

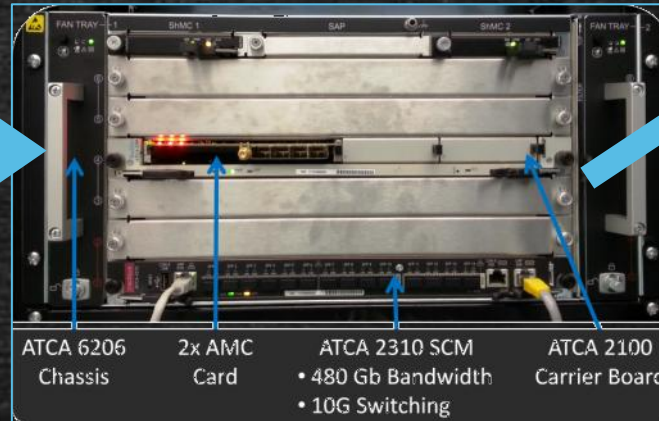
An Integration Framework Tool for ATCA Chassis in the ATLAS Detector

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Infrastructure Upgrade



sROD



ATCA Chassis



- ATCA replacement for VME Crates
- ATCA will house sROD and interface into the Detector Control System
- Were no software tools for this integration effort

	Present	Phase II
Total BW	~165 Gbps	~40 Tbps (+40 Tbps)
N. fibers	256	4096 (+4096)
BW/drawer	640 Mbps	160 Gbps (+160 Gbps)

Advantages of ATCA

Large Telecom Industry



High Availability

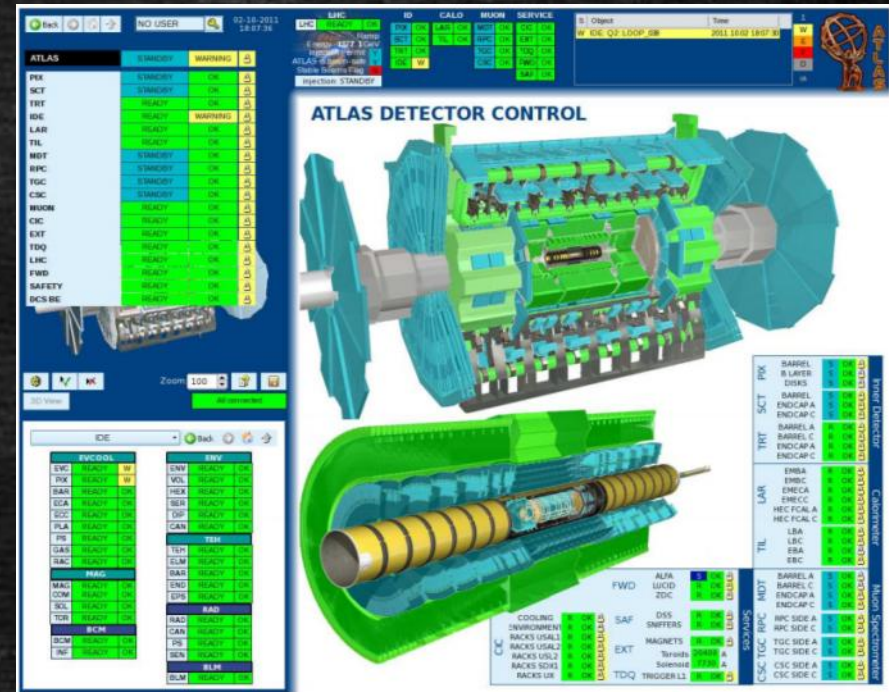
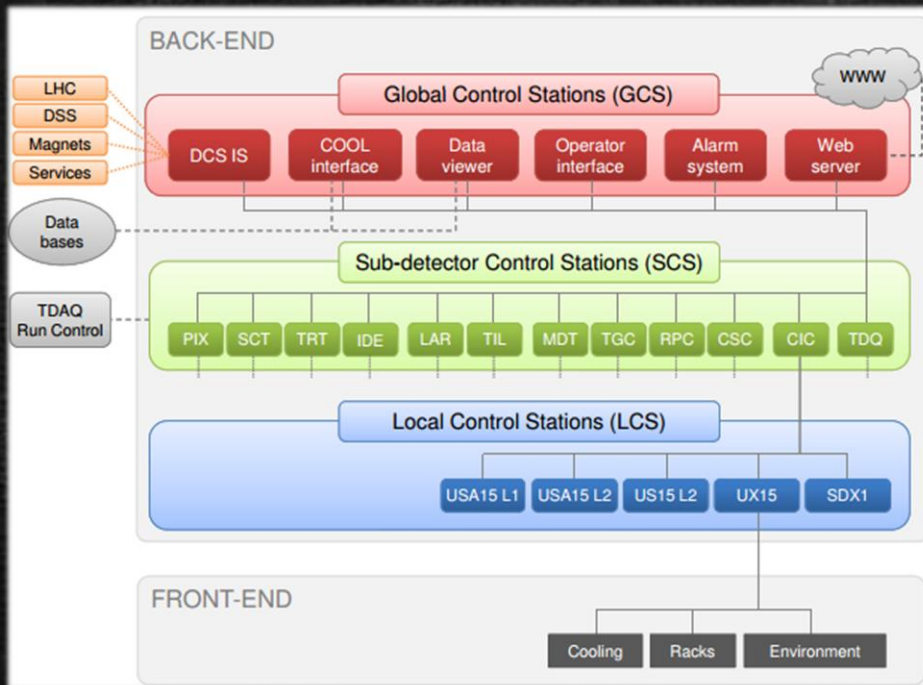
High Reliability

