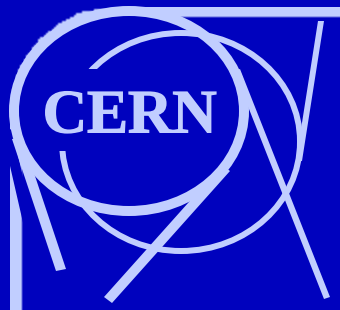


GSN Activities at CERN

1 Optical Standard

2 OC48c/SDH16 >><< GSN

3 10 Gigabit Ethernet >><< GSN

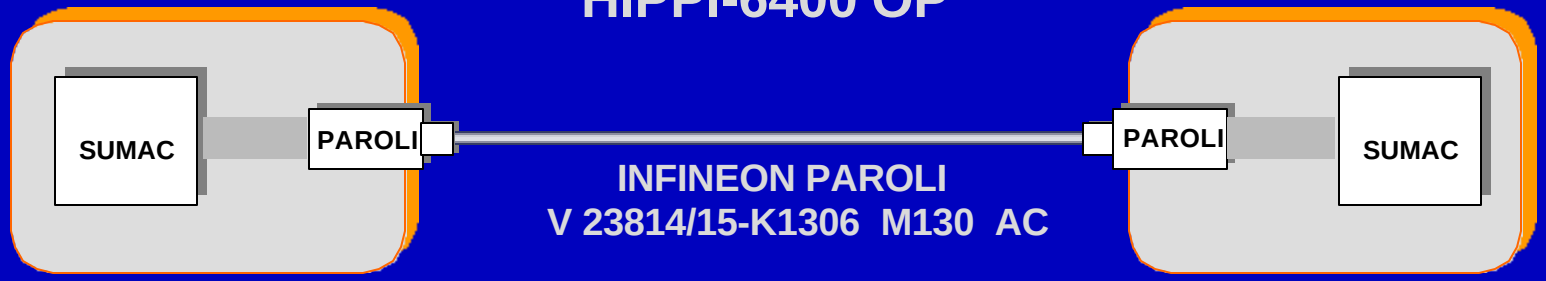
Arie Van Praag

CERN 1211 Geneve 23 Switzerland
e-mail a.van.praag@cern.ch
Tel: +41 22 767 5034 FAX: +41 22 7679495

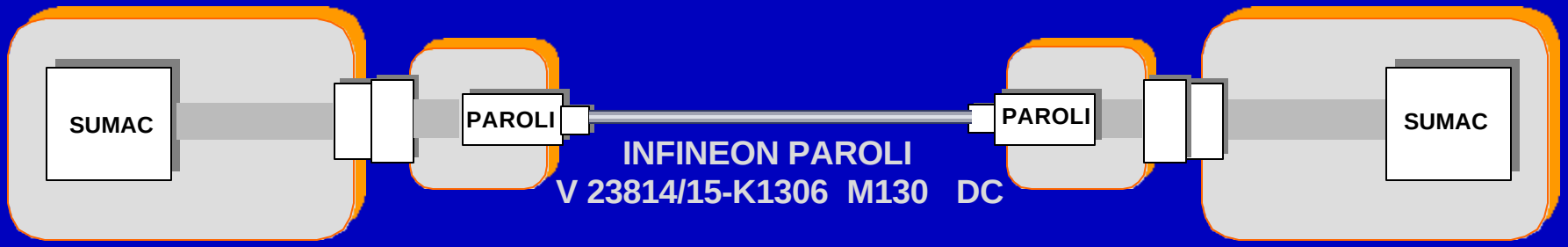
Optical Tests

Use Infineon *PAROLI'S* and/or Gore *nLIGHTEN*

HIPPI-6400 OP



Copper Cable Replacement



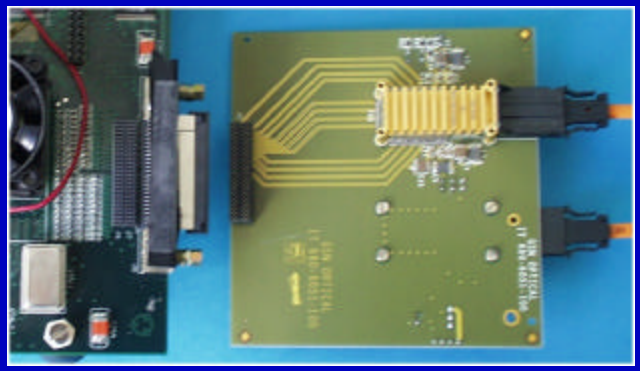
Optical Test

Tests limited to simple layout:

- **PAROLI AC version delivred but not working**
- **PAROLI DC version worked**
- **PAROLI DC version on the test circuit moved 1.35 Tera Byte Data error free**

