

Status of FTK & requests 2013

- Old Milestones: we have even more relaxed our schedule
- Status of FTK work
- Money requests for 2013

NEWS & Future steps

- **TDR** with tested prototypes June 2013
- **University of Geneva** **joined** FTK. Integration/commis./**LAMB** project
- **LPNHE** and **University of Tessoniki** show interest – will sign IMOU
- **Heidelberg** got few funds (25 keuros x 4 years)- will sign the IMOU
- **FTK IAPP project** selected for **negotiation**@FP7 - manpower support
- **CAEN** & **PRISMA ELECTRONINCS** joining with IAPP

Paola Giannetti, INFN Pisa, for the FTK Group

ATLAS Italia, Sep 5, 2012

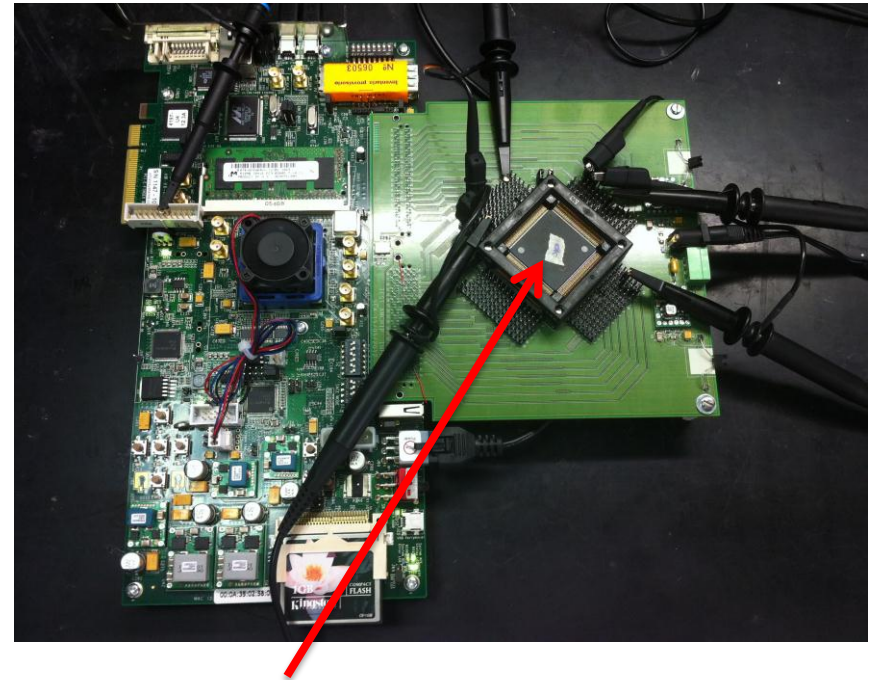
Our intended schedule

- Install needed dual-output HOLAs during the upcoming winter shutdown. **DONE January 2012**
- Commission in 2012 the FTK vertical slice covering a small η - ϕ region of the detector. **September 2012** **2013**
- Have tested prototypes of FTK boards by the end of ~~2012~~ (some delays are possible due to US funding delay and possible need for a second prototype).
- **Install in 2014 FTK covering the barrel** ~~(~~

As much as possible with 8 PUs

MILESTONEs 2012

30-05-2011	Fisica - sottomissione per pubblicazione della ricerca di particelle supersimmetriche con l'intera statistica 2011 nei principali canali di ricerca con Emiss (0 lepton, 1 lepton, multilepton)
30-04-2012	Calcolo - Processamento e ricostruzione 5% dati raccolti al Tier1 e simulazione 10% dati MC nel Tier1 e nel Tier2
30-04-2012	Fisica - ricerche W' e Z' con l'intera statistica 2011 (assunta 4 fb-1)
30-04-2012	Fisica - ricerche di decadimenti di nuove particelle con lunga vita media con la statistica 2011
30-06-2012	IBL-produzione ROD versione finale
30-06-2012	Fisica-misura sezione d'urto single top nel canale t
30-06-2012	Fisica - pubblicazione misura WW->l nu jj
31-07-2012	IBL - primo stave completamente equipaggiato
31-07-2012	Fisica - misura dell'asimmetria Afb in funzione della massa invariante o della rapidita' del sistema ttbar, con tutti i dati del 2011
30-09-2012	FTK - completato test AMchip-1
31-12-2012	IBL - Completamento produzione moduli
31-12-2012	FTK - vertical slice for Dh-Df ~ 1x1 commissioned and fully tested in parasitic
31-12-2012	Fisica - Ricerca SM Higgs da 114 a 600 GeV



Patterns firing correctly @100 MHz

Consumption ok, refined measurements ongoing

Yield measurement ongoing, seems good -

100% expected at 30/09

During the September Technical Stop the VS will be Installed at Point 1.

