To FF

Allied
Telesyn
AT9424

GigE GigE GigE GigE GigE

Dual Xeon Blade (×5)

GigE GigE GigE GigE GigE

GigE GigE GigE GigE GigE GigE GigE GigE GigE GigE GigE GigE GigE GigE

Dual Xeon Blade (×14)

GigE GigE GigE GigE GigE GigE GigE GigE GigE GigE GigE GigE GigE GigE

Cisco
Catalyst
4948

Cisco
Catalyst
4948

Cisco
Catalyst
4948

Cisco
Catalyst
4948

Cisco
Catalyst
4948

BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB
BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB

From 32 BBs, 2 from each Baseline Rack.

CBE Rack

Control Rack #1 Switch

Control Rack #2 Switch

CBE Configuration #0: Minimum Configuration

-1 x 14-blade crate, 1 x 6-blade crate $XXk ea (each blade: Intel SBX82,
 with SBCE chassis, 2, 2.8 GHz Xeon CPUs, 2 Gb RAM,
 dual GigE ports 80 Gb HD)

-5 x 48-port GigE wire-speed switch: Cisco wsc4948s,
 $8k ea. (300 W ea)

-1 x 24-port GigE switch: Allied Telesyn 9424, $1k ea. (100 W ea)

Total CPUs: 40 2.8 GHz Xeon.
Power per full blade crate: 2.8 kW
Power per Cisco switch: 300 W
Power per rack: 5.6 kW
Voltage input: 208 VAC
Total system power: 5.6 kW

Minimum sustained correlator H/W integration time into CBE: ~100 msec.
(based on 2 Xeon CPUs per BB required for 10 msec H/W int time @ full GigE
O/P)

Total output data rate to FF: ~80 Mbytes/sec; ~10 Mvis/sec (could be
greater, depending on performance of AT9424 switch, or less, depending on lag-
processing requirements).
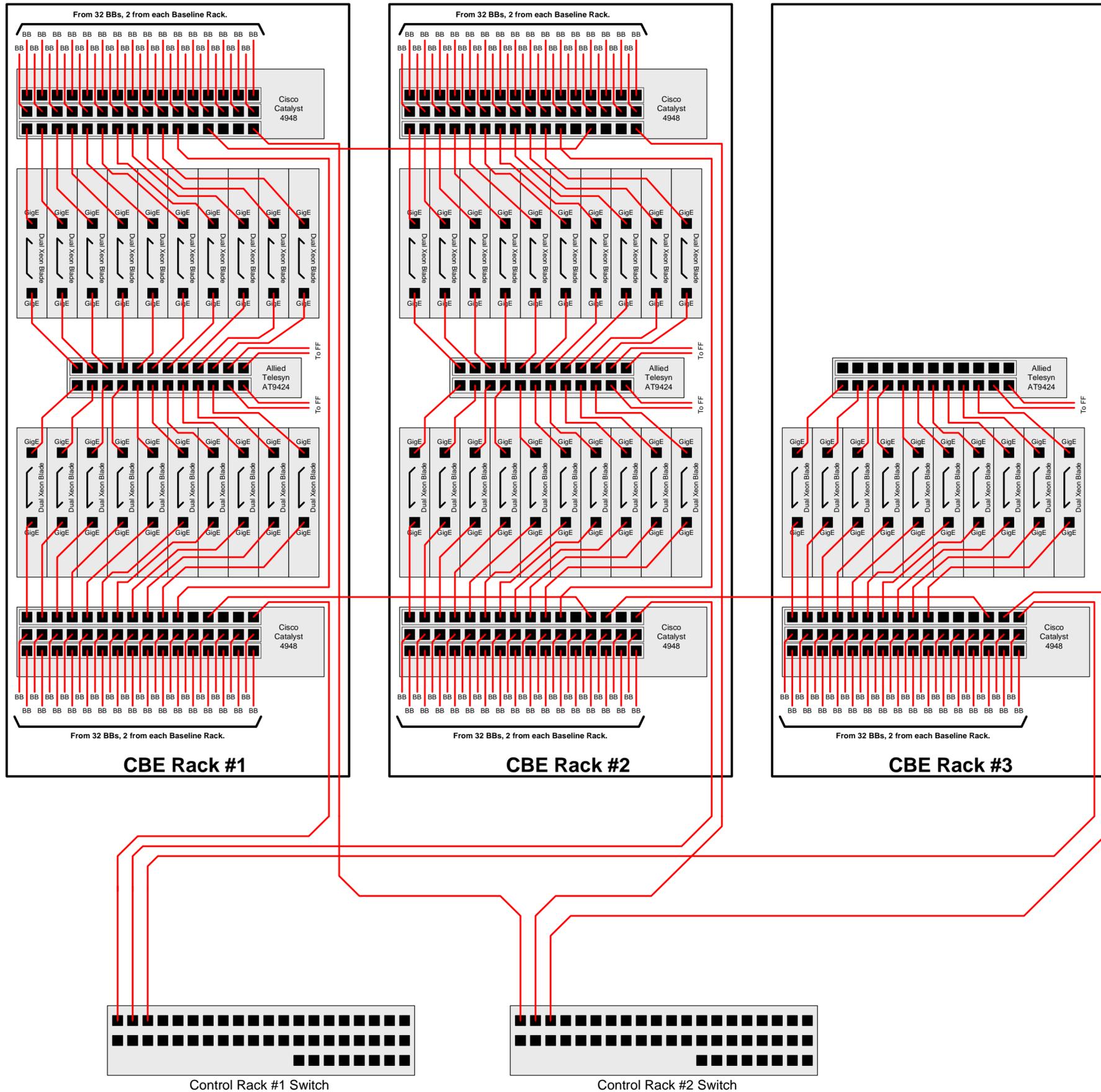
TOTAL Cost: ~$xxk USD (likely <$80k)

