Monitoring the WLCG sites is important. MadFace is a new monitoring framework for every WLCG site and any kind of infrastructure, which is easy to integrate with our existing monitoring workflow and install on your smart phone. We present the key concepts of MadFace, including its browser crawler, image processor, Bayesian analyser, mobile viewer and a model of how to manage a complex infrastructure like the WLCG.

**Motivation**

- Monitoring many web pages in real WLCG systems
- Various grid services in HEP
- New and different interfaces
- Have designed them for browsers (or web service outputs)
- Finding and solving problems as soon as possible
- Running *High Throughput Computing* clusters
- Used *HappyFace* as a low-level meta information collector

**Monitoring plays a key role**

- Checking status and providing 24-7 service
- Discovering problems in each site/cloud/world-wide level
- Displaying or sending notifications or messages
- Finding reasons why system does not work

**Monitoring and administration in mobile application**

- Reduce stress of administrators
- Increase system reliability
- Understand status in a whole system well

**Model**

**MadFace: HappyFace compatible UI**

- Flexible
- Only one mobile application
- Up-to-date monitoring information
- History function
- Fast
- Comfortable
- Simple warning system
- Customisable

**Bayes analysis of browser views**

<table>
<thead>
<tr>
<th>State 0 = Normal</th>
<th>State 1 = Error</th>
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Binary segmentation coding of status

\[
P = \frac{P(\text{State 0} | X)}{1 - P(\text{State 1} | X)} = \frac{P(\text{State 0} | X)}{P(\text{State 1} | X) + P(\text{State 0} | X)}
\]

where \( X \) is a last state of each state point

- HappyFace is a meta-monitoring system. The MadFace prototype system works in the same manner.
- Designed as a sophisticated meta-monitoring mobile application.
- The latest frameworks can easily deliver a flexible meta-monitoring system and mobile application.
- Some shift duties would be automated.
- A mobile administration drastically reduces the efforts of site/cloud/world-wide collaboration.

**Application and results**

- Test instances are monitoring a WLCG site and the ATLAS distributed computing system. Our prototype system and application can detect the Bayesian change and analyse the status.
- Bayesian change status in a browser view. When posterior probability is high, a change point.

**Implementation**

**Web + Mobile framework**

- Ionic, AngularJS framework
- Server-side JavaScript technology
- Firefox + Madfox addon developed by JetPack Manager

**Online Bayesian analyser**

- Uses R language and libraries
- Conversion from browser views to information criteria
- Bayesian change process analyser
- Bayesian network analyser

**Meta-monitoring architecture (browser view mode)**

- Firefox MadFox
- Browser view analyser and status detector
- Ionic meta-monitoring instances
- Ionic mobile application

**Meta server RPMs**

**GitHub: MadFace**

**GitHub: HappyFace**

**Android MadFace application**

Try it out!