AVESTOR
A VISION FOR POWER

HATCH™

IT Monitor – monitoring for high availability

by: Robert J. Laurin - AVESTOR
& Michel Daigle - Hatch

A VISION FOR POWER

Agenda

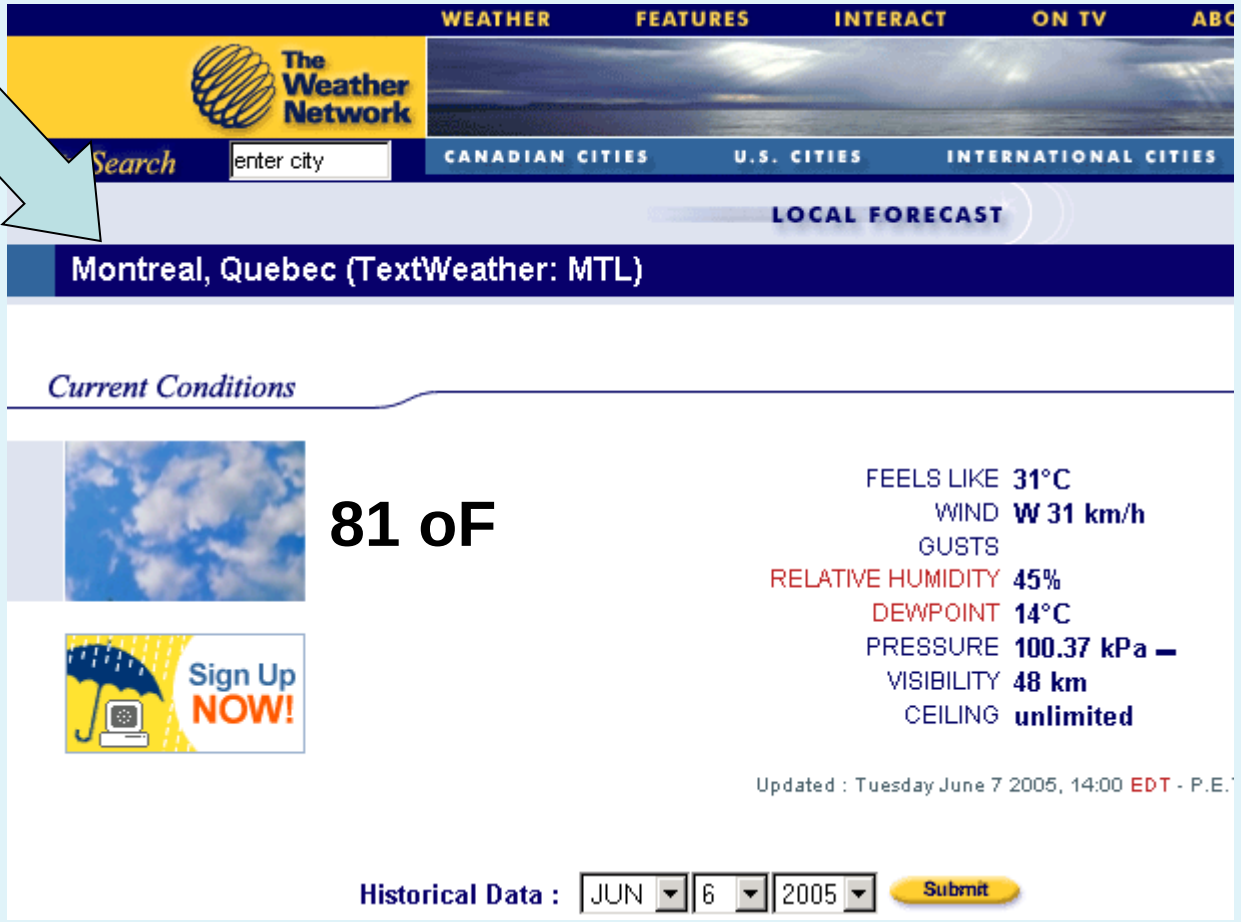
- AVESTOR corporate overview
- About HATCH
- IT infrastructure description
- DRP
- Monitoring
- IT Monitor
- Next steps, lessons learned, conclusion
- Questions & answers

In Canada: We're proud of our cold weather

- 2003, PI Users Conference, SF, CA, USA (Z. Zacharias & M. Daigle)
- 2003, The temperature in Yellowknike, NWT, Canada

Yesterday in SF

Yesterday in Montreal



Conclusion…

- This is a delta temperature of 28 oF
- So, next year, the Users Conference will be held in Montreal !

AVESTOR
Corporate Overview

Overview

- 250+ Employees
- Partnership between Hydro-Québec and Kerr McGee (50:50)
- R&D Building in Boucherville PQ
- Coating Plant, expansion in progress
- Commercial Production Plant
- Lithium Vanadium Oxide (LVO) plant in Soda Springs, Idaho
- APEX, Nevada (30 min from Las Vegas) for LVO additional Plant and future battery plants

A VISION FOR POWER

AVESTOR
A VISION FOR POWER

Corporate Milestones

1979	Development started
1993	First USABC contract for EV
1994	AVESTOR is established
1997	GM contract for HEV
1999	First telecom field test
2000	EVS-17 demonstrations EV and HEV
2001	Kerr McGee and Hydro-Quebec partnership
2002	Inauguration of the world first LMP commercial plant
2003	First commercial delivery
2004	Ramping up of ALPHA plant
2005	Industrial sales

