Name	CPU capa	Memory (	Additional N	Image Type	CP	Ne	Zon	Hour 1 (	Hour 2 (	Hour 3 (	Hour 4 (	Hour 5	Hour 6 (	CPU capacity	Memory capacity
NCHC cloud	16	32	ENT/IPOP	centos7/rocks-basic/rocks-sge	-	-	can	10,16	4,24	6,24	8,30	10,14	2,16	16	32
AIST Cloud	32	64	ENT/IPOP	centos7/rocks-basic/rocks-sge	-	-	can	32,64	30,62	24,54	22,44	0,0	2,8	32	64
Indiana University	16	64	IPOP	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	2,2	2,2	6,12	6,12	6,12	6,12	16	64
NAIST cloud	92	192	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	pan	92,192	92,192	92,192	28,56	28,56	92,192	92	192
TOS cloud	64	32	ENT/IPOP	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	16,32	16,32	16,32	16,32	6,10	6,10	64	32
TP cloud	32	64	IPOP	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	32,64	32,62	2,2	2,2	4,16	2,8	32	64
UCSD cloud	64	128	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	64,128	64,128	35,72	64,128	64,128	8,44	64	128
TW cloud	64	64	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	10,30	10,20	20,40	20,40	20,40	20,40	64	64
B1 cloud	32	32	ENT	centos7/rocks-basic/rocks-sge	-	-	can	4,16	4,16	2,2	2,2	4,16	2,8	32	32
CC cloud	128	64	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	64,32	64,32	64,32	64,40	64,40	64,32	128	64
								*available cpu,me							
Note															
This case is used as an example for the Interfaces page.								32							
CPU speed and network speed of muti-site are equal to the minimum values in all sites.															
Hour (x, y) x, y is CPU available, Memory available at that time.															
Zone shows the location of each site that is the same or not.															
Name of site, CPU, and Memory A self-defined example.															
If the search returns the least number of sites (ie, if the number of sites is equal to 2 The search will stop immediately, search for sites 3 and 4)															
CPU:2Mem (ex. cpu = 15 memory = 30)															
Case 1: user receives the expected results.															
Search for:															
No. of sites = Any, CPU=60, Mem=120, Additional Net=IPOP, Image=rocks-basic, Time begin=8:00, Time end=10:00, Duration=From begin to end															
Flow:															
1) Check for sites that match Additional Net = IPOP and Image = rocks-basic --> NCHC cloud,AIST Cloud,Indiana University cloud,TOS cloud,TP cloud															
2) Start with 2 sites: resource demand CPU=30, Mem=60 on each site															
3) Check for sites that has capacity for the resource demand -->AIST Cloud,TP cloud															
4) For each site, check available cpu,memory > demand during the time specified by the user (Hour1 to H															
5) Create combination as results															
Results:															
Sites	***CPU Need***	***Total CPU***	***Mem Neede***	***Total Mem Avail./Capacity***	***CP***	***Ne***	***Ado***	***Image T***	***Time Be***	***Time End***					
(AIST Cloud)&(TP	30:30	62/64	60:60	124/128	-	-	IPO	rocks-ba	8:00	10:00					

Name	ır 1 (8:00-9	2 (9:00-10:00)
AIST Cloud	32,64	30,62
TP cloud	32,64	32,62

Name	CPU capa	Memory (	Additional N	Image Type	CP	Ne	Zon	Hour 1 (	Hour 2 (	Hour 3 (	Hour 4 (	Hour 5	Hour 6 (	CPU capacity	Memory capacity
NCHC cloud	16	32	ENT/IPOP	centos7/rocks-basic/rocks-sge	-	-	can	10,16	4,24	6,24	8,30	10,14	2,16	16	32
AIST Cloud	32	64	ENT/IPOP	centos7/rocks-basic/rocks-sge	-	-	can	32,64	30,62	24,54	22,44	0,0	2,8	32	64
Indiana University	16	64	IPOP	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	2,2	2,2	6,12	6,12	6,12	6,12	16	64
NAIST cloud	92	192	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	pan	92,192	92,192	92,192	28,56	28,56	92,192	92	192
TOS cloud	64	32	ENT/IPOP	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	16,32	16,32	16,32	16,32	6,10	6,10	64	32
TP cloud	32	64	IPOP	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	32,64	32,62	2,2	2,2	4,16	2,8	32	64
UCSD cloud	64	128	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	64,128	64,128	35,72	64,128	64,128	8,44	64	128
TW cloud	64	64	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	10,30	10,20	20,40	20,40	20,40	20,40	64	64
B1 cloud	32	32	ENT	centos7/rocks-basic/rocks-sge	-	-	can	4,16	4,16	2,2	2,2	4,16	2,8	32	32
CC cloud	128	64	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	64,32	64,32	64,32	64,40	64,40	64,32	128	64

