

## B Glossary

The glossary has been split into two sections, one with acronyms and their meaning, and another with actual definitions of some terms.

### B.1 Acronyms

<b>API</b>	Application Program Interface
<b>ASIC</b>	Application Specific Integrated Circuit
<b>ATLAS</b>	A Toroidal LHC Apparatus
<b>BC</b>	Bunch Crossing
<b>BCID</b>	Bunch Crossing Identifier
<b>BCR</b>	Bunch Counter Reset
<b>BE</b>	Back-End
<b>CAN</b>	Controller Area Network
<b>CBR</b>	Constant Bit Rate
<b>CBQ</b>	Class Base Queuing
<b>CERN</b>	European Laboratory for Particle Physics
<b>CF</b>	Connect Forum
<b>CFS</b>	Complex Front-end Systems
<b>CIC</b>	Common Infrastructure Controls
<b>CMA</b>	Coincidence Matrix
<b>CMC</b>	Common Mezzanine Card
<b>CMT</b>	Configuration Management Tool
<b>CondDB</b>	Conditions Database
<b>ConfDB</b>	Configuration Database
<b>CORBA</b>	Common Object Request Broker Architecture
<b>COTS</b>	Commodity/Commercial Off-The-Shelf
<b>CP</b>	Cluster Processor
<b>CSC</b>	Cathode Strip Chamber
<b>CTP</b>	Central Trigger Processor
<b>DAL</b>	Data Access Library
<b>DAQ</b>	Data Acquisition System
<b>DBMS</b>	Database Management System
<b>DC</b>	Data Collection
<b>DCS</b>	Detector Control System

<b>DDC</b>	DAQ-DCS Communication
<b>DDC-CT</b>	DDC Control Transfer
<b>DDC-DT</b>	DDC Data Transfer
<b>DDC-MT</b>	DDC Message Transfer
<b>DF</b>	DataFlow System
<b>DFM</b>	Data Flow Manager
<b>DID</b>	Destination Identifier
<b>DIG</b>	Detector Interface Group
<b>DMA</b>	Direct Memory Access
<b>DSA</b>	Diagnostics Supervision Agent
<b>DSP</b>	Digital Signal Processor
<b>DSS</b>	Detector Safety System
<b>DVS</b>	Diagnostics and Verification System
<b>EB</b>	Event Builder
<b>EBN</b>	EB Network
<b>ECAL</b>	Electromagnetic Calorimeter
<b>ECR</b>	Event Counter Reset
<b>ED</b>	Event Dump
<b>EDM</b>	Event Data Model
<b>EF</b>	Event Filter
<b>EFD</b>	Event Filter Data flow
<b>EFL</b>	Event Format Library
<b>EFN</b>	EF Network
<b>EFPU</b>	EF Processing Unit (processor)
<b>EH</b>	Event Handler
<b>EL1ID</b>	Extended Level-1 ID
<b>ELMB</b>	Embedded Local Monitor Board
<b>EMB</b>	Electromagnetic Barrel
<b>EMEC</b>	Electromagnetic Endcap
<b>EMS</b>	Event Monitoring Service
<b>ERS</b>	Error Reporting Service
<b>ESA</b>	European Space Agency
<b>ESS</b>	Event Selection Software
<b>EVS</b>	Event Viewing System
<b>FC</b>	Flow Control

<b>FCAL</b>	Forward Calorimeter
<b>FDR</b>	Final Design Review
<b>FE</b>	Front-End
<b>FEC</b>	Front-End Controller
<b>FEL</b>	Front-End Link
<b>FILAR</b>	Four Input Links for ATLAS Readout
<b>FPGA</b>	Field Programmable Gate Array
<b>FSM</b>	Finite State Machine
<b>GCS</b>	Global Control Station
<b>GID</b>	Global event Identifier
<b>HEC</b>	Hadronic Endcap Calorimeter
<b>HLT</b>	High Level Trigger
<b>HMI</b>	Human Machine Interface
<b>HOL</b>	Head Of Line
<b>HOLA</b>	High-speed Optical Link for ATLAS
<b>ID</b>	Inner Detector
<b>IDC</b>	Identifiable Container
<b>IGUI</b>	Integrated Graphical User Interface
<b>ILU</b>	Inter-Language Unification system
<b>IOV</b>	Interval Of Validity
<b>IP</b>	Interaction Point
<b>IP</b>	Internet Protocol
<b>IPC</b>	Inter-Process Communication
<b>IPC_REF_FILE</b>	IPC Reference File
<b>IS</b>	Information System
<b>JCOP</b>	Joint Controls Project
<b>JDBC</b>	Java Database Connectivity
<b>JEP</b>	Jet Energy Processor
<b>L1A</b>	LVL1 accept
<b>L1ID</b>	LVL1 Trigger Accept Identifier
<b>L2N</b>	LVL2 Network
<b>L2P</b>	LVL2 Processor
<b>L2PU</b>	Level-2 Processing Unit (application)
<b>L2SV</b>	Level-2 Supervisor
<b>LAr</b>	Liquid Argon

