

APROL R 4.00 Multi Runtime System (Part 1)





- MRS concept and basic conditions
- Motivation and Advantage of MRS
- Changes in the CAE Manager
 - CaeManager
 - Physical Structure View
 - Configuration ProjectPart ControlComputer
 - PP Runtime
 - PP Operator / PT Gateway
 - PP Controller
 - Configuration Logic
 - PP Process Graphic
 - PP Equipment
 - PT CFC



- Adaptation Visualisation
- Adaptation alarming DC
- Adaptation trending
- Access to historical data
- Iosys connection monitoring



■ MRS Konzept

MRS = Multi Runtime-System

- A MRS consists more runtime-systems (logical APROL Systems), which are projected in one CAE-Project. These runtime-systems can run on one or more physical ControlComputer.
- Each runtime-system is a complete „automation unit“ and includes configurations for
 - alarms,
 - trends,
 - Ucb und parametermanagement,
 - Drivers for communication with the Kommunikation mit den assigned CTRL
 - ControlComputer-Tasks



■ Motivation and Advantage of MRS

■ **Decentralization** the engineering respective to

- Configuration
- and download

Advantage: Download only parts of the whole plant respectively parts of the so called „automation unit“ is now possible.

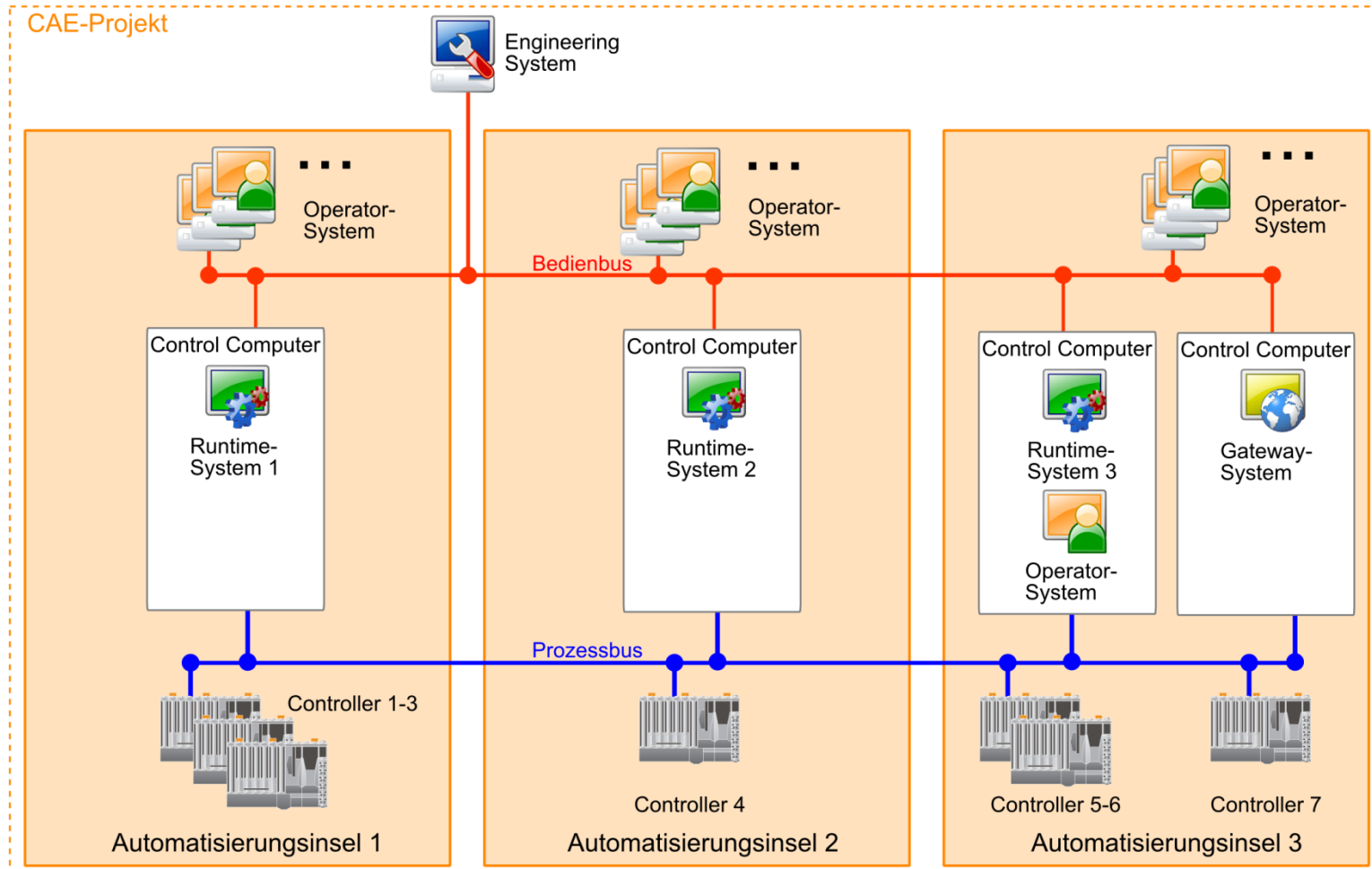
(functionality of plant section could be changed, without a standstill of the whole plant)

- Split your plant automation in different „automation units“, which are autonomous.