Data taking expected in November

100% expected at 31/12

AMCHIP04 big Jump in technology! (LNF, Pisa, Milano + ideas from USA)

Annovi, Beretta, Crescioli,
Liberali, Sacco, Stabile, Hoff

Consumption & performances OK
Yield under Measurement

NEW AMCHIP



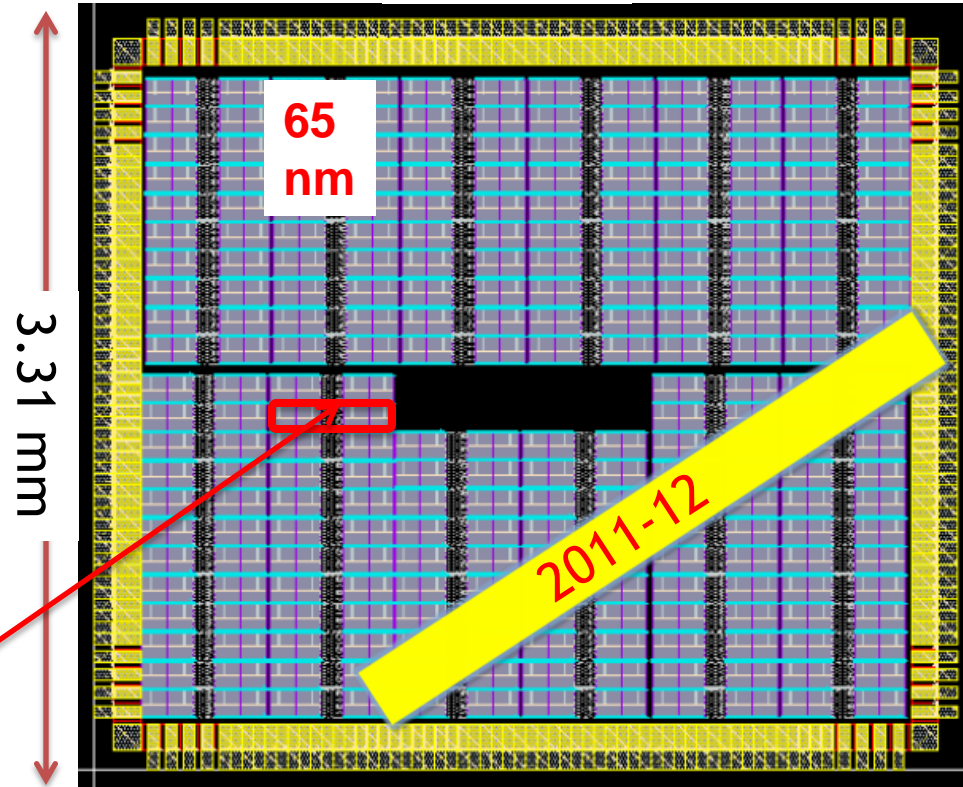
OLD	NEW	
40	100	MHz
6	8	#input parallel buses
4.3	12	Input BW Gbit/s
1	1	# output bus

Next step:

- 32 kpatt instead of 8kp
- Serial links
- New package Flip BGA

64 patterns= 2 full custom cells

← 3.80 mm →



AMBoard generations & tests

AMBslim5 for
standard test stands

AMBslim5++ for cooling tests

NEW:AMBFTK
for 2015 (PI-MI)



