TDAQ WBS 6.6

Previous WBS Structure

6.6		
6.6.1	Level-0 Trigger	
6.6.1.1	L0Calo	ANL, Chicago, Indiana, MSU
6.6.2	Hardware Tracking	
6.6.2.1	L1Track	ANL, Indiana, Penn, SLAC
6.6.2.2	FTK++	Chicago, NIU, Stanford, UIUC
6.6.3	L1Global	BNL, Chicago, Indiana, Louisiana, MSU, Oregon, Penn, Pitt
6.6.4	DAQ/HLT	
6.6.4.1	FELIX & Network	ANL, BNL, Oregon, SLAC

Recent Updates

- Informational meeting on July 3
- Continuously working with TDAQ management and project coordinators
  - To incorporate the changes introduced into the projects US interested in
  - To identify the suitable deliverables for US institutes
- Develop the WBS structure to reflect what in scoping document

ATLAS TDAQ WBS

WBS	Item	Reference Total Cost [kCHF]	Medium Differential Cost [kCHF]	Low Differential Cost [kCHF]
1	TDAQ system	43,305	-11,417	-18,194
1.1	L0 Central	1,206	-	-
1.1.1	L0CTP	720	-	-
1.1.2	MuCTPI	279	-	-
1.1.3	RoI Distributor	207	-	-
1.2	L0 Calorimeter	695	-	-241
1.2.1	FEX	499	-	-241
1.2.2	Topo. Proc.	142	-	-
1.2.3	Optical Plant	49	-	-
1.2.4	L0Calo-to-L1Calo	5	-	-
1.3	L0 Muon Endcap	2,557	-110	-110
1.3.1	TGC Sector Logic	1,777	-	-
1.3.2	End-cap MDT Trigger	780	-110	-110
1.4	L0 Muon Barrel	1,320	-145	-171
1.4.1	RPC Sector Logic	541	-35	-61
1.4.2	Barrel MDT Trigger	780	-110	-110
1.5	L1 Central	1,933	-	-
1.5.1	L1CTP	858	-	-
1.5.2	TTC	1,075	-	-
1.6	L1Global	3,390	-	-
1.6.1	Aggregator	843	-	-
1.6.2	Event Processor	2,546	-	-
1.7	L1Track	4,191	-668	-2,494
1.7.1	Processing	2,769	-422	-1,553
1.7.2	Second stage	1,442	-246	-940
1.8	FTK++	13,035	-4,876	-9,561
1.8.1	Processing	9,304	-3,437	-6,735
1.8.2	Second stage	3,893	-1,504	-2,951
1.9	DAQ/EF	14,978	-5,616	-5,616
1.9.1	Detector Readout	8,707	-961	-961
1.9.2	Dataflow	1,471	-905	-905
1.9.3	EF	4,800	-3,750	-3,750

DRAFT

Revised WBS

WBS	Item		
6.6.1	L0 Central		
6.6.1.1	RoI Distributor		
6.6.2	L0 Calorimeter		
6.6.2.1	FEX		
6.6.3	L1 Global		
6.6.3.1	Aggregator		
6.6.3.2	Event Processor		
6.6.4	L1 Track		
6.6.4.1	Processing		
6.6.4.2	Second stage		
6.6.5	FTK++		
6.6.5.1	Processing		
6.6.5.2	Second stage		
6.6.6	DAQ/EF		
6.6.6.1	Detector Readout		

Two Issues

- Several institutes interested in L0Calo Topo clustering
  - Not in baseline WBS
  - Straddles the LAr/TDAQ boundary
    - LAr backend electronics
    - L0 Calorimeter FEX
- Institute interested in ITK readout previously as a ROD
  - FELIX in TDAQ
  - Other specific upstream items in ITK (common)

Next few slides showing the WBS down to Level 5, at which we aim to associate individual items with only one institute