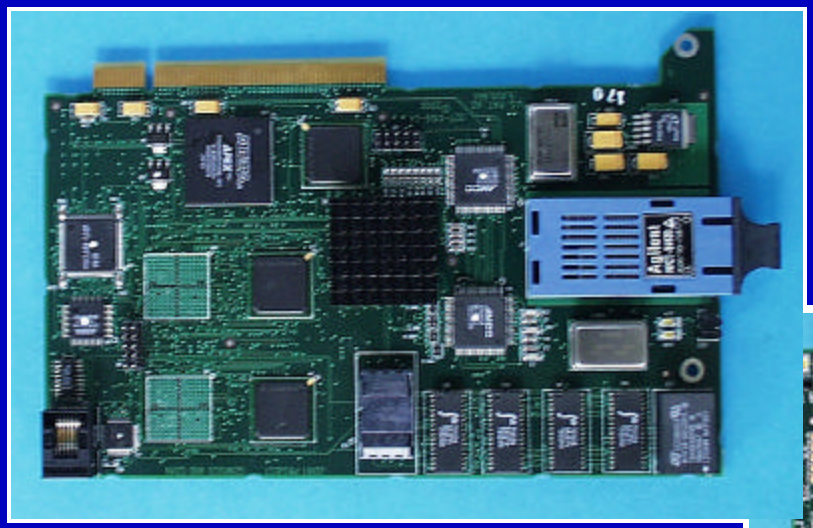
```
Enter : 15
IP headers ? [n] :
SNAP headers ? [n] :
Single Step ? [n] :
Virtual Channel (0-3, or F for Variable) [F]: 2
Destination ULA (hex) [0x0]:
Check DST ULA? [y] :
Source ULA (hex) [0x0]:
Message size (hex, in uPKTs, 1-7f, 0 for variable) [0]: 10
M_len (hex bytes, 0 for variable) [1f0]:
pass 2146324, VC2
Press any key to continue :
```

