




AVESTOR
A VISION FOR POWER

HATCH™

IT Monitor – monitoring for high availability

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Confidential

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 Yellowknife, NWT, Canada



Ranges from
-54 to 27 degrees C or
-65 to 81 degrees F

Yesterday in SF

Home | My Page | Health | Travel | Driving | Events | Recreation | Home & Ga
Allergies | Skin Protection | Air Quality | Aches & Pains | Cold & Flu | Fitness



weather.com


Local Weather

Home > Health > Allergies > Local PollenCast for San Francisco, CA

Yesterday Today Hour-by-Hour Weekend 10

San Francisco
[Save this Location](#)

On The Spot Weather


Fair

53°F
Feels Like 53°F

Updated Jun 7 11:45 a.m. PT

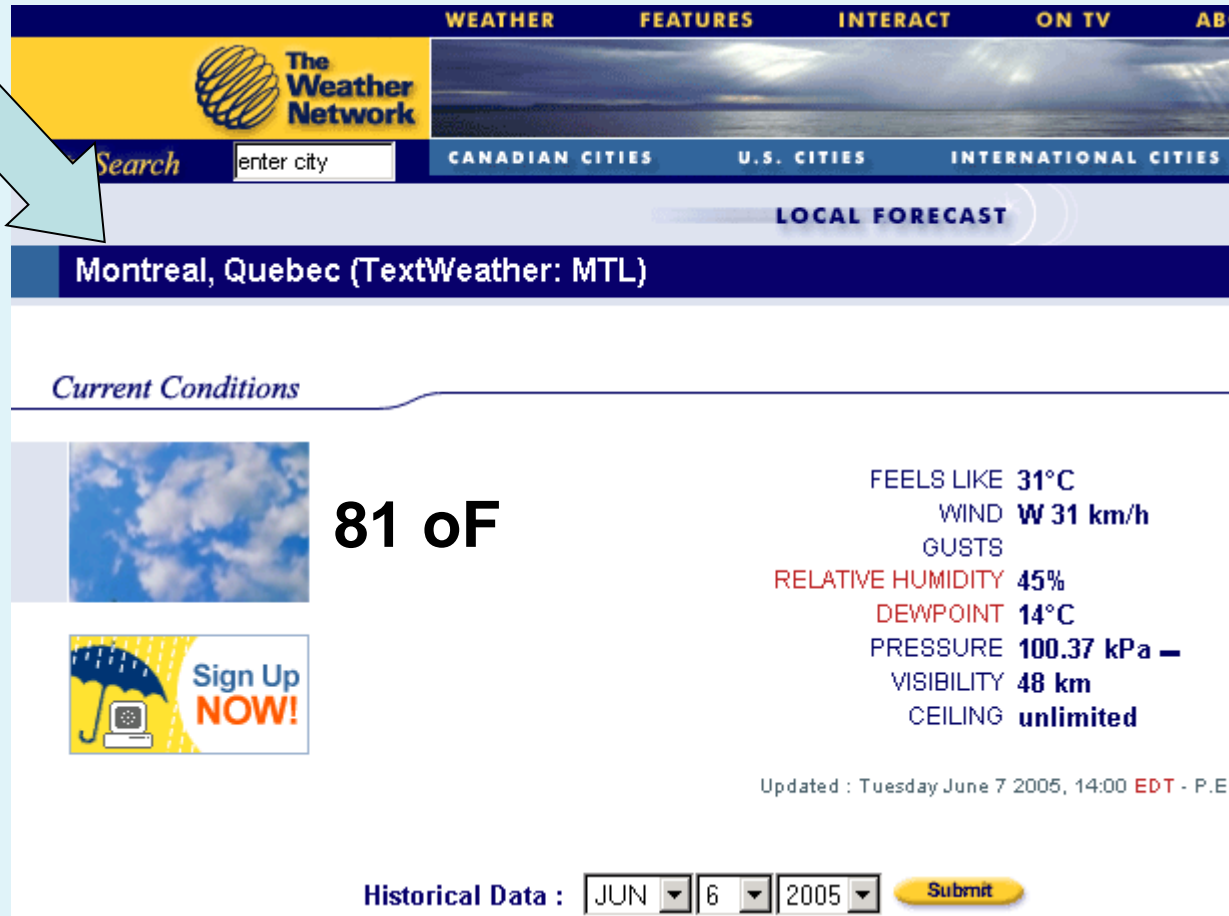
UV Index: 8 Very High
Wind: From WSW at 15 mph
Humidity: 80%
Pressure: 30.06 in. ↓
Dew Point: 47°F
Visibility: 10.0 miles

[NEW! 3x Faster Radar & No Ads](#)

Click the tabs for more info

► Sunlight Summary

Yesterday in Montreal



The screenshot shows the weather page for Montreal, Quebec (TextWeather: MTL). The page features a navigation bar with links for WEATHER, FEATURES, INTERACT, ON TV, and ABC. Below the navigation bar is a search bar with the placeholder text "enter city" and buttons for CANADIAN CITIES, U.S. CITIES, and INTERNATIONAL CITIES. The main content area displays the current conditions for Montreal, Quebec, with a temperature of 81°F. A large image of a cloudy sky is shown next to the temperature. To the right of the temperature, a list of weather metrics is provided: FEELS LIKE 31°C, WIND W 31 km/h, GUSTS, RELATIVE HUMIDITY 45%, DEWPOINT 14°C, PRESSURE 100.37 kPa, VISIBILITY 48 km, and CEILING unlimited. A "Sign Up NOW!" button is located below the temperature. At the bottom of the page, there is a "Historical Data" section with dropdown menus for the month (JUN), day (6), and year (2005), and a "Submit" button. The page is updated as of Tuesday, June 7, 2005, at 14:00 EDT - P.E.T.

