

How (and Why) to build a Plug-in to the IR360 framework

A.J. Aronoff Blue Sky Devops

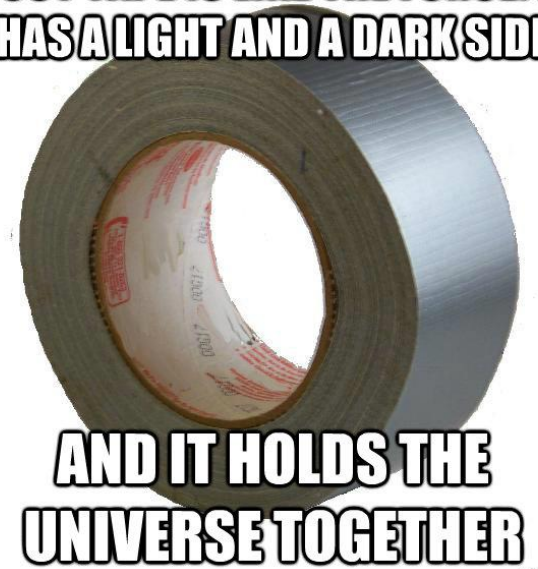
How & why to build a Plug-in to the IR360 framework - **Intermediate**

How should tools evolve?

- Small incremental seamless changes?
- Evolution based on real world experience?
- Scalability?
- Do It Yourself tools (e.g. 3D Printing)?
- Shifts needed for mobile devices?



**DUCT TAPE IS LIKE THE FORCE: IT
HAS A LIGHT AND A DARK SIDE**



**AND IT HOLDS THE
UNIVERSE TOGETHER**

How & why to build a Plug-in to the IR360 framework - **Intermediate**

The presentation covers

- ▶ Why building plug-ins is a great way to build tools
- ▶ The advantages of building on top of IR360
- ▶ A look at features of the plug-in
- ▶ Techniques for building plugins

Agenda

- **Seamless Integration – Benefits of a Plugin**
- **Plug-in Features**
 - ▶ Security – features based on Real World Experience
 - ▶ Scalability
 - ▶ Do It Yourself – combining “small sharp tools”
 - ▶ Mobile Web
 - ▶ Security Roadmap
- **Plug-in Technology**
 - ▶ Struts
 - ▶ Tag Libraries
 - ▶ A word about Curl
- **Summary**

A word about Blue Sky Devops

- **Guy Kawasaki said:**
 - ▶ Great companies start because the founders want to change the world'
- **Better tools & automation are one way to change the world**
- **For twenty years we've been helping customers solve MQ/Security problems and providing custom automation**
- **Now, Blue Sky Devops is taking that experience & building tools that**
 - ▶ Help more people
 - ▶ Tackle large/larger problems
 - ▶ Lets us stay with customers for the long term



MQ Security Guy
T Rob Wyatt
704-443-TROB (8762)



Tool Builder
A.J. Aronoff

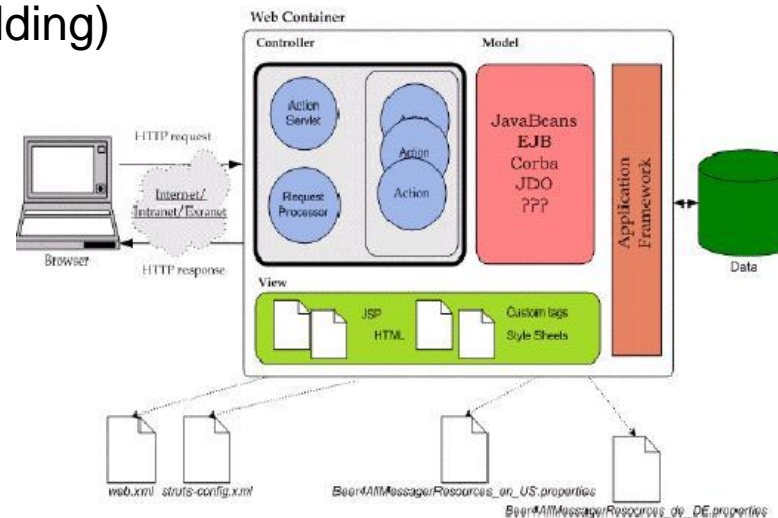
Seamless Integration – Benefits of a plug-in