2 146 324 Passes corresponds to a total of 1.35 Tera Byte



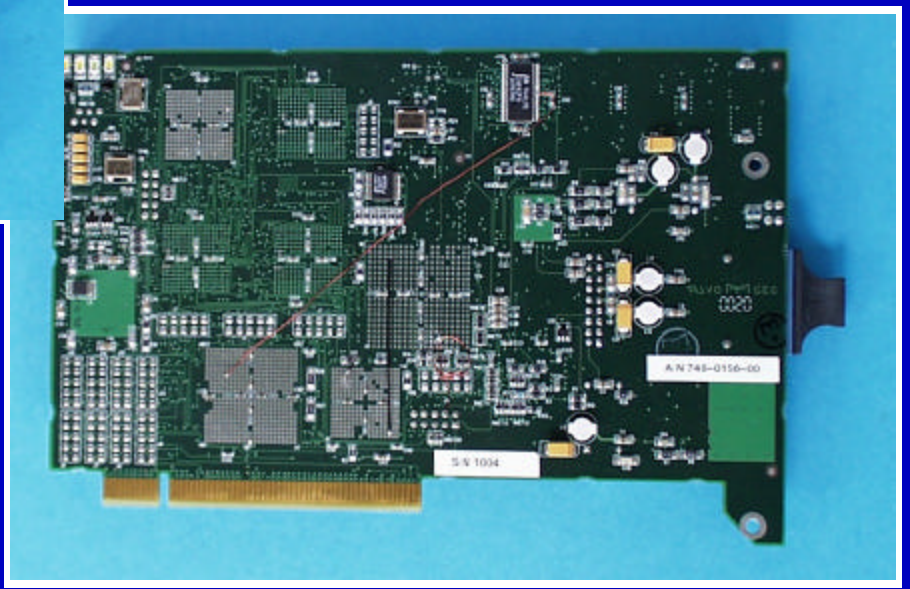
OC48c/SDH16 >><< GigE

for the Genroco Bridge



Component Side

Solder Side



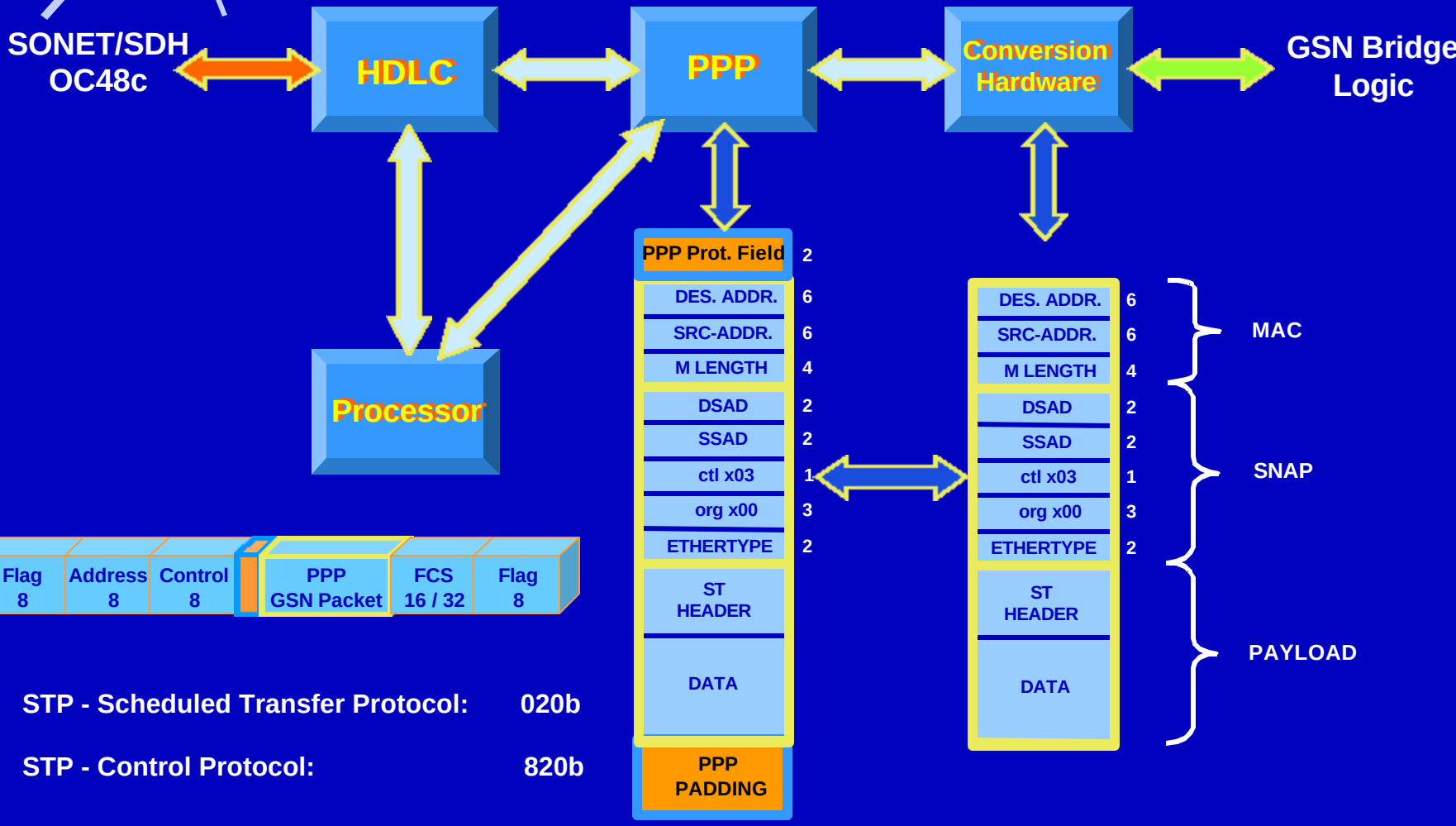
HIPPI-6400 OPT adapted as for Paroli DC

- Paroli Dc has 23 Channels
- SUMAC Chip runs at 500 MHz (copper cable mode).
- Multiplexing and DC Balancing inside the Paroli. (4b5b upcoding internal)
- Synchronous Transfer.
- Make CLOCK2_In with a 1 nsec delay.

SUMAC_Out Signals		PAROLI DC TX Pin No			PAROLI DC RX Pin No			SUMAC_In Signals	
CLOCK2_Out		Pins	11-12		Pins	11-12		CLOCK2_In	
D00_Out	DO8_Out	Pins	17-18	13-14	Pins	17-18	13-14	D00_In	D08_In
D01_Out	DO9_Out	Pins	21-22	15-16	Pins	21-22	15-16	D01_In	D09_In
D02_Out	D10_Out	Pins	26-27	19-20	Pins	26-27	19-20	D02_In	D10_In
D03_Out	D11_Out	Pins	31-32	23-24	Pins	31-32	23-24	D03_In	D11_In
D04_Out	D12_Out	Pins	35-36	29-30	Pins	35-36	29-30	D04_In	D12_In
D05_Out	D13_Out	Pins	39-40	33-34	Pins	39-40	33-34	D05_In	D13_In
D06_Out	D14_Out	Pins	43-44	37-38	Pins	43-44	37-38	D06_In	D14_In
D07_Out	D15_Out	Pins	49-50	41-42	Pins	49-50	41-42	D07_In	D15_In
C0_Out	C2_Out	Pins	53-54	46-47	Pins	53-54	46-47	C0_In	C2_In
C1_Out	C3_Out	Pins	57-58	51-52	Pins	57-58	51-52	C1_In	C3_In
FRAME_Out	CLOCK_Out	Pins	55-56	59-60	Pins	55-56	59-60	FRAME_In	Clock_In