WEATHER FEATURES INTERACT ON TV ABC


The Weather Network

Search enter city CANADIAN CITIES U.S. CITIES INTERNATIONAL CITIES


LOCAL FORECAST

Montreal, Quebec (TextWeather: MTL)

Current Conditions

 **81 °F**

FEELS LIKE 31°C
WIND W 31 km/h
GUSTS
RELATIVE HUMIDITY 45%
DEWPOINT 14°C
PRESSURE 100.37 kPa —
VISIBILITY 48 km
CEILING unlimited

 Sign Up NOW!

Updated : Tuesday June 7 2005, 14:00 EDT - P.E.T.

Historical Data : JUN 6 2005 Submit

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

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

AVESTOR Alpha LMP Plant



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Applications

Stationary



Telecommunications



Electric Utilities

Automotive



Other Stationary Markets



Signaling



Oil and Gas



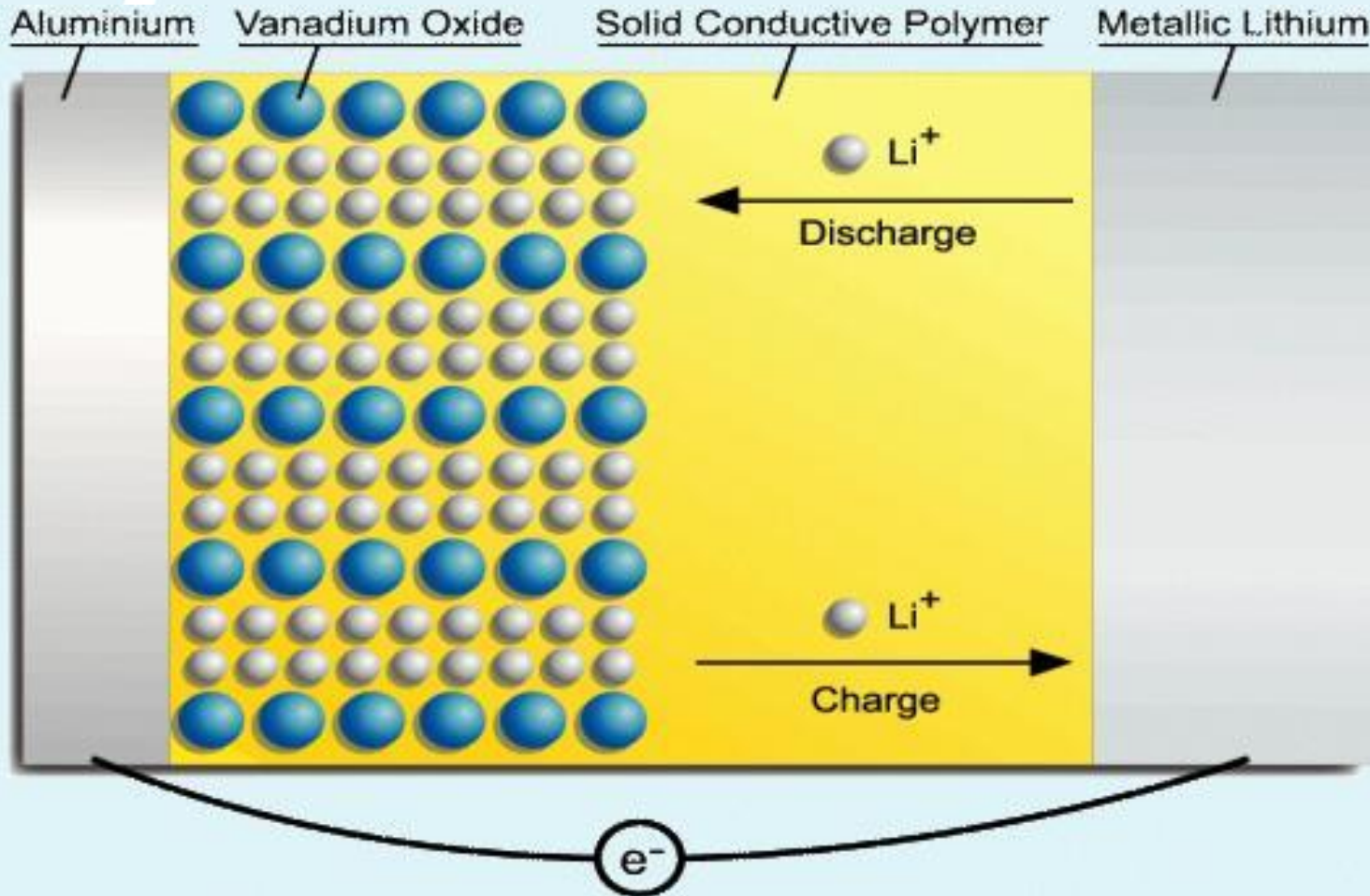
Renewable

Other Stationary Markets



Data Center Installation

LMP Electrochemistry



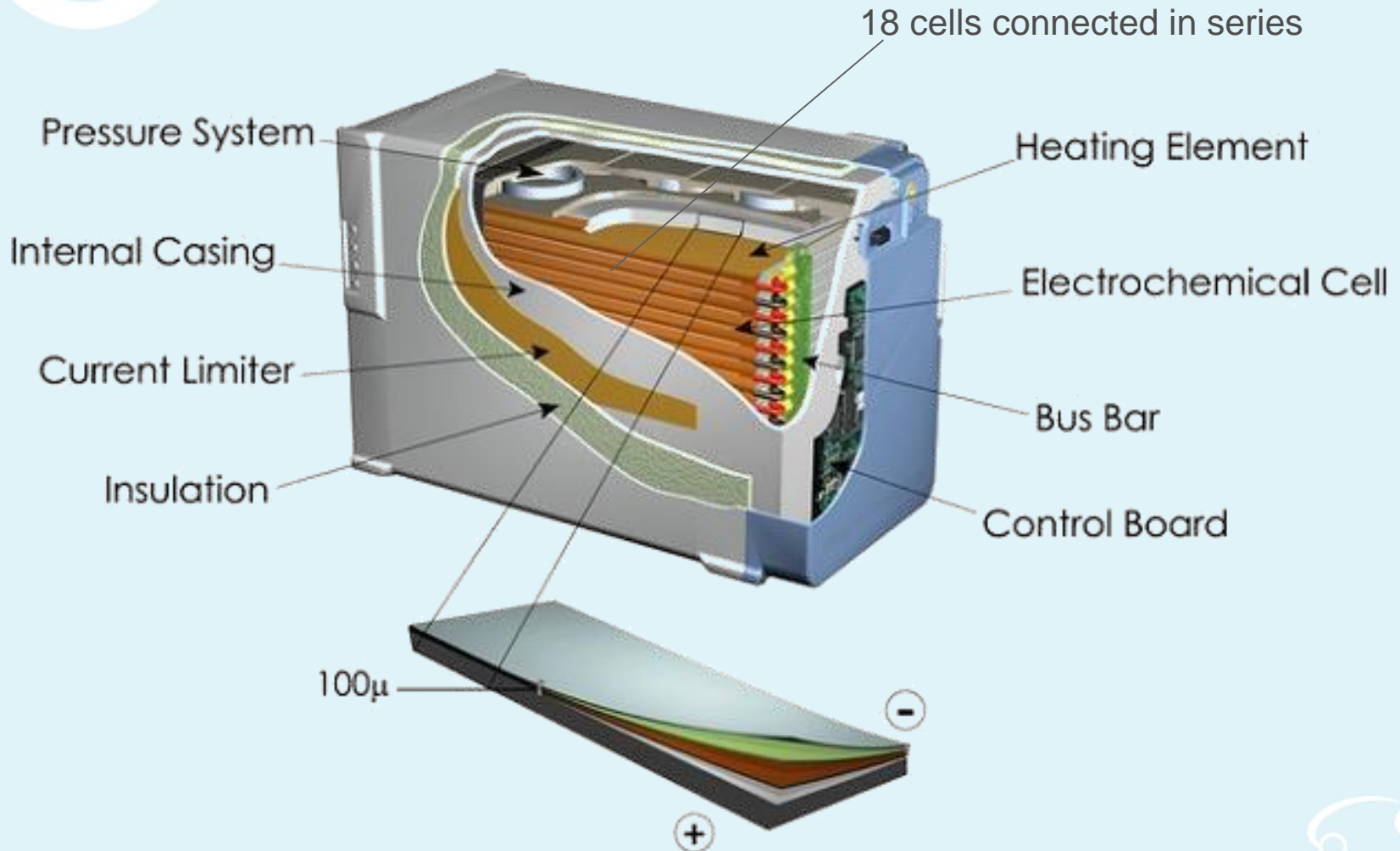
100 microns (0.004 inches)

Battery Specifications

Voltage:	48 Vcc
Capacity:	63 Ah (3 kWh)
Weight:	28 kg
Length:	400 mm
Width:	200 mm
Height:	272 mm



Battery Construction



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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