A VISION FOR POWER

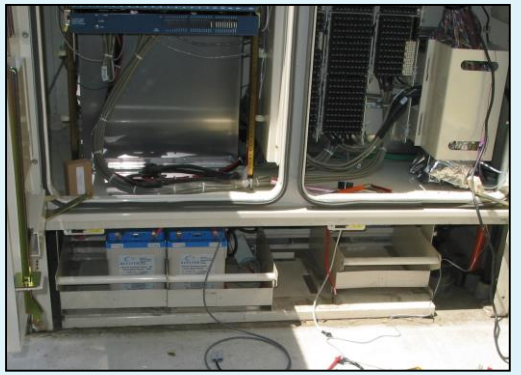
AVESTOR
A VISION FOR POWER

AVESTOR Alpha LMP Plant

Applications

Stationary

Telecommunications



Electric Utilities

Automotive

Other Stationary Markets

Signaling

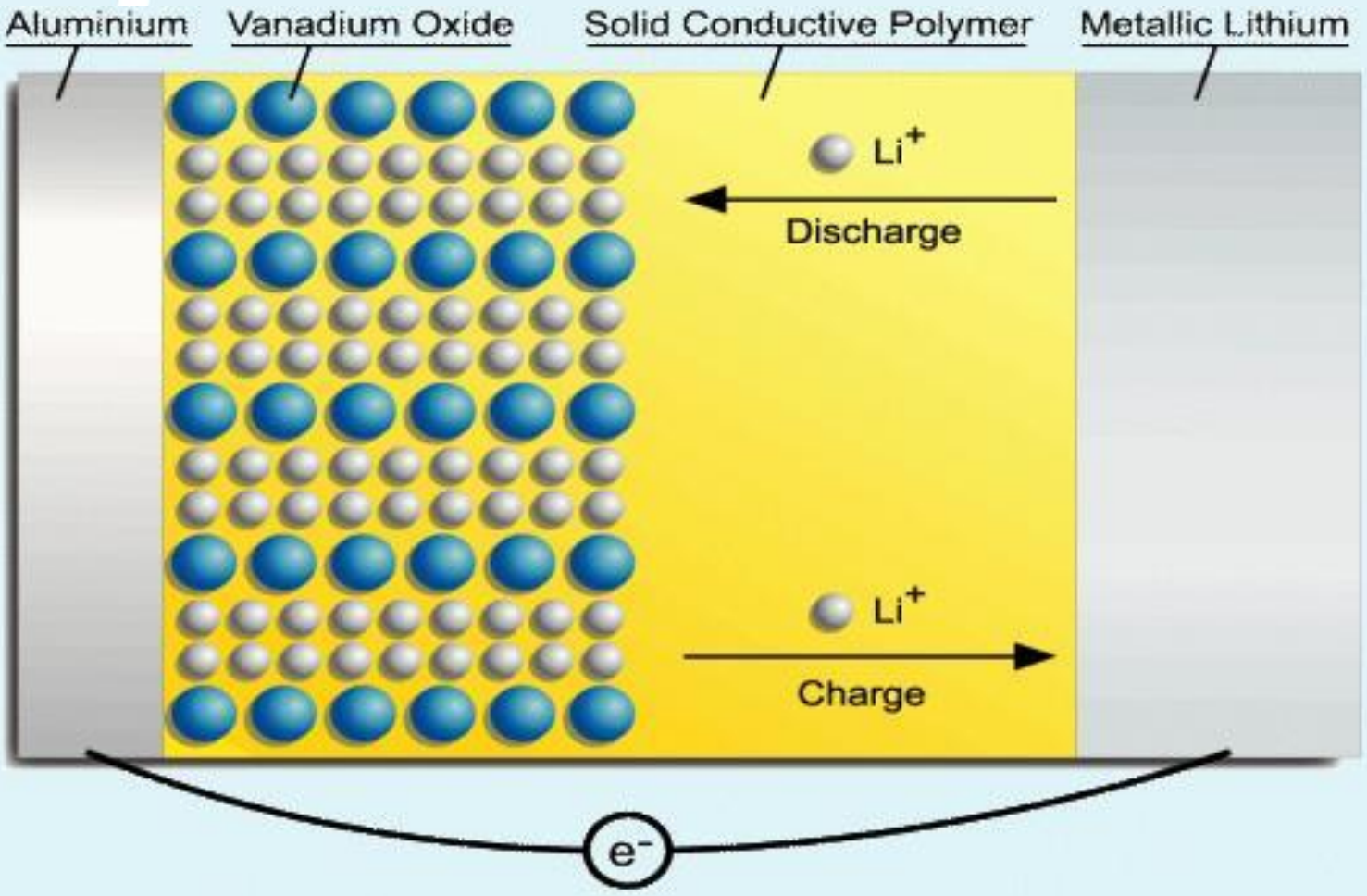
Oil and Gas

Renewable

Other Stationary Markets

Data Center Installation

LMP Electrochemistry



Battery Specifications

Voltage: 48 Vcc

Capacity: 63 Ah (3 kWh)

