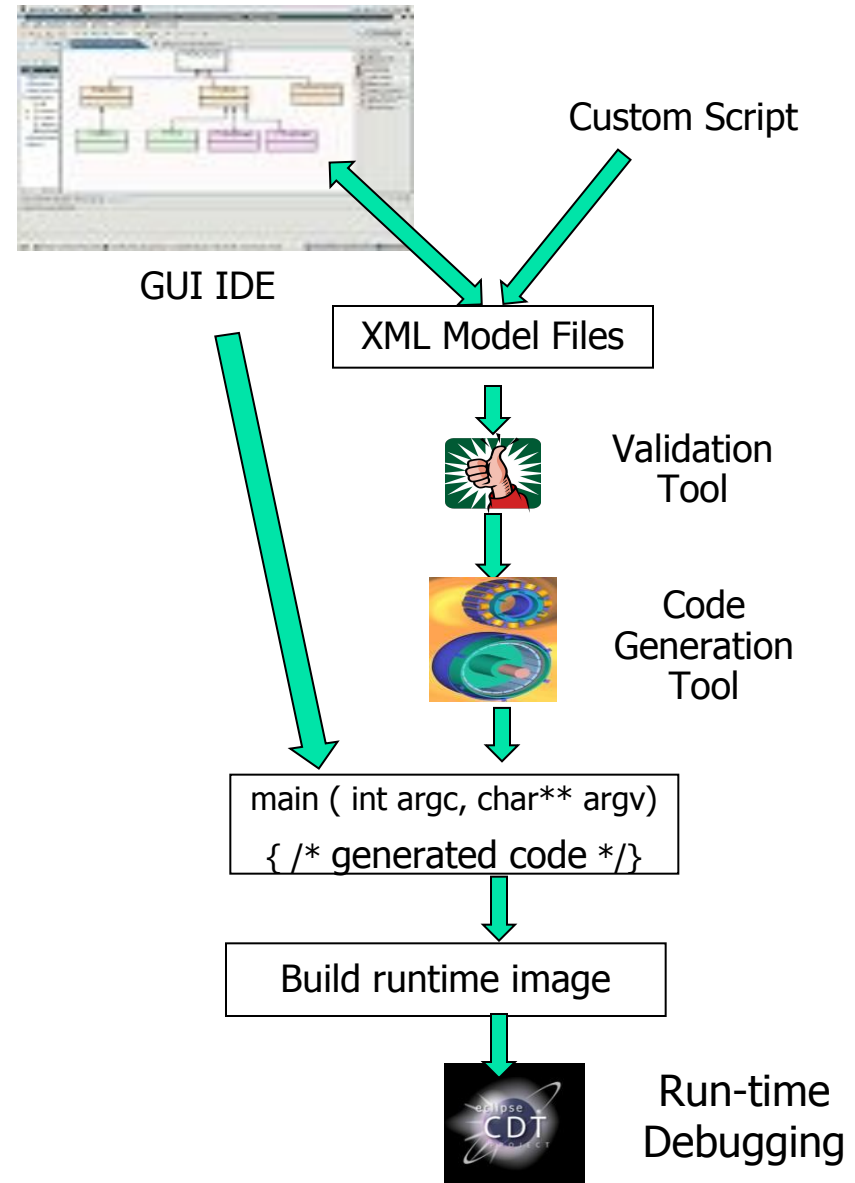
# OpenClovis - Architecture



# OpenClovis IDE

## Support Full development cycle

- Modeling Information
  - Describe entire project
    - HA & System management
  - Well defined format (XML)
  - User modifiable
- Code Generation
  - HA code
  - Management code
  - Configuration files
  - Customizable templates
- Build Environment
  - Native and Cross build tool chain provided
  - Integrated with pre-existing tool chains
- Run-time Debugger
  - Full source code debugging environment integrated





# OpenClovis TAE

## Test Automation Environment

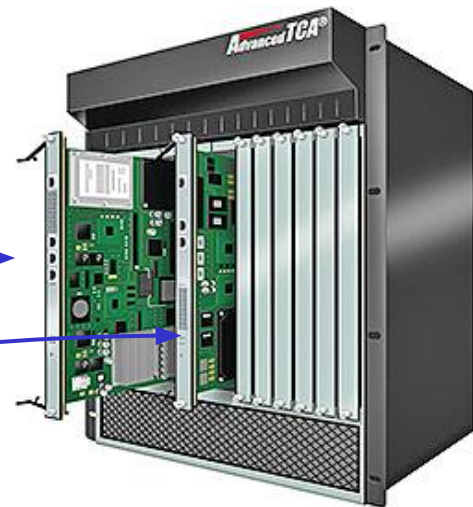
Code Repository



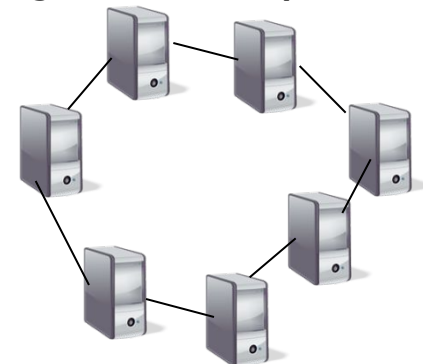
Build Server



Target Platform (ATCA Chassis)