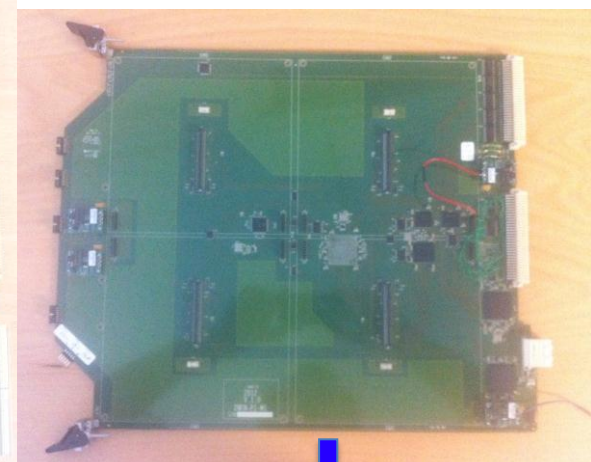
Old - CDF like
64 AMchips

(a)



New - 128 AMchips
6 A @ 48 Volts
270 Watts @ 1,8 V

(b)



Under test in Pisa



LAMBFTK to be assembled

(PG-PI-PV)

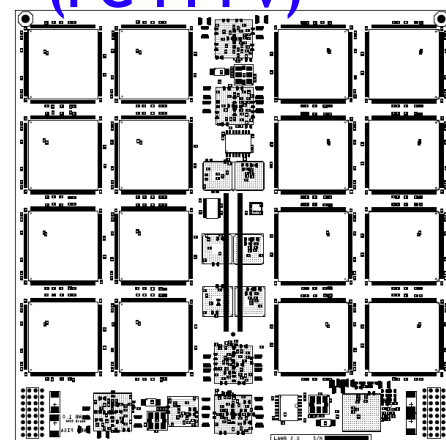
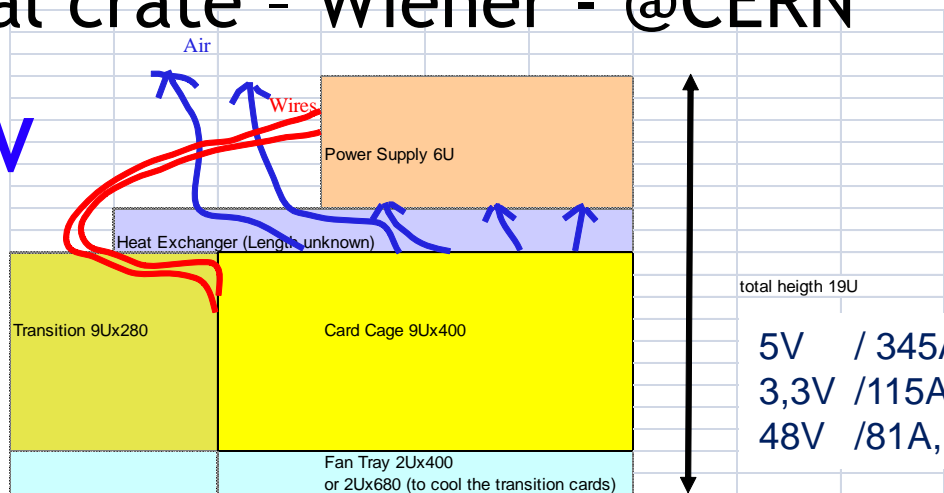