Weight: 28 kg

Length: 400 mm

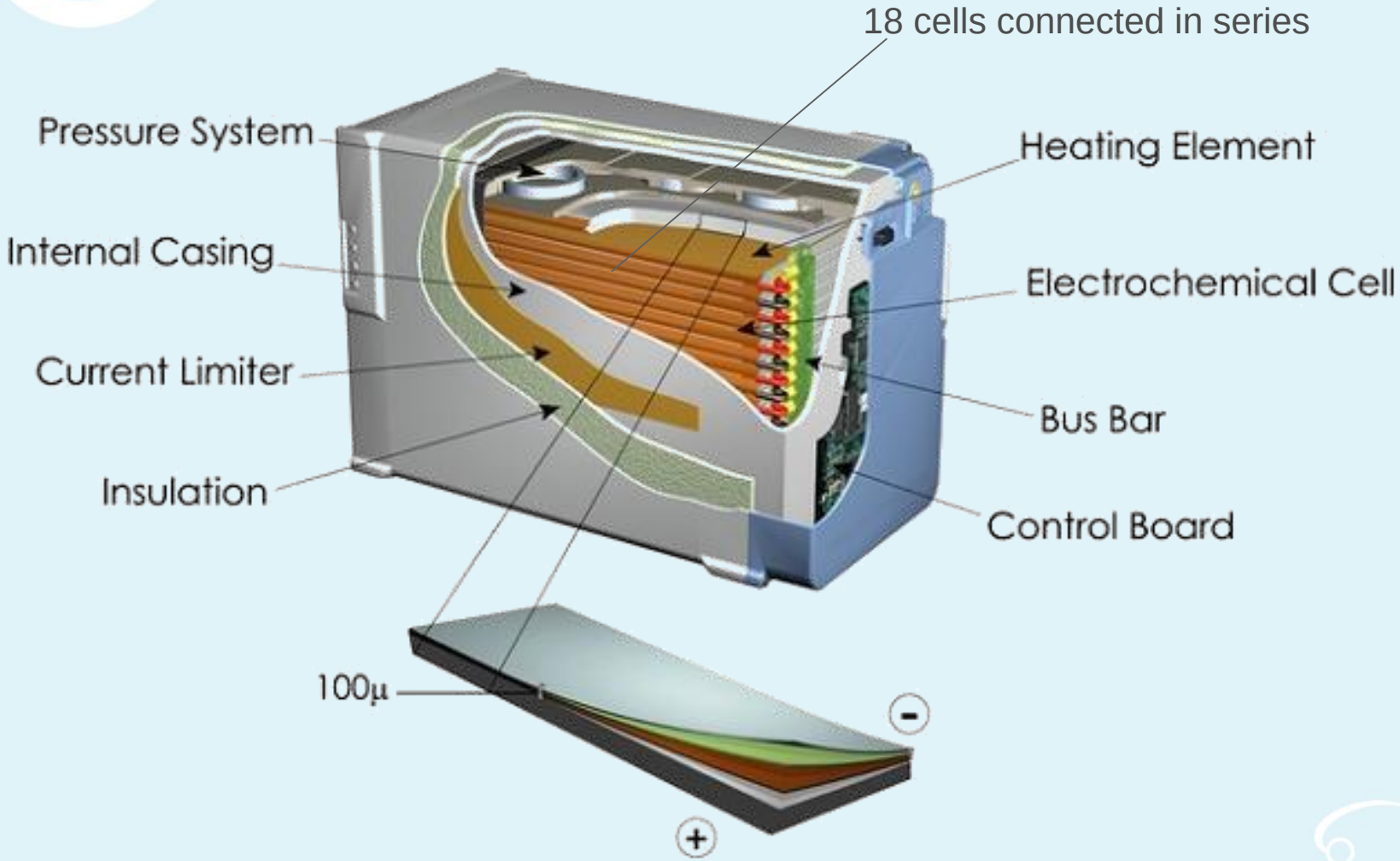
Width: 200 mm

Height: 272 mm

A VISION FOR POWER

AVESTOR
A VISION FOR POWER

Battery Construction



Main Characteristics

Stable electrochemical system

- Long life (10 years guaranty)
- High temperature tolerance (-40 °C to +75 °C)
- Improved Safety (solid electrolyte)

Light and small

- 1/3 the volume of lead-acid and 1/5 the weight

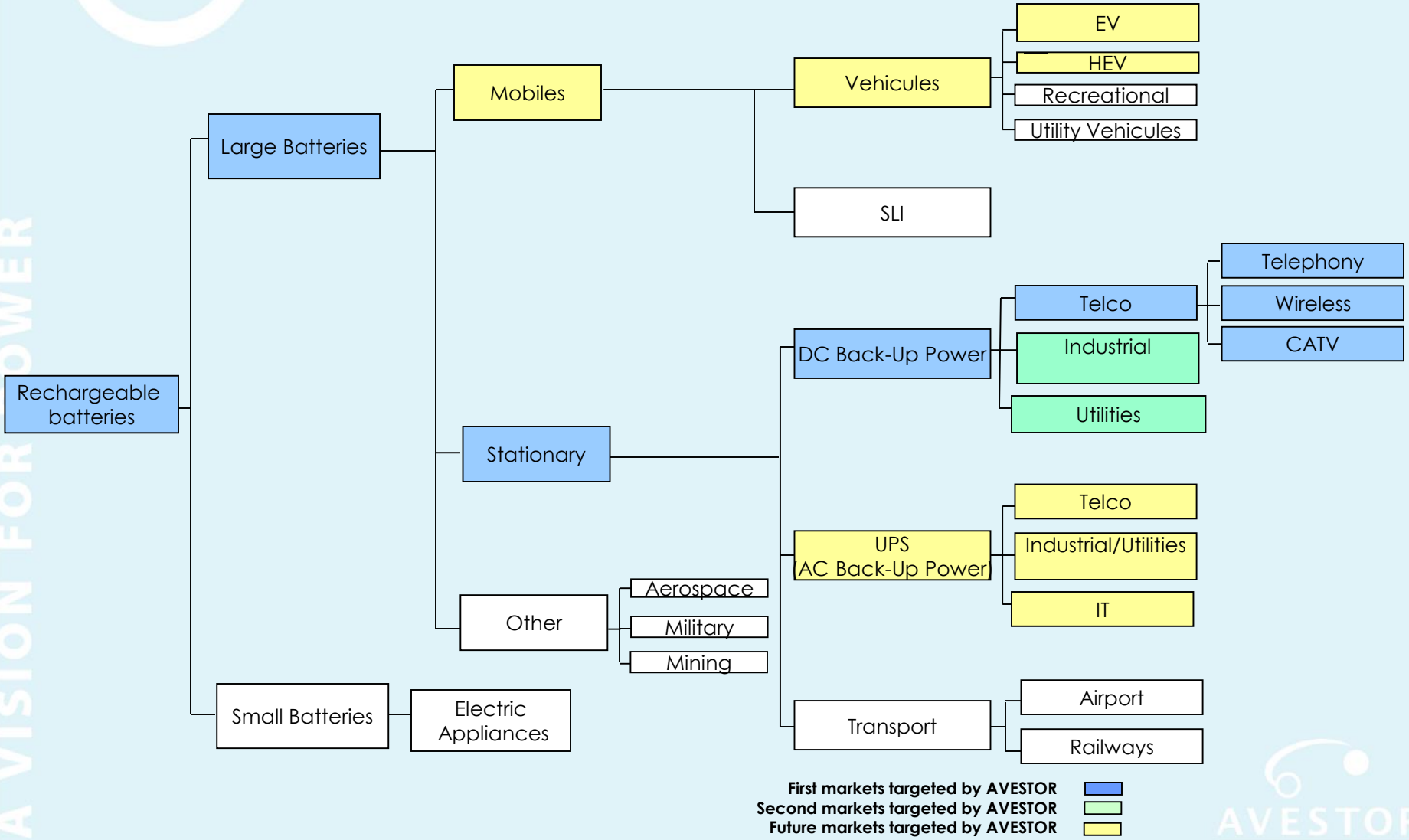
Predictable

- Remote and local monitoring of battery parameters

Smart

- Integrated thermal management system
- State of health and state of charge calculation

Markets



Field Installations

About Hatch

HATCH™

- Founded in 1955: worldwide leader in consulting, information systems, project management and construction and engineering
- ISO-9001 2000 certified
- Head office located in Mississauga, Ontario; over 60 global offices on all continents
- 6,000 professionals worldwide
- Manages over US $20 Billion dollars in programs and projects
- Work with OSIsoft since 1996

IT infrastructure description

The requested level of service

Request:

Get the main services availability at 99.8% from

There will be service failures. But how long will it take for you to know? How long will it take to fix them?

First Measure:

- Email sending, receiving and reading.

