

GMSEC

GSFC Mission Services Evolution Center



GMSEC Criteria Action Table (CAT)

At A Glance

CAT is a highly portable exception monitoring and action agent that automates a set of ground system functions.

Benefits

- Automates detection of anomalous conditions
- Provides more automation and autonomy to mission operations
- Assists in efficient ground system operations

Features

- Plug-and-Play Component
- GSMEC Compliant
- Platform Transparency
- Highly-Configurable
- Non-Intrusive to Current Missions (monitor only mode)
- Simple to complex monitoring criteria are user configurable

Summary

The Criteria Action Table is an independent component developed for the purpose of monitoring real time system messages against a set of pre-defined rules so that certain specific events can be detected in order to take associated pre-defined actions in an effort to automate and enhance the reliability of the system. The standardized GMSEC event messages and the message oriented middleware (MOM) approach under the GMSEC architecture have made it possible to develop a flexible, portable, scalable, and extensible Criteria Action Table as a compliant GMSEC component able to meet the needs of different missions.

MONITOR_TYPE	PRIMARY_KEY	START_TIME	DURATION	STATUS
HeartBeatMonitor	CAT	111-19:25:23	00:00:41	running
HeartBeatMonitor	EG	111-19:25:32	00:00:32	running
PassMonitor	SC12	111-19:25:43	00:00:21	action taken on 111-19:26:04, still running
LimitViolationMonitor	SC12.IPSM4 I	111-19:25:48	00:00:16	action taken on 111-19:25:59, still running
LimitViolationMonitor	SC12.GFALTYPA	111-19:25:56	00:00:09	running
LimitViolationMonitor	SC12.QGPHIRATE	111-19:26:03	00:00:02	running

CAT Monitoring Display

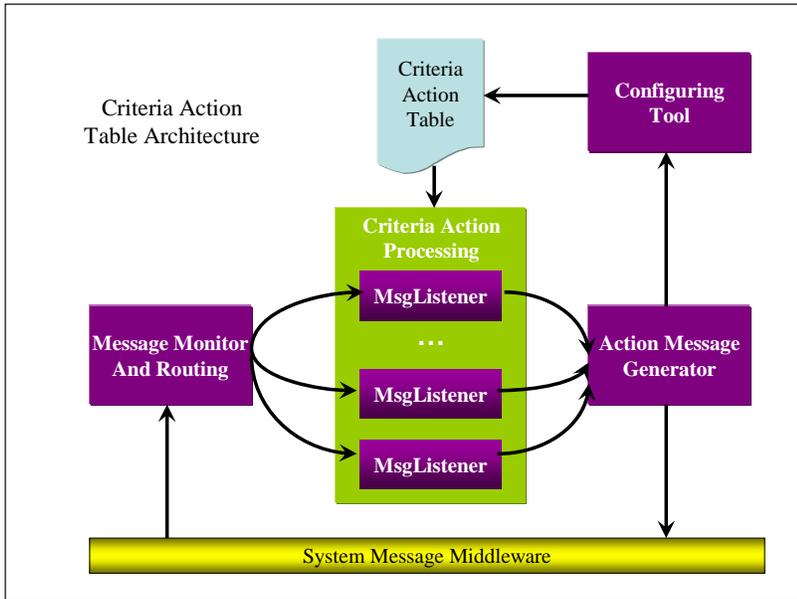
Under the GMSEC architecture, the system event messages have been expanded significantly providing a broad and full context of system information. The GMSEC Criteria Action Table defines a new criteria action schema to take advantage of this rich base of system event messages to detect and automatically act upon certain pre-defined conditions and anomalies. These pre-defined conditions may be as simple as a single event message, or involve a complex analysis of extracted data from a series of event messages at a special time that supply environmental and contextual information to the detected condition.

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Criteria Action Table Summary

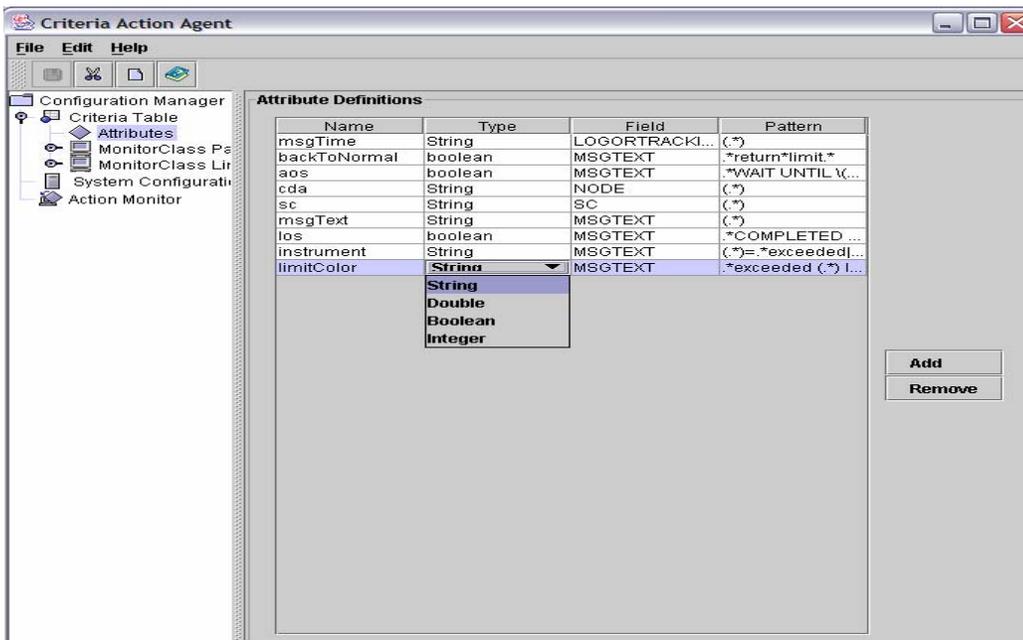
The actions in the Criteria Action Table are automatically generated (if enabled) when the criteria are satisfied. These actions are typically based upon standard and contingent operating procedures (SOPs, and COPs) and normally take the form of directives that would be issued to other software components. For example, the detection of a serious anomalous satellite condition would result in the pre-defined actions of 1) the generation of an event message (that the condition was detected), 2) a directive to the trending and plotting system to collect relevant data and generate a plot of parameters over a specified time period, and 3) a directive sent to a paging/notification system to alert a satellite system engineer.



CAT Architecture

The **Message Monitor and Routing** module shown in the accompanying figure will receive all event messages off the middleware bus and route them to the different subcomponents in the **Criteria Action Processing** module. This module is designed as the container that interfaces to each criteria-processing subcomponent. The subcomponents contain the criteria action processing logic for a criteria action group (making CAT highly scalable). Accordingly, the entries in the **Criteria Action Table** will be represented as a hierarchical tree structure according to the groups. When criteria are met, the **Action Message Generator** will execute the pre-defined actions.

The **Configuring Tool** provides the real-time GUI presentation of the Criteria Action Table. Separately, it also provides the editor to allow the user to define, add, modify, and delete the criteria for monitoring as well as the actions to be taken. Actions can be enabled and disabled individually, by group, or for the whole component. A log records changes to the configuration and also records actions that were taken.



Editing Tool for Criteria