High Redundancy

- Modular (Extremely)
- Hot swapping
- Rear Transition Module
- High Speed Backplane - 10G 40G
- Redundancy
- Monitoring and Control



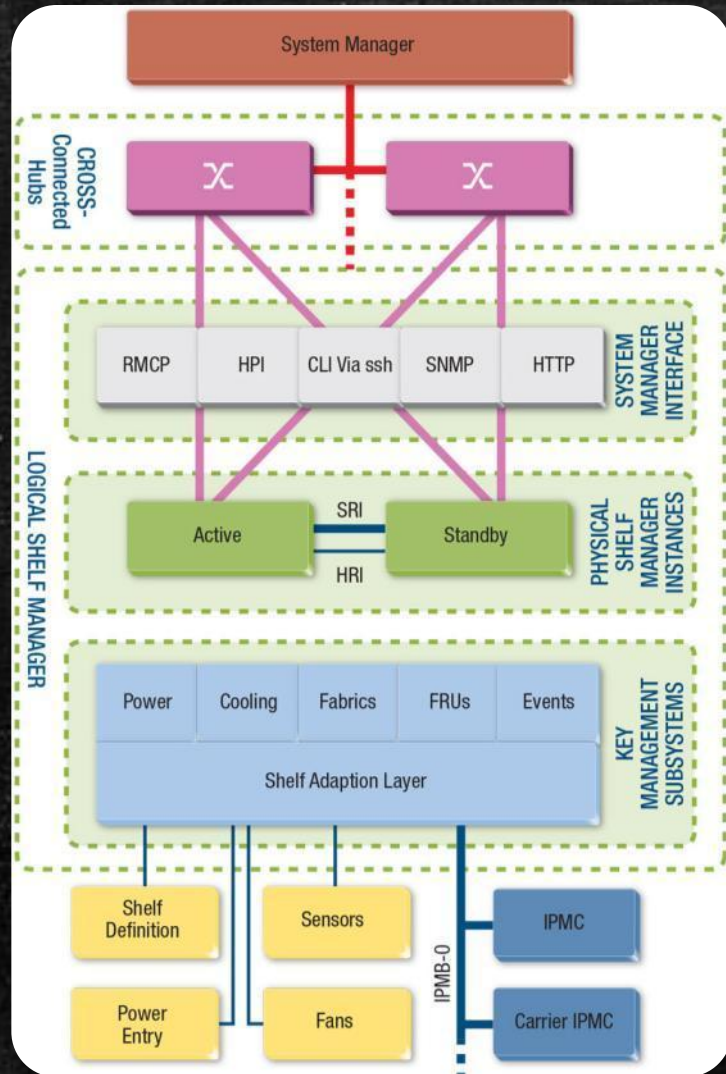
Detector Control System



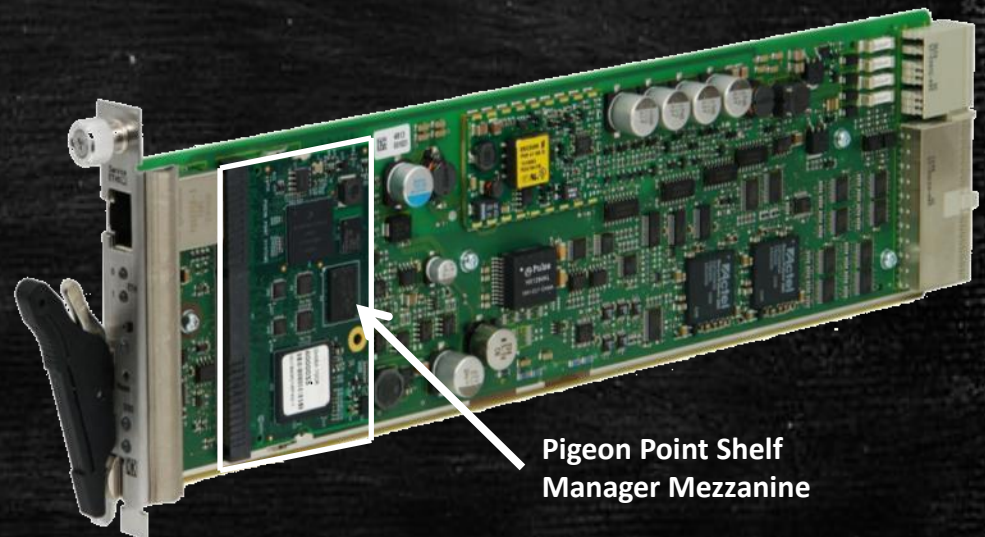
- 12 Sub-detectors and common infrastructure
- Distributed system
- Reads, processes and archives $\sim 10^6$ parameters

- DCS Web interface
 - Summary of information
 - Live update
 - Easy to read

Interface to ATCA - Shelf Manager



- Pigeon Point Shelf Managers
 - Ethernet connection (SNMP)
 - Passive control
 - Interface to the chassis
 - Follows specifications defined by PICMG VITA and SAForum – Open design, source code and operation
 - Suggested by ATLAS DCS



Framework Tool Desired Functionality



Search

Sort

Create

Configure

fwATCA – Search – Sort – Create

QuickTest : fwATCA/snmpDpCreate.pnl (System1 - ATLTILATCA; #1)

Module Panel Scale Help

Host Name: localhost Agent: System1: 2_SNMPAgent_1 Poll Delay: 10 Datapoint Address: Activate on Creation Discover...

Atca Content	Name	Name	Value	Thresh	Type	OID
		setPowered	1	-	INT	1.3.6.1
		ipmbAddress	136	-	INT	1.3.6.1
		present	1	-	INT	1.3.6.1
		getPowered	1	-	INT	1.3.6.1
		manufacturer	RadSys Corp.	-	STRING	1.3.6.1
		healthy	1	-	INT	1.3.6.1
		slot	4	-	INT	1.3.6.1
		reset	0	-	INT	1.3.6.1
		name	ATCA-1200	-	STRING	1.3.6.1

Standard data points

Create standard data points

Create Standard DataPoints Create Selected DataPoints

Delete All DataPoints Delete Selected DataPoints