The infrastructure at a glance

- **2 sites:**
  - Boucherville, Québec (Alpha Plant & R&D building)
  - Apex, Nevada
- **225+ desktops**
- **80+ laptops**
- **28 servers**
- **2 times 3 tb of disk space with 2 San switches**
- **Automation network / Administrative network and Wireless**
- **Fully redundant access to Internet**

Disaster recovery plan

(business continuity)

Disaster recovery plan

(how long will it take to fix)

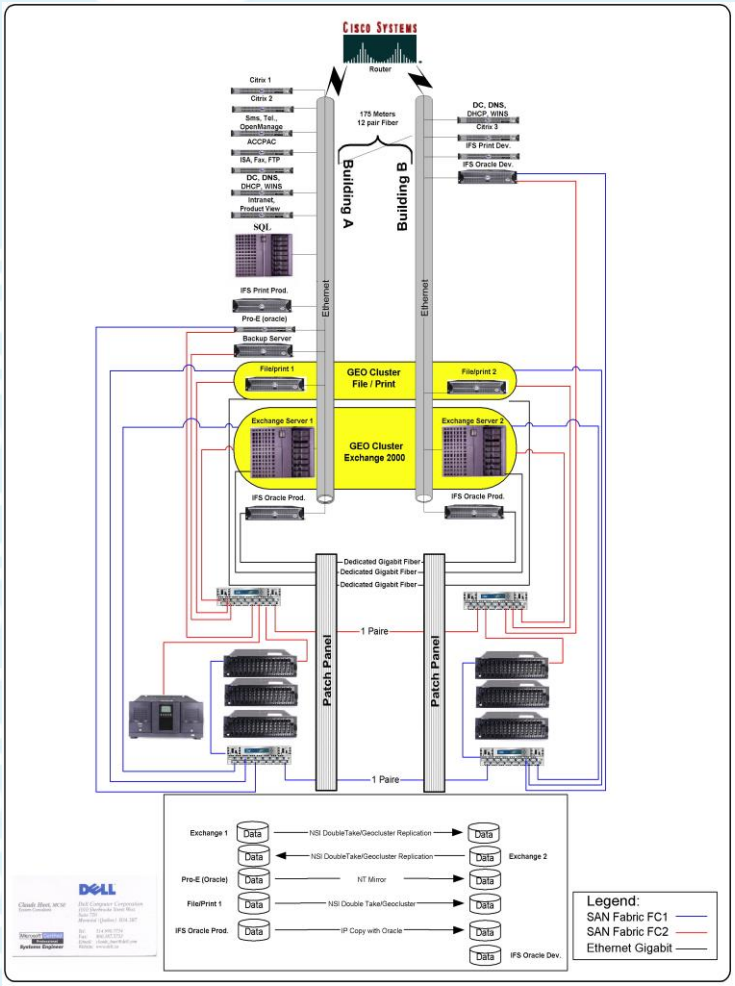
Strategy:

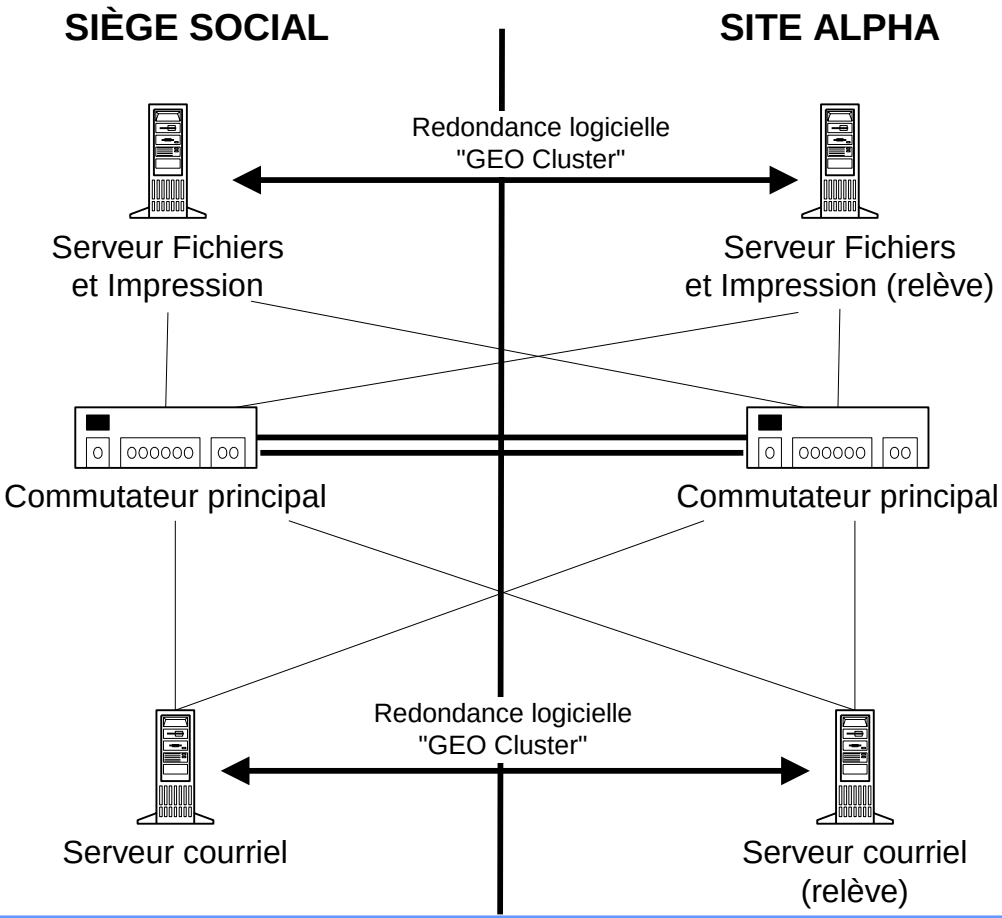
- Dual SAN
- GeoClusters
- Every service has a replicated instance in standby
- 4 routers to telco
- Dual loop to all network switches
- Max acceptable is 4 hours for any service