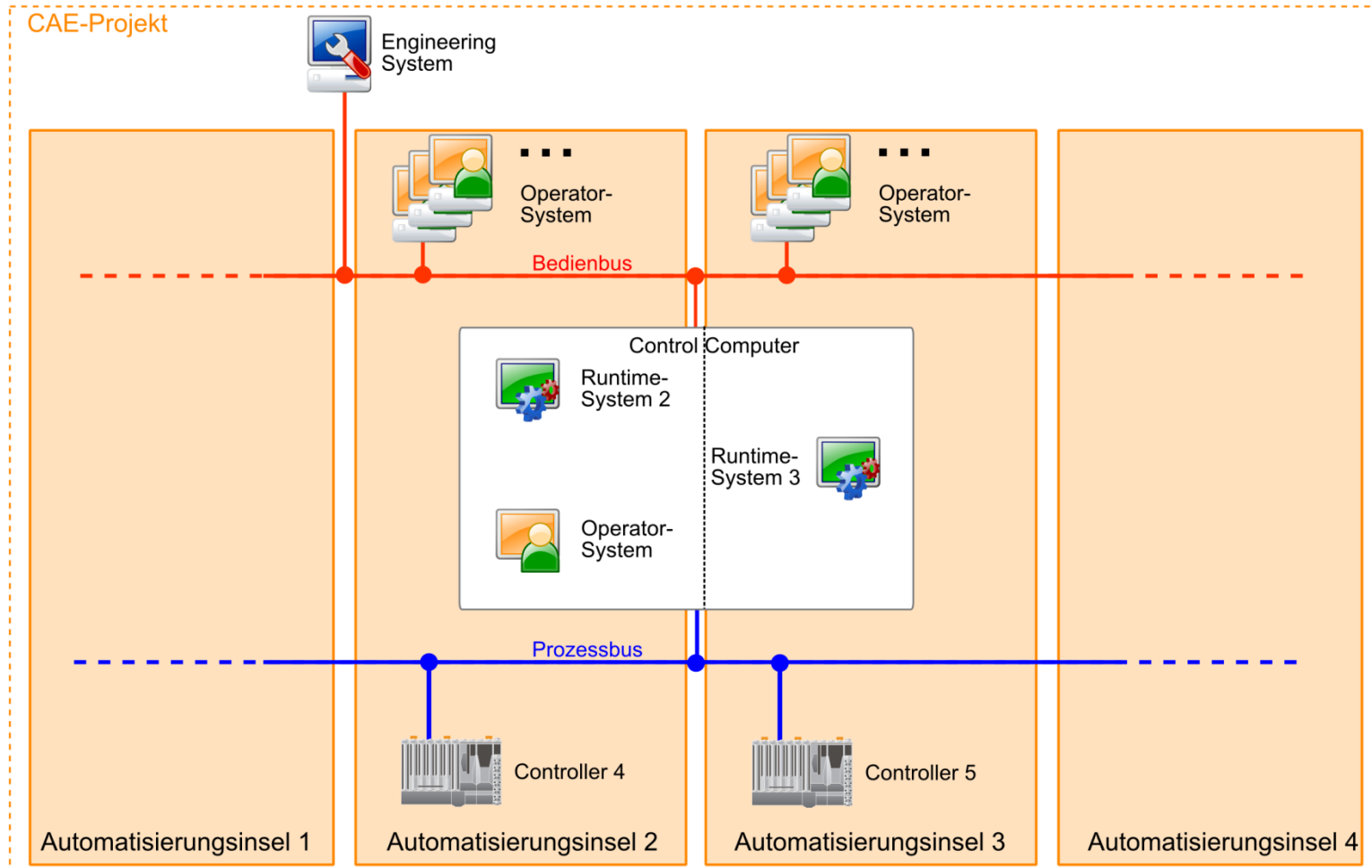
Advantage: Build is faster, only one runtime system with less tasks have to be build.

- **Load distribution** to more controll computers.