Key ■ Data Points Not Found

QuickTest : fwATCA/snmpDpCreate.pnl (System1 - ATLTILATCA; #1)

Module Panel Scale Help

Host Name: localhost Agent: System1: 2_SNMPAgent_1 Poll Delay: 10 Datapoint Address: Activate on Creation Discover...

Atca Content	Name	Sen#	Name	Value	Thresh	Type
		0	ATCA FRU Hotswap	Current State Mask 0x0010	-	MASK
		1	ATCAPhysIpmb	Current State Mask 0x0008	-	MASK
		2	ATCAPhysIpmb-L	Current State Mask 0x0002	-	MASK
		3	Ejector Closed	Current State Mask 0x0002	-	MASK
		4	-48V Absent A	Current State Mask 0x0001	-	MASK
		5	-48V Absent B	Current State Mask 0x0002	-	MASK
		6	-48V Fuse Fault	Current State Mask 0x0001	-	MASK
		7	IPMC WD Reset	Current State Mask 0x0001	-	MASK
		8	NTS Interrupt	Current State Mask 0x0001	-	MASK
		9	Power Fail	Current State Mask 0x0001	-	MASK
		10	+3.3V_IPMC	3.325000	<input checked="" type="checkbox"/>	FLOAT
		11	+12V	11.928000	<input checked="" type="checkbox"/>	FLOAT
		12	+3.3V	3.325000	<input checked="" type="checkbox"/>	FLOAT
		13	+2.5V	2.502500	<input checked="" type="checkbox"/>	FLOAT
		14	+1.8V	1.802500	<input checked="" type="checkbox"/>	FLOAT
		15	+1.5V	1.496000	<input checked="" type="checkbox"/>	FLOAT
		16	+1.25	1.232000	<input checked="" type="checkbox"/>	FLOAT
		17				
		18				
		19				
		20	+3.3V_PEX	3.264000	<input checked="" type="checkbox"/>	FLOAT
		21	ZoneA In Temp	28.000000	<input checked="" type="checkbox"/>	INT
		22	ZoneB In Te			INT
		23	ZoneC In Te			INT
		24	ZoneD In Te			INT
		25	ZoneA Out T			INT
		26	ZoneB Out T			INT
		27	ZoneC Out T			INT