The Main Computer room

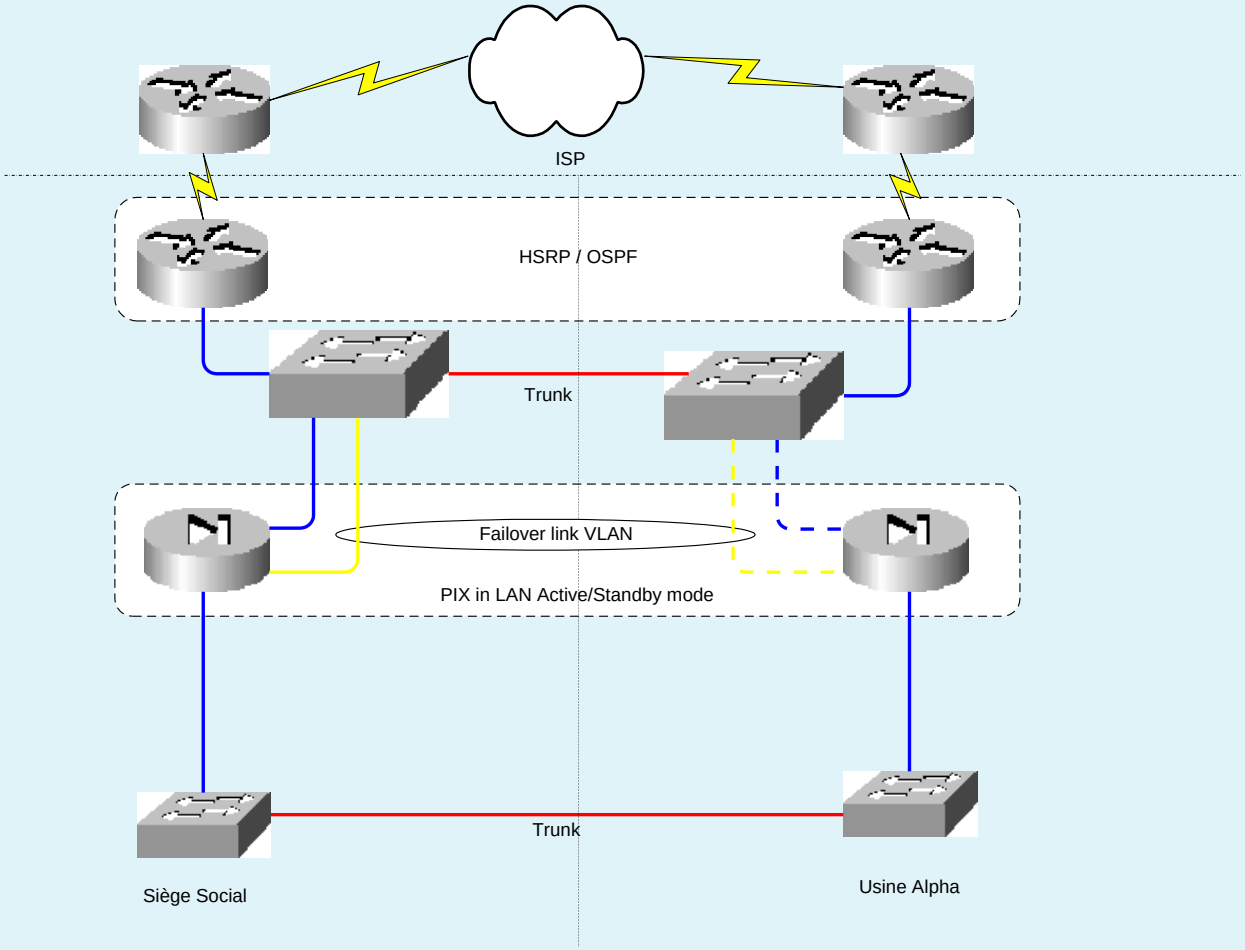
The Backup Computer room

DRP design (Servers / San)





DRP design (Internet access)



Monitoring

Monitoring Objectives

(how long will it take for you to know
=> how long will it take to fix)

The objectives are to monitor every important point of failure and report the different states and values.

+

Alarm the support team of any problem or event putting at risk of a perceived downtime.

The context

- Looking at implementing PI
- Expanding infrastructure
- Very high-tech company with special monitoring needs
- Had some vendor solutions already deployed
- How to measure the sending, receiving and reading of an email as a functional loop rather than looking at every possible points of failure in the process?

Needed a flexible tool that allowed us to program a logic, then have a state or value

What to monitor

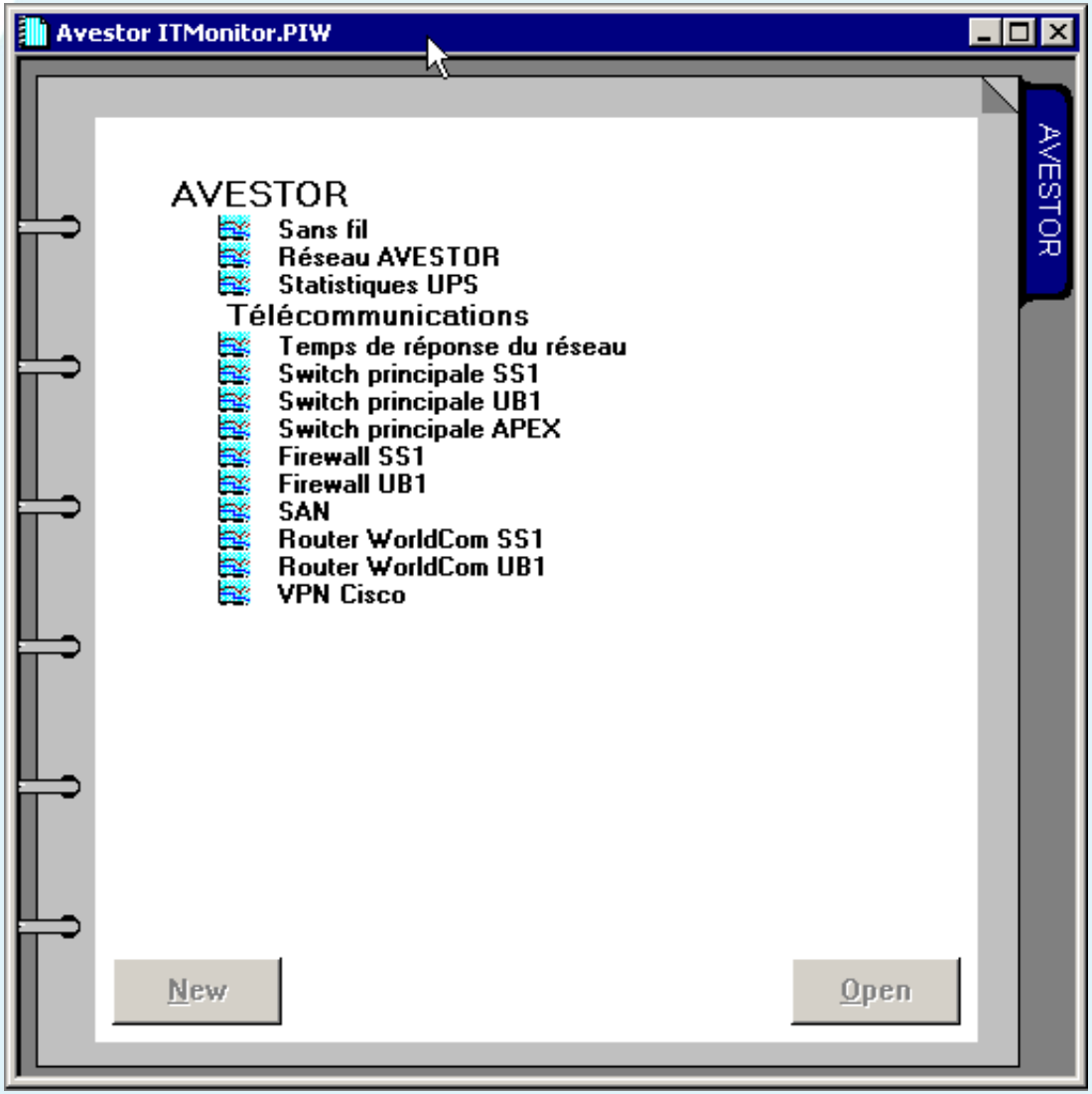
- Servers (in many aspects)
- Disks / San
- Telecommunication and equipments
- Mail (complete loop)
- Computer room (environmental)
- UPS
- Modems
- So much more…