CBE Configuration #0: Minimum Configuration Network Diagram
D25028R0002 — Sheet 1
Version: DRAFT
Date: August 24, 2006
B. Carlson

From 32 BBs, 2 from each Baseline Rack.

BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB

Cisco Catalyst 4948

GigE GigE GigE GigE GigE GigE GigE GigE GigE GigE

Dual Xeon Blade (×10)

GigE (×10)

To FF

Allied Telesyn AT9424

To FF

GigE (×10)

Dual Xeon Blade (×10)

GigE (×10)

Cisco Catalyst 4948

BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB

From 32 BBs, 2 from each Baseline Rack.

CBE Rack #1

From 32 BBs, 2 from each Baseline Rack.

BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB

Cisco Catalyst 4948

GigE GigE GigE GigE GigE GigE GigE GigE GigE GigE

Dual Xeon Blade (×10)

GigE (×10)

To FF

Allied Telesyn AT9424

To FF

GigE (×10)

Dual Xeon Blade (×10)

GigE (×10)

Cisco Catalyst 4948

BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB

From 32 BBs, 2 from each Baseline Rack.

CBE Rack #2

Allied Telesyn AT9424

To FF

GigE (×10)

Dual Xeon Blade (×10)

GigE (×10)

Cisco Catalyst 4948

BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB BB

From 32 BBs, 2 from each Baseline Rack.

CBE Rack #3

Control Rack #1 Switch

Control Rack #2 Switch

CBE Configuration #1:

-5 x 10-blade crate: $15.7k ea (each blade: 2, 2.8 GHz
  Xeon CPUs, 2 Gb RAM, dual GigE ports 80 Gb HD, 300W)

