ALICE DETECTOR CONTROL SYSTEM

The Detector Control System (DCS) is responsible for SAFE and STABLE operation of the ALICE experiment.

The DCS interacts with ALICE Online and Offline systems as well as with external services.

The core of the ALICE Detector Control System is based on the commercial SCADA system WINCC OA. Autonomous detector systems are built by detector experts using CORI and ALICE frameworks.

The DCS is configured as a set of 2000 independent and cross-connected software modules, called managers, forming one distributed system running on 100 computers.

Device with similar functionality are grouped into subsystems. About 100 different subsystems are implemented in ALICE.

A high level of standardization is achieved by deployment of industrial device whenever possible.

Communication with devices is based on the OPC standard, through a standard OPC tool.

A powerful alert system informs the shift crew about detected anomalies. An embedded help system provides instructions required for recovery.

The ALICE DCS has provided uninterrupted service to ALICE since 2007.

DCS IN NUMBERS

The DCS computer cluster consists of 170 central servers and about 750 embedded computers.

About 1200 network attached devices are deployed in ALICE controls.

The cluster provides services like storage, database, central SCADA system, network and communication exchange, etc, in 24/7 mode.

<table>
<thead>
<tr>
<th>No. of Components</th>
<th>Description</th>
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<tbody>
<tr>
<td>270 nodes</td>
<td>More than 750 embedded computers</td>
</tr>
<tr>
<td>170 central servers</td>
<td>1200 network devices</td>
</tr>
<tr>
<td>100 WINCC systems</td>
<td>More than 100 subsystems</td>
</tr>
<tr>
<td>100 000 front-end services</td>
<td>200 000 OPC items</td>
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<tr>
<td>1 000 000 parameters</td>
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DCS OPERATION PANELS

The central operator can control the whole experiment using just a single user interface.

Experts can gain remote access to the detector systems using the DCS computing and network infrastructure.

Hierarchical organization of the system allows for participation of the system and parallel work of several experts.