IT Monitor

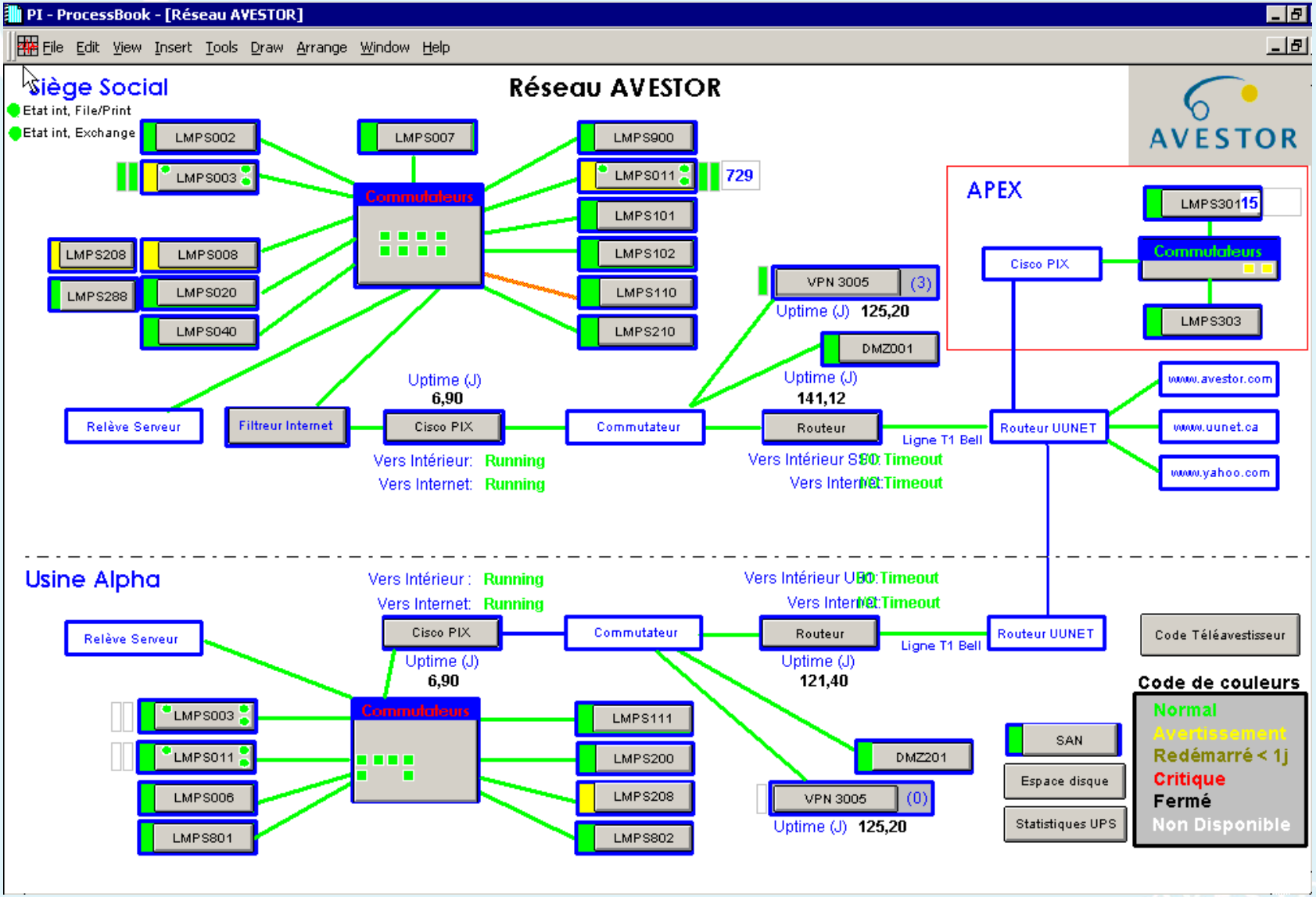
IT Monitor

- **Implementation strategy (in 2002)**
  - Ping devices
  - Perfmon
  - SNMP (mibs) fetching
  - Complete procedure loop programming
  - Integrate DELL & Cisco
  - REPORTING !!! ALERTING !!!