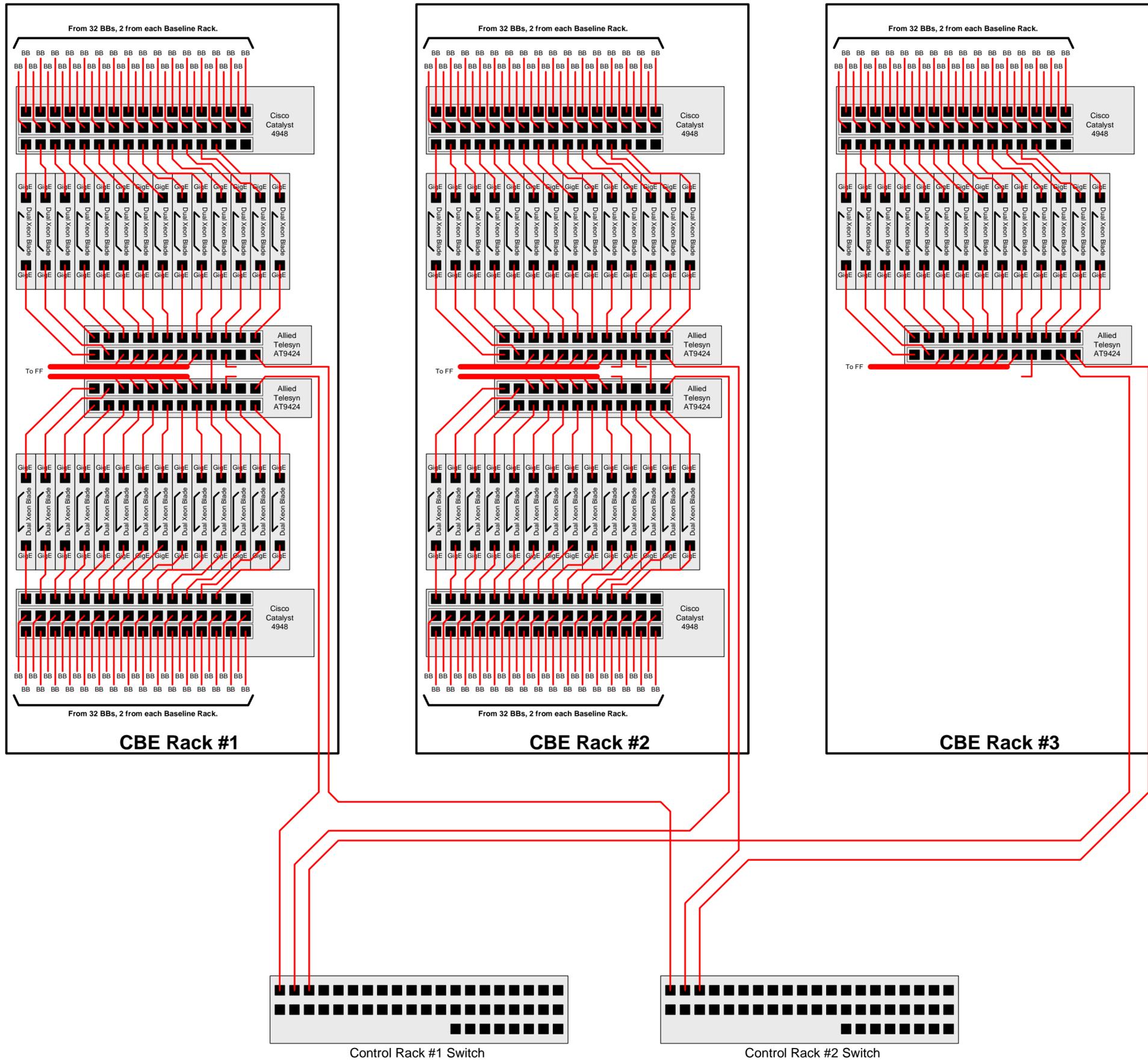-5 x 48-port GigE wire-speed switch: Cisco wsc4948s,
  $8k ea. (300 W)

-3 x 24-port GigE switch: Allied Telesyn 9424, $1k ea. (100 W)

Total CPUs: 100 2.8 GHz Xeon.
Power per blade crate: ~3kW
Power per Cisco switch: 300 W
Power per rack: ~6.7 kW
Voltage input: 208 VAC
Total system power: ~16.8 kW(?)

Minimum sustained correlator H/W integration time into CBE: ~30 msec.
(based on 2 Xeon CPUs per BB required for 10 msec H/W int time @ full GigE O/P)

Total output data rate to FF: ~100 Mbytes/sec; ~12.5 Mvis/sec (could be
greater, depending on performance of AT9424 switch, or less, depending on lag-
processing requirements).

TOTAL Cost: ~$122k USD

CBE Configuration #1 Network Diagram
D25028R0002 — Sheet 2
Version: DRAFT
Date: August 24, 2006
B. Carlson

From 32 BBs, 2 from each Baseline Rack.