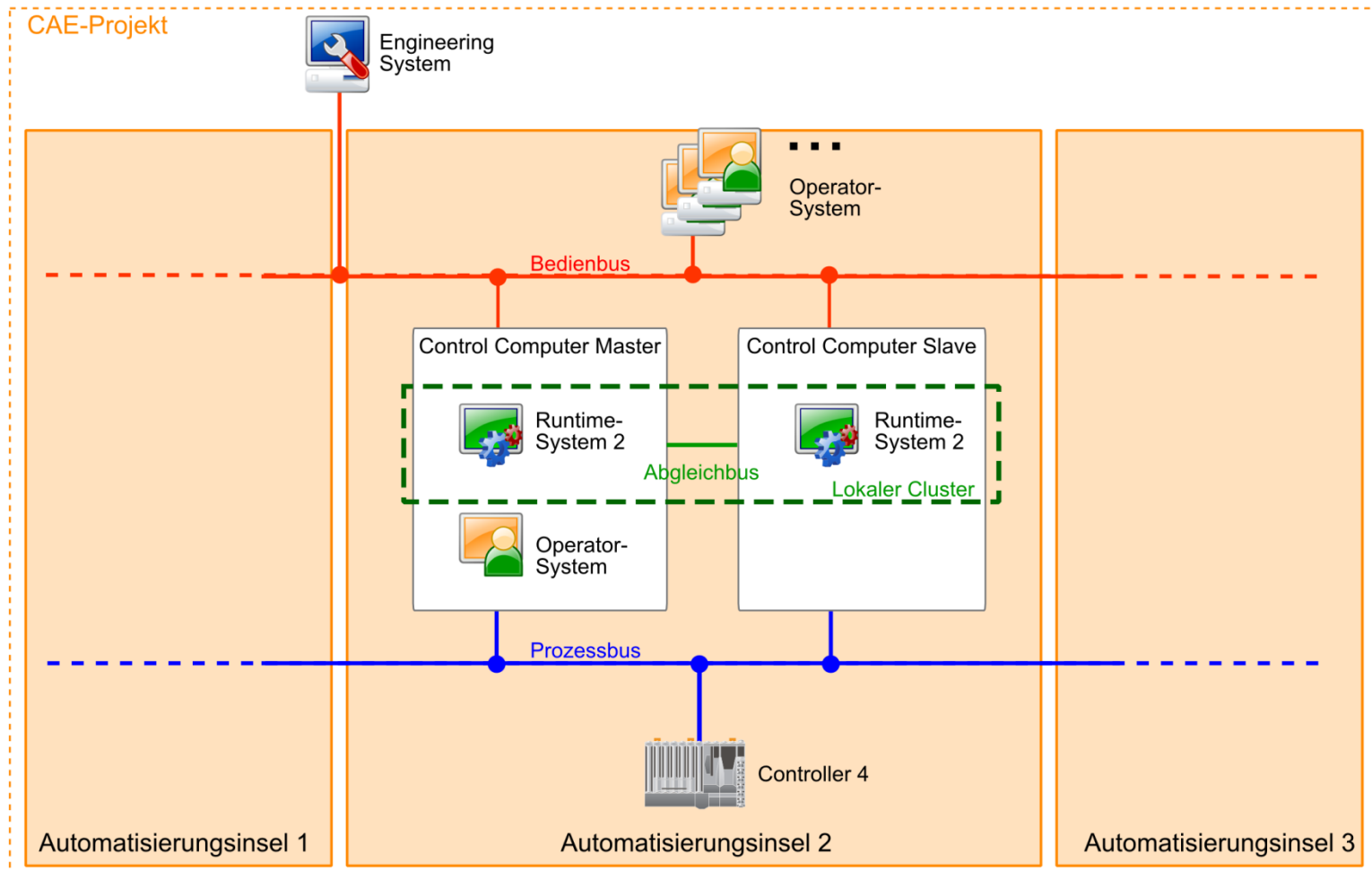
MRS Topologie 1



MRS Topologie 2



MRS Topologie 3





- **1 to n** relationship between runtime-system and controller
To each runtime-system you can assign one or more controller. Each controller communicate only with the assigned runtime-system.
- Each process graphic is assigned to one runtime-system. In the Displaycenter you can open every process graphic and every faceplate of your project.