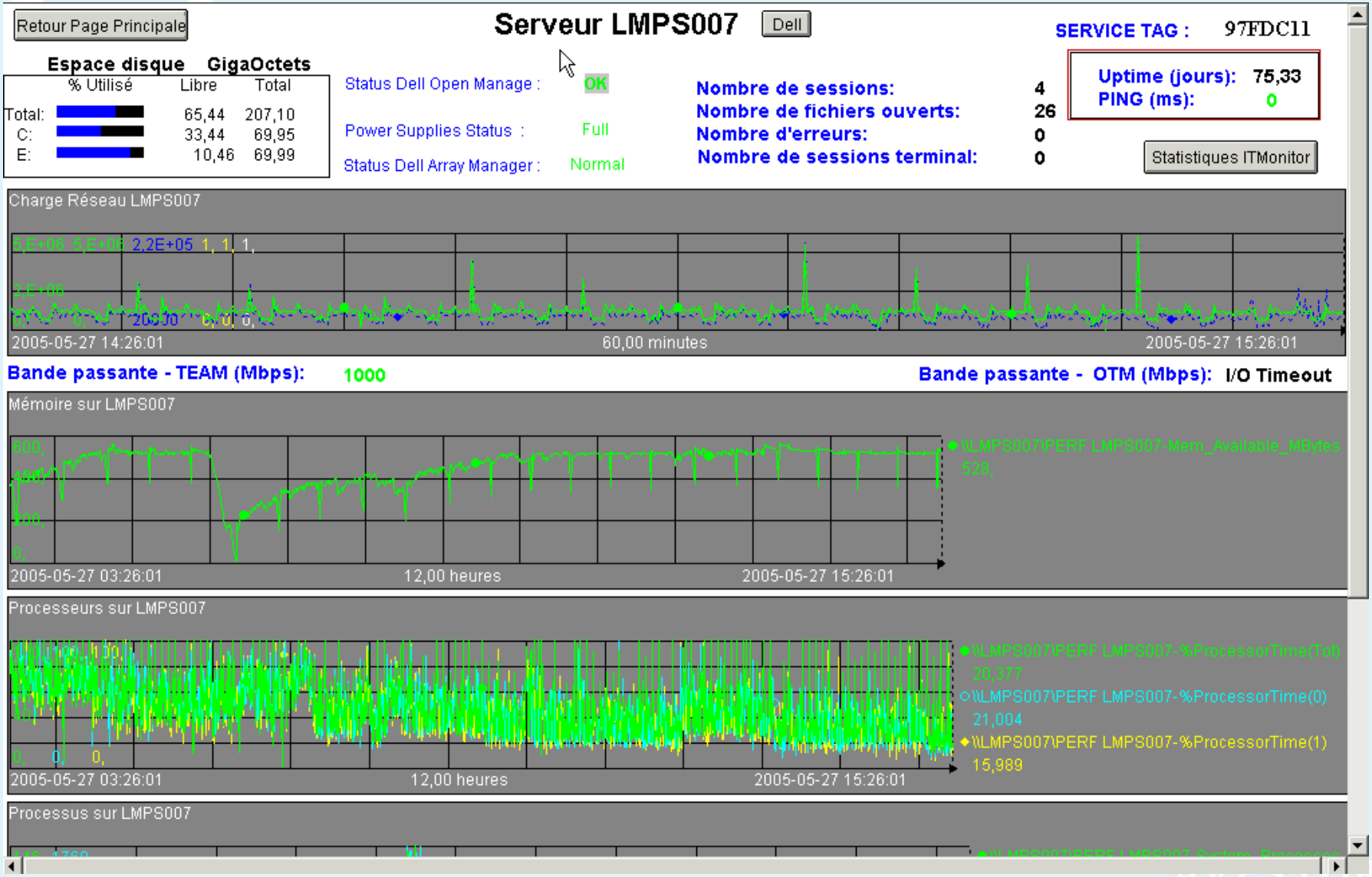
IT Monitor – Process book (menu)



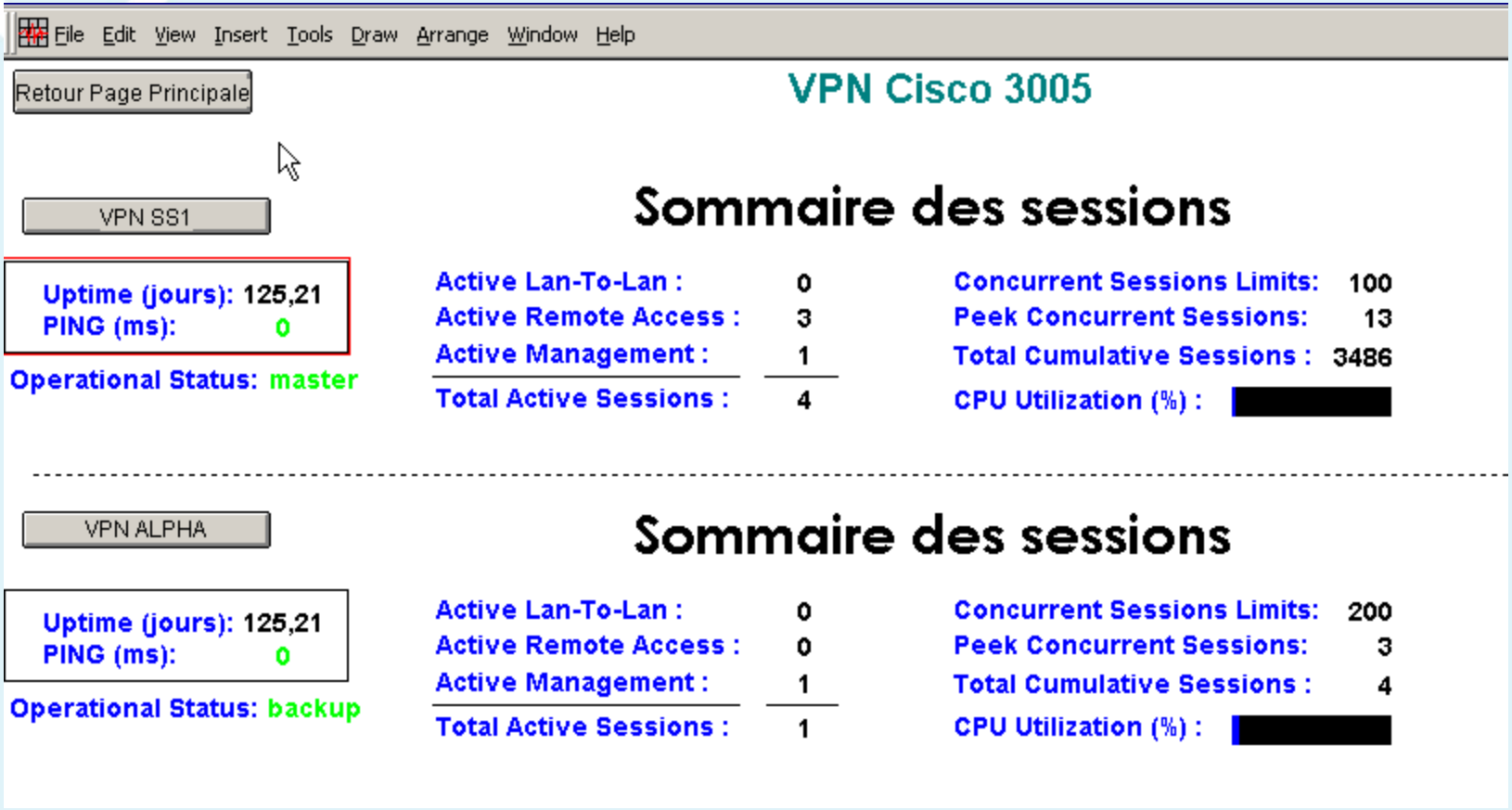
IT Monitor – Process book (Network)



