

DISCOVERY

- 1) CENTRALIZED SERVER
- 2) COMPLETELY DISTRIBUTED
(FLOODING)
- 3) MIX (FLOODING + SERVERS)

→ DISCOVERY
OF RESOURCES
↓
PE to be RECRUITED for
PARALLEL COMPUTATION

→ IMPLEMENT
MASTER/WORKER
template

DISCOVERY

2

DESIGN PHASE

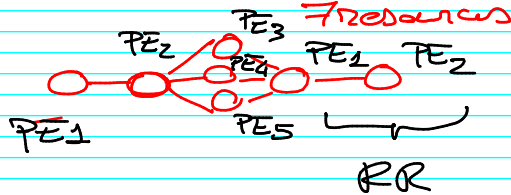
ALGORITHM → PAR PROGRAM

DEPLOY/RUN PHASE

PAR PROGRAM → HW



KUESLI



HW
←
5 PE

ZSL for

DISCOVERY

2) automatic discover. mpirunc -np X

1) Config. files host file (X-k resources)

(XML) (TXT)

TXT

<machine>

<ip> ...

</ip>

ip1 L ncores

<core> 2

</core>

ip2 L ncores

</machine>

2) automatic discovery p2p - like protocol

1) RTS \rightarrow PEs

\rightarrow thread / process
answering DISCOVERY MESSAGES

2) template supporting
parallel appl

pl1 : discovery p2p \rightarrow List of AVAILABLE PEs

pl2 : recruits
necessary resources \rightarrow part of (list)
is recruited

\downarrow runs the application

MUSKEL (JAVA)

VPE

small RTS is RUN

thread answering UDP on Port xxx

the "main" program : broadcasts msg
wait answers \rightarrow LIST OF PEs

per degree (N)

\rightarrow N PEs

\rightarrow start
full RTS

IMPLEMENT

4

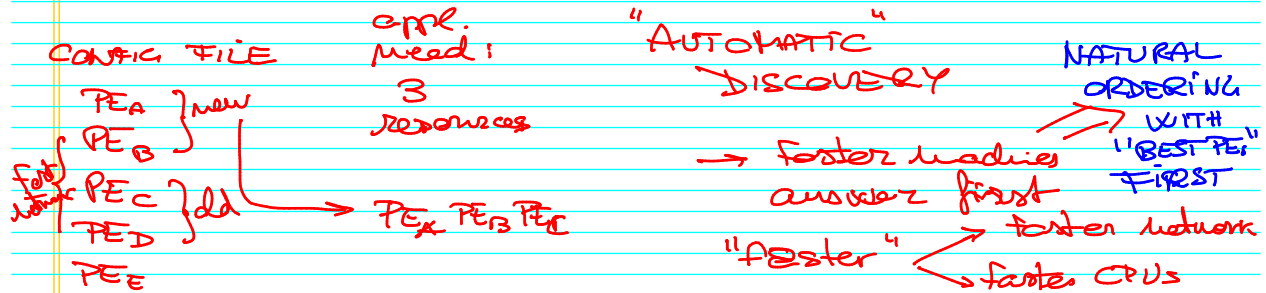
MASTER/WORKER TEMPLATE

1) RUN the "MASTER" ON PE_j

↑
we know
it is
available

2) the MASTER

- broadcasts (floods) discovery message
- builds the LIST of available PEs
- recruits the #NW workers



3rd SOLUTION

1) CONFIG FILE

2) DISCOVERY (P2P)