Because of the Internal multiplexing it is difficult to define channels: such define pin numbers

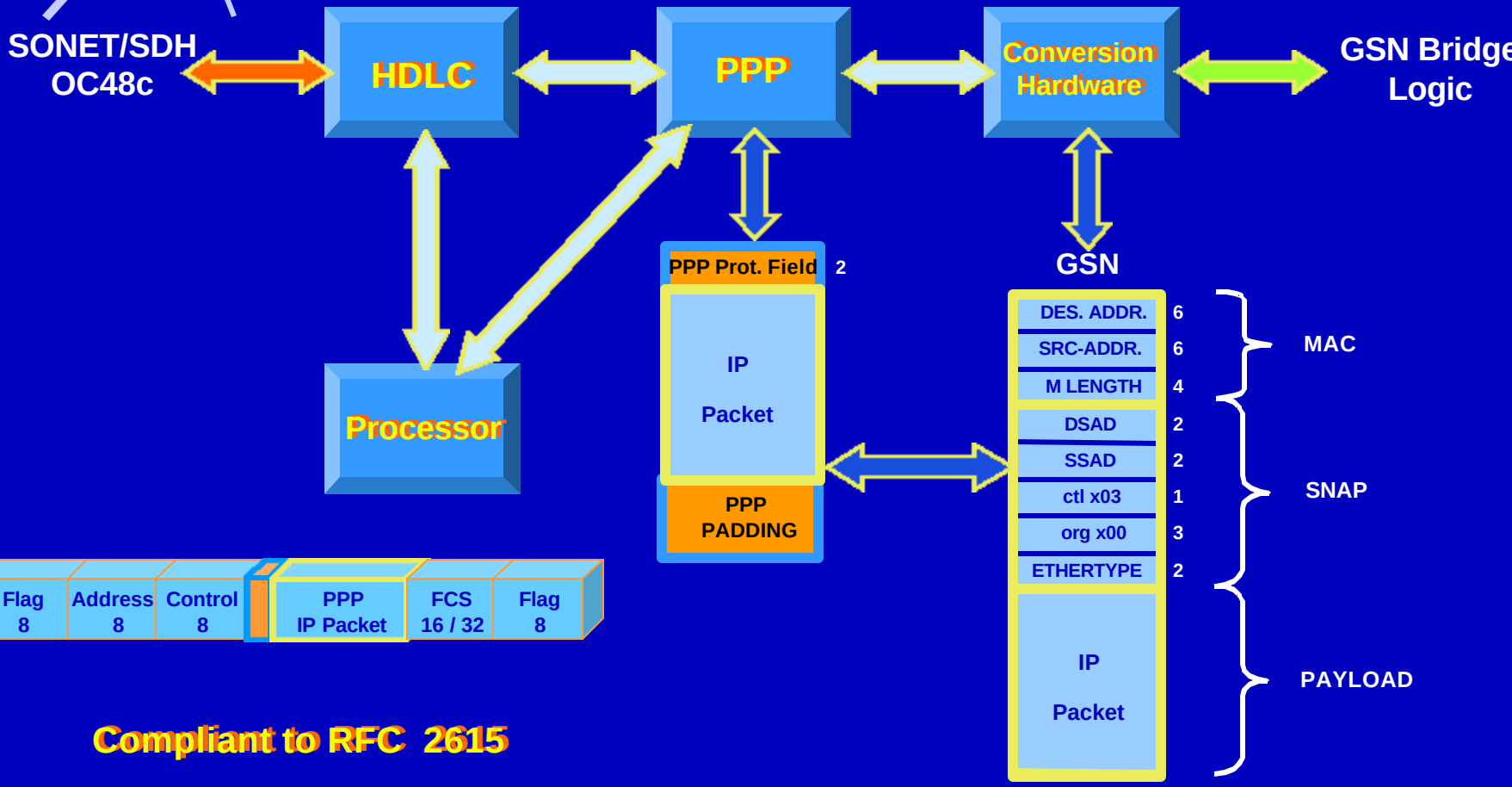
OC48c GSN ST Header Conversion



STP - Scheduled Transfer Protocol: 020b

STP - Control Protocol: 820b

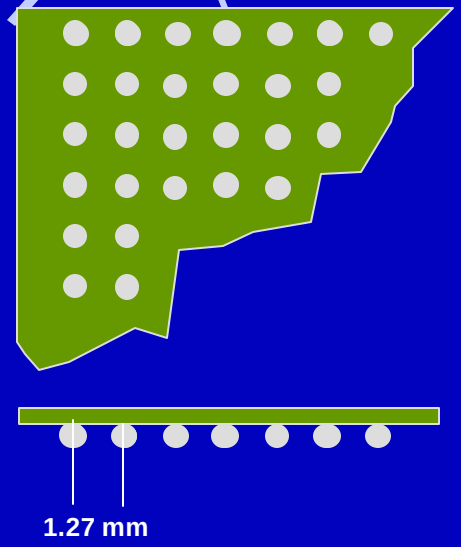
OC48c GSN IP Header Conversion



Compliant to RFC 2615

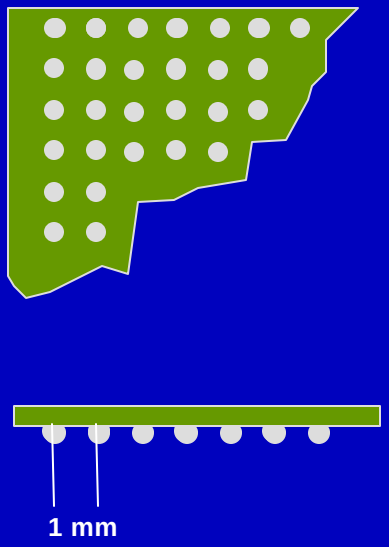
Problems with new Technology

BGA's ??



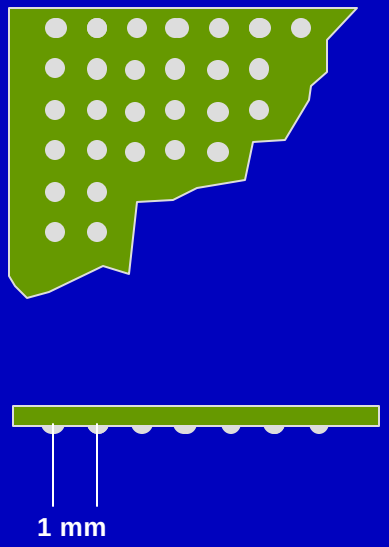
AMAZON
360 pins = 19 X 19 -1
Solder Ball 1.27 mm

6 boards 1chip
1 board with error