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<b>LAN</b>	Local Area Network
<b>LBSF</b>	Local Buffering and Storage Facility
<b>LCG</b>	LHC Computing Grid
<b>LCS</b>	Local Control Station
<b>LDC</b>	Link Destination Card
<b>LHC</b>	Large Hadron Collider
<b>LVL1</b>	Level-1 trigger system
<b>LVL2</b>	Level-2 trigger system
<b>LSC</b>	Link Source Card
<b>LTP</b>	Local Trigger Processor
<b>LUT</b>	Look-Up Table
<b>MAC</b>	Media Access Control
<b>MDT</b>	Monitored Drift Tube
<b>MRS</b>	Message Reporting System
<b>MSSM</b>	Minimal SuperSymetric Model
<b>MTTF</b>	Mean Time To Failure
<b>NIC</b>	Network Interface Card
<b>OBK</b>	Online Book Keeper
<b>ODBC</b>	Open Database Connectivity
<b>OHS</b>	Online Histogramming Service
<b>OKS</b>	Object Kernel Support
<b>OLE</b>	Object Linking and Embedding
<b>OMG</b>	Object Management Group
<b>OPC</b>	OLE for Process Control
<b>OSF</b>	Online Software Farm
<b>OSN</b>	Online Software Network
<b>PCI</b>	Peripheral Component Interconnect
<b>PDR</b>	Preliminary Design Review
<b>PESA</b>	Physics and Event Selection Architecture
<b>PLC</b>	Programmable Logic Controller
<b>PMG</b>	Process Manager
<b>PP</b>	Pre-Processor
<b>pROS</b>	pseudo-ROS
<b>PRR</b>	Production Readiness Review
<b>PSC</b>	PESA Steering Controller

<b>PT</b>	Processing Task
<b>QoS</b>	Quality of Service
<b>RC</b>	Run Control System
<b>RCC</b>	ROD Crate Controller
<b>RCM</b>	ROD Crate Module
<b>RCP</b>	ROD Crate Processor
<b>RCW</b>	ROD Crate Workstation
<b>RDB</b>	Remote Database
<b>RDO</b>	Raw Data Object
<b>RIO</b>	Reconstruction Input Object
<b>RM</b>	Resource Manager
<b>ROB</b>	Read-Out Buffer
<b>ROBin</b>	Read-Out Buffer input
<b>ROC</b>	Read-Out Crate (Specific implementation of a ROS)
<b>ROD</b>	Read-Out Driver
<b>RoI</b>	Region of Interest
<b>RoIB</b>	Region of Interest Builder
<b>ROL</b>	Read-Out Link
<b>ROS</b>	Read-Out Sub-system
<b>RPC</b>	Resistive Plate Chamber
<b>RRC</b>	ROD to ROB Connection
<b>RRM</b>	ROB to ROS Multiplexer
<b>RT</b>	Real Time
<b>RUP</b>	Rational Unified Process
<b>SCADA</b>	Supervisory Control and DAQ
<b>SCS</b>	Sub-system Control Station
<b>SCT</b>	Silicon Tracker
<b>SCX</b>	Surface control room
<b>SDP</b>	Software Development Process
<b>SDX</b>	Surface counting room
<b>SERDES</b>	SERial DESerialiser
<b>SFC</b>	Sub-Farm Crate
<b>SFI</b>	Sub-Farm Input
<b>SFO</b>	Sub-Farm Output
<b>SID</b>	Source Identifier

<b>S-LINK</b>	Simple Link Interface
<b>STL</b>	Standard Template Library
<b>STP</b>	Spanning Tree Protocol
<b>TBF</b>	Token Bucket Filter
<b>TCP</b>	Transmission Control Protocol
<b>TDAQ</b>	ATLAS Trigger/DAQ/DCS
<b>TDR</b>	Technical Design Report
<b>TES</b>	Transient Event Store
<b>TGC</b>	Thin Gap Chamber
<b>TM</b>	Test Manager (also TMGR)
<b>TMGR</b>	Test Manager
<b>TOF</b>	Time Of Flight
<b>TRG</b>	Trigger Module (function inside present implementation of ROS)
<b>TRT</b>	Transition Radiation Tracker
<b>TTC</b>	Timing, Trigger and Control (TTC)
<b>TTCrx</b>	TTC Receiver
<b>TTCvi</b>	TTC VME Interface
<b>UDP</b>	User Datagram Protocol
<b>URD</b>	User Requirements Document
<b>US15</b>	Underground service area
<b>USA15</b>	Underground counting room
<b>UX15</b>	Experimental cavern
<b>VLAN</b>	Virtual Local Area Network
<b>WRR</b>	Weighted Round Robin
<b>XML</b>	Extensible Markup Language