Figure 3: AM Board - (a) standard VME VIPA version (b) custom 48V version

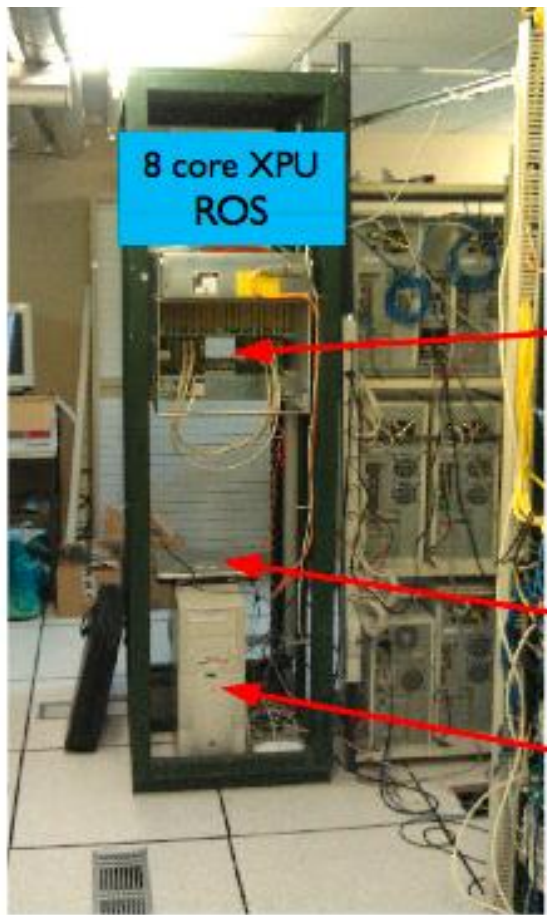
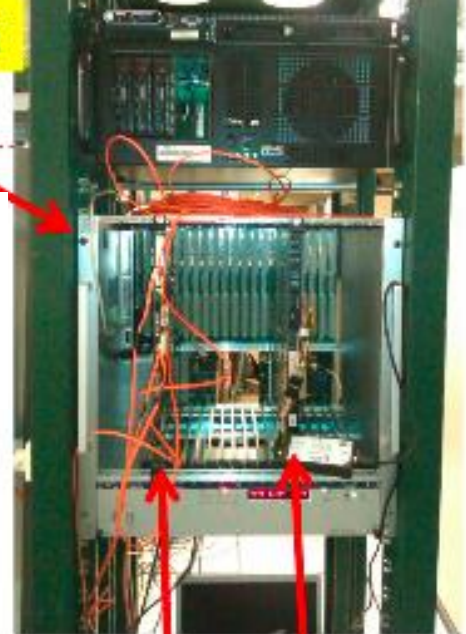
Final crate - Wiener - @CERN

PI-PV



FRONT OF THE CRATE

VERTICAL SLICE will move to LAB4 for TDAQ Integration tests - all involved



8 core XPU ROS

Crate with VS boards: it's accessible from the front and the back.