■ Building on top of IR360 provided many benefits including

- ▶ Same great IR360 interface – no new interface design
 - IR360 was built with SOA principle from the start –making it easy to build on
 - JSP tag libraries make it simple for the plug-in to have the same interface
 - Struts – MVC architecture makes it easy for the plug-in to reuse existing classes, actions, services and functionality
- ▶ Same Agentless approach (no agent building)
- ▶ Audit and logging of every action
- ▶ Built on top of IR360:
 - Navigation
 - Services
 - Alerts
 - Database schema
 - Reports

Struts Architecture



■ Summary – IR360 is letting us get right to new security functionality

Security – Plug-in features based on Real World Experience

- Make it easy to do security the right way.



What happens to security architecture
when the incremental cost
of provisioning access...
of managing a certificate...
of securing a channel...
drops to near zero?

How does the risk profile change
when “defense in depth”
has actual depth?



- Let the tool do the heavy lifting

Security – Plug-in Features

■ Streamlined SSL/TLS Certificate Management

- ▶ Manage CA-Signed and Self-Signed Certificates in situ
 - Create Self Signed Certificates / Request new CA Signed certificates
 - One click to apply renewed self-signed certificates.
- ▶ Centrally manage trusted certs and signer chains
- ▶ Policy- and rule-based reporting and alerting

■ Track expiring certificates and renewal requests

- ▶ Color coding of at risk certificates that will expire soon

■ Out of Support MQ Version for Queue Managers Report

- ▶ Patch management report / SSL Update required

■ Optional Business Partner Certificate Expiry report

- ▶ An SSL Expiry Report can optionally be created with expiry times for Partner's gateway machines.



When do my certs expire - Expiry Report

Queue Manager Certificate Expiry Report run at Fri Sept 25 00:54:14 2015



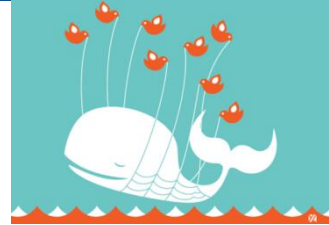
Certificates that have already expired

Nbr	Queue Manager	TTL	Expiry Date	Certificate Details
No certificates with this expiry found.				

Certificates expiring in under 10 days

Nbr	Queue Manager	TTL	Expiry Date	Certificate Details
1	ASH	8 Days	Oct 2, 2015	ec2.aws.machine1:1414 issuer= /C=US/ST=Arizona/L=Scottsdale/O=GoDaddy.com, Inc./OU=http://certs.godaddy.com/repository//CN=Go Daddy Secure Certificate Authority - G2 subject= /OU=Domain Control Validated/CN=ash.mq.ioptconsulting.com