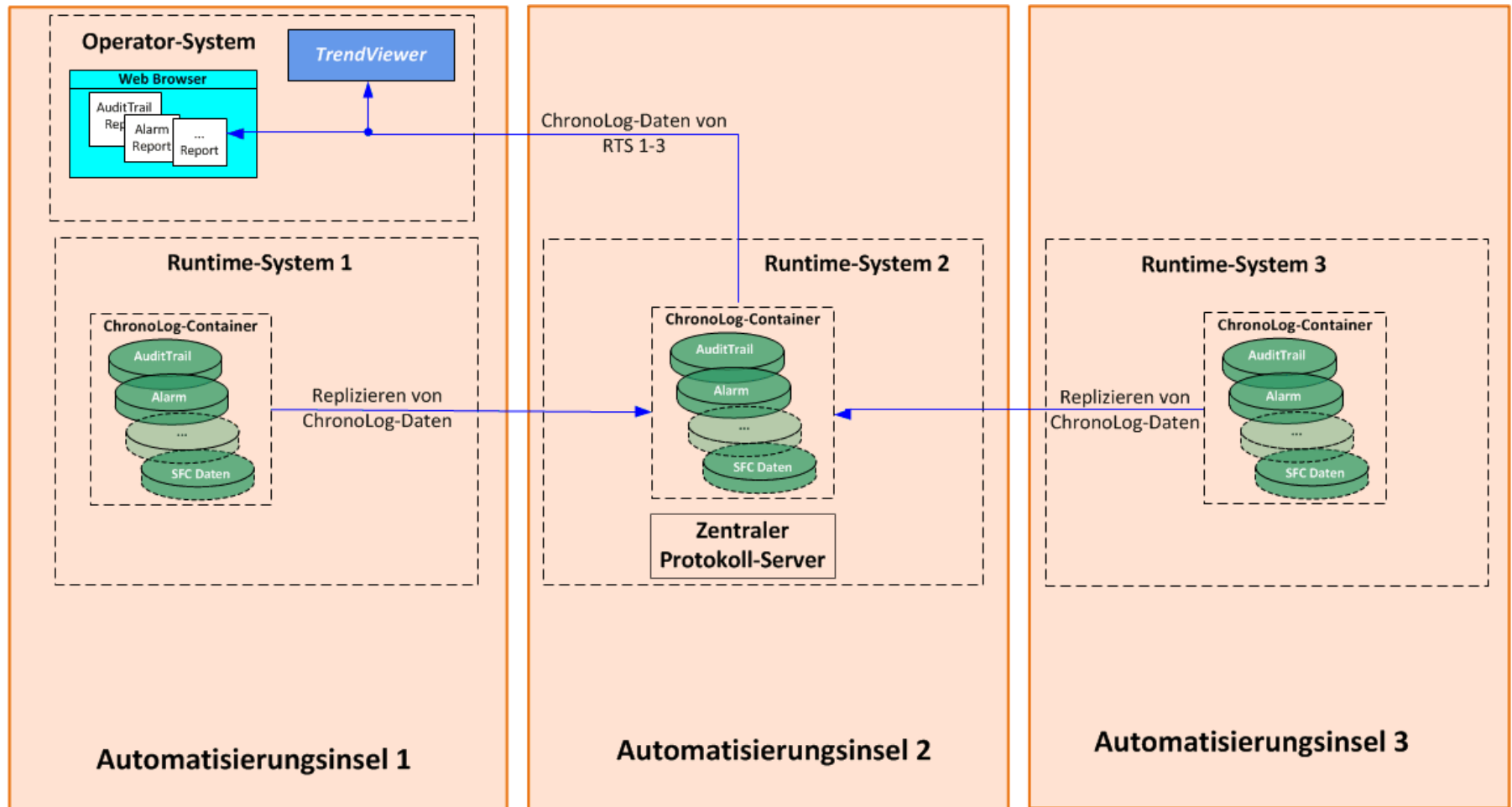


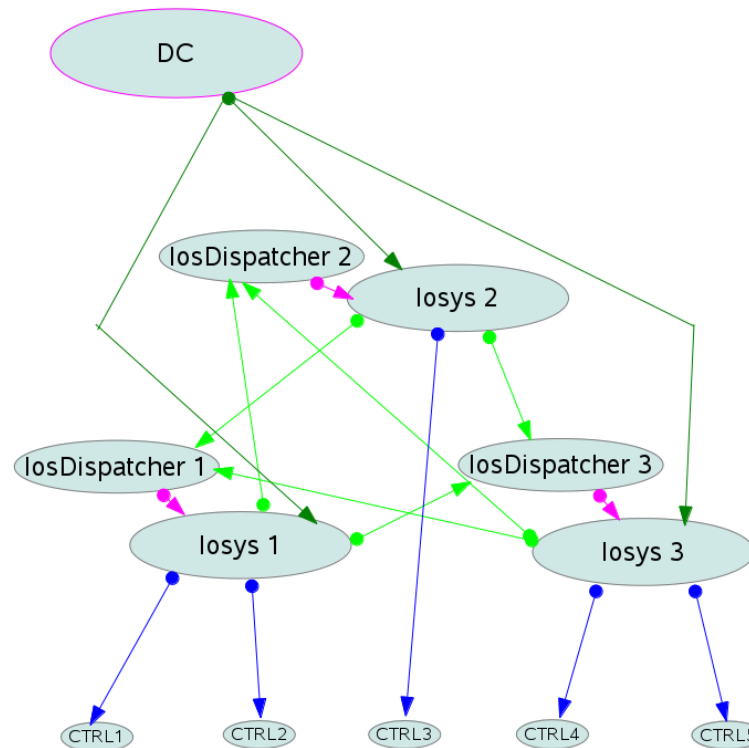
- Data exchange between different runtime-systems will be done with project variables (z.B. [Hardware I/Os](#), [Connectors](#), ...).
- The CAE Manager calculates the configuration for data exchange automatically.



- Reporting/storage of historical data (alarms and trends) will be done on a central protocol server (global cluster). The individual runtime-systems reply their own data to the central protocol server.

Data exchange for ChronoLog-Data und Reports





- → Datenrichtung Importdaten von fremden losys
- → Datenrichtung Importdaten zum lokalen losys
- → INA-Verbindung zugeordneter CTRL
- → losys – Verbindung DC zu losys

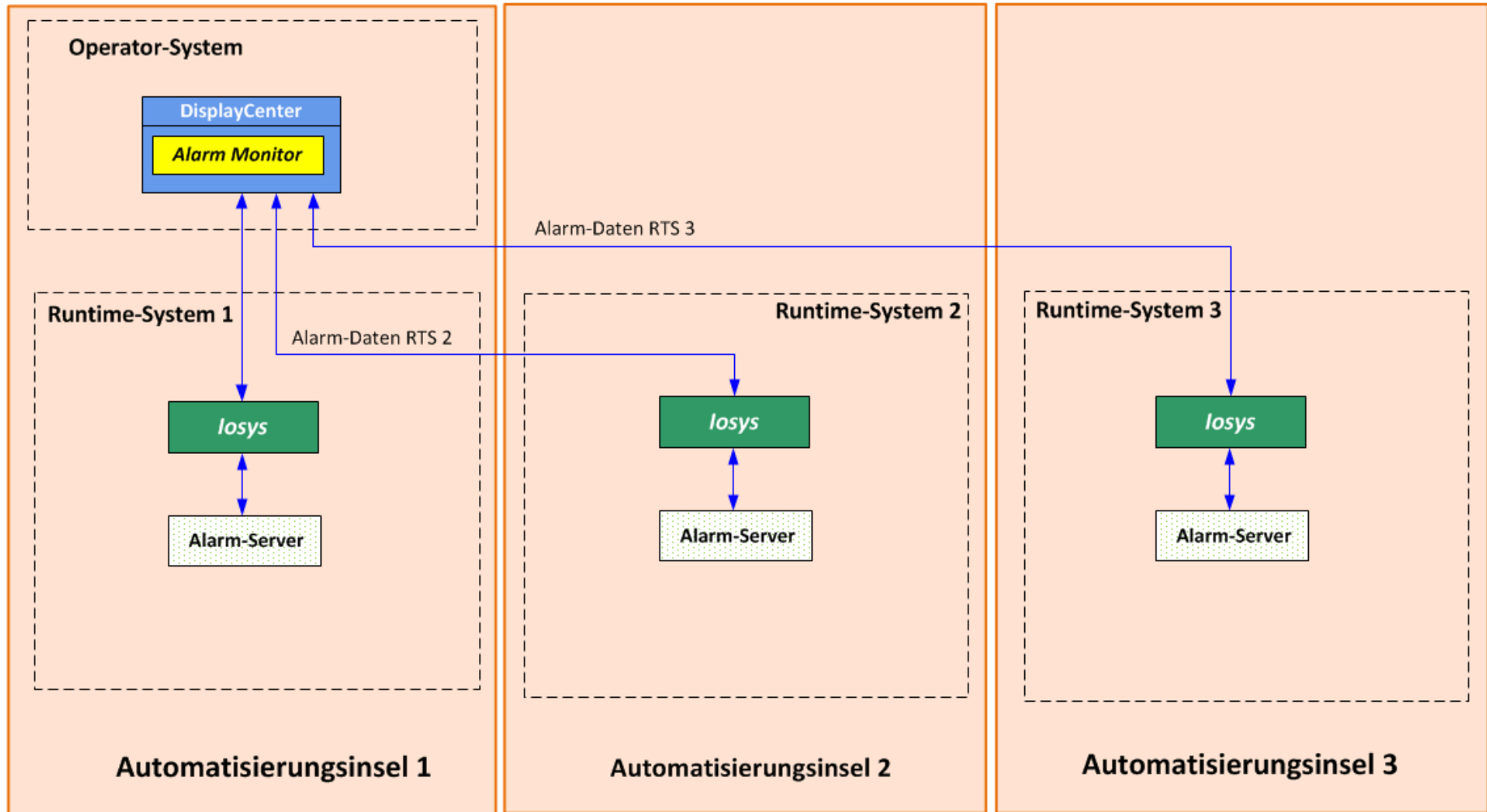


- Alarms from the individual runtime-systems can be viewed in one alarm monitor.