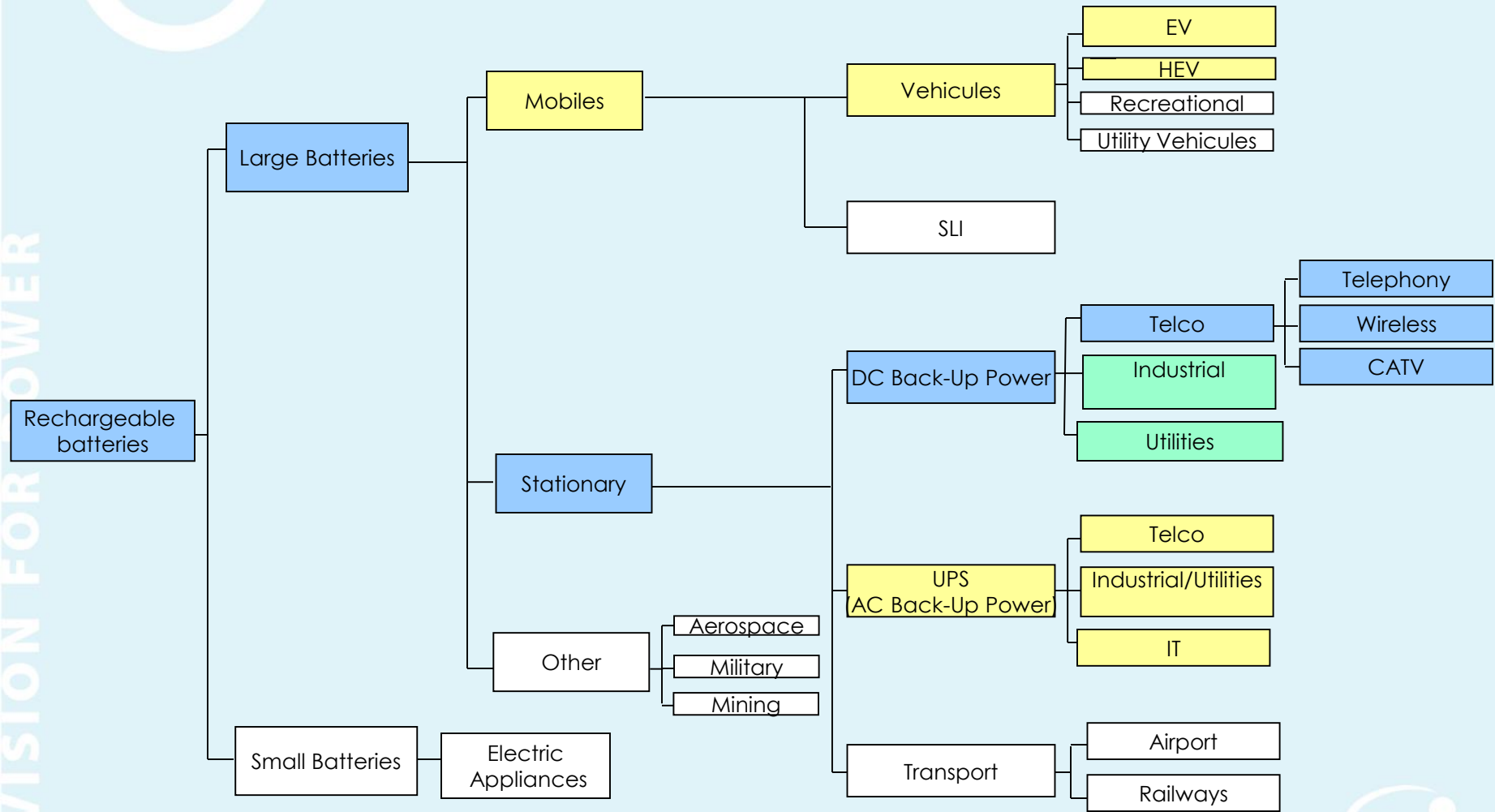
- Remote and local monitoring of battery parameters

Smart

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

Markets

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First markets targeted by AVESTOR ■
 Second markets targeted by AVESTOR ■
 Future markets targeted by AVESTOR ■



