SmartFrog: brief overview & first experiences

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openlab for DataGrid applications
Developing Solutions for the Data-Intensive Science of the Large Hadron Collider

What's it all about ?

- SmartFrog = Smart Framework for Object Groups
- Describe, deploy, ignite and manage distributed applications
- Developed over serveral years at hp Labs in Bristol
- Planned to be released under the LGPL open source license by the end of 2003
- Openlab has an old beta version

SmartFrog Framework

1. Configuration description language

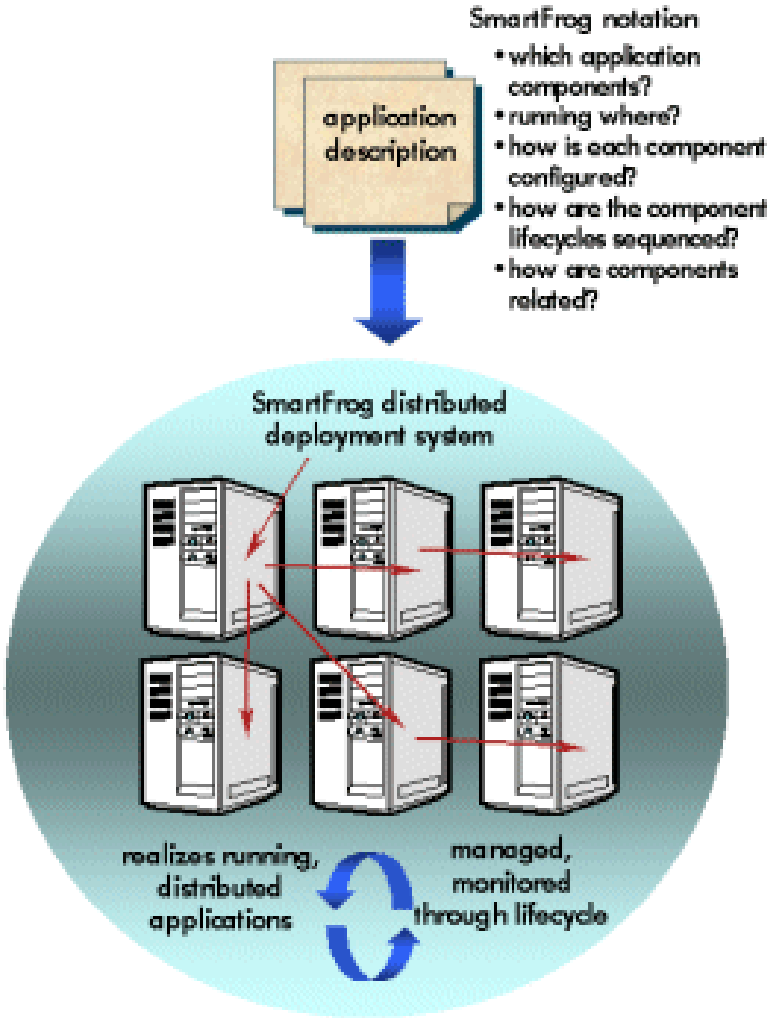
2. Component Model

System = collection of components
lifecycle management

3. Runtime System

SmartFrog deamon on every machine
Interprets system descriptions and creates components
locate/interconnect components

SmartFrog Framework



Language

```
#include "componentsJetty.sf"

fileServer "oplapro26.cern.ch";
commonPort "8080";

sfConfig extends {
   serverUp extends HttpServer {
       sfProcessHost ATTRIB fileServer;
       port ATTRIB commonPort;
   }
}
```