Custom data points

Create selected custom data points

Create Standard DataPoints Create Selected DataPoints

Delete All DataPoints Delete Selected DataPoints

Key ■ Data Points Not Found

fwATCA - Configure

Filters to Search Data Points

List of Data Points Previously Created

1 **2** **3**

Data Point Configure

Sub Det ID: TIL | Sub Sys Name: SROD | Host Name: ATLTILWITS

System1:ATCA/ATLTILWITS/Slot3/Fru0

dpElement	Act Addr	Description
name	<input type="checkbox"/>	TIL SROD ATLTILWITS Slot1 Sensor17 Vcc+12V name
hresholdActive	<input type="checkbox"/>	TIL SROD ATLTILWITS Slot1 Sensor17 Vcc+12V thres
value	<input type="checkbox"/>	TIL SROD ATLTILWITS Slot1 Sensor17 Vcc+12V value
valueRaw	<input type="checkbox"/>	TIL SROD ATLTILWITS Slot1 Sensor17 Vcc+12V value

Cross Check Data Points to show data points not found in Shelf

ATLAS ATCA DCS Developers

- We started E-group after first version of fwATCA
 - atlas-dcs-atca-developers@cern.ch
- Currently have 14 members
- First kick starter meeting
 - <https://indico.cern.ch/event/370695/>
- Outcome:
 - Positive feedback about fwATCA with some suggestions
 - accepted by DCS and developers group
 - Using framework as the basis of integration effort
 - Adding new features:
 - Finite State Machine (Almost complete – CSC Group)
 - Generic status panels (Almost complete – CSC Group)
 - Alert configuration (Work in progress)

FSM Generation & Display

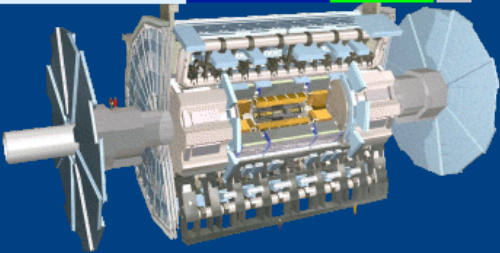
Back Home Refresh NO USER 09-02-2015 10:40:02

CSC INFRASTRUCTURE CSC ATCA

ATCA SHELF 1	READY	OK	
BLADE 1	ON	OK	✓
BLADE 2	ON	OK	✓
BLADE 3	ON	OK	✓
BLADE 4	ON	OK	✓
BLADE 5	ON	OK	✓
BLADE 6	ON	OK	✓
POWER SUPPLY 1	ON	OK	✓
POWER SUPPLY 2	ON	OK	✓
POWER SUPPLY 3	ON	OK	✓
SHELF MANAGER 1	ON	OK	✓
SHELF MANAGER 2	OFF	OK	✓

LHC
LHC UNKNOWN E
No Beam
Energy: 449.9 GeV
Injection Permit
ATLAS is beam-safe ?
Stable Beams Flag ?
Handshake

S	Object	Time	2
W	CSC: CSC COOLING::Side A	2015.02.09 10:39:42	W
W	CSC: CSC COOLING::Side C	2015.02.09 10:39:42	E
			F
			D
			U



QuickTest: csc_atca_tools/fwATCA_FsmGene...
Module Panel Scale Help

Generate ATCA FSM [CSC]

Stop FSM Create object types Generate FSM
 Remove ATCA tree Configure object types
 Remove object types Create ATCA tree Start FSM

WARNING: This script will stop and remove the current ATCA FSM tree before creating the new one!

CSC subdetector detected.