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

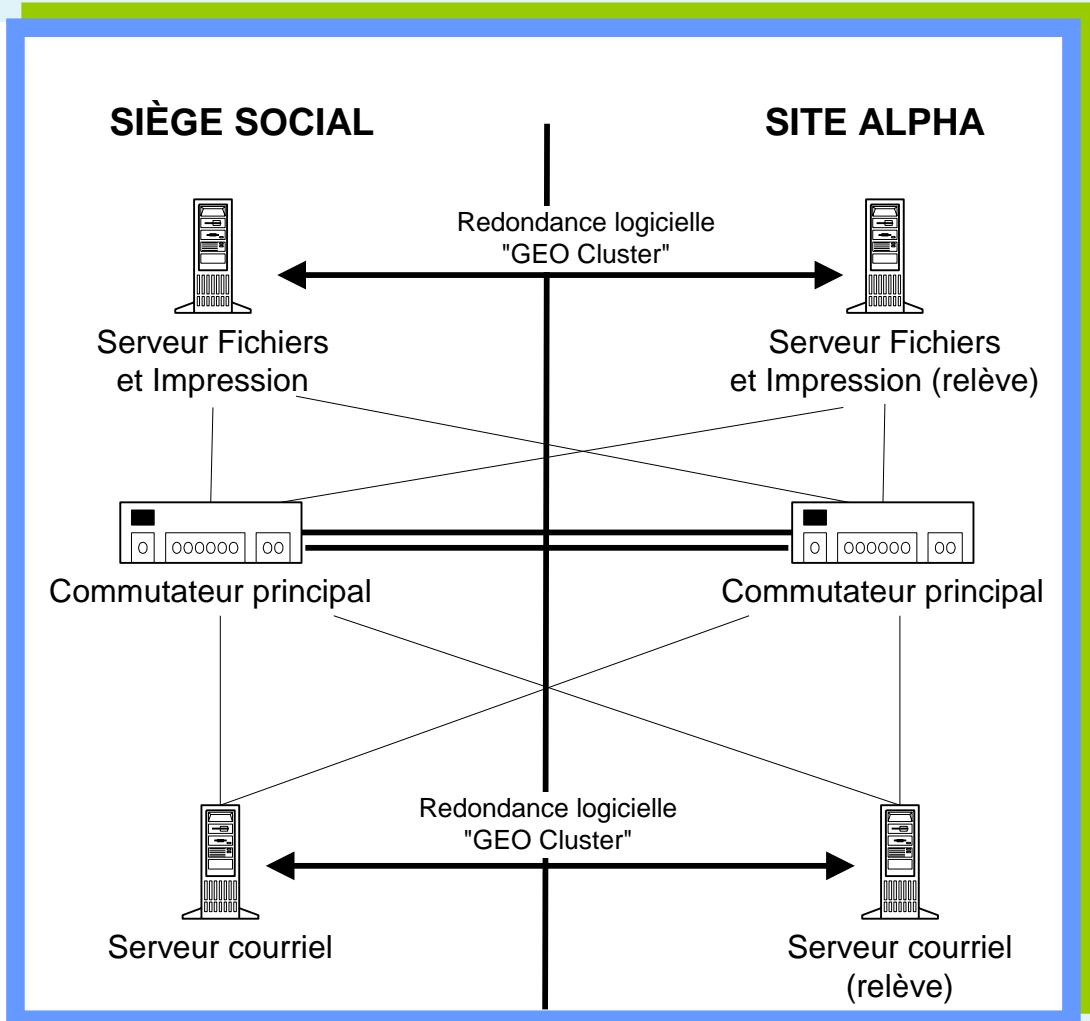
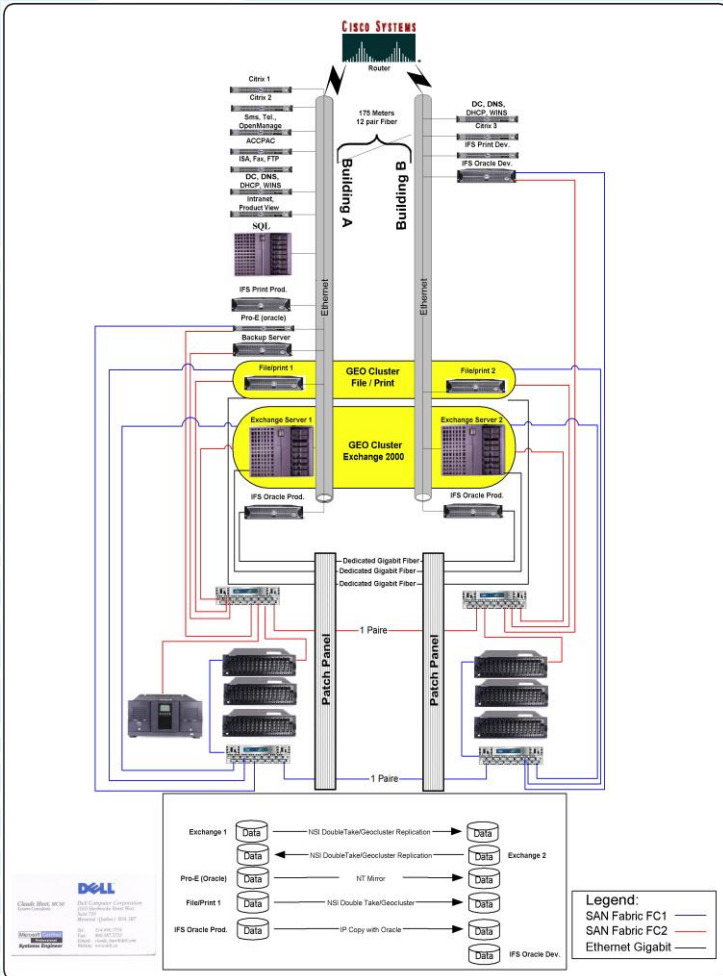