Laptop with Xilinx programmer

PC with QUEST and FILAR cards

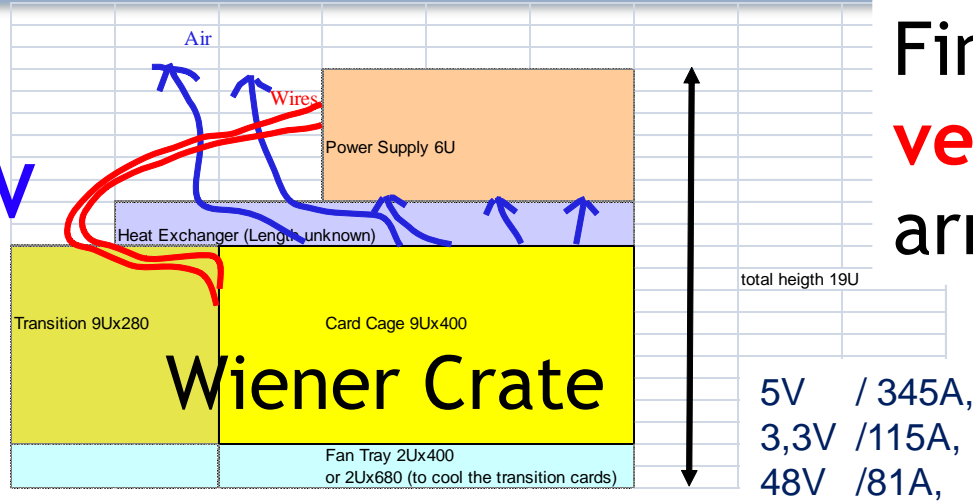
AMBOARD

EDRO with input Fibers

ACTIVITY @CERN 2013

Cooling tests @Pavia first, point 1 after

PI-PV

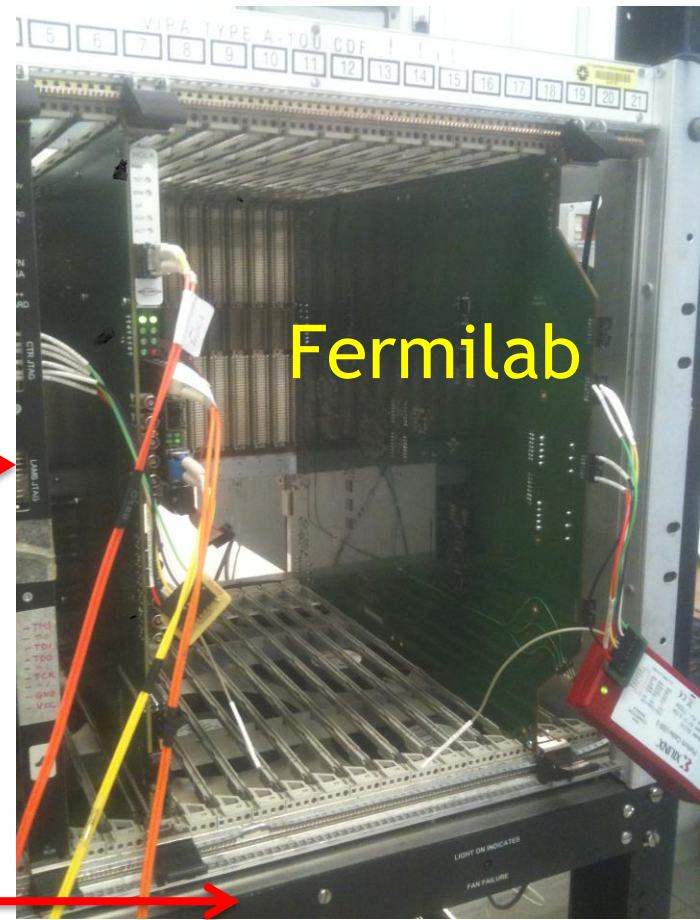


Final crate - Wiener
versus CDF crate
arrived from Fermilab

CDF Crate

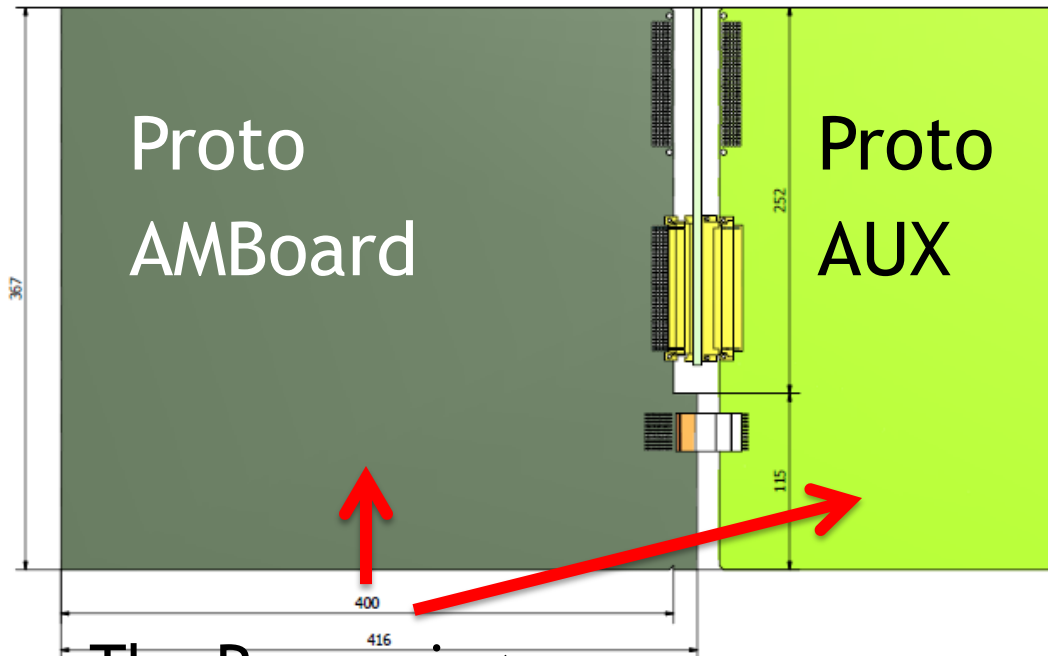
We will put in the crate 4 AMBoards+EDros
together with boards full of resistors
able to sink current

Powerful 1U FAN

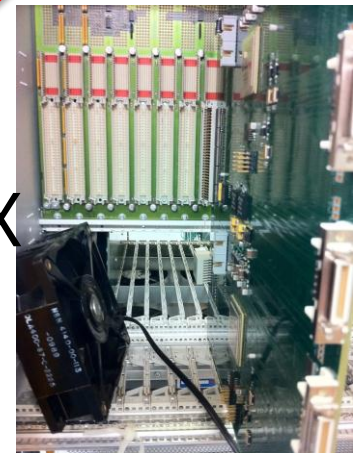


ACTIVITY @CERN 2014

Integration, tests[Italy-Japan-USA]: AMBFTK + FTK_IM + [AUXFTK + DF + FLIC + ... From USA]



The reality:
AMBFTK + ProtoAUX
in the crate today
Proto-PU



The Processing
Unit (PU) project
2014: 10 AMBFTK+
40 LAMBFTK + 80
FTK_IM @point 1

Sblocco SJ - 24 keuros - Pisa

8 9U VME (VIPA) crates from CDF

+ Powerfull FANs + heat exchangers + 4 racks....