Component model

component = single Java object that implements a specific API

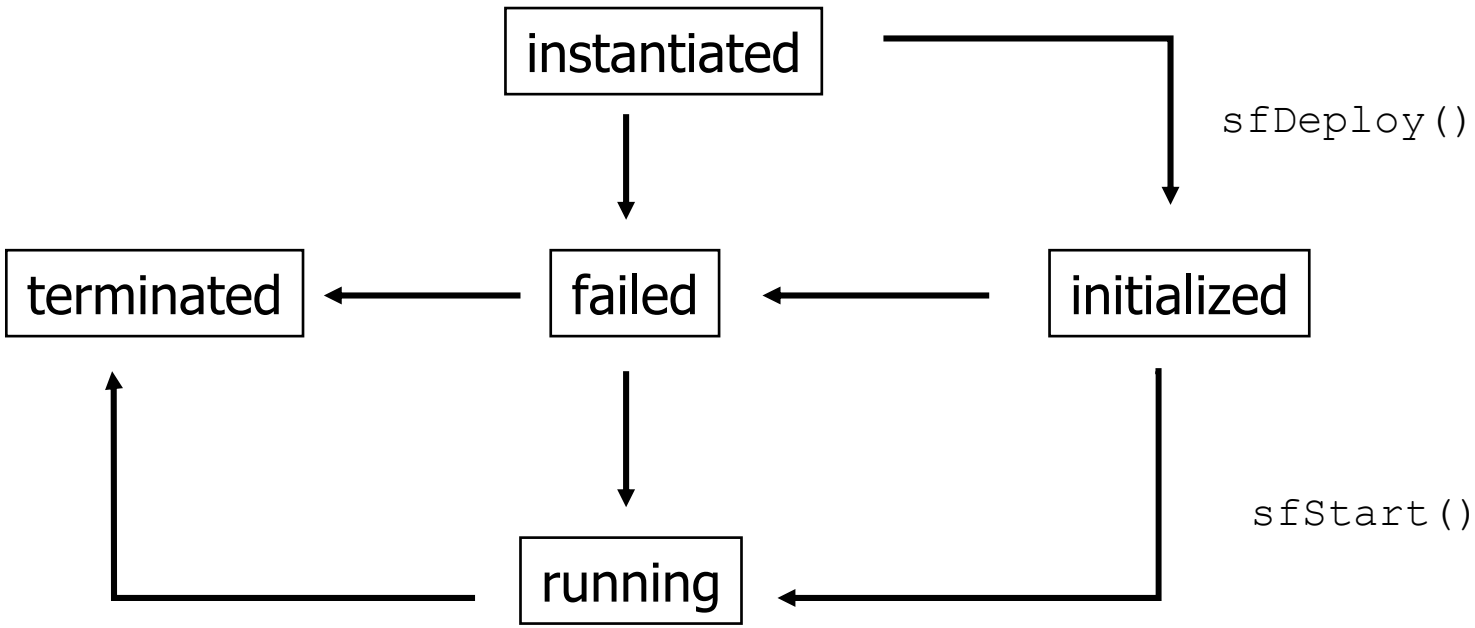
```
myComponent extends {
  sfClass "cern.ch...."; <-------- component class

  sfProcessHost "...";
  sfProcessName "..."; <-------- component location

  val_1 42;
}
```

Component model

lifecycle:



Component model

Additional features:

- **Workflow:** Sequence, Parallel, Timeout, During, Retry, Try, Delay
- **Event Framework:** OnEvent, EventSend, EventCounter
- **Execute OS commands:** StartCmd, StartAtt, StopCmd, WorkDir, EnvProperties,...
- **Service Discovery** (SLP)

Runtime system

- Implemented in Java
- RMI for communication
- SF deamon on every host; may deploy subprocesses
- Security via PKI: classes and configuration descriptions only loaded from signed jar`s, RMI calls tunneled over SSL, each node has a certificate

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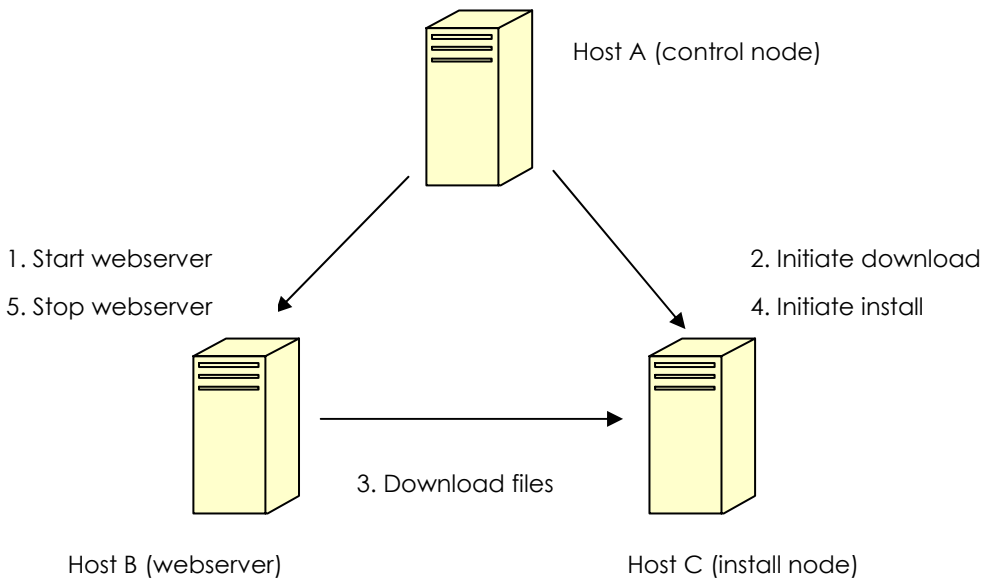
SF deployment at openlab



3 IA64 hosts
SmartFrog 2.0 beta
RH AW 2.1
JDK 1.4.2

Tested:
- Workflow
- OS commands
- Own Java classes

Not yet tested:
- Security
- Event handling

SF work at hp

- **Combine LCFG and SmartFrog: demo of of a robust printing service with an OGSA interface. (details to be presented at LISA 03)**

A first SF resume

- Easy to install
- Seems to be a mature product
- So far only an old beta version is available (some bugs, insufficient documentation)
- Good support from hp Bristol
- It is a – yet empty – framework (considerable programming effort would be neccessary for more complicated applications)
- Java expertise neccessary