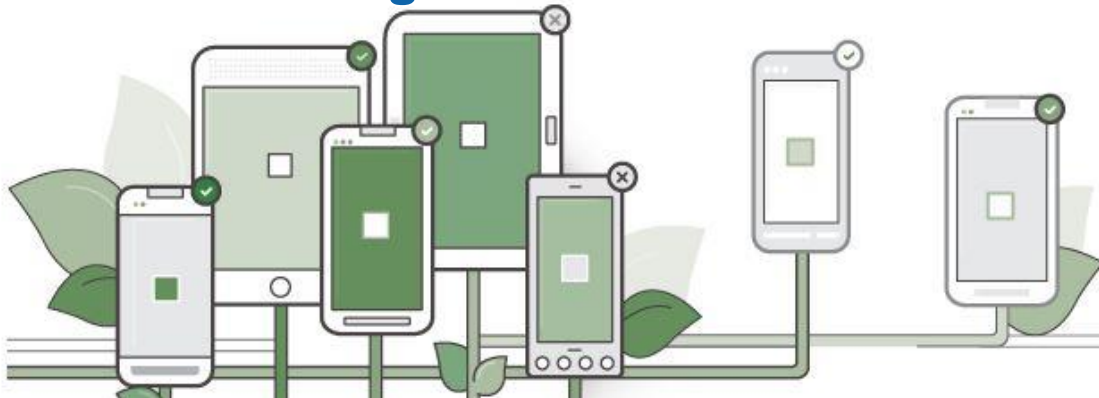
Scalability



- **The plugin uses efficient scaling techniques (avoiding the *fail whale*)**
 - ▶ Avoid blocking operations – classic example Node.js
 - ▶ Careful parallelism – start copying certs for machine B in the background while applying already copied certs for machine A.
- **Plugin batch operations use IR360 q-manager groups & display QMs in grids**
 - ▶ Checkboxes let you select some or all queue managers in the group for the operation.
- **Push and apply Public self signed certs to a group of queue managers**
- **Push CA Signer packages to a group of queue managers**
- **Bulk request of new certificates for queue managers when Certificate's Organizational Unit changes because of merger/acquisition or split**

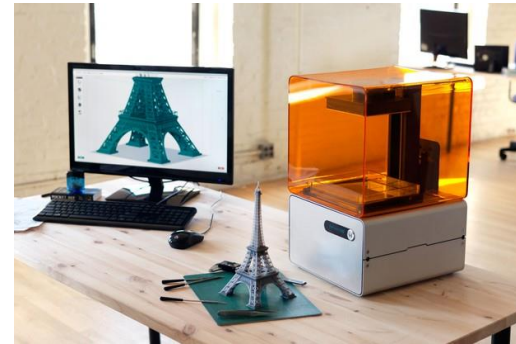
Mobile Web

- **Web based applications must run on mobile devices**
 - ▶ Even a *mobile first philosophy* is being adopted at some companies
- **Amazon has device farms for testing mobile apps.**
 - ▶ <https://aws.amazon.com/blogs/aws/aws-device-farm-test-mobile-apps-on-real-devices/>
- **IR360 uses elastic functionality adjusts the web page to your screen**
 - ▶ Alert emails have web links for easy navigation
 - ▶ Editable portlets for your workflow preferences
- **The plugin reuses the tag libraries and inherits the above benefits**



Do It Yourself

- **Shouldn't we be able to create/customize our tools?**
 - ▶ <http://www.space.com/28095-3d-printer-space-station-ratchet-wrench.html>
- **Assortments of “Small sharp tools” is a great start at do it yourself tools**
 - ▶ <https://brandur.org/small-sharp-tools>
- **Erik Raymond (author of *The Art of UNIX Programming*) has helpful rules**
 - ▶ **Rule of Modularity:** Write simple parts connected by clean interfaces.
 - ▶ **Rule of Composition:** Design programs to be connected to other programs.
- **IR360 embodies *Erik's rules* by having MQ services and notifications that can be combined and arranged to formed to new custom services.**
 - ▶ MQ service variables such as +QMNAME+ make services more portable
 - ▶ http://ibm.com/support/knowledgecenter/SSFKSJ_7.5.0/com.ibm.mq.adm.doc/q021030_.htm
 - ▶ There are services for auditing, backup, clone, notify ...
- **Customizable alerts and reports**
 - ▶ Customizable condition for alerts
 - ▶ Customizable fields for reports