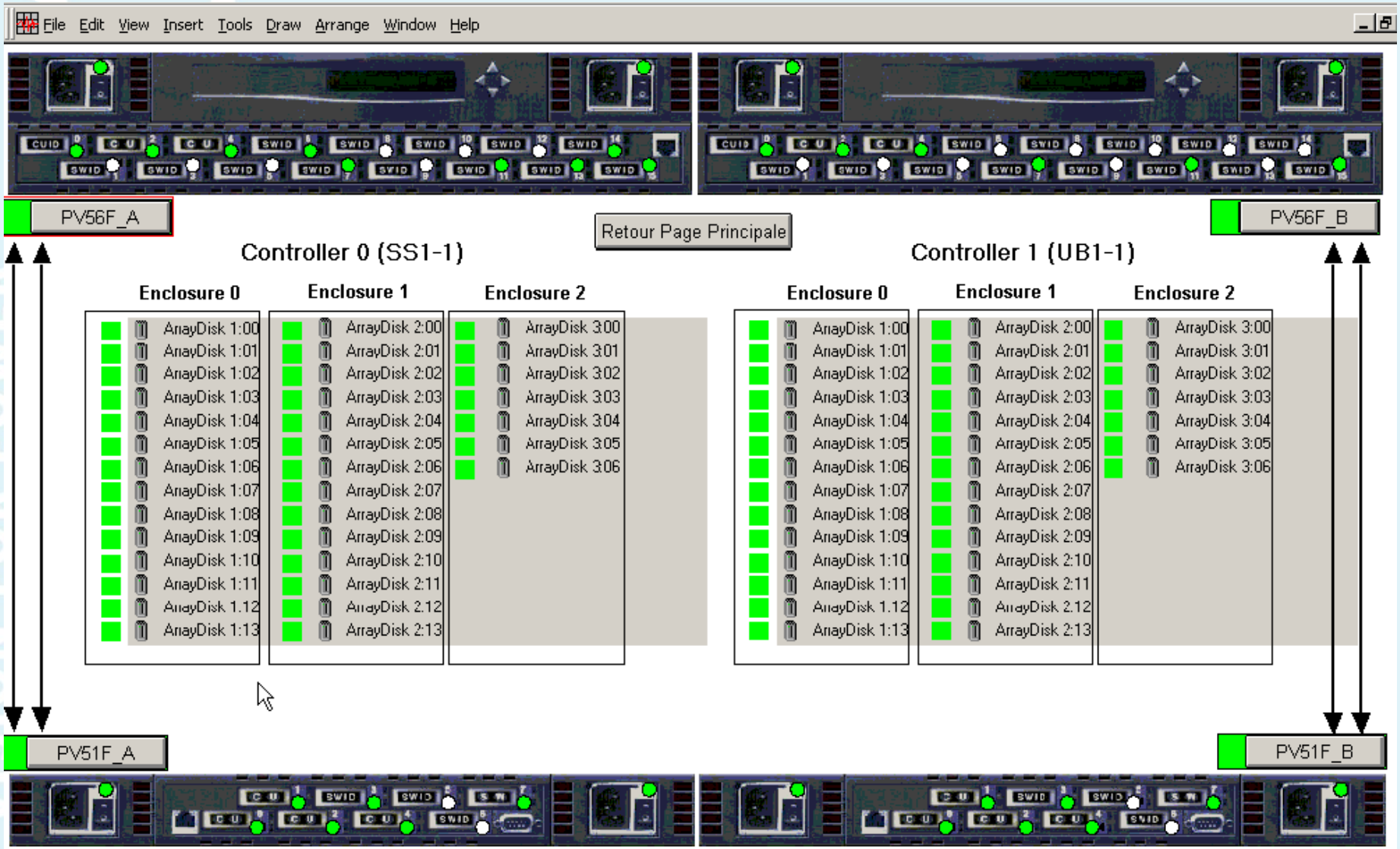
IT Monitor – Process book (Server)



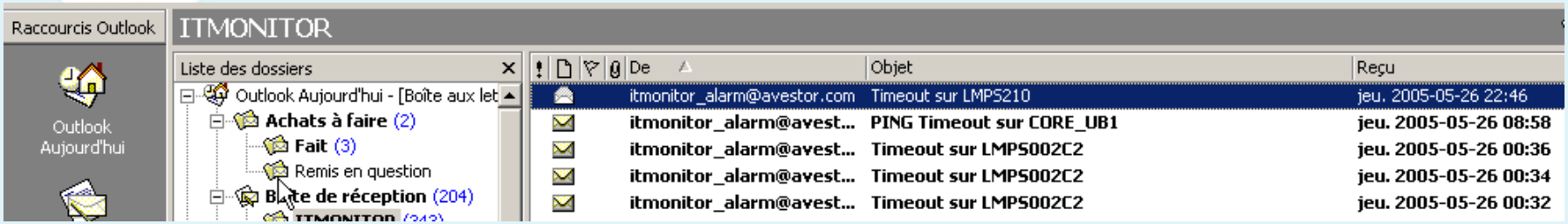
IT Monitor – Process book (Cisco VPN)

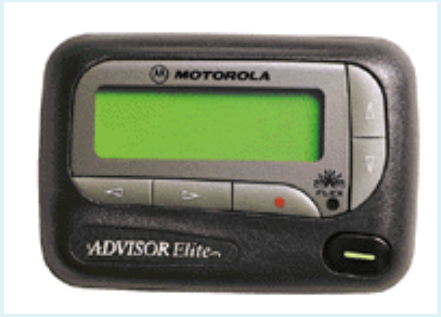


IT Monitor – Process book (San)



IT Monitor – ACE & Alerting





Conclusion & Next Steps

The success

- Alerted immediately on critical issues
- Process book to communicate the real-time status
- Historical data to verify our hypothesis and help pinpoint problems
- Anything can be monitored
- Problem detection with process book is part of the helpdesk's "Good morning routine"
- We have met the objective with more than 99.9% uptime!

Next step: Add more

- **More devices under the same monitoring**
  - Battery watching system
  - Process control network
  - Process control system (use of IDC)
  - Building automation (key to our production).
- **More points from already monitored devices.**
- **Evaluate WiredCity's solution**
  - SNMP Traps
  - Log reading
  - Templates
  - IDC

Next step: Add more

- Program an "alerting hierachy"
- Program alerting groups per types of event

More IT! More than IT!

Lessons Learned

- What to monitor is part of the implementation and learning process

IT Monitor IS VERY POWERFUL and FLEXIBLE to MANAGE ANY TYPE OF EQUIPMENT

success

- Have a solution ready to solve the events for which you are monitoring.

Questions & Answers

Robert J. Laurin, AVESTOR
rlaurin@avestor.com, (450) 645-2135
Michel Daigle, Hatch
mdaigle@hatch.ca, (514) 864-5558