Cisco Catalyst 4948

Allied Telesyn AT9424

To FF

CBE Rack #1

From 32 BBs, 2 from each Baseline Rack.

Cisco Catalyst 4948

Allied Telesyn AT9424

To FF

CBE Rack #2

From 32 BBs, 2 from each Baseline Rack.

Cisco Catalyst 4948

Allied Telesyn AT9424

To FF

CBE Rack #3

Control Rack #1 Switch

Control Rack #2 Switch

CBE Configuration #1a:

-5 x 14-blade crate: $XXk ea (each blade: Intel SBX82, with SBCE chassis, 2, 2.8 GHz Xeon CPUs, 2 Gb RAM, dual GigE ports 80 Gb HD)

-5 x 48-port GigE wire-speed switch: Cisco wsc4948s, $8k ea. (300 W ea)

-5 x 24-port GigE switch: Allied Telesyn 9424, $1k ea. (100 W ea)

Total CPUs: 140 2.8 GHz Xeon.
Power per blade crate: 2.8kW
Power per Cisco switch: 300 W
Power per rack: 6.4 kW
Voltage input: 208 VAC
Total system power: 16 kW

Minimum sustained correlator H/W integration time into CBE: ~25 msec. (based on 2 Xeon CPUs per BB required for 10 msec H/W int time @ full GigE O/P)

Total output data rate to FF: ~300 Mbytes/sec; ~37.5 Mvis/sec (could be greater, depending on performance of AT9424 switch, or less, depending on lag-processing requirements).
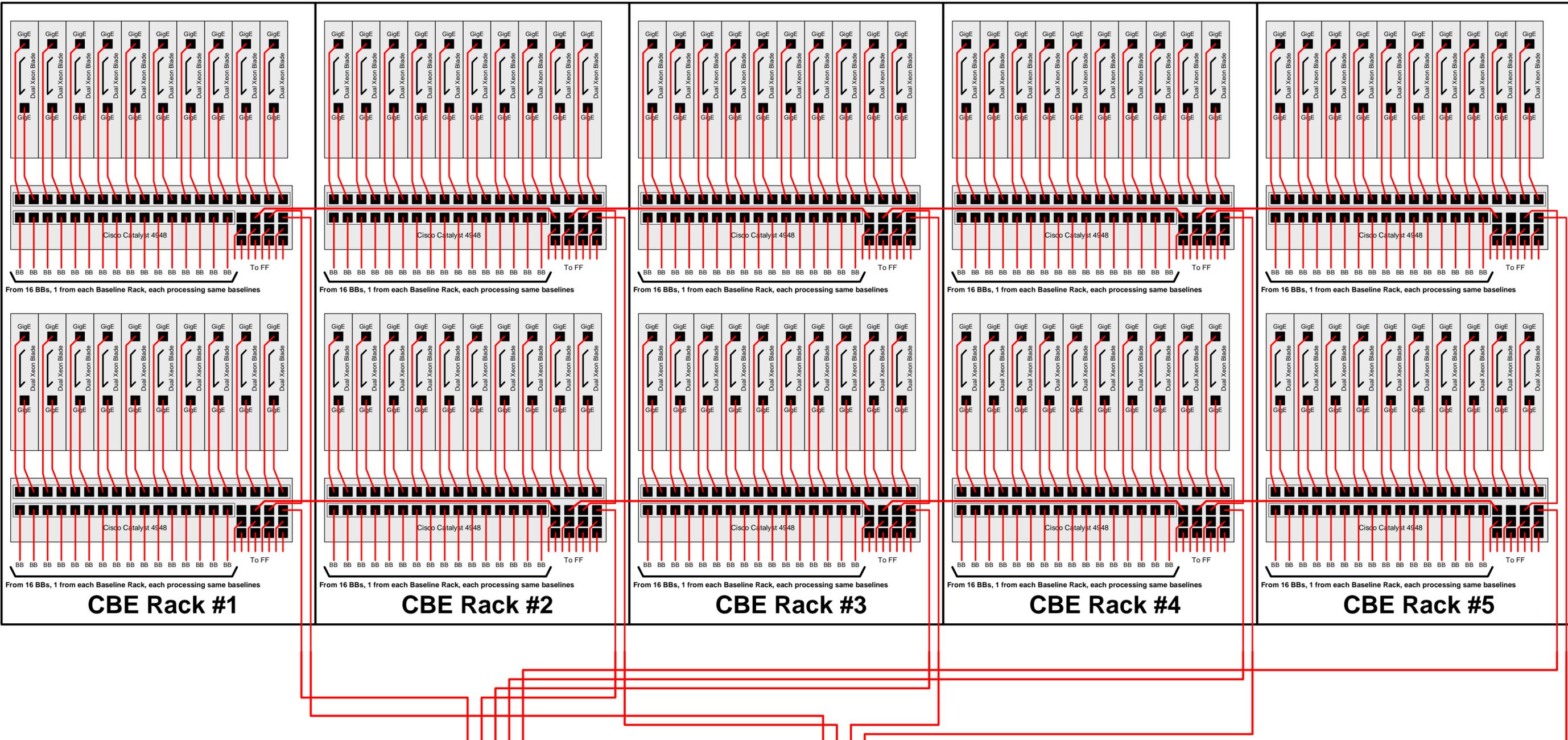
TOTAL Cost: ~$xxk USD