Concept data exchange



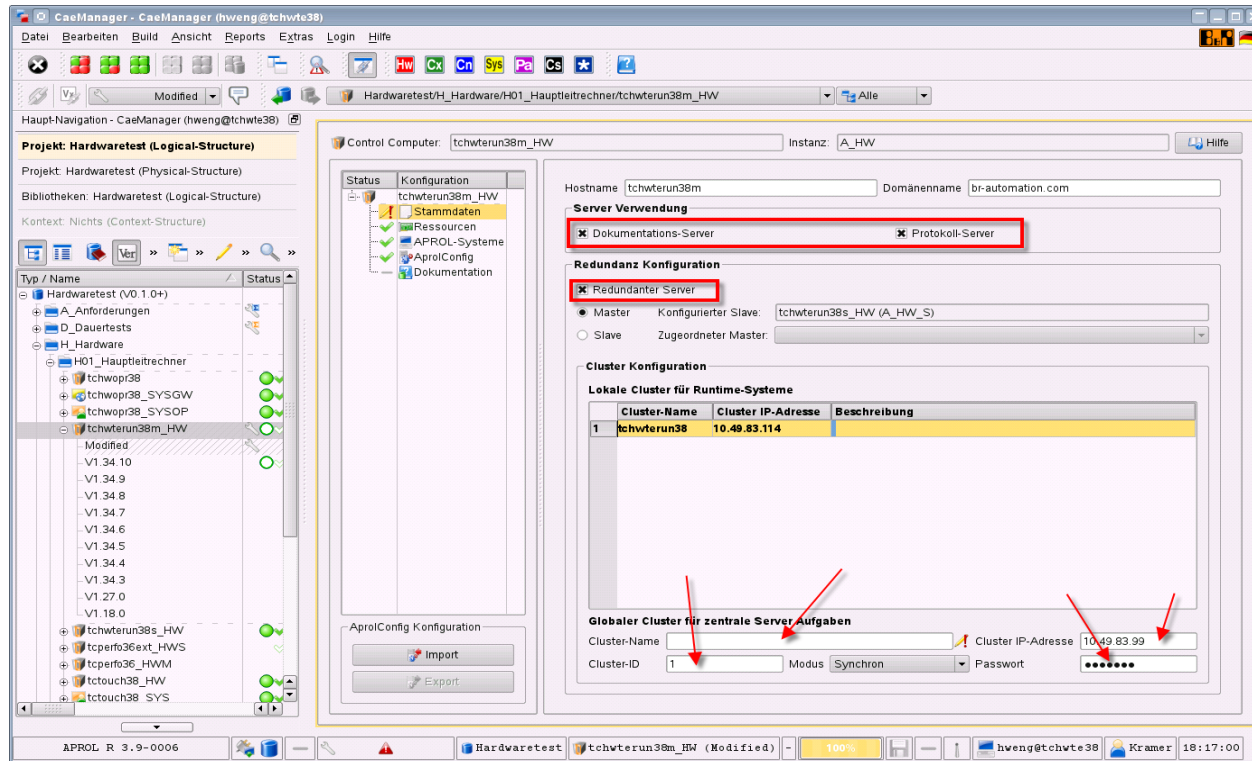
data exchange for alarms



Configuration project parts



- CaeManager -> Configuration ControlComputer
 - Local Cluster for each redundant runtime-system
 - Global Cluster for reporting



Configuration project parts



■ CaeManager -> Configuration APROL-System

CaeManager - CaeManager (hweng@tchwte38)

Datei Bearbeiten Build Ansicht Reports Extras Login Hilfe

Modified Hardwaretest/H_Hardware/H01_Hauptleitnehmer/vmchwterun38_SYS Alle

Haupt-Navigation - CaeManager (hweng@tchwte38)

Projekt: Hardwaretest (Logical-Structure)

Projekt: Hardwaretest (Physical-Structure)

Bibliotheken: Hardwaretest (Logical-Structure)

Kontext: Nichts (Context-Structure)

Typ / Name Status

- Hardwaretest (V0.1.0+)
- A_Anforderungen
- D_Dauertests
- H_Hardware
 - H01_Hauptleitnehmer
 - tchwopr38
 - tchwopr38_SYSGW
 - tchwopr38_SYSOP
 - tchwterun38m_HW
 - tchwterun38s_HW
 - tcperfo36ext_HWS
 - tcperfo36_HWM
 - tctouch38_HW
 - tctouch38_SYS
 - vmchwterun38_SYS (default)
 - Modified
 - V2.2.13
 - V2.2.12
 - V2.2.11
 - V2.2.10
 - V2.2.9
 - V2.2.8
 - V2.2.7
 - V1.92.0
 - V1.87.0
 - V1.82.0

APROL-System: vmchwterun38_SYS Instanz A

APROL-Systemtyp: Runtime-System

Zugeordnetes Runtime-System:

☒ Default Runtime-System

☐ Runtime-System mit integriertem Operator-System

Iosys-Port 3 Mit zusätzliche Iosys-Port Überprüfung

☐ Lokaler Iosys für Gateway-Systeme

Sprache Deutsch KDE-Konfiguration Service

Control Computer Zuordnung

Instanz	CC-Account	Control Computer	Redundanz	Passwort	System Start	AprolLoader Start	AprolLoader Port
1	A	hwrun	tchwterun38.. W (A_HW)	*****	☒	☒	Automatische