## B.2 Definitions

### **Bunch Crossing Identifier (BCID)**

Number that defines the bunch crossing at which an event occurred. Potential bunch crossings are numbered 0 to 3563 per LHC orbit, starting with the first following the LHC extractor gap.

### **Bunch Counter Reset (BCR)**

Signal Broadcast by the TTC system once per LHC orbit to control the phase of local bunch counters.

**Back-End (BE)**

Part of the DCS system furthest from the detector (as opposed to Front-End)

**Central Trigger Processor (CTP)**

The place where the LVL1 trigger is generated.

**Conditions database (CondDB)**

The conditions database contains the record of the detector conditions required for data analysis, e.g. calibration and geometry constants.

**Configuration databases (ConfDB)**

The configuration databases store the parameters necessary to configure the TDAQ system's architecture, hardware and software components, and running modes.

**TDAQ Run or Run**

A continuous period in time of data taking using a given hardware and software configuration and a defined set of run parameters. It is identified by a unique run number. The run begins when the TDAQ, detectors and other sub-systems are correctly configured and the machine conditions are acceptable. A run terminates either cleanly when the pre-defined goals of the run are met (e.g. a certain number of events have been taken) or aborts when a serious unexpected problem occurs (e.g. loose the beam or the machine conditions are unacceptable etc.) or when the configuration of the partition changes.

**DataCollection (DC)**

DataCollection is a subsystem of the Atlas TDAQ DataFlow system responsible for the movement of event data from the ROS to the High Level Triggers. This includes data from Regions of Interest (RoIs) for LVL2 Processing, building complete events for the Event Filter and finally transferring accepted events to Mass Storage. It also handles passing the LVL1 RoI pointers and the allocation of LVL2 processors and load balancing of Event Building.

**DataCollection Framework**

A set of services used by all LVL2 and EB applications, which provides a unified program structure and common interfaces to Configuration Database, Run Control and other Online Software services.

**Data Flow Manager (DFM)**

The DFM orchestrates the correct flow of data fragments between ROSs and SFIs. It is triggered by the L2SV, load balances the event building tasks on the SFIs and ensures that the ROSs do not overflow their internal memory buffers.

**Data Flow system (DF)**

System comprising the ROS and DC HLT subsystems.

**Detector Control System (DCS)**

It comprises the control of the subdetectors and of the common infrastructure of the experiment and the communication with the services of CERN (cooling, ventilation, electricity distribution, safety etc.) and the LHC accelerator.

**Diagnostic package (DVS)**

This element uses the test manager to diagnose problems with the TDAQ system and confirm its functionality.

**Event**

All ROB fragments from the same beam crossing. Identified by run number and GID after event building.

**Event Builder (EB)**

Part of the DF system, it merges all the fragments belonging to a unique EL1ID into a full event at a single destination and assigns a GID.

**Event Counter Reset (ECR)**

Signal broadcast by the TTC system to reset the local event counters.

**Event Filter (EF)**

The hardware and software required for the final stage of the on-line event selection, data monitoring and calibration using offline style algorithms operating on complete events accepted by LVL2.

**Event Filter Dataflow (EFD)**

Part of the EF system responsible for the flow of event data within the EF.

**Event Filter Farm**

The farm of processors in which the Event Filter runs. The same farm may also be used for different purposes, e.g. calibration, by running different software on the farm.

**Event Filter Sub-Farm**

A sub-set of the Event Filter Farm. Input and output are provided, respectively, by the Sub Farm Input and Output elements.

**Event filter supervisor**

The hardware and software required to globally control the Event Filter. It is also responsible for the configuration, initialisation, and overall error handling of the Event Filter.

**Event fragment**

A generic term for a sub-set of event data. Specific instances of an event fragment are ROD, ROB, ROS, and sub-detector fragments.

**Event Handler (EH)**

The logical object within the EF consisting of an event distributor, an event collector, one or more processing elements, an event handler supervisor and an appropriate communication layer.

**Extended Level-1 ID (EL1ID)**

The L1ID extended to 32 bits by concatenating an 8 bit ECR counter in the high end bits.

**Global event Identifier (Gid)**

For a given run, the unique TDAQ wide identifier of an event added to the event during event building.