CBE Configuration #1a Network Diagram
D25028R0002 — Sheet 3
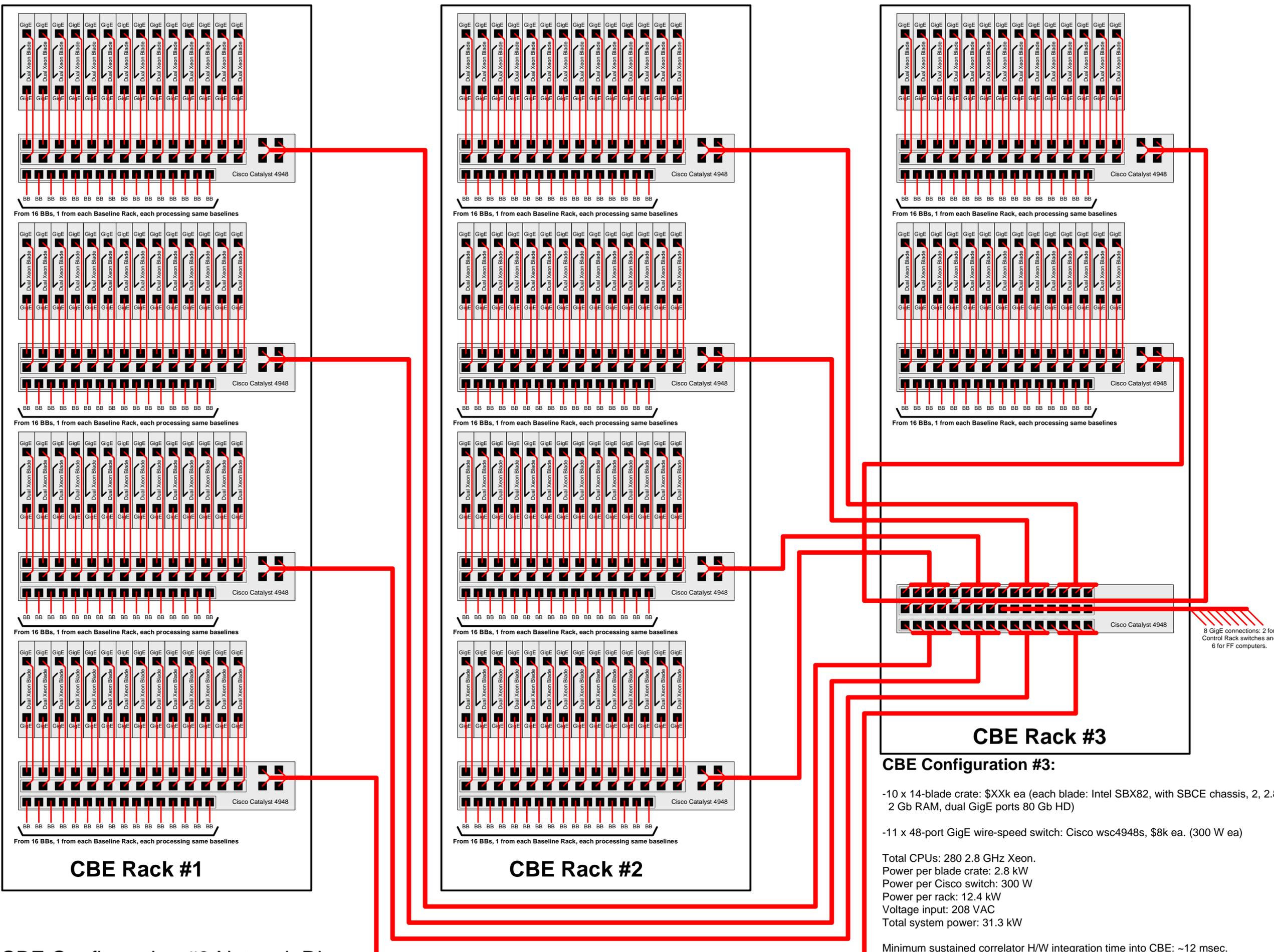Version: DRAFT
Date: August 24, 2006
B. Carlson