Target Platform (PC Cluster)



2. Build Runtime images

1. Fetch code

3. Fetch images

4. Load images on each blade per configuration file

5. Start test in sequence, inject faults and other external control logic

6. Stop test and collect results from each blade

7. Post process results and publish

Test Automation Robot



Configuration file describing

1. Build Server
2. Tests to build
3. Target blade(s)
4. Tests set up

# ASP Run-time Director – Runtime modeling and management

Nodes

Last Refresh: Fri Aug 29 19:48:51 2008

chassis | nodes | applications | deployments | programs | upgrade

	Slot Name	IP Address	Admin	Status	Cluster Role	Redundancy Role	Failures	Application Deployments	Processes	
<input type="checkbox"/>	1	ctrlI0	192.168.1.103	on	up	Controller	active	0	ClusterMgrSGi0, virtualIpSGi0,	ClusterMgrI0, virtualIpCi0_vip_on_ctrlI0,
<input type="checkbox"/>	2	ctrlI1	192.168.1.105	on	up	Controller	standby	0	ClusterMgrSGi0, virtualIpSGi0,	ClusterMgrI1, virtualIpCi0_vip_on_ctrlI1,
<input type="checkbox"/>	3	payloadI0	192.168.1.104	idle	idle	Worker	none	0	virtualIpSGi0,	virtualIpCi0_vip_on_payloadI0,
<input type="checkbox"/>		payloadI1	192.168.1.51	on	not present	Worker	none	0		

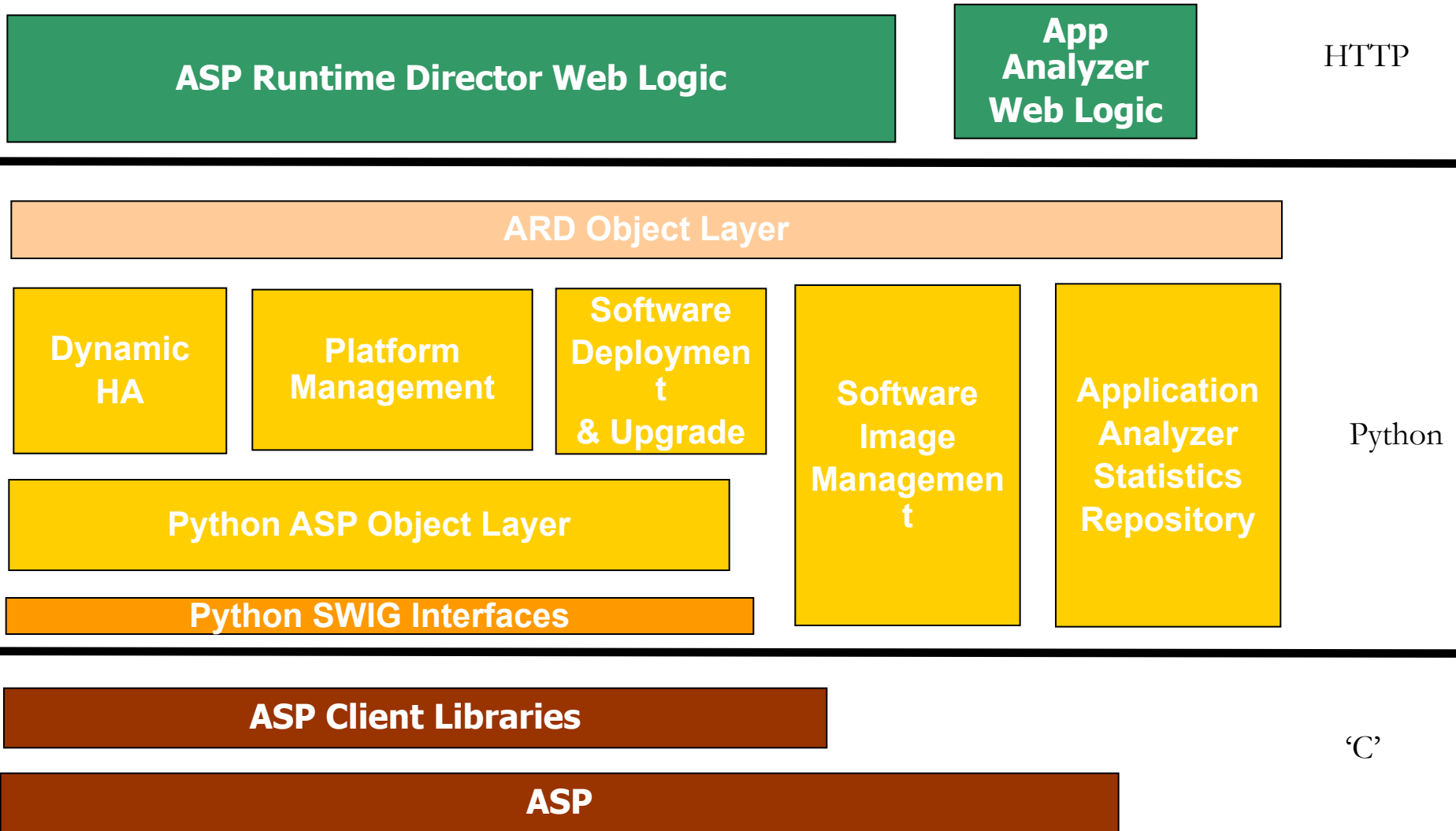
Operate on checked nodes:

SA Forum terminology is:  Auto-Refresh is:

Created using Python/Turbogears

- Dynamic/Run-time HA management
- Platform Management
- In-Service Software Upgrade
- Application Analyzer

# OpenClovis ASP Runtime Director Architecture



# Distributed Application Analyzer

Application View - Mozilla Firefox

http://10.10.11.120:8081/appview

Application View | screen capture windows XP - Google Se... | Taking a Screen Capture

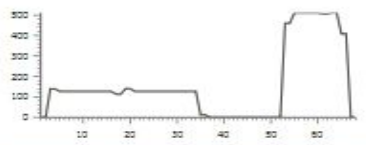
OpenClovis

Last Refresh: Mon Oct 20 19:28:43 2008

Application View

virtual machines | application map | ASP web director

Application resource statistics history



Detailed Application I/O statistics

Detailed Application Resources statistics

Application per connection statistics

Information about process tcpServer (pid 9949) running on 10.10.11.120

Connections					Network		Memory			IO and CPU	
Node	Program	Pid	Sent (rate)	Received (rate)	item	value	item	value	item	value	
10.10.11.130	tcpClient	10449	20608 (0)	20608 (0)	send rate	199	percent used	0.1	CPU use	0.0	
10.10.11.130	tcpClient	11997	34304 (0)	34304 (0)	receive rate	199	resident use (in kilobytes)	3820	disk read	0	
10.10.11.130	tcpClient	12641	3400 (207)	3400 (207)	packets sent	245	peak use (in kilobytes)	14768	disk write	0	
					packets received	245	current use (in kilobytes)	14764			
					bytes sent	58312	data size (in kilobytes)	9672			
					bytes received	58312	stack size (in kilobytes)	84			
					largest packet	512					

Information about process tcpClient (pid 12641) running on 10.10.11.130

Connections					Network		Memory			IO and CPU	
Node	Program	Pid	Sent (rate)	Received (rate)	item	value	item	value	item	value	
10.10.11.120	tcpServer	9949	3400 (206)	0 (0)	send rate	206	percent used	0.1	CPU use	0.0	
					receive rate	0	resident use (in kilobytes)	3620	disk read	0	
					packets sent	17	peak use (in kilobytes)	6288	disk write	0	
					packets received	0	current use (in kilobytes)	6288			
					bytes sent	3400	data size (in kilobytes)	1216			
					bytes received	0	stack size (in kilobytes)	84			
					largest packet	200					

# Our Product Deployment Scenarios

## ■ Supported Platforms

- ATCA Chassis
  - SUN Netra Platform
  - Huawei and ZTE
  - Radisys 12U Promentum 6000
  - Schroff ATCA 5U & 12U Chassis
  - Samina
  - Kontron/ZYNX switches
  - Emerson ATCA
  - others
- AMC's
- HP Proliant
- IBM BladeCenter
- Rack Mount Servers

## ■ Processors

- Intel/AMD (32 and 64 bit)
- Multi-core CPUs
- PowerPC (32 and 64 bit)
- Mixed mode
- Cavium

ARM

## ■ Operating Systems

- Target Runtime
  - Wind River PNE Linux
  - Red Hat Enterprise Linux
  - Montavista CGL
  - VxWorks 6.x
  - Solaris
  - QNX
- Development OS
  - Red Hat 9
  - CentOS
  - Ubuntu
  - Debian
  - Yellow dog Linux (PowerPC)

## ■ Mixed Endian

- Mixed Endian fully supported
- Various nodes in the system can be x86 and/or PowerPC

# Dual License Business Model

- GPLv2 for ASP middleware – Free
- Commercial – per project/product
  - ASP Middleware – provides full buildable source code
    - Per user Annual Development License for first 4 years
      - Perpetual license also available
    - Annual Support & Maintenance
    - Run-time Royalty (buyout option also available)
  - IDE
    - Per user annual license
  - TAE – including 3000 ready-to-deploy test cases
    - One-time setup
    - Annual License for first 4 years
    - Annual Support & Maintenance
  - ASP Run-time Director
    - Annual development license and support
    - Run-time Royalty
- Training & Professional Services

# Product-based Development Services

- Full development lifecycle service including architecture, design, development, integration and testing based on OpenClovis products
- Application domain expertise in WiMAX, LTE, PON/DSL, Optical, SIP, IMS, Video delivery services.
- Domain expertises in OS, COTS hardware (xTCA, BladeCenter, etc.), SAF middleware, L2/L3 protocols and integration work