handling node fadine in ochercarion protown. when do you need comeneus? -> You have a bunch of processes, and --(1) need to make some they deliner the same menages en the lame order. (your need them all to keep track of which prounes exed. You would need them all to keep a but of which brocenes exact. Andwhenerer onyone dres or leaves for whatever heaven, energous host has to get updated) (1) you need thom all to know which processes exerts and which are runing. Horas oud that (11) You want on brown to play a there are all clamic duringuals voll Condyon want destributed other process to know about 12). System wooblew. (iv) You want them to take turns getting mutually exclusive access and to some renounce. frey ma haw (v) They are all paroticipating names them to tramaction and you need committed/ ague en vohether it!
aborted.

hought in anything above employed _, Totally Ordered Broad Cord problem Calro called atomic broadeard (1) -> horoup membership hooblen Corfailme detection 1) (11) -> Leader detection brooken. (N) - Destributed mutual exclusive problem (1) -> Dutributer Tramachen commit problem. So, what aloes auther processes have in common? They all involve this bunch of processes trying to co-ordinate math one another.

and reach agreement about sometime. Thething they are trying to agree on can voroy But all of there are going to boil down to the consensus problem, Coshich to gotting a growth of provinces to co-ordinate.

M

CN

and agree on cometurg. Moter The thing that makes iconsensus horord and DS 10- Januts (cranhfaults & omanion faults which me one going to countain) Consensus > So, me have some procenes and me want And to make though sample, let's say that the thing that they are trying to agree on to get them agree. in just one bet Cozero or one. So, every provenes gets to have a Lay, and every processes gets to contribut one bet -> zero or one promising owned recens a pend was just bus course mocerni). comensu. and their decorron also ut from buch

The roll of the consensus is to make all procen agree on a Sergle be them ectus or comenn de la comen and indeed two notion of majority is going is emported Moter- You have to keep in mind is there con't Some external brocen that looks at there numbers and makes the choice. Rotner, it's Itherez fines procenes coming in methont any knowledge of what number the other ones probled that have to coordinate among thennelnes and reach a hound where they all agree and they have to do it in the presence of failine any asyuchrony.

Properties that algorithms try to satisfy in (1) Termination 1-Each correct process eventually decider a value. al come of brocenes agree on the (11) Agreement 1-(iii) validaty or Integraty or nontrivality the agreed when values month be one of the proposed values. We Said that connensus algorithm tryto earisty

But it terms out that no consenous algorithm actually does satisfy them all, especially on not or asynchronous network model.

Market Technology to general process and the

will gotte made no alley lighter and week

bud when you one boarding Pax on It to

something and had attended

- It is a cornersus algorithm sovented by "Leeke lamport'

-> Pares is a family of algorithm.

for now, we one just going to talk about

_ There are three roles that a Paxos can plays

Marion of Freehorer t beobare raines

o acceptor 1.1 - condribute to a de cerror.

From among the proposed

values.

o barners: - levon treagreed whom value.

Moter Infractive, a single process might can.

take multiple roles or over all of them.

but when you are learning Pax as it is

good to arrun that one process.

can take one rule at atome.

one thing that every node is to know that what is not in the "majoriti" of acceptor in. (egy 3 acceptors than majority is 2. So, all nodes need to know this in advance. For now, the protocal we are booking at is for decideng en a single value. G Bot, if you want to decide on a sequere to valuer then you have to run to the prostocal again. NO : 100 enter a anatorial of theory of montered and prosent hose of as ab of bord of front time for not, as conserve maderal to be tolled to contra rootspan popular porm of wester of

Let's look at an actual run of the algo. -let ! say there is one proponer -> P, majority -> 2 A, war A2 bee A 3 whom hip , 02 of the graded in ser hoseland pot and and western our o surge value. of samuel and should to want to to B al rest to me good was to a super se to the forest let 19 lay our properer, P, wants to propere a value.

Co, the prost thing it had to do so to send what's called as "Preficue memage" to acceptoss.

so, P, to going to send a meg prepar', and that meg to going to come along meth proposed number Mater The "proposal number" need to be unique (And if you had multiple proposers, you might entablish rules in advance, liberg one proponer can only one oddnumberd propheral hills.

and other propherer can only me even numbered propheral number) 19 1 1 1 1 2 comment empland of 2 to 19 That hasto be established in advance - And the proposal number has to be higher that than any of the proposal number that proposes has tried before. (90, it has to be able to stone the prophoral numbers it is used and make sure not to reuse them) go, proponent (P1) sends a prepare memage. utha proporal number. (lets say the proposal number is t) and P, is going to land it to may onity of acceptons.

(let's say it goes to A (& A2)

P. A. A. A. L. L. was as the proposed of the same of the same of the - soften not surveyed order must pay to my 5 19 2 supplies how to los shipping retrieved to some property and position of the sound to t Controlled to the property and the second of - when an acceptor gets à prepare merrage, It looks at that proporal number, and it does this Did I premounty promise to ignore requests with this properal number? If It did not son It no It now promues ther It ignore it to ignore my request that has a isdomina languard andher proporal number () as many and advod only proceed lower than that So, the Acceptors replices Properer unter a "Promine" msg Promue (5)

Now that the properer has received promine menages from a majority of acceptors, Hean now send what's called an "accept meg" to or majority of acceptors. (3) 300 00 m The Accept msg to going to have the Hotel. ' proposal number that was frommed and the lactual value that I, wants to E propose. Prepare (1) top w Roomin (t) head of soft mino a Accept (10) The value a house reached a with form bear 100 Mechany maganity of proportion though the menon has avail or anything teld-train 5.

A2 Preparets) Brief to see the start top will not on our (4) mmored promente) (and analysis) from the Accept (10) Accepted (Mio) Accept do rol So, the point when a majority of acceptors send then S'Accepted ? myly for a particular proposal no. 4 parsycular valu in fue hours when consensus is reached. pour Mossi conserve a reached there P/ knows that comemn a noched twhen majority reply acceptal knows here. · 1 lanours here

"So there is a difference by the moment at which consensus is reached and the moment at which energy body moment at consensus is reached"

Junds out that consensus is reached"