Security Roadmap

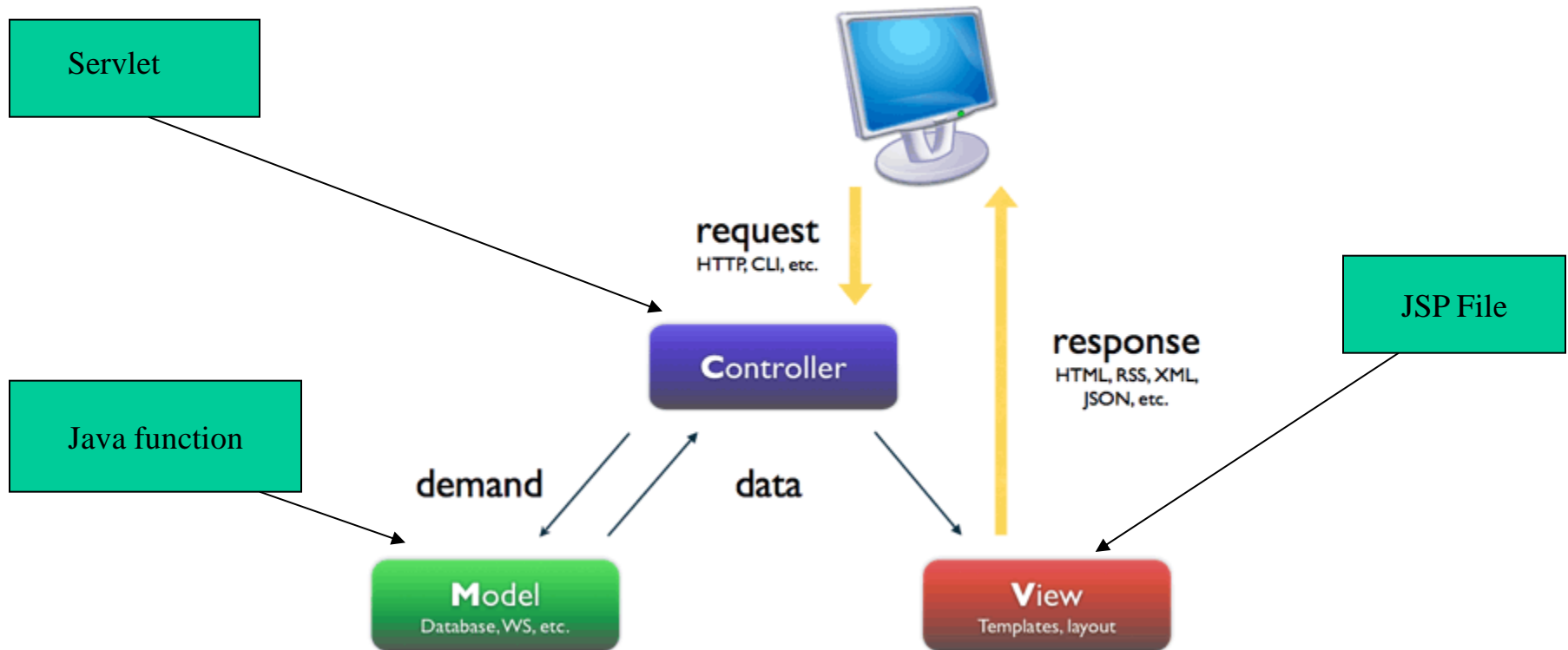


- **The Security plug-in starts with SSL/TLS Certificate management**
- **The road map includes**
 - ▶ Policies to “limit the blast radius” mitigating damage in the event of intrusion
 - ▶ Reports and alerts for intrusion detection
 - ▶ Incident Response
 - ▶ Forensic Capability
- **Catch T Rob Wyatt’s presentation on ‘Beyond intrusion detection’ for Details**



Plug-in technology - Struts

- **Struts separates the Presentation Layer (View) from the Data Layer (Model)**
 - ▶ Presentation code (View) done with JSPs, tag libraries, HTML
 - ▶ Server side logic (Model) can be done with POJOs.
 - ▶ Getter and Setters allow values to be passed back and forth



Plug-in technology – Struts Model View Controller Details

■ View

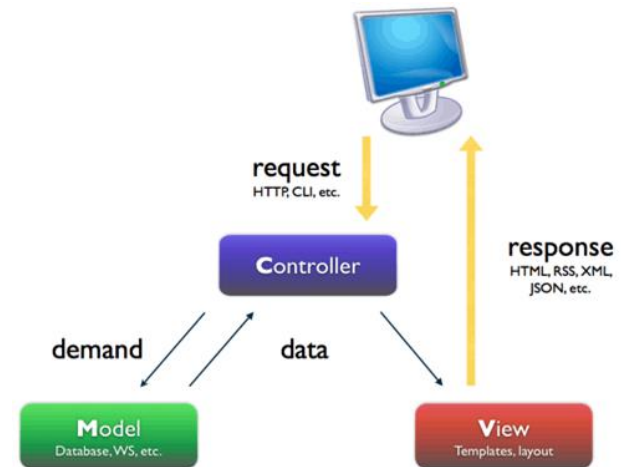
- ▶ presentation of parts of the Model to the user
- ▶ independent from the internal implementation of the Model
- ▶ there can be different Views presenting the same Model data