0% Close

CSC ATCA SHELF 1

BROOKHAVEN NATIONAL LABORATORY

Device: ATCA 6U Push-Pull AC/DC chass **AdvancedTCA**
 Manufacturer: Asis ltd.
 Chassis ID: ASM-CSC-PRI-01
 Uptime: 06 day(s) 00 hour(s) 49 min(s) Healthy

Slot	Power	Present	Healthy	Hot Swap	Device	Basic Sensors	Reset
Slot 1	ON	ON	ON	OFF	SLAC / Cluster On Board	Sensor1 Sensor2 Sensor3 Sensor4 Sensor5 Sensor6	Reset
Slot 2	ON	ON	ON	OFF	SLAC / Cluster On Board	Sensor1 Sensor2 Sensor3 Sensor4 Sensor5 Sensor6	Reset
Slot 3	ON	ON	ON	OFF	SLAC / Cluster On Board	Sensor1 Sensor2 Sensor3 Sensor4 Sensor5 Sensor6	Reset
Slot 4	ON	ON	ON	OFF	SLAC / Cluster On Board	Sensor1 Sensor2 Sensor3 Sensor4 Sensor5 Sensor6	Reset
Slot 5	ON	ON	ON	OFF	SLAC / Cluster On Board	Sensor1 Sensor2 Sensor3 Sensor4 Sensor5 Sensor6	Reset
Slot 6	ON	ON	ON	OFF	SLAC / Cluster On Board	Sensor1 Sensor2 Sensor3 Sensor4 Sensor5 Sensor6	Reset

Instance: 1 [ON] Instance: 2 [OFF]
 Active Present Healthy (for each instance)

Power Supply: 1 [Present] Power Supply: 2 [Present] Power Supply: 3 [Present]

Fan tray info		PEM info	
fruID	32	fruID	3
ipmbAddress	-1	healthy	0
present	1	ipmbAddress	32
healthy	1	present	0
slot	1	slot	1
fanLevel	0		

Misc Sensors info

BOTTOM side	32 C	3.3STBY voltage	3.36 V
TOP side	28 C	3.3MAIN voltage	3.36 V
Local Temp	23 C	+5V voltage	5.07 V
BoardTemp:RTM	31 C	VBAT	2.62 V
BoardTemp:DTM	34 C	FT 1 Tach. 1	4580 rpm
JunctionTemp:DTM	44 C	FT 1 Tach. 2	4708 rpm
BoardTemp:DPM	41 C	FT 1 Tach. 3	4708 rpm
JunctionTemp:DPM	55 C	FT 1 Tach. 4	1059 rpm
BoardTemp:RTM	29 C	FT 1 Tach. 5	1059 rpm
BoardTemp:DTM	35 C	FT 1 Tach. 6	4708 rpm
JunctionTemp:DTM	43 C	FT 1 Tach. 7	4708 rpm
BoardTemp:DPM	41 C	FT 1 Tach. 8	4842 rpm
JunctionTemp:DPM	55 C	FT 1 Tach. 9	1129 rpm
BoardTemp:RTM	29 C	FT 1 Tach. 10	1059 rpm
BoardTemp:DTM	32 C	FT 2 Tach. 1	4708 rpm
JunctionTemp:DTM	44 C	FT 2 Tach. 2	4708 rpm

Work by CSC Group:
Paris Moschovakos
Konstantinos Ntekas

Summary & Plans

- Pioneered the integration of ATCA into the ATLAS DCS – Now used by:
 - CSC (MicroMega), L1Topo and FTK
- Common ATLAS framework which provides a platform to:
 - Search, Sort and standardize information
 - Automate data point creation and configuration
- Platform allows:
 - Custom panel development
 - Finite State Machine development
 - Expert configuration and control
- Future work
 - Alert configuration panel



Questions

Who?

What?

Where?

Why?

How?

Acknowledgement & Information

Stefan Schlenker

Filipe Martins

Alberto Valero and Carlos Solans

- Documentation

<https://twiki.cern.ch/twiki/bin/viewauth/Atlas/AtlasDcsAtca>

- SVN Repository

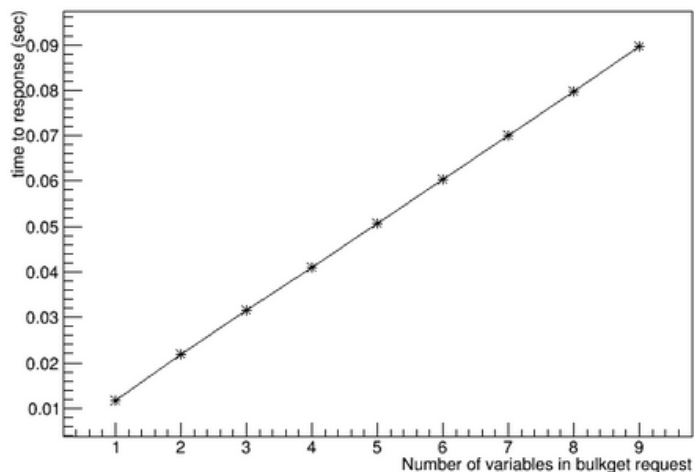
<https://svnweb.cern.ch/cern/wsvn/atlasdcs/fwATCA/>