Case 2:

Search for:

No. of sites = 2, CPU=70, Mem=140, Additional Net=ENT, Image=rocks-sge, Time begin=8:00, Time end=13:00, Duration=3 hours

Flow:

1) Check for sites that match Additional Net = ENT and Image = rocks-sge--> NCHC cloud,AIST Cloud, NAIST cloud,TOS cloud,UCSD cloud,TW cloud,B1 cloud,CC cloud

2) Start with 2 sites: resource demand CPU=35, Mem=70 on each site

3) Check for sites that has capacity for the resource demand -->NAIST cloud,UCSD cloud

4.1) For each site, check available cpu,memory > demand during the time specified by the user (Hour1 to Hour3) ->NAIST cloud,UCSD cloud

4.2) For each site, check available cpu,memory > demand during the time specified by the user (Hour2 to Hour4) ->UCSD cloud

4.3) For each site, check available cpu,memory > demand during the time specified by the user (Hour3 toHour5) -> UCSD cloud

5) Create combination as results

Results:

Sites	***CPU Need***	***Total CPU***	***Mem Neede***	***Total Mem Avail./Capacity***	***CP***	***Ne***	***Add***	***Image T***	***Time Be***	***Time End***
(NAIST cloud)&(U	35:35	127/156	70:70	264/320	-	-	ENT	rocks-sg	8:00	11:00

Name	**ır 1 (8:00-9**	**2 (9:00-10**	**r 3 (10:00-11:00)**	**Hour 2 (9:0**	**0:0**	**11:00-12:00)**	**Hour 3 (10:00-**	**(11:00-**	**5 (12:00-13:00)**
NAIST cloud	92,192	92,192	92,192	2,19	2,19	28,56	92,192	28,56	28,56
UCSD cloud	64,128	64,128	35,72	4,12	5,74	4,12	35,72	64,128	64,128

Note: In the case that we found many combinations with 2 sites, all results will be shown to users.

For example, if NAIST+UCSD have sufficient resources from Hour1 to Hour 5, three results will be shown: NAIST+UCSD (Hour1 to Hour3), NAIST+UCSD (Hour2 to Hour4), NAIST+UCSD (Hour3 to Hour5)

Case 3: The system tries to show the results by changing the search rule from the 50/50 rule t

Search for:

No. of sites = Any, CPU=80, Mem=160, Additional Net=None, Image=centos7, Time begin=11:00, Time end=13:00, Duration=From begin to end

Flow:

Name	CPU capa	Memory	Additional N	Image Type	CP	Ne	Zon	Hour 1 (	Hour 2 (	Hour 3 (	Hour 4 (	Hour 5	Hour 6 (	CPU capacity	Memory capacity
NCHC cloud	16	32	ENT/IPOP	centos7/rocks-basic/rocks-sge	-	-	can	10,16	4,24	6,24	8,30	10,14	2,16	16	32
AIST Cloud	32	64	ENT/IPOP	centos7/rocks-basic/rocks-sge	-	-	can	32,64	30,62	24,54	22,44	0,0	2,8	32	64
Indiana University	16	64	IPOP	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	2,2	2,2	6,12	6,12	6,12	6,12	16	64
NAIST cloud	92	192	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	pan	92,192	92,192	92,192	28,56	28,56	92,192	92	192
TOS cloud	64	32	ENT/IPOP	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	16,32	16,32	16,32	16,32	6,10	6,10	64	32
TP cloud	32	64	IPOP	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	32,64	32,62	2,2	2,2	4,16	2,8	32	64
UCSD cloud	64	128	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	64,128	64,128	35,72	64,128	64,128	8,44	64	128
TW cloud	64	64	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	10,30	10,20	20,40	20,40	20,40	20,40	64	64
B1 cloud	32	32	ENT	centos7/rocks-basic/rocks-sge	-	-	can	4,16	4,16	2,2	2,2	4,16	2,8	32	32
CC cloud	128	64	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	64,32	64,32	64,32	64,40	64,40	64,32	128	64