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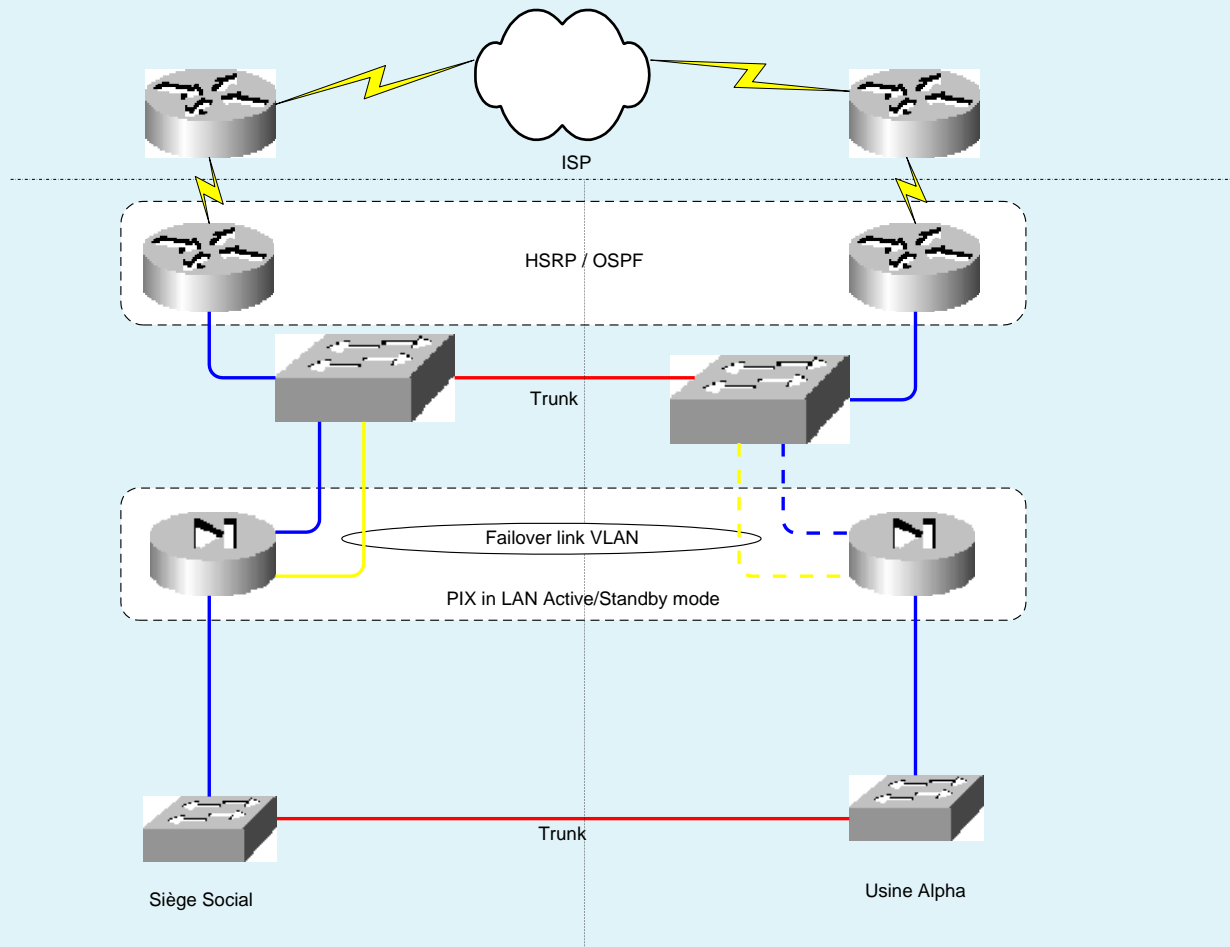
The Backup Computer room



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

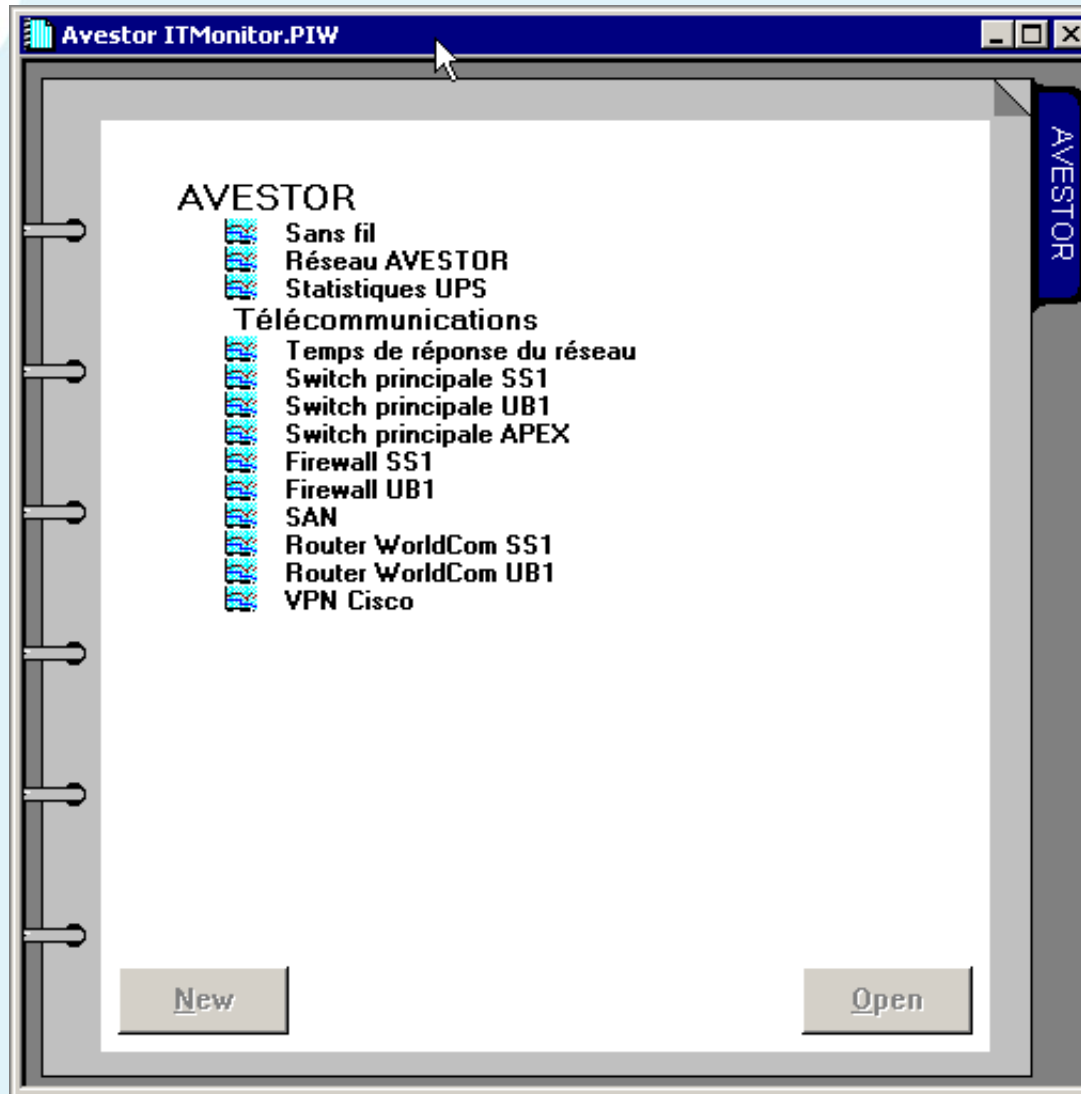
- Servers (in many aspects)
- Disks / San
- Telecommunication and equipments
- Mail (complete loop)
- Computer room (environmental)
- UPS
- Modems
- So much more...