unknown



ALTERA
484 pins = 22 X 22
Solder Ball .5 mm

6 boards 1 chip
1 board with error
bad solder joint



IDT Fifo
256 pins = 16 X 16 -1
Solder Ball .25 mm

6 boards 5chips
5 boards with multiple errors
bad solder joints

AMAZON CHIP

OFD0 PROBLEM:

If descrambling discovers the code 0FD0 in the on off last 4 bytes AND the message length is a multiple of 4 >> >> this code is seen as an error code and the frame is **DISCARDED**.

CERN

LHC Experiments:

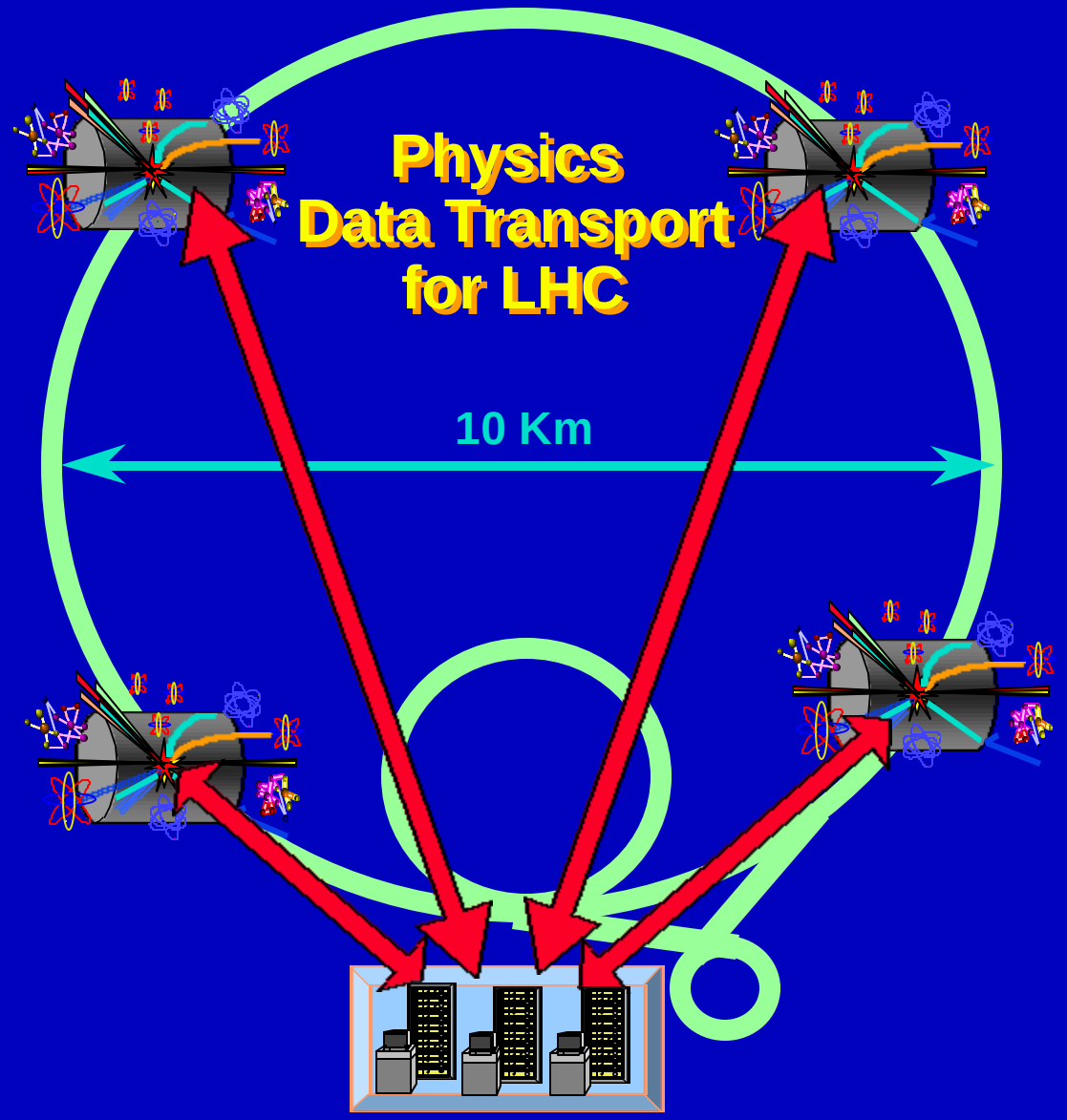
Each experiment Transmits at least to 100 MBytes/s