Netzwerk Verwendung

Bedienbus Device	Bedienbus Cluster	Prozessbus Device	Prozessbus Cluster	Abgleichbus Device	Alternativer Abgleichbus Device
Master eth1	tchwterun38	eth0	tchwterun38	eth0	eth0
Slave eth0	tchwterun38	eth0	tchwterun38	eth0	eth0

Kommunikation tchwterun38mr.3

AProlConfig Konfiguration

Import

APROL R 3.9-0006 Hardwaretest vmchwterun38_SYS (Modified) 100% hweng@tchwte38 Kramer 10:20:44



■ CaeManager -> Configuration APROL-System (Operator)

Aprol-System anlegen - CaeManager (eng32zeich@tcapc175)

Erstellungspfad: ControlComputer

Pfadbeschreibung: B&R APC 810

Name: Operator Station

Beschreibung:

Instanz: CC04_HW

APROL-Systemtyp: ☐ Runtime-System ☒ Operator-System ☐ Gateway-System

Zugeordnetes Runtime-System: Default Runtime-System (CC01)

OK Abbrechen

Versions-Eigenschaften - CaeManager (eng32zeich@tcapc175)

Allgemein

Name: APROL_Operator_SYS

Beschreibung: B&R APC 810 Operator Station

Instanz: CC02

Zugeordnetes Runtime-System: Default Runtime-System (CC01)

Erstellt: 10.05.2011 13:47:08 CEST aprol

Pfad: Hardware/ControlComputer (B&R APC 810)

Projekt: SamplesProject (Bei...OL Funktionalitäten)

Lesezeichen:

■ CaeManager -> Configuration Controller

Erstelle Controller-Hardware - CaeManager (eng32zeich@tcap)

Erstellungspfad: Controller

Pfadbeschreibung: B&R Controller

Name: CTRL_TR

Beschreibung:

Instanz: CTRL03

Zugeordnetes Runtime-System: Default Runtime-System (CC01)

OK Abbrechen

Versions-Eigenschaften - CaeManager (eng32zeich@tcapc17)

Allgemein

Name: CTRL_TR

Beschreibung: B&R Controller, Temperaturregelung, CP1486

Instanz: CTRL03

Zugeordnetes Runtime-System: Default Runtime-System (CC01)

Erstellt: 03.11.2009 00:00:00 CET aprot

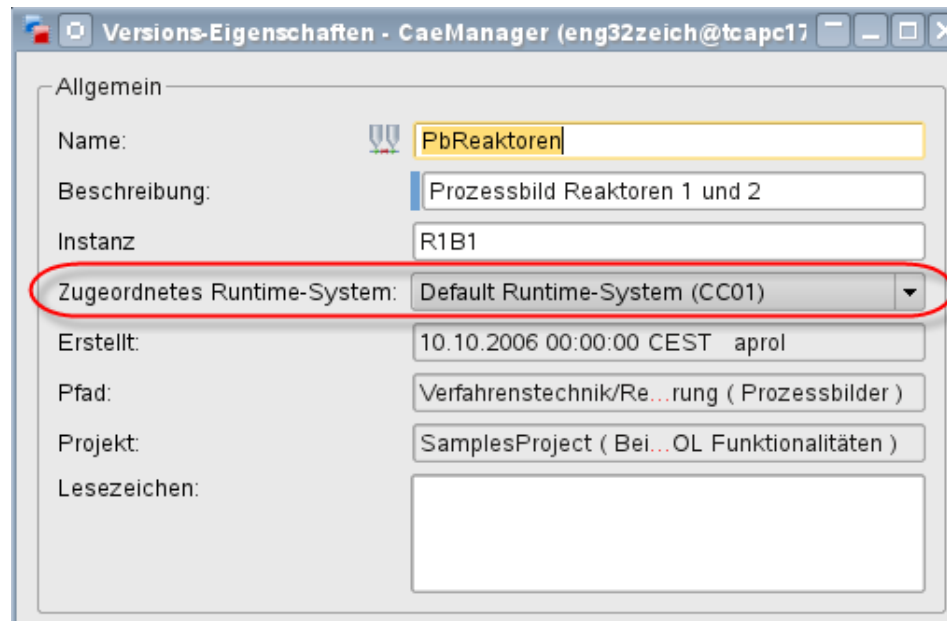
Pfad: Hardware/Controller (B&R Controller)

Projekt: SamplesProject (Bei...OL Funktionalitäten)

Lesezeichen:



- CaeManager -> Configuration Logik (Process graphik ...)





- CaeManager -> Configuration Logik (Cfc, ..)
 - Runtime-system assignment control computer-task
 - If there is no CC-Task assignment, the default CC-Task of the connected CC is used.