- E-Group

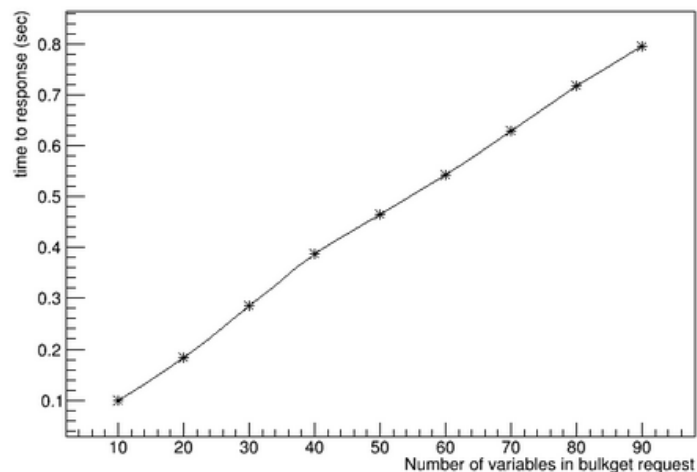
atlas-dcs-atca-developers@cern.ch

Back Up

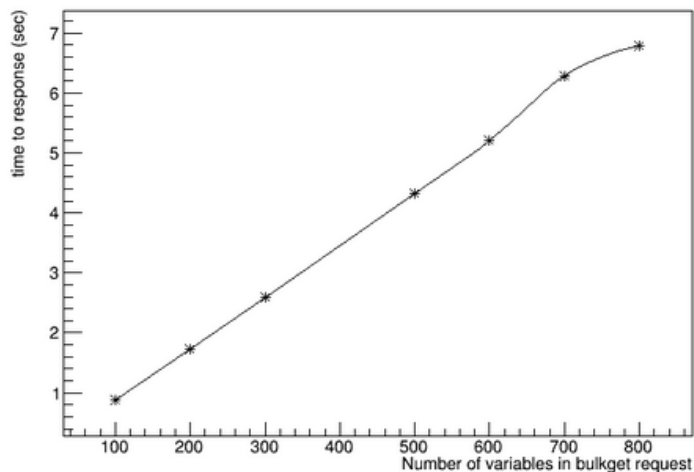
Graph



Graph



Graph



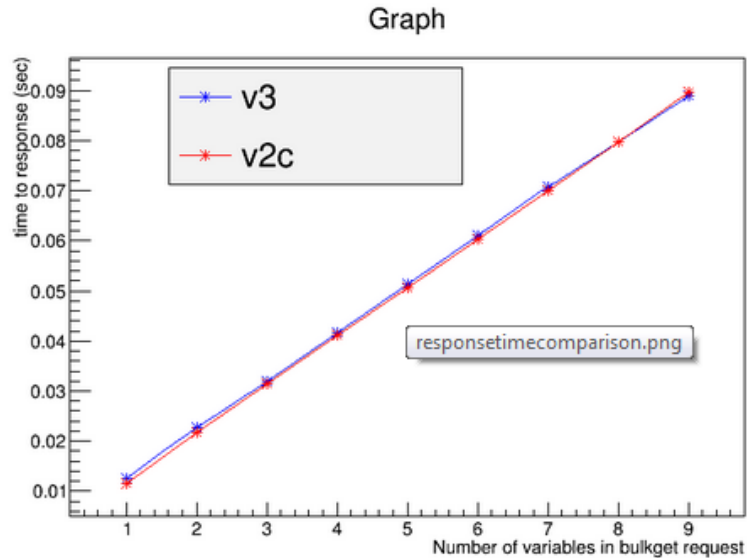
Bulk Get up to 900 Variables

~100 sensors / sec for standard time out

Taken from:
<https://twiki.cern.ch/twiki/bin/view/ath/Atlas/ShelfManagerInterfaceToD>
CS

Back Up

Timing results without load on the shelf manager, v2c v3 comparison



No major difference

Taken from:

<https://twiki.cern.ch/twiki/bin/viewauth/Atlas/ShelfManagerInterfaceToDCS>