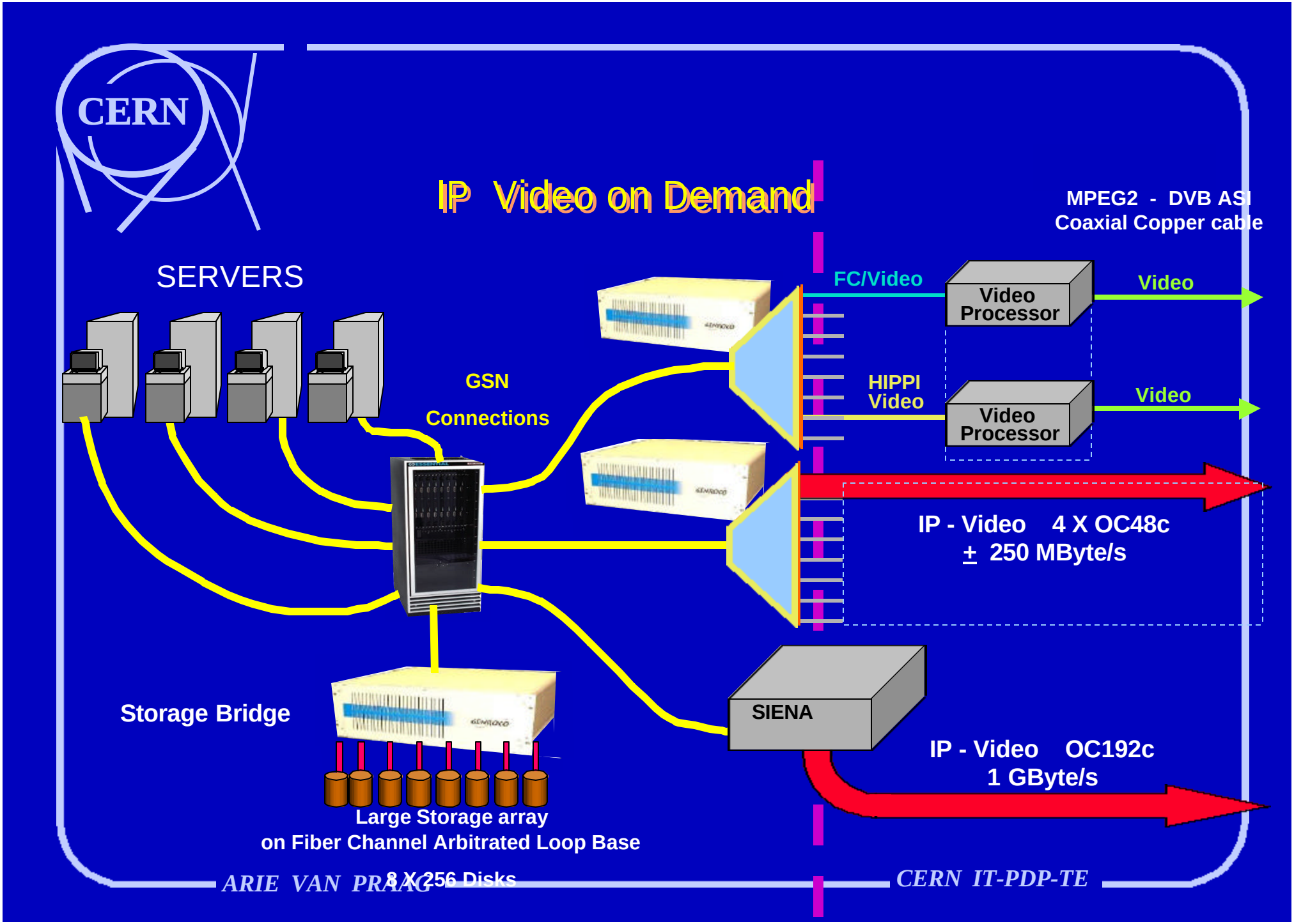
How to get this data to the computer center ?