Versions-Eigenschaften - CaeManager (eng32zeich@tcapc175)

Allgemein

Name: PARA_UCB_Instance99Z

Beschreibung: Parameterumschaltung

Instanz: START_CFC_SYS_P_Instance99_2...xyxyxy80xyxyxyx90xyxyxyx99

Task / CC-Task: Reaktoren1 @CC01

CC-Task: Default-Task des zugeord...puters (System1@CC01)

CFC-Target:

☐ 'Controller' Task mit optionalem 'Control Computer' Taskanteil

☐ Nur Control Computer Task

☒ Komplexe CFC-Erstellung mit mehrfacher Taskzuweisung

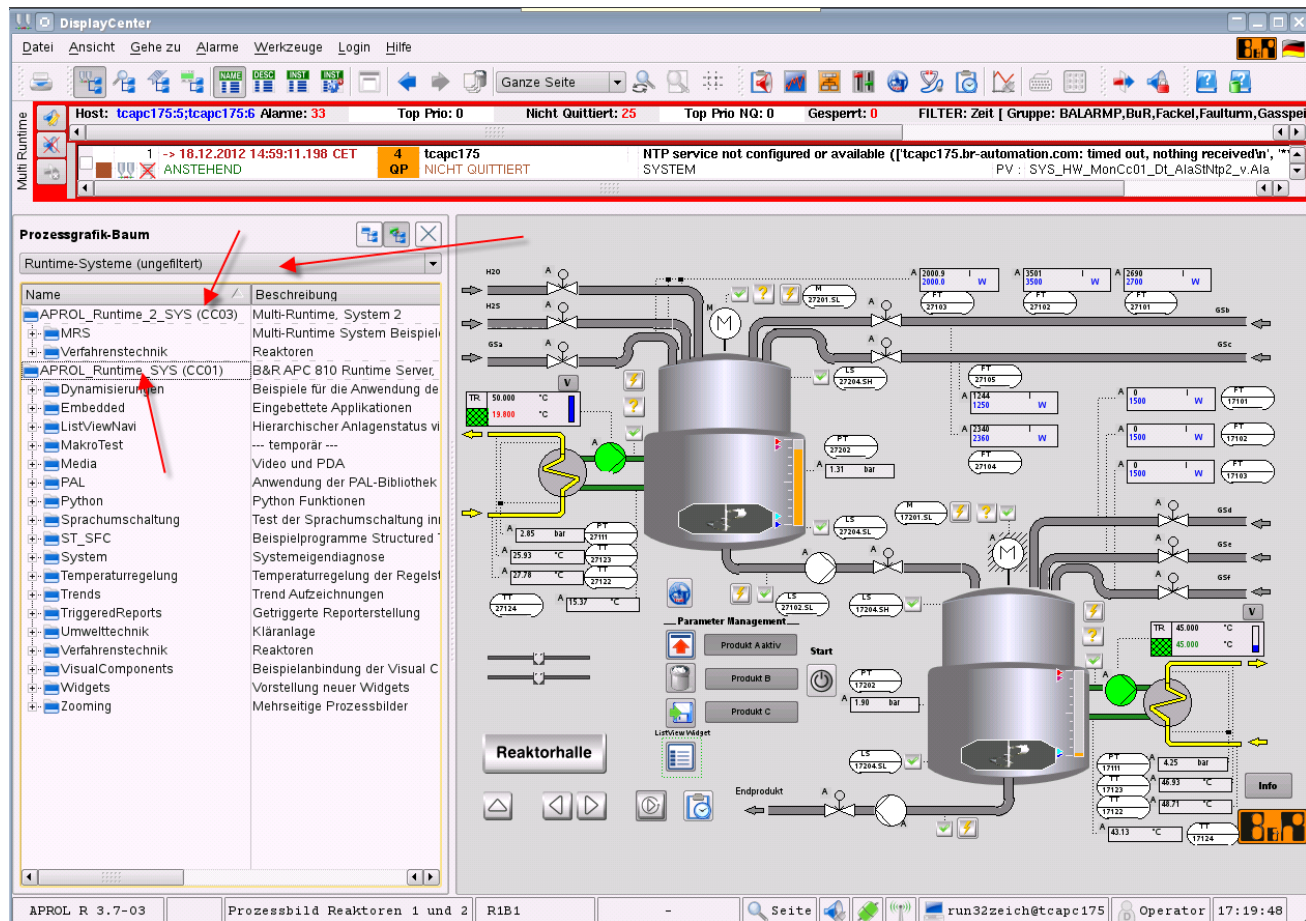
Erstellt: 10.10.2006 00:00:00 CEST aprot

Pfad: Verfahrenstechnik/Reaktor_1_2/Logik (Funktionspläne)

Projekt: SamplesProject (Beispiele für di...ng von APROL Funktionalitäten)

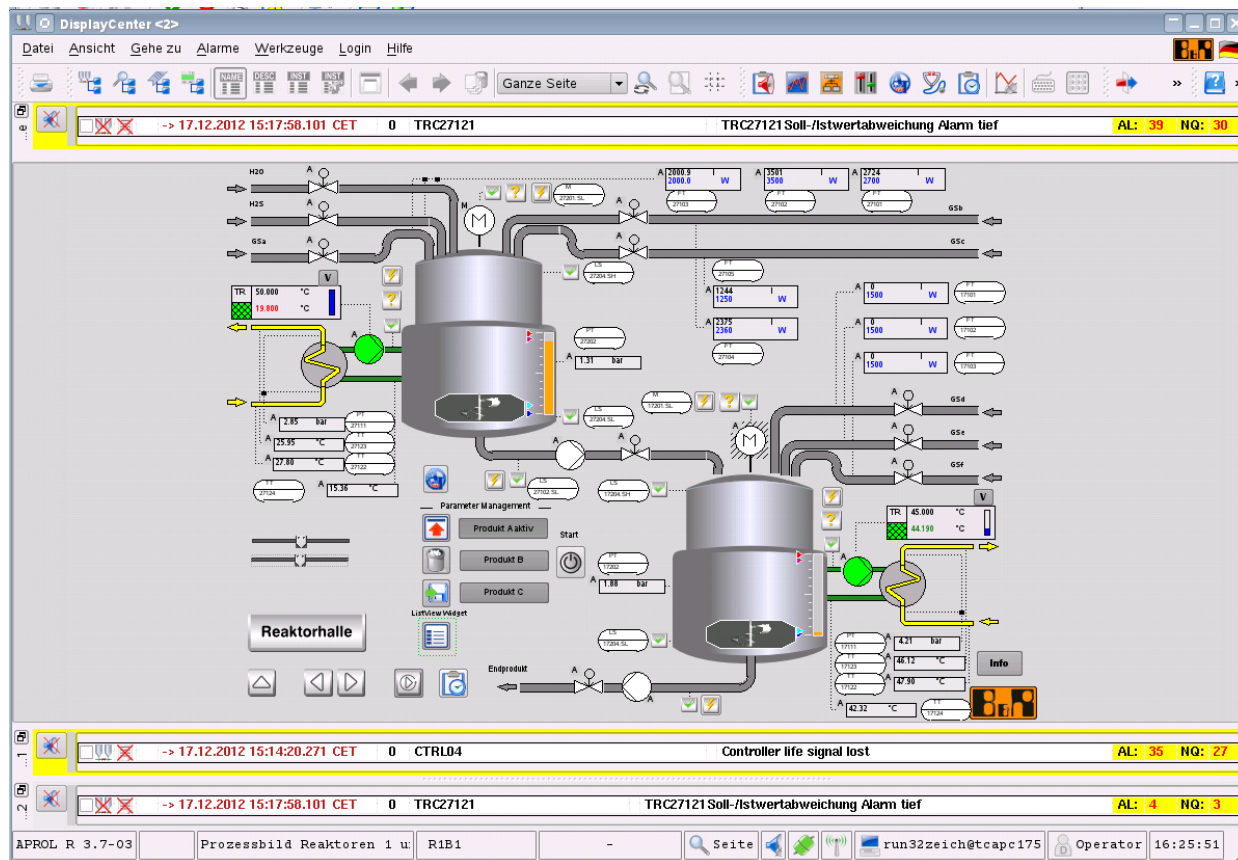
Lesezeichen:

- Visualization
 - Access to process graphics from Operator-Station



DisplayCenter

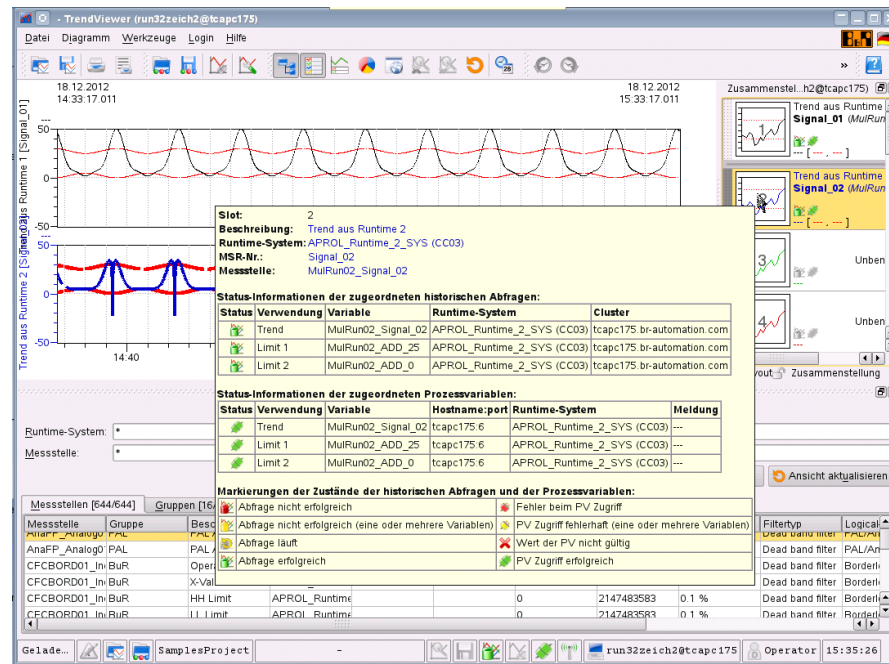
- Alarm-Handling (Quit / Lock / ...) is for all runtime-systems in one or more alarm monitors possible.



Trending



■ TrendViewer





■ Reports

- Runtime-Systems reply their Data to one **central protoco**llserver, so all ChronoLog data will be available on every runtime-system.

AuditTrail-Report - Gefiltert

31.01.2013 00:00:00 - 31.01.2013 24:00:00 | 100 | SamplesProject

Ergebnisse / Seite

Aktionsgruppen: Alle (mit Leserecht) | Security Login : Login | Security Login : Logout | Alarm : Alarm quittiert | Zeige alle Operator-Typen an

Zeit	Aktion	Operator	Nachname	Vorname	CC-Account	Server	Operator-Terminal	Projekt
31.01.2013 15:19:44	Filter der Alarmliste modifiziert	Operator	Operator	Otto	run32zeich2	tcapc175	tcapc175.br-automation.com:6	SamplesProject
31.01.2013 15:19:44	Filter der Alarmliste modifiziert	Operator	Operator	Otto	run32zeich2	tcapc175	tcapc175.br-automation.com:6	SamplesProject
31.01.2013 15:19:44	Filter der Alarmliste modifiziert	Operator	Operator	Otto	run32zeich2	tcapc175	tcapc175.br-automation.com:6	SamplesProject
31.01.2013 15:19:43	Filter der Alarmliste modifiziert	Operator	Operator	Otto	run32zeich2	tcapc175	tcapc175.br-automation.com:6	SamplesProject
31.01.2013 15:19:43	Prozessgrafik geöffnet	Operator	Operator	Otto	run32zeich2	tcapc175	tcapc175.br-automation.com:6	SamplesProject
31.01.2013 15:19:42	Filter der Alarmliste modifiziert	Operator	Operator	Otto	run32zeich2	tcapc175	tcapc175.br-automation.com:6	SamplesProject
31.01.2013 15:19:42	Filter der Alarmliste modifiziert	Operator	Operator	Otto	run32zeich2	tcapc175	tcapc175.br-automation.com:6	SamplesProject

Ihr weltweiter Automatisierungspartner