- Pavia 1 rack with 2 crates for cooling tests/LAMB production
- Milan 1 rack with 1 crate for AMBFTK test/production
- Frascati 1 rack with 1 crate for FTK_IM production
- Perugia 1 crate for LAMB tests VS work (Magalotti CMS)
- 2 crates at CERN (one at point 1 and one in lab 4)

A lot of test stands to prepare for **production**. We need:
some PS, some VME CPUs, Xilinx/Altera programmers,
2 Extra EDROs.

What for 2015? Small production

2 (like VS)-8 barrel wedges : 8 AMBFTK 32 LAMB 1.5 k chips

This is not too expensive for a demonstrator (small & modern)
After this (2015) we can do the pilot run

- 8 AMBoards → 20 keuro
 - 32 LAMBs → 20 keuro
 - 1,5 kchips → ~90 keuro
- } ~ **130 keuro**
in 2014

+

Production of FTK_IM **135 keuro** in 2014

Richieste 2013 - linee guida

- Produzione **rimandata ancora**
- 2012 si costruiscono e testano **pre-prototipi**
- 2013 **prototipi finali e loro tests** (Test stand=CDF Crates to be adjusted)
 - 20 k€** a Pavia per LAMB finali - Test Stand (TS) VME
 - 10 k€** a Pisa per AMBFTK finali + **10 SJ di contingenza**
 - 5 k€** a Milano per Test Stand (sviluppo di firmware)
 - 20 k€** a LNF per FTK_IM finale piccola produzione.

- **chip AM 2013**: IMPORTANTE prepararsi allo step finale costoso
 1. **Crescita dell'area** per ridurre il rischio step finale **(x10)**
 2. **Input/output Serializzati** per liberare pads per VCC/GND
 3. **Multi-packaging of dies** per aumentare la densita'

→ **200 k€** a Milano per crescita chip

Integration test still based on EDRO in 2013:

5 k€ a Bologna per 'rewarking' of EDROs e miglioramento
test stand

SUPER TOT **260 k€ + 10 SJ**

Summary

Milano: 5 k€ TS + AMchip05, 200 k€

Pisa: 10 k€ new AMBFTK + 10 SJ

Pavia: 20 k€: LAMBFTK (small prod) + Test board LAMB

LNf: 20 k€ FTK_IM

Bologna: 5 k€ (spese di laboratorio) ← **DIMENTICATI**

Tot: 260 keuro + 10 SJ

Responsabilita' e ME

- Paola G. L2 4 mesi
- Marco P. L2 4 mesi
- Agostino L. L2 1 mese
- Andrea N. L2 1,5 mesi
- Annovi A. L2 4 mesi
- Volpi G. L3 2 mesi
- Mauro V. L3 3 mesi
- A. Stabile L3 1 mese
- Valentino L. L3 1 mese

Responsabilita' descritte a questa pagina:

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

Integrazione di FTK con prototipi americani @CERN:

Pisa	1 mese
Milano	1 mese
Frascati	1 mese
Pavia	1 mese
Bologna	1 mese

Missioni interne

4 K€	Frascati	integrazione prototipi e AMchip I e II
5 K€	Pisa	integrazione prototipi
4 K€	Milano	AMchip I e II
4 K€	Pavia	integrazione prototipi
	Bologna	integrazione prototipi

Conclusions

- We are working hard for both the Final FTK & the intermediate versions (vertical slice and demonstrator)
- First prototypes (chip and boards) under tests.
- the AMchip is ok.
- the vertical slice plan has been reduced (LHC schedule).
- the TDR in 2013 should start final approvals
- A demonstrator expected in 2015, production will start after.

A thick, yellow diagonal bar with a blue outline, slanted from the bottom-left to the top-right. The word "Backup" is written in red, bold, sans-serif font across the center of the bar.

Backup