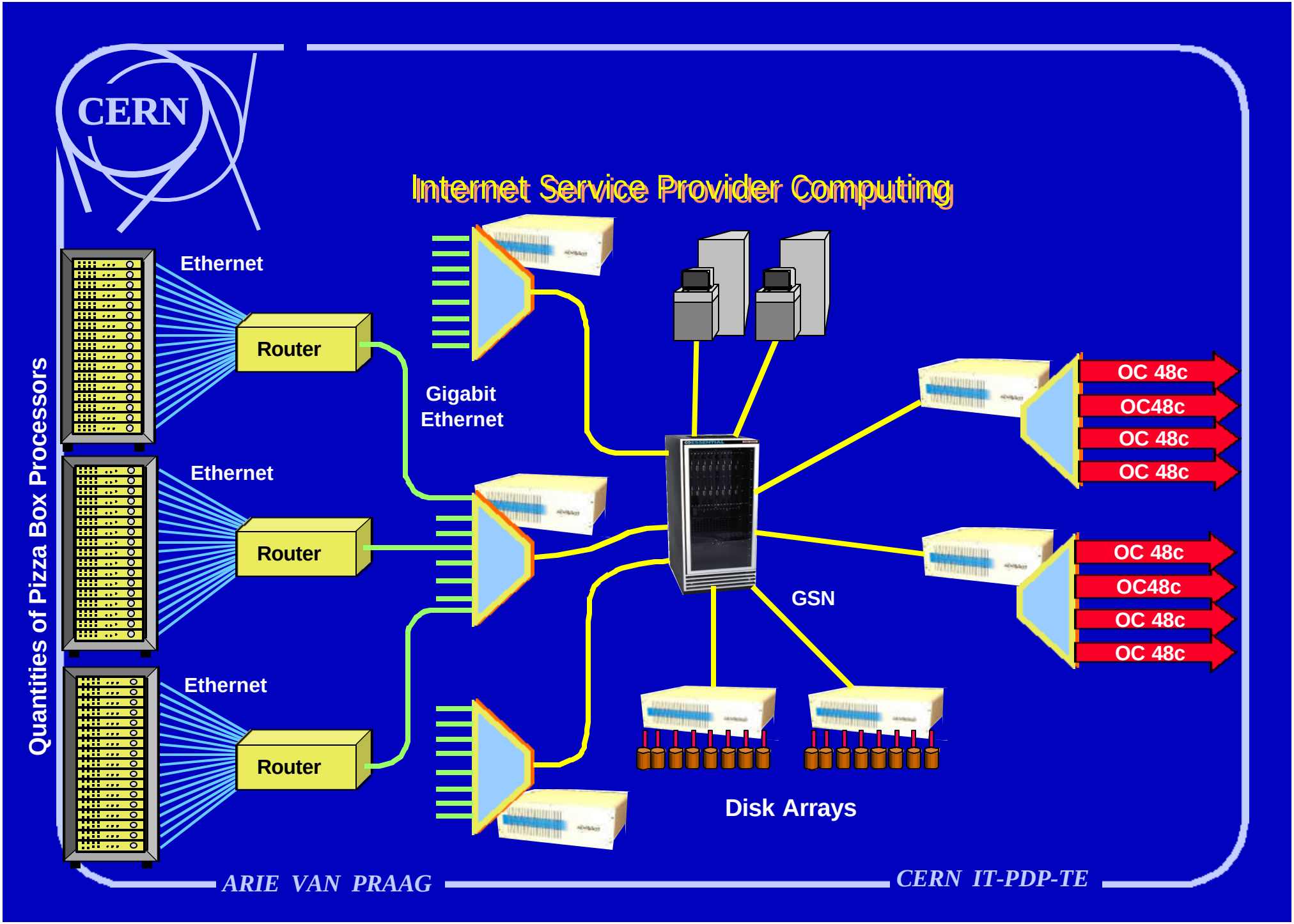
OC 48c does 250 MByte/s

Atlas Alice

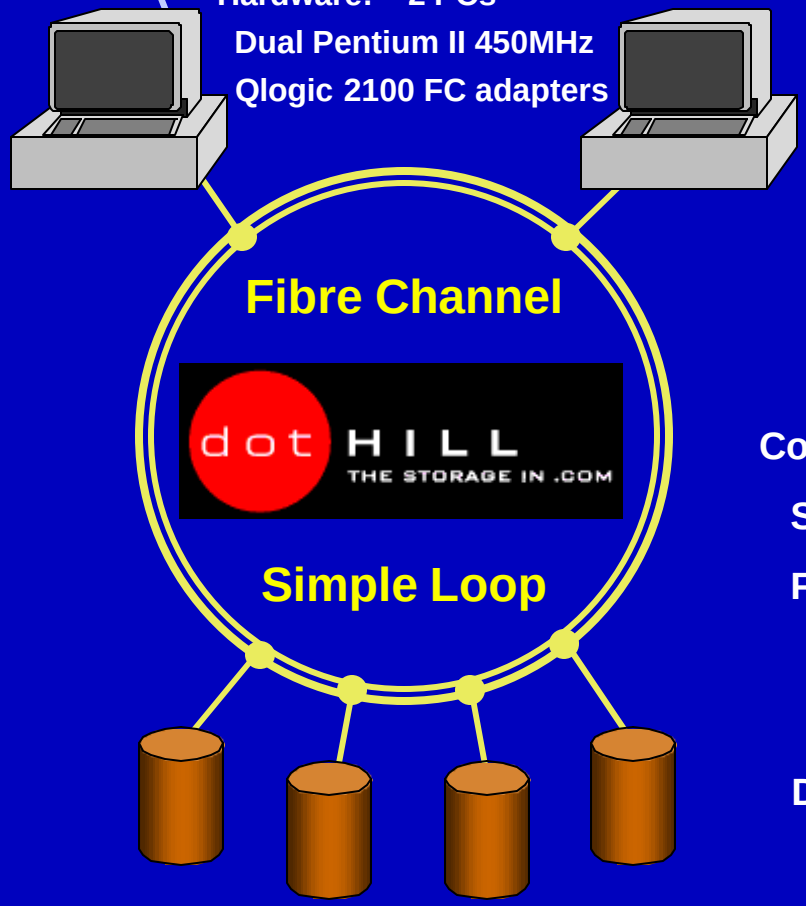
LHCB CMS




CERN
IP Video on Demand
MPEG2 - DVB ASI
Coaxial Copper cable
SERVERS
GSN
Connections
FC/Video
Video
Processor
Video
HIPPI
Video
Video
Processor
Video
IP - Video 4 X OC48c
± 250 MByte/s
Storage Bridge
SIENA
IP - Video OC192c
1 GByte/s
Large Storage array
on Fiber Channel Arbitrated Loop Base
8 X 256 Disks
ARIE VAN PRAAG
CERN IT-PDP-TE


CERN
Internet Service Provider Computing
Quantities of Pizza Box Processors
Ethernet
Router
Ethernet
Router
Ethernet
Router
Gigabit
Ethernet
GSN
OC 48c
OC48c
OC 48c
OC 48c
OC 48c
OC48c
OC 48c
OC 48c
Disk Arrays
ARIE VAN PRAAG
CERN IT-PDP-TE

Global File System



Hardware: 2 PCs
Dual Pentium II 450MHz
Qlogic 2100 FC adapters

FC disk array with Four 8GB Disks
Seagate Barracuda s

Software:
Linux kernel 2.2.16 with necessary kernel patches

GFS stable release (Antimater Anteater, 21.09.1999) with update patches (no journaling)

GFS development version taken from CVS repository (with journaling support) is being tested

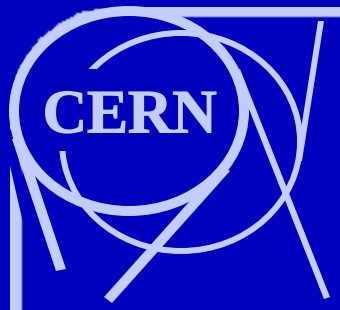
Configuration of the GFS test pool:

Single pool containing four disks.

For the journaled version:
one GFS data pool and 2 GFS journal subpools (separate journal for each host accessing the GFS pool).

Device-based locking (DLocks).

Aneta Baran Aneta.Baran@cern.ch



STP on Linux

- Currently at version 0.32 for 2.4pre kernels
- Supports STP over Ethernet and encapsulation inside IP packets
- Accessible using INET sockets (SOCK_SEQPACKET using IPPROTO_STP)
- Supports some hardware acceleration using Alteon GbE cards
- Work is currently being done on libst to enable OS bypass
- More information can be found at http://oss.sgi.com/projects/stp/

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