IT Monitor

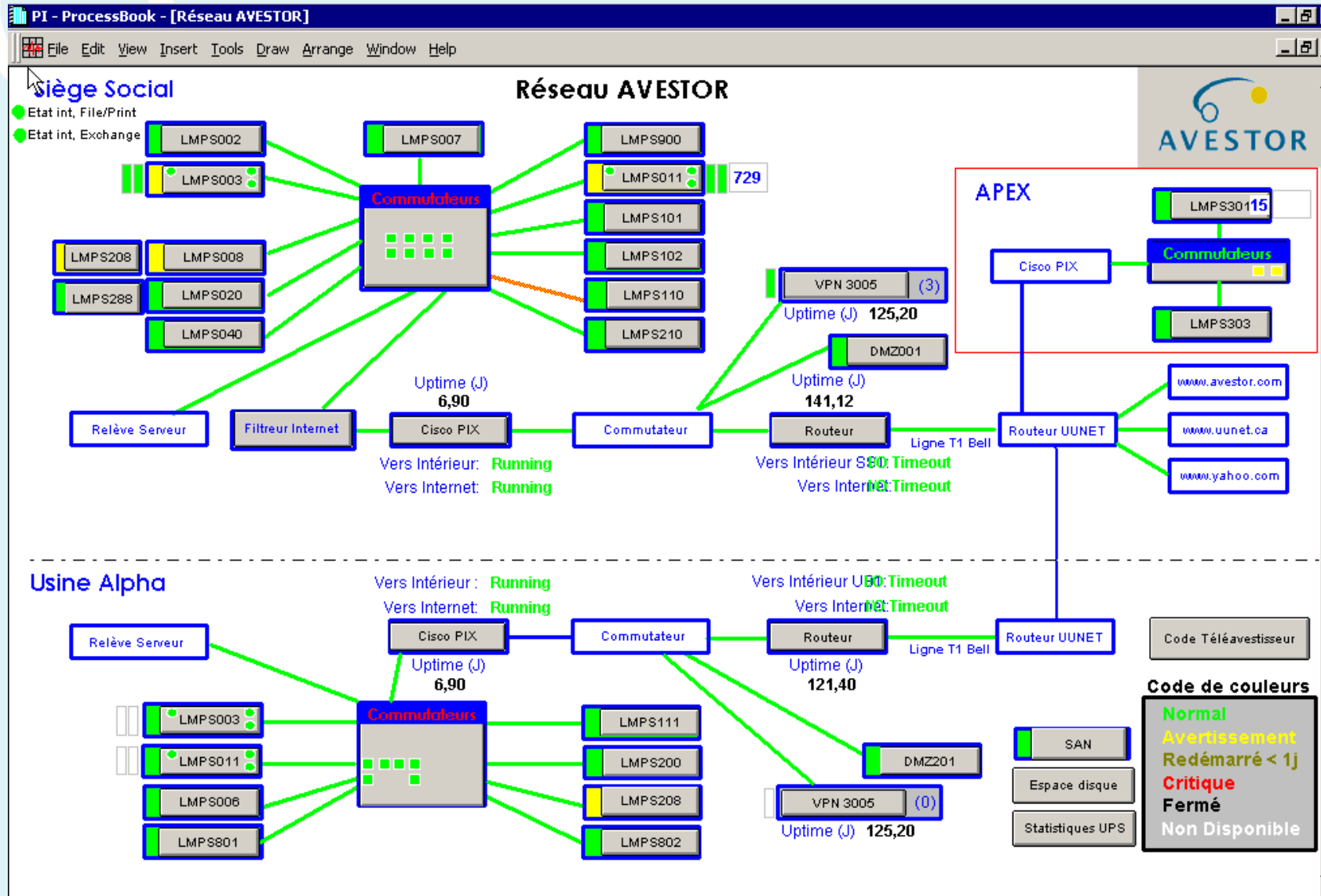
IT Monitor

- **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)

Retour Page Principale

Serveur LMPS007 Dell

SERVICE TAG : 97FDC11

Espace disque GigaOctets

	% Utilisé	Libre	Total
Total:		65,44	207,10
C:		33,44	69,95
E:		10,46	69,99

Status Dell Open Manage : OK

Power Supplies Status : Full

Status Dell Array Manager : Normal

Nombre de sessions: 4

Nombre de fichiers ouverts: 26

Nombre d'erreurs: 0

Nombre de sessions terminal: 0

Uptime (jours): 75,33

PING (ms): 0

Statistiques ITMonitor

Charge Réseau LMPS007

Bande passante - TEAM (Mbps): 1000

Bande passante - OTM (Mbps): I/O Timeout

Mémoire sur LMPS007

Processeurs sur LMPS007

Processus sur LMPS007

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IT Monitor – Process book (Cisco VPN)