1) Check for sites that match Additional Net = None and Image = centos7-->NCHC cloud,AIST Cloud,Indiana University cloud,NAIST cloud,TOS cloud,TP cloud,UCSD cloud,TW cloud,B1 cloud,CC cloud

2) Start with 2 sites: resource demand CPU=40, Mem=80 on each site

3) Check for sites that has capacity for the resource demand -->NAIST cloud,UCSD cloud

4) For each site, check available cpu,memory > demand during the time specified by the user (Hour4 and

5) Create combination as results ->No results if No. of sites = 2

Name	Hour 4 (11	Hour 5 (12:00-13:00)
NAIST cloud	28,56	28,56
UCSD cloud	64,128	64,128

6)The system tries to recalculate from 50/50 to 80/20 using the CPU. Maximum Memory in Results

7) from 6) resource demand CPU=64 (80% of 80), Mem=128 (80% of 160) on each site

8) from 6) resource demand CPU=16 (20% of 80), Mem=32 (20% of 160) on each site

9) from 7) Check for sites that has capacity for the resource demand -->NAIST cloud,UCSD cloud

9.1) For each site, check available 80% of cpu,80% of memory > demand during the time specified by the

Name	Hour 4 (11	Hour 5 (12:00-13:00)
NAIST cloud	28,56	28,56
UCSD cloud	64,128	64,128

10) from 8) Check for sites that has capacity for the resource demand -->NCHC cloud,AIST Cloud,Indian

10.1) For each site, check available 20% of cpu,20% of memory > demand during the time specified by t

Name	Hour 4 (11	Hour 5 (12:00-13:00)
NCHC cloud	8,30	10,14
AIST Cloud	22,44	0,0
Indiana University	6,12	6,12
NAIST cloud	28,56	28,56
TOS cloud	16,32	6,10
TP cloud	2,2	4,16

Name	CPU capa	Memory (	Additional N	Image Type	CP	Ne	Zon	Hour 1 (	Hour 2 (	Hour 3 (	Hour 4 (	Hour 5	Hour 6 (	CPU capacity	Memory capacity
NCHC cloud	16	32	ENT/IPOP	centos7/rocks-basic/rocks-sge	-	-	can	10,16	4,24	6,24	8,30	10,14	2,16	16	32
AIST Cloud	32	64	ENT/IPOP	centos7/rocks-basic/rocks-sge	-	-	can	32,64	30,62	24,54	22,44	0,0	2,8	32	64
Indiana University	16	64	IPOP	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	2,2	2,2	6,12	6,12	6,12	6,12	16	64
NAIST cloud	92	192	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	pan	92,192	92,192	92,192	28,56	28,56	92,192	92	192
TOS cloud	64	32	ENT/IPOP	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	16,32	16,32	16,32	16,32	6,10	6,10	64	32
TP cloud	32	64	IPOP	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	32,64	32,62	2,2	2,2	4,16	2,8	32	64
UCSD cloud	64	128	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	64,128	64,128	35,72	64,128	64,128	8,44	64	128
TW cloud	64	64	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	10,30	10,20	20,40	20,40	20,40	20,40	64	64
B1 cloud	32	32	ENT	centos7/rocks-basic/rocks-sge	-	-	can	4,16	4,16	2,2	2,2	4,16	2,8	32	32
CC cloud	128	64	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	64,32	64,32	64,32	64,40	64,40	64,32	128	64
UCSD cloud	64,128	64,128													
TW cloud	20,40	20,40													
B1 cloud	2,2	4,16													
CC cloud	64,40	64,40													

11) Create combination as results from 9.1) and 10.1)

Results:

Sites	*CPU Need*	*Total CPU*	*Mem Neede*	*Total Mem Avail./Capacity*	*CP*	*Ne*	*Adc*	*Image T*	*Time Be*	*Time End*
(UCSD cloud)&(N	64:16	92/156	128:32	184/320	-	-	one	centos7	11:00	13:00
(UCSD cloud)&(T	64:16	84/128	128:32	168/192	-	-	one	centos7	11:00	13:00
(UCSD cloud)&(C	64:16	128/192	128:32	168/192	-	-	one	centos7	11:00	13:00

Case 4: The system tries to show the results by changing the search rule from the 50/50 rule to Puttir

Search for:

No. of sites = 2, CPU=150, Mem=300, Additional Net=ENT, Image=hku_biolinux, Time begin=8:00, Time en

Flow:

1) Check for sites that match Additional Net = ENT and Image = hku_biolinux-->NAIST cloud,TOS cloud,UCSD cloud,TW
2) Start with 2 sites: resource demand CPU=75, Mem=150 on each site
3) Check for sites that has capacity for the resource demand -->NAIST cloud
4) For each site, check available cpu,memory > demand during the time specified by the user (Hour1 to H
5) Create combination as results ->No results if No. of sites = 2 (in rule 50/50)
6)The system tries to find the site with the most resources left over from all. ->NAIST cloud
7)The system uses all the resources of the NAIST cloud and then selects the rest to reduce the size of the resource.
8)NAIST useCPU = 92 and Memory = 184
9)NAIST cloud CPU Using resources to shrink the remaining needs 150-92 = 58 and CPU Using resources to shrink the remaining needs 300-184 = 116
10)The required resources are left to CPU = 58, Memory = 116 to be searched.
11) Start with CPU = 58 and memory = 116 Check for sites that has capacity for the resource demand -->UCSD cloud
12)For each site, check available cpu,memory > demand during the time specified by the user (Hour1 to Hour2) ->UCSD cloud

Name	CPU capa	Memory (	Additional N	Image Type	CP	Ne	Zon	Hour 1 (	Hour 2 (	Hour 3 (	Hour 4 (	Hour 5	Hour 6 (	CPU capacity	Memory capacity
NCHC cloud	16	32	ENT/IPOP	centos7/rocks-basic/rocks-sge	-	-	can	10,16	4,24	6,24	8,30	10,14	2,16	16	32
AIST Cloud	32	64	ENT/IPOP	centos7/rocks-basic/rocks-sge	-	-	can	32,64	30,62	24,54	22,44	0,0	2,8	32	64
Indiana University	16	64	IPOP	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	2,2	2,2	6,12	6,12	6,12	6,12	16	64
NAIST cloud	92	192	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	pan	92,192	92,192	92,192	28,56	28,56	92,192	92	192
TOS cloud	64	32	ENT/IPOP	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	16,32	16,32	16,32	16,32	6,10	6,10	64	32
TP cloud	32	64	IPOP	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	32,64	32,62	2,2	2,2	4,16	2,8	32	64
UCSD cloud	64	128	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	64,128	64,128	35,72	64,128	64,128	8,44	64	128
TW cloud	64	64	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	10,30	10,20	20,40	20,40	20,40	20,40	64	64
B1 cloud	32	32	ENT	centos7/rocks-basic/rocks-sge	-	-	can	4,16	4,16	2,2	2,2	4,16	2,8	32	32
CC cloud	128	64	ENT	centos7/hku_biolinux/rocks-basic/rocks-sge	-	-	can	64,32	64,32	64,32	64,40	64,40	64,32	128	64

13) It get NAIST combine with NAIST cloud and UCSD cloud

Result:

Sites	*CPU Need*	*Total CPU*	*Mem Neede*	*Total Mem Avail./Capacity*	*CP*	*Ne*	*Adc*	*Image T*	*Time Be*	*Time End*
(NAIST cloud)&(U	92:58	156/156	184:116	320/320	-	-	ENT	_biolinux	8:00	10:00

Name	Hour 1 (8:	Hour 2 (9:00-10:00)
NAIST cloud	92,192	92,192
UCSD cloud	64,128	64,128