Racks labeled across the top:

CBE Rack #1   **CBE Rack #2**   **CBE Rack #3**   **CBE Rack #4**   **CBE Rack #5**

Each Cisco Catalyst 4948 switch. Labels under switches:

From 16 BBs, 1 from each Baseline Rack, each processing same baselines

Blade labels: GigE / Dual Xeon Blade

To FF

BB BB BB BB BB BB BB BB BB BB BB BB

Control Rack #1 Switch

Control Rack #2 Switch

CBE Configuration #2:

-10 x 10-blade crate: $15.7k ea (each blade: 2, 2.8 GHz
 Xeon CPUs, 2 Gb RAM, dual GigE ports 80 Gb HD, 300 W)

-10 x 48-port GigE wire-speed switch: Cisco wsc4948s,
 $8k ea. (300 W ea)

Total CPUs: 200 2.8 GHz Xeon.
Power per blade crate: 3 kW
Power per Cisco switch: 300 W
Power per rack: 6.6 kW
Voltage input: 208 VAC
Total system power: 33 kW

Minimum sustained correlator H/W integration time into CBE: ~16 msec
(based on 2 Xeon CPUs per BB required for 10 msec H/W int time @ full GigE O/P)

Total output data rate to FF: ~8 Gbytes/sec; ~1 Gvis/sec (could be less depending
on lag-processing requirements).

TOTAL Cost: $237k USD

CBE Configuration #2 Network Diagram
D25028R0002 — Sheet 4
Version: DRAFT
Date: August 24, 2006
B. Carlson

CBE Rack #1

CBE Rack #2

CBE Rack #3

Cisco Catalyst 4948

From 16 BBs, 1 from each Baseline Rack, each processing same baselines

8 GigE connections: 2 for Control Rack switches and 6 for FF computers.

CBE Configuration #3:

-10 x 14-blade crate: $XXk ea (each blade: Intel SBX82, with SBCE chassis, 2, 2.8 GHz Xeon CPUs, 2 Gb RAM, dual GigE ports 80 Gb HD)

-11 x 48-port GigE wire-speed switch: Cisco wsc4948s, $8k ea. (300 W ea)

Total CPUs: 280 2.8 GHz Xeon.
Power per blade crate: 2.8 kW
Power per Cisco switch: 300 W
Power per rack: 12.4 kW
Voltage input: 208 VAC
Total system power: 31.3 kW

Minimum sustained correlator H/W integration time into CBE: ~12 msec.
(based on 2 Xeon CPUs per BB required for 10 msec H/W int time @ full GigE O/P)

Total output data rate: 600 Mbytes/sec; 75 Mvis/sec (could be less, depending on lag-processing requirements). 2 Gbytes/sec possible without final Cisco switch.

Note: likely have to distribute hardware across 5 racks.

TOTAL Cost: $xxk USD

CBE Configuration #3 Network Diagram
D25028R0002 — Sheet 5
Version: DRAFT
Date: August 24, 2006
B. Carlson