3) DISCOVERY
↳ to produce the CONFIG FILE

↓
RUN it in a loop
in back ground

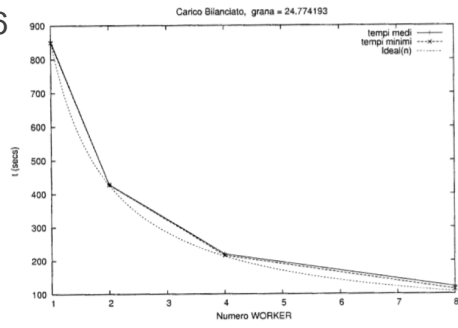
⇓
time update
CONFIG FILE

EXPERIMENT

SUN JXTA 1.x

Morici → MUSKEL
on top
of JXTA

6



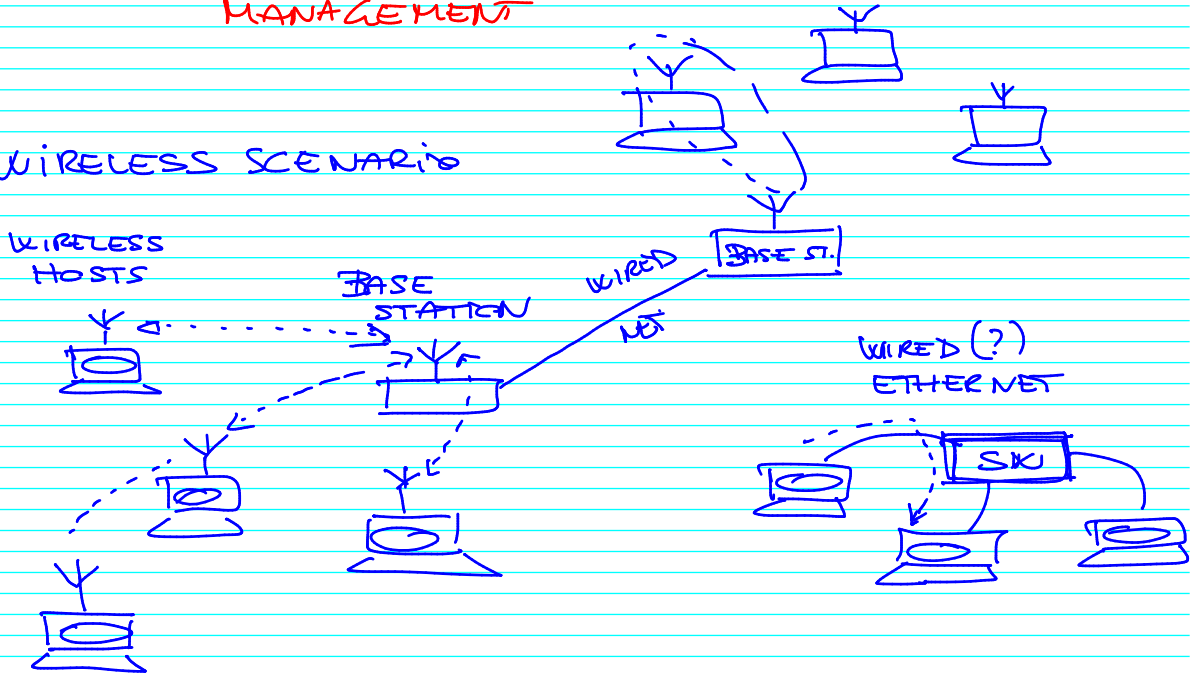
Performance MUSKEL/JXTA

WIRELESS NETWORKS

↳ MEETINGS

↳ EMERGENCY
MANAGEMENT

WIRELESS SCENARIO



" WIRELESS "

1) WiFi:

Range $\approx (10)$ meters

Bandwidth 100 Mbit
11-54 Mbits

Standards 802.11_g
m.

2) BLUETOOTH

802.15.1

Range $\approx (1)$ m

Bandwidth 1 Mbit/sec

3) WiMAX (outdoor)

11 Mbit/sec $\approx (1000)$ m

4) (enhanced) 3G phone networks

(UMTS / HSPA ...)

4-6 Mbit/sec $\approx (1000)$ m

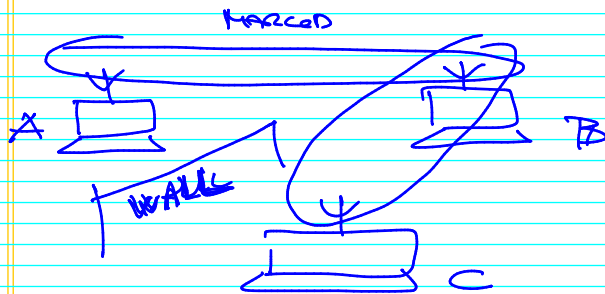
9 Two typical usages (Wifi)

1) INFRASTRUCTURE

2) "AD HOC"

1) Base Station "wired"

2) Hosts directly connected
- NO BASE STATION



SINGLE HOP MULTIPLE HOP
NETWORKS

↓
HOST ↔ BASE STATION

↓
HOST
↓
HOST
↓
BASE STATION

A & C DON'T
SEE EACH OTHER

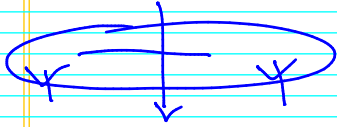
PROBLEMS (WIRELESS NETWORKS)

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1) SIGNAL DEGRADATION

"OPEN AIR" \approx NO DEGRADATION

(NOT TRUE BUT
TAKE IT AS
REF ϕ DEGRADATION)

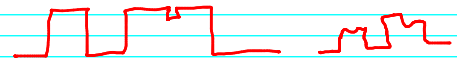


WALLS (CONCRETE
& IRON)

PAPER (BOOK
SHELF)

PERSONS

TRANSMIT RECEIVE



2) INTERFERENCES

CORDLESS PHONES
MICROWAVES OVEN



MALFUNCTIONING
→ DEGRADATION

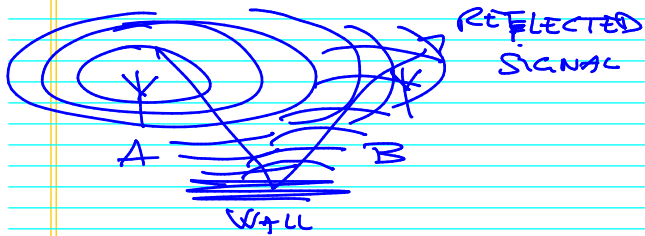
TRANSMIT

01101

RECEIVE

01001

31) MULTIPATH PROPAGATION



"FEATURES" OF SIGNALS

MEASURES: SNR
signal to noise ratio
↓
"the higher the better"

BER
bit error rate
increases when SNR decreases