**High Level Triggers (HLT)**

Comprised of both the LVL2 and EF, the two ATLAS trigger levels that are implemented primarily in software.



### **Level-1 Trigger (LVL1)**

The ATLAS First Level Trigger system provides a hardware based first trigger decision using only a sub-set of an event's data (Calorimeter and Muon only). Normally only the events accepted by LVL1 are transferred from the detectors into the HLT/DAQ system.

### **Level-1 Trigger Type**

An 8-bit word transmitted with the L1A and giving information about the type of event.

### **Level-2 Farm**

The farm of processors (L2Ps) in which the LVL2 software runs.

### **Level-2 Sub-Farm**

A sub-set of the LVL2 farm.

### **Level-2 Trigger (LVL2)**

The ATLAS Second Level Trigger system is a sub-system of the HLT which provides a software based second stage trigger decision, to reduce the rate of triggers from LVL1 by about a factor of 100. It uses 'Regions of Interest' (RoIs) as given by the LVL1 trigger to selectively read out only certain parts of the ATLAS detector hardware and computes a LVL2 trigger decision.

### **LVL1 Accept (L1A)**

LVL1 trigger Accept signal produced by the Central Trigger Processor (CTP) when an event has met the LVL1 trigger criteria. Also in case of partitioned running the local triggers generate L1As.

### **LVL1 Trigger Accept Identifier (L1ID)**

A L1ID is built at different levels of the read-out system. The TTCrx provides a 24-bit L1ID with each L1A signal. In conjunction with the BCID, it defines uniquely an event within a small time frame, of order 1 s.

### **LVL2 Processing Unit (L2PU)**

The L2PU is the application running on one of the Level-2 processors, hosting the HLT processing algorithms and also incorporating the calculations from which the LVL2 trigger decision is derived.

### **LVL2 Processor (L2P)**

A processor within the LVL2 farm.

### **LVL2 Supervisor (L2SV)**

The L2SV is the interface to the LVL1 system via the RoI Builder. It is responsible for distributing events to the LVL2 farm/subfarms and manages the computing resources by means of load balancing algorithms. The L2SV receives the final LVL2 decision from the L2PU. The decision results are communicated to the DFM so that accepted events can be further analyzed, and rejected events can be flushed from the ROS memory.

### **LVL2 Trigger Type**

An 8-bit word transmitted with the LVL2 decision.

### **Message Reporting System (MRS)**

A facility which allows all software components in the ATLAS TDAQ system to report error messages to other components.

**Object Kernel Support (OKS)**

This is a package which provides a simple active persistent in-memory object manager which is used to implement run-time configuration databases.

**Online Software System**

All the software for configuring, controlling and monitoring of the TDAQ system. It excludes the management, processing and transportation of physics data.

**Partitions (many defs)**

See chapter 3.

**Process Manager (PMG)**

This element performs basic job control of software components of the TDAQ (starting, stopping, and monitoring basic status).

**Processing Task (PT)**

The software running on an EF processing node in charge of transforming the event data. The transformation may be filtering, reformatting, monitoring or calibration. Several processing tasks can be running concurrently on the same processing node.

**pseudo-ROS (pROS)**

The pROS is the unit which receives the detailed LVL2 result from the LVL2 Processing Units for each event to be passed to event building. At event building time the pROS is treated just like a ROS, thus including the detailed LVL2 result into the full event.

**Read-Out Buffer (ROB)**

The buffer which receives data from one ROL.

**Read-Out Driver (ROD)**

The detector specific Front-End Functional element which gathers data from the derandomizers over one or more data streams and builds ROD fragments of events to be sent to the ROS or RoIB. Gathers data from FEBs; Sends fragments to ROB or RoIB.

**Read-Out Link (ROL)**

The physical link between ROD and ROS through which the data are sent at the event rate of the LVL1 trigger accept.

**Read-Out Sub-system (ROS)**

Unit which holds a number of ROBins.

**Read-Out System (ROS)**

A system of the ATLAS TDAQ comprising the ROS sub-systems and responsible for receiving data from the RODs and for supplying event fragments to the LVL2 and EB sub-systems.

**Region of Interest (RoI)**

A region limited in eta and phi, indicated by the LVL1 trigger to contain candidates for objects requiring further computation. Some RoI's may be defined internally within the level-2 trigger system.

**Region of Interest Builder (RoIB)**

The element which combines RoI information from different parts of LVL1 and forwards it to a LVL2 supervisor.

**ROD fragment**

Data fragment provided by one ROD to the Read-Out System (ROS).

**ROS fragment**

The set of ROB fragments, within a ROS (in this case sub-system), with the same Gid and to be sent to HLT.