File Edit View Insert Tools Draw Arrange Window Help

Retour Page Principale

VPN Cisco 3005

Sommaire des sessions

VPN SS1

Uptime (jours): 125,21	Active Lan-To-Lan : 0	Concurrent Sessions Limits: 100
PING (ms): 0	Active Remote Access : 3	Peek Concurrent Sessions: 13
Operational Status: master	Active Management : 1	Total Cumulative Sessions : 3486
	Total Active Sessions : 4	CPU Utilization (%) : ██████████

VPN ALPHA

Sommaire des sessions

Uptime (jours): 125,21	Active Lan-To-Lan : 0	Concurrent Sessions Limits: 200
PING (ms): 0	Active Remote Access : 0	Peek Concurrent Sessions: 3
Operational Status: backup	Active Management : 1	Total Cumulative Sessions : 4
	Total Active Sessions : 1	CPU Utilization (%) : ██████████

IT Monitor – Process book (San)

File Edit View Insert Tools Draw Arrange Window Help

PV56F_A

Retour Page Principale

PV56F_B

Controller 0 (SS1-1)

Controller 1 (UB1-1)

Enclosure 0 Enclosure 1 Enclosure 2

Enclosure 0 Enclosure 1 Enclosure 2

Enclosure 0 Enclosure 1 Enclosure 2

ArrayDisk 1:00 ArrayDisk 1:01 ArrayDisk 1:02 ArrayDisk 1:03 ArrayDisk 1:04 ArrayDisk 1:05 ArrayDisk 1:06 ArrayDisk 1:07 ArrayDisk 1:08 ArrayDisk 1:09 ArrayDisk 1:10 ArrayDisk 1:11 ArrayDisk 1:12 ArrayDisk 1:13

ArrayDisk 2:00 ArrayDisk 2:01 ArrayDisk 2:02 ArrayDisk 2:03 ArrayDisk 2:04 ArrayDisk 2:05 ArrayDisk 2:06 ArrayDisk 2:07 ArrayDisk 2:08 ArrayDisk 2:09 ArrayDisk 2:10 ArrayDisk 2:11 ArrayDisk 2:12 ArrayDisk 2:13

ArrayDisk 3:00 ArrayDisk 3:01 ArrayDisk 3:02 ArrayDisk 3:03 ArrayDisk 3:04 ArrayDisk 3:05 ArrayDisk 3:06

ArrayDisk 1:00 ArrayDisk 1:01 ArrayDisk 1:02 ArrayDisk 1:03 ArrayDisk 1:04 ArrayDisk 1:05 ArrayDisk 1:06 ArrayDisk 1:07 ArrayDisk 1:08 ArrayDisk 1:09 ArrayDisk 1:10 ArrayDisk 1:11 ArrayDisk 1:12 ArrayDisk 1:13

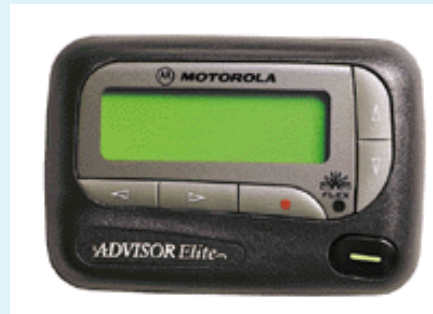
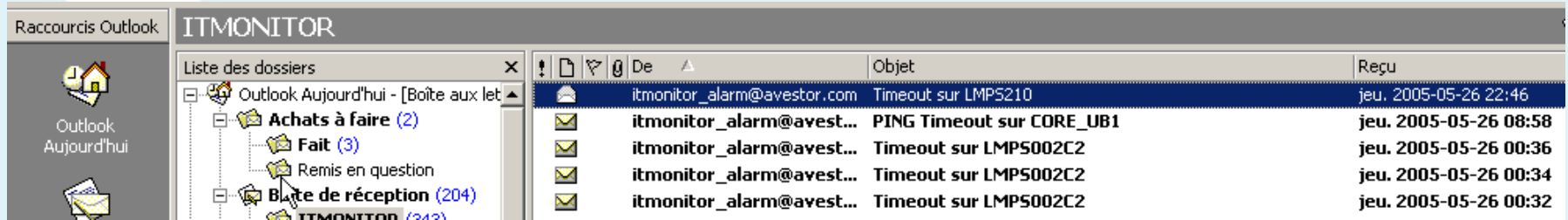
ArrayDisk 2:00 ArrayDisk 2:01 ArrayDisk 2:02 ArrayDisk 2:03 ArrayDisk 2:04 ArrayDisk 2:05 ArrayDisk 2:06 ArrayDisk 2:07 ArrayDisk 2:08 ArrayDisk 2:09 ArrayDisk 2:10 ArrayDisk 2:11 ArrayDisk 2:12 ArrayDisk 2:13

ArrayDisk 3:00 ArrayDisk 3:01 ArrayDisk 3:02 ArrayDisk 3:03 ArrayDisk 3:04 ArrayDisk 3:05 ArrayDisk 3:06

PV51F_A

PV51F_B

IT Monitor – ACE & Alerting



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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



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