■ Controller

- ▶ “bridge” between Model and View
- ▶ controls the flow of the application
 - receives/interprets user input
 - performs operations on the Model
 - triggers View update

■ Benefits:

- ▶ better maintainability and testability of applications
- ▶ ability to easily develop different kinds of UIs (e.g. console, GUI, mobile)
- ▶ separation of different tasks in development
- ▶ code reusability



Plug-in technology – Struts Features

- **Model 2 -MVC Implementation**
- **Internationalization(I18N) Support – Perfect for multi language support**
 - ▶Text output can be defined in "resource bundles" for many different languages
 - ▶Struts automatically detects the users language through the HTTP request
- **Rich JSP Tag Libraries**
- **Annotation and XML configuration options**
- **POJO-based actions that are easy to test**
- **Less xml configuration**
- **Easy to test and debug with new features**
- **Embodies Java's Write Once, Run Anywhere Philosophy**

Plug-in technology – Struts Java Annotations

- How do you connect the JSP (Presentation) and Java code (Model)

- One elegant way is to use Java Annotations

```
package com.geekcap.struts2.action; import org.apache.struts2.config.Result;
@Result(name="success", value="/hello.jsp")
public class HelloAction {
    private String name;
    public String execute() {
        return "success";
    }

    public String getName() {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }
}
```

- The @Result annotation connects the HelloAction class and hello.jsp
- The getter and setter connect the “name” variable in the class and the jsp

Plug-in technology – Struts Tag Libraries – Sorted by use

- Don't reinvent the wheel use tag libraries. Great for mobile
 - `<%@ taglib prefix="s" uri="/struts-tags" %>`

# of uses	Tag
2235	s:label
1122	s:text
784	s;if
589	s:textfield
561	s:property
361	s:select
236	s:url
133	s:hidden
132	s:else
123	s:elseif
98	s:div
77	s:form

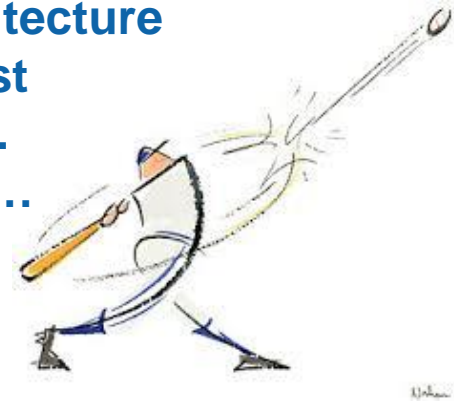
Plug-in technology – Curl

- **Curl is a perfect way to invoke IR360 functionality via scripts**
 - ▶ Extremely useful for testing
- **Seven standard steps for a Curl program calling IR360:**
 1. Set default values for variables
 2. Parse arguments
 3. Build URL
 4. Get a sessionid by calling IR360 (critical)
 5. Login (nothing happens without login)
 6. Query (example get GUID for Q Manager)
 7. Invoke action or run report

Summary



**What happens to security architecture
when the incremental cost
of provisioning access...
of managing a certificate...
of securing a channel...
drops to near zero?**



■ The plug-in approach – Key Characteristics

- ▶ Builds on the existing functionality of IR360 (benefits of the Struts MV architecture)
- ▶ Keeps the agentless approach (built on IR360)
- ▶ Has the same user interface as the new IR360 release (benefits of tag libraries)
- ▶ Relies of two decades of MQ and security experience to build a product that will do the heavy lifting of certificate management.