WBS	Item
6.6.1	L0 Central
6.6.1.1	RoI Distributor

Institute
ANL

WBS	Item
6.6.2	L0 Calorimeter
6.6.2.1	FEX
6.6.2.1.1	FEX algorithm 1
6.6.2.1.2	FEX algorithm 2
6.6.2.1.3	Topo cluster processing
6.6.2.1.4	Topo cluster handling

Institute
Chicago
Indiana
MSU
Oregon

WBS	Item
6.6.3	L1 Global
6.6.3.1	Aggregator
6.6.3.1.1	Aggregator hardware
6.6.3.1.2	Control firmware
6.6.3.1.3	Data handling firmware
6.6.3.2	Event Processor
6.6.3.2.1	Processor unit
6.6.3.2.2	Control firmware
6.6.3.2.3	Processing algorithm 1
6.6.3.2.4	Processing algorithm 2
6.6.3.2.5	Processing algorithm 3
6.6.3.2.6	Processing algorithm 4
6.6.3.2.7	Processing algorithm 5

Institute
BNL
Chicago
Indiana
Louisiana
MSU
Oregon
Pitt

WBS	Item
6.6.4	L1 Track
6.6.4.1	Processing
6.6.4.1.1	Input data handling
6.6.4.1.2	Pre-processor
6.6.4.1.3	AM carrier
6.6.4.2	Second stage
6.6.4.2.1	Tracking firmware
6.6.4.2.2	Output handling

Institute
ANL
Indiana
Penn
SLAC

WBS	Item
6.6.5	FTK++
6.6.5.1	Processing
6.6.5.1.1	Data formatter
6.6.5.1.2	Data organizer
6.6.5.2	Second stage
6.6.5.2.1	Track fitting
6.6.5.2.2	Global fitting
6.6.5.2.3	Output handling

Institute
Chicago
UIUC
NIU
Stanford

WBS	Item
6.6.6	DAQ/EF
6.6.6.1	Detector Readout
6.6.6.1.1	FELIX data handling hardware and firmware
6.6.6.1.2	FELIX control hardware and firmware

Institute
ANL
BNL

ATLAS TDAQ Schedule

Concerning the Schedule

- Generally ok for US planning
- Schedule varying significantly for different WBS items
- TDAQ aiming major installation and commissioning in 2025 (not 2024)
- Several TDAQ deliverables needed early for detector testing (such as ITK commissioning on surface)

Software

WBS	Areas	Comments	
	HLT core software	New framework, future technology, etc	
	Readout software	Data handler, etc	
	Dataflow software	Storage handler, etc	

- Prepare WBS with software projects in Phase-II construction scope
- Working with USATLAS management and TDAQ management to define the feasible items

Next Steps

- Advance the WBS structure with
  - Schedule
  - Effort
  - Cost
- Evolve with all US TDAQ institutes

US Interests Expressed

Institute	Area	Available FTE/year
ANL	RoID, L1Track (AM carrier), FELIX Readout	2.5 FTEs
BNL	L0CALO, L1Global, FELIX readout	3.0 FTEs
Chicago	FTK++ (tracking fitting), L1Global (jet algorithms)	2.0 FTEs
UIUC	FTK++ (second stage)	1.0 FTE
Indiana	L1Global, L1Track	2.0 FTEs
Louisiana Tech	GPU for jet triggers	*
MSU	L0CALO (Topo cluster in LAr DPS), L1Global	3.5 FTEs
NIU	FTK++ (firmware)	1.0 FTE
Oregon	L0CALO, L1Global (Topo cluster, jet algorithms)	1.0 FTE
Penn	L1Track	1.0 FTE
Pittsburgh	Extend gFEX related work	*
SLAC	L1Track (Data Formatter), ITK readout	1.5 FTEs
Stanford	FTK++	

Engineer effort only

Software Interests

Institutes	Area	
UCI	Dataflow and HLT software	
Wisconsin	Dataflow and HLT core software	
MSU	Dataflow software